



**ROBO Cylinder  
RCP6W/RCP6SW Actuator  
Rod Type  
Instruction Manual**

**First edition**

Dust-proof/splash-proof  
specification

Motor Straight Type:  
Side-Mounted Motor Type:

RA4C, RA6C, RA7C, RA8C  
RA4R, RA6R, RA7R, RA8R



## **Please Read Before Use**

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, among others, providing the information you need to know to use the product safely.

Before using the product, be sure to read this manual and fully understand the contents explained herein to ensure safe use of the product.

The DVD that comes with the product contains instruction manuals for IAI products. When using the product, refer to the necessary portions of the applicable instruction manual by printing them out or displaying them on a PC.

After reading the instruction manual, keep it in a convenient place so that whoever is handling this product can reference it quickly when necessary.

### **[Important]**

- This instruction manual is original.
- This product is not to be used for any other purpose from what is noted in this instruction manual. IAI shall not be liable whatsoever for any loss or damage arising from the result of using the product for any other purpose from what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of production improvement.
- If you have any question or finding regarding the information contained in this instruction manual, contact our customer center or our sales office near you.
- Using or copying all or a 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.

Description of RCP6SW controller unit is not included in this instruction manual.

With regard to RCP6SW controller unit, refer to the separate instruction manual.

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## Safety Guide

“Safety Guide” has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it before the operation of this product.

### Safety Precautions for Our Products

The common safety precautions for the use of any of our robots in each operation.

No.	Operation Description	Description
1	Model Selection	<ul style="list-style-type: none"> <li>• This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications.               <ol style="list-style-type: none"> <li>1) Medical equipment used to maintain, control or otherwise affect human life or physical health.</li> <li>2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility)</li> <li>3) Important safety parts of machinery (Safety device, etc.)</li> </ol> </li> <li>• Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product.</li> <li>• Do not use it in any of the following environments.               <ol style="list-style-type: none"> <li>1) Location where there is any inflammable gas, inflammable object or explosive</li> <li>2) Place with potential exposure to radiation</li> <li>3) Location with the ambient temperature or relative humidity exceeding the specification range</li> <li>4) Location where radiant heat is added from direct sunlight or other large heat source</li> <li>5) Location where condensation occurs due to abrupt temperature changes</li> <li>6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid)</li> <li>7) Location exposed to significant amount of dust, salt or iron powder</li> <li>8) Location subject to direct vibration or impact</li> </ol> </li> <li>• For an actuator used in vertical orientation, select a model which is equipped with a brake. If selecting a model with no brake, the moving part may drop when the power is turned OFF and may cause an accident such as an injury or damage on the work piece.</li> </ul>

No.	Operation Description	Description
2	Transportation	<ul style="list-style-type: none"> <li>● When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane.</li> <li>● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers.</li> <li>● When in transportation, consider well about the positions to hold, weight and weight balance and pay special attention to the carried object so it would not get hit or dropped.</li> <li>● Transport it using an appropriate transportation measure. The actuators available for transportation with a crane have eyebolts attached or there are tapped holes to attach bolts. Follow the instructions in the instruction manual for each model.</li> <li>● Do not step or sit on the package.</li> <li>● Do not put any heavy thing that can deform the package, on it.</li> <li>● When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work.</li> <li>● When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit.</li> <li>● Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength.</li> <li>● Do not get on the load that is hung on a crane.</li> <li>● Do not leave a load hung up with a crane.</li> <li>● Do not stand under the load that is hung up with a crane.</li> </ul>
3	Storage and Preservation	<ul style="list-style-type: none"> <li>● The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation.</li> <li>● Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.</li> </ul>
4	Installation and Start	<p>(1) Installation of Robot Main Body and Controller, etc.</p> <ul style="list-style-type: none"> <li>● Make sure to securely hold and fix the product (including the work part). A fall, drop or abnormal motion of the product may cause a damage or injury. Also, be equipped for a fall-over or drop due to an act of God such as earthquake.</li> <li>● Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life.</li> <li>● When using the product in any of the places specified below, provide a sufficient shield.             <ol style="list-style-type: none"> <li>1) Location where electric noise is generated</li> <li>2) Location where high electrical or magnetic field is present</li> <li>3) Location with the mains or power lines passing nearby</li> <li>4) Location where the product may come in contact with water, oil or chemical droplets</li> </ol> </li> </ul>

No.	Operation Description	Description
4	Installation and Start	<p>(2) Cable Wiring</p> <ul style="list-style-type: none"> <li>● Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool.</li> <li>● Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error.</li> <li>● Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error.</li> <li>● When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction.</li> <li>● Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product.</li> <li>● Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire.</li> </ul> <p>(3) Grounding</p> <ul style="list-style-type: none"> <li>● The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation.</li> <li>● For the ground terminal on the AC power cable of the controller and the grounding plate in the control panel, make sure to use a twisted pair cable with wire thickness 0.5mm<sup>2</sup> (AWG20 or equivalent) or more for grounding work. For security grounding, it is necessary to select an appropriate wire thickness suitable for the load. Perform wiring that satisfies the specifications (electrical equipment technical standards).</li> <li>● Perform Class D Grounding (former Class 3 Grounding with ground resistance 100Ω or below).</li> </ul>





No.	Operation Description	Description
4	Installation and Start	<p>(4) Safety Measures</p> <ul style="list-style-type: none"> <li>● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers.</li> <li>● When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot's movable range. When the robot under operation is touched, it may result in death or serious injury.</li> <li>● Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation.</li> <li>● Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product.</li> <li>● Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input.</li> <li>● When the installation or adjustment operation is to be performed, give clear warnings such as "Under Operation; Do not turn ON the power!" etc. Sudden power input may cause an electric shock or injury.</li> <li>● Take the measure so that the work part is not dropped in power failure or emergency stop.</li> <li>● Wear protection gloves, goggle or safety shoes, as necessary, to secure safety.</li> <li>● Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire.</li> <li>● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.</li> </ul>
5	Teaching	<ul style="list-style-type: none"> <li>● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers.</li> <li>● Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well.</li> <li>● When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency.</li> <li>● When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly.</li> <li>● Place a sign "Under Operation" at the position easy to see.</li> <li>● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.</li> </ul> <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>

No.	Operation Description	Description
6	Trial Operation	<ul style="list-style-type: none"> <li>● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers.</li> <li>● After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation.</li> <li>● When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation.</li> <li>● Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc.</li> <li>● Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.</li> </ul>
7	Automatic Operation	<ul style="list-style-type: none"> <li>● Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence.</li> <li>● Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication.</li> <li>● Make sure to operate automatic operation start from outside of the safety protection fence.</li> <li>● In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product.</li> <li>● When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.</li> </ul>

No.	Operation Description	Description
8	Maintenance and Inspection	<ul style="list-style-type: none"> <li>● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers.</li> <li>● Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well.</li> <li>● When the work is to be performed inside the safety protection fence, basically turn OFF the power switch.</li> <li>● When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency.</li> <li>● When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly.</li> <li>● Place a sign “Under Operation” at the position easy to see.</li> <li>● For the grease for the guide or ball screw, use appropriate grease according to the instruction manual for each model.</li> <li>● Do not perform the dielectric strength test. Failure to do so may result in a damage to the product.</li> <li>● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.</li> <li>● The slider or rod may get misaligned OFF the stop position if the servo is turned OFF. Be careful not to get injured or damaged due to an unnecessary operation.</li> <li>● Pay attention not to lose the cover or untightened screws, and make sure to put the product back to the original condition after maintenance and inspection works. Use in incomplete condition may cause damage to the product or an injury.</li> </ul> <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>
9	Modification and Dismantle	<ul style="list-style-type: none"> <li>● Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.</li> </ul>
10	Disposal	<ul style="list-style-type: none"> <li>● When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste.</li> <li>● When removing the actuator for disposal, pay attention to drop of components when detaching screws.</li> <li>● Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.</li> </ul>
11	Other	<ul style="list-style-type: none"> <li>● Do not come close to the product or the harnesses if you are a person who requires a support of medical devices such as a pacemaker. Doing so may affect the performance of your medical device.</li> <li>● See Overseas Specifications Compliance Manual to check whether complies if necessary.</li> <li>● For the handling of actuators and controllers, follow the dedicated instruction manual of each unit to ensure the safety.</li> </ul>

## Alert Indication

The safety precautions are divided into “Danger”, “Warning”, “Caution” and “Notice” according to the warning level, as follows, and described in the instruction manual for each model.

Level	Degree of Danger and Damage	Symbol
Danger	This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.	 <b>Danger</b>
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	 <b>Warning</b>
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.	 <b>Caution</b>
Notice	This indicates lower possibility for the injury, but should be kept to use this product properly.	 <b>Notice</b>

## Caution in Handling

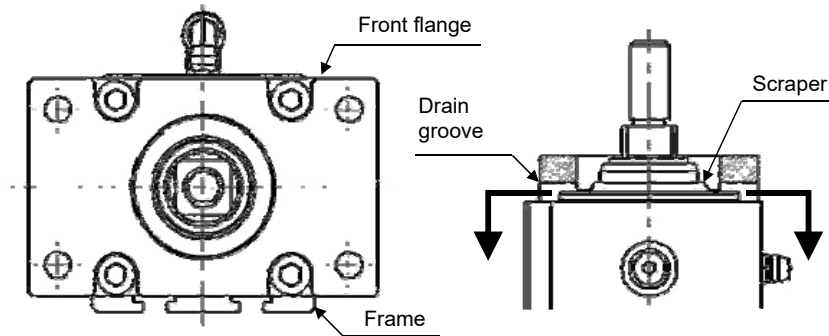
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1. Make sure to follow the usage condition, environment and specification range of the product.  
In case it is not secured, it may cause a drop in performance or malfunction of the product.
2. Do not attempt to have any handling or operation that is not stated in this Instruction manual.
3. It is recommended to apply our products for the wiring between the actuator and the controller.
4. Do not attempt to establish the settings for the speed and acceleration/deceleration above the allowable range.  
An operation with speed and acceleration/deceleration beyond the allowable range may cause an abnormal noise, vibration, malfunction or shortened life.
5. Do not apply radial load and load moment to the rod.  
Loads can only be applied in the axial direction matching with the rod axis.
6. If return operations are repeated over a short distance, they may degrade the film of grease.  
Continuous return operation within a distance less than 30mm may cause the grease film to degrade.  
As a reference, have approximately 5 cycles of back and forth operation in a distance more than 50mm in every 5,000 to 10,000 cycles to regenerate the oil film. Keep using the actuator with the grease worn out may cause malfunction. If it is extreme, flaking may occur on the guide, ball screw.
7. Do not attempt to hit the rod against an obstacle with high speed.  
It may destroy the coupling.
8. Make sure to attach the actuator properly by following this instruction manual.  
Using the product with the actuator not being certainly retained or affixed may cause abnormal noise, vibration, malfunction or shorten the product life.
9. Make sure that no liquid at a temperature lower than the ambient temperature comes in contact with the actuator.  
Depending on the operating environment of the actuator, condensation may occur inside the unit and cause it to break down.



10. For actuator front bracket end face mounting with the rod upward, provide a drain groove so that liquid does not accumulate in the scraper part of the front bracket.

A drain groove is provided on the front flange (option setting). Be careful not to block the drain groove when mounting components.



11. Grease gradually flows outside from the rod.

Grease gradually flows out in order to maintain lubrication on the scraper. Protect the peripheral equipment if there is a risk of grease adhesion.

12. The degree of protection is IP65 (dust-resistant/jet-proof).

“Jet-proof units” refers to products which, even after being subjected to 3 minutes of direct water jets in the prescribed method, will incur no entry of water harmful to normal device operation or safety. The unit may be damaged in an environment where there are constant water jets. Please take appropriate protective measures.

13. For PCON-CB, RCON-PC and MCON Controllers (with option: T), parameter setting can be used to switch the high-output setting between enabled and disabled; please use with the high-output setting enabled.

(In the setting at delivery, the high output setting is set to effective.)

For MSEL Controller, the high output setting is effective and cannot switch it over to ineffective.

[Refer to an instruction manual for each controller for details]

Controller	Parameter	Remarks
PCON-CB RCON-PC	No.152 High Output Setting [0: Ineffective, 1: Effective]	
MCON	No.152 High Output Setting [0: Ineffective, 1: Effective]	Option T: In high output setting, available to have high output setting effective.

14. The RCP6SW with built-in controller specification does not have a port for teaching tool connection.

Connect a teaching tool to the gateway unit and set position data, etc., via the gateway unit.

## International Standards Compliances

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This actuator complies with the following overseas standard.  
Refer to Overseas Standard Compliance Manual (ME0287) for more detailed information.

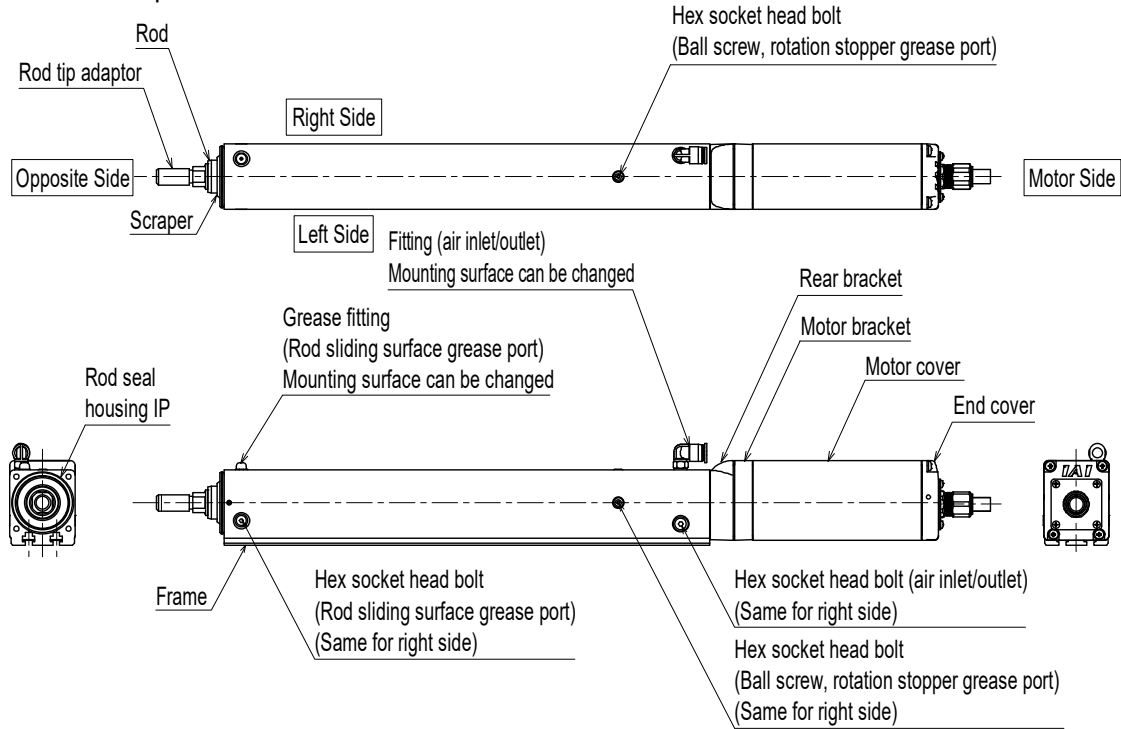
RoHS Directive	CE Marking
○	○

## Names of the Parts

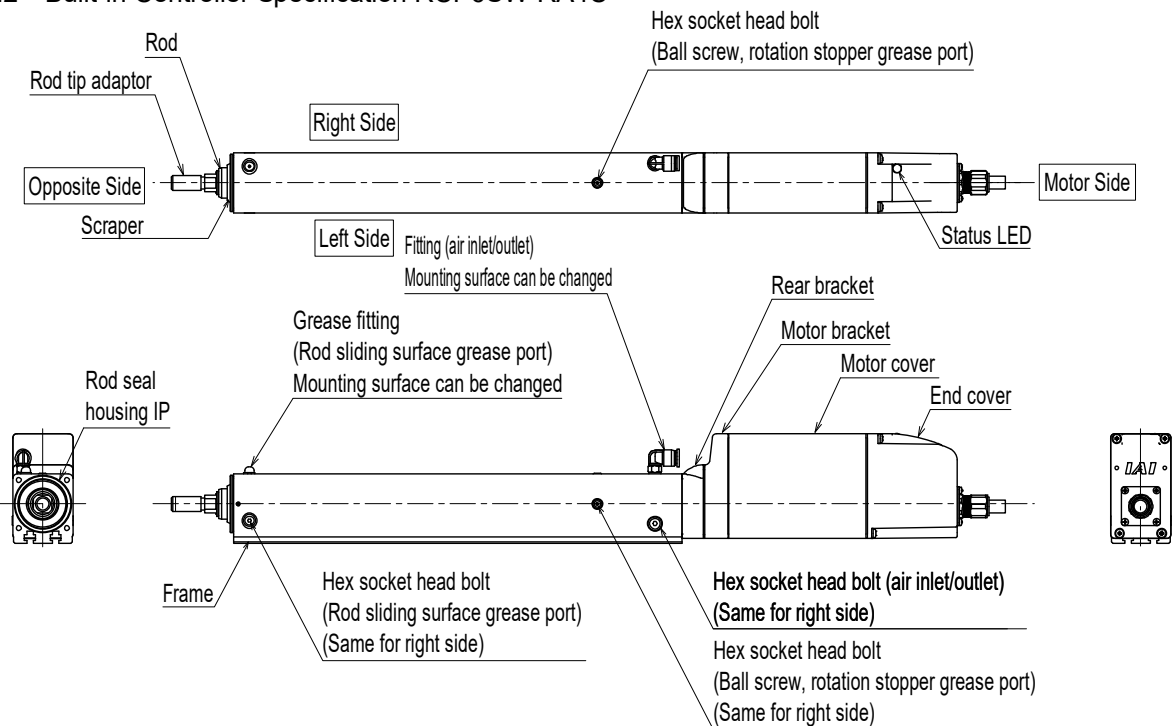
In this Instruction Manual, the left and right sides are indicated by looking at the actuator from the motor end, with the actuator placed horizontally, as shown in the figure below.

### 1. Dust-proof/splash-proof Specification: Straight type

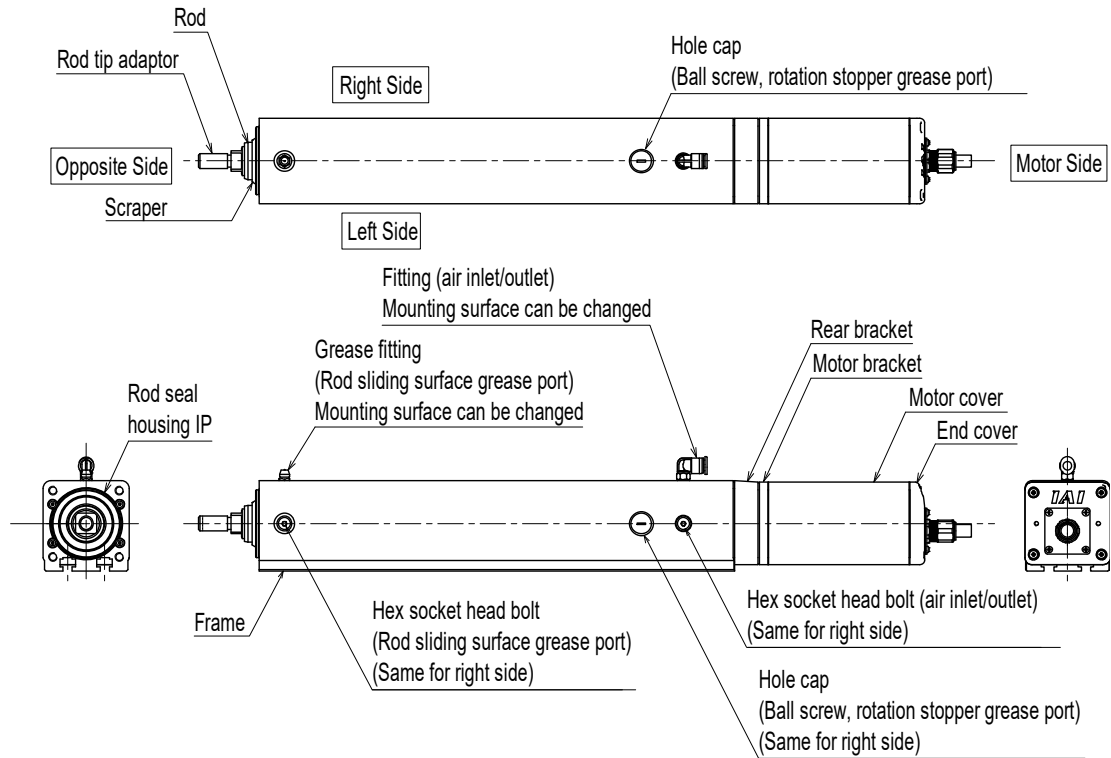
#### 1.1 Standard Specification RCP6W-RA4C



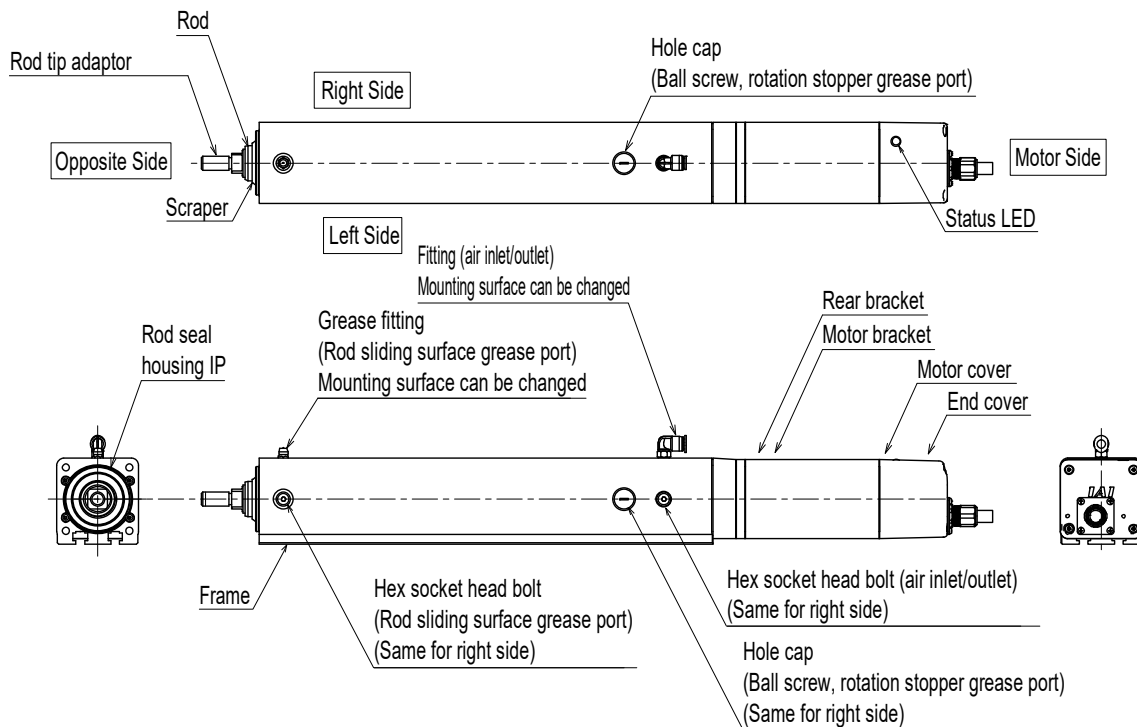
#### 1.2 Built-in Controller Specification RCP6SW-RA4C



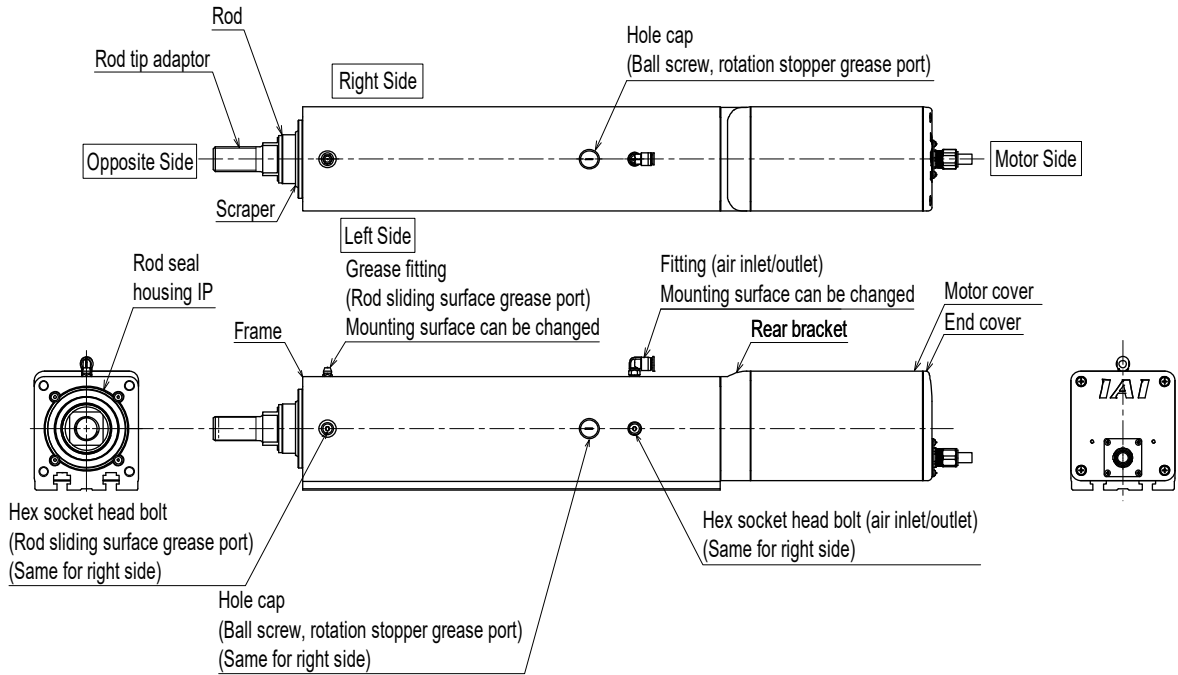
## 1.3 Standard Specification RCP6W-RA6C, RA7C



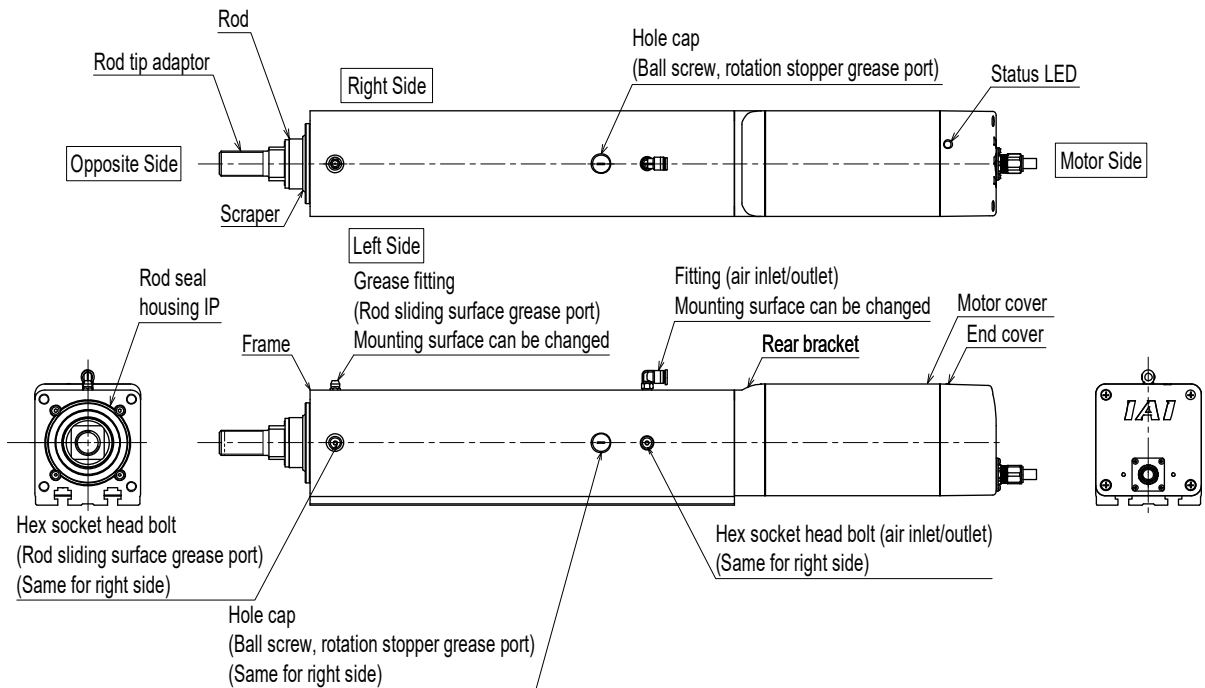
## 1.4 Built-in Controller Specification RCP6SW-RA6C, RA7C



## 1.5 Standard Specification RCP6W-RA8C

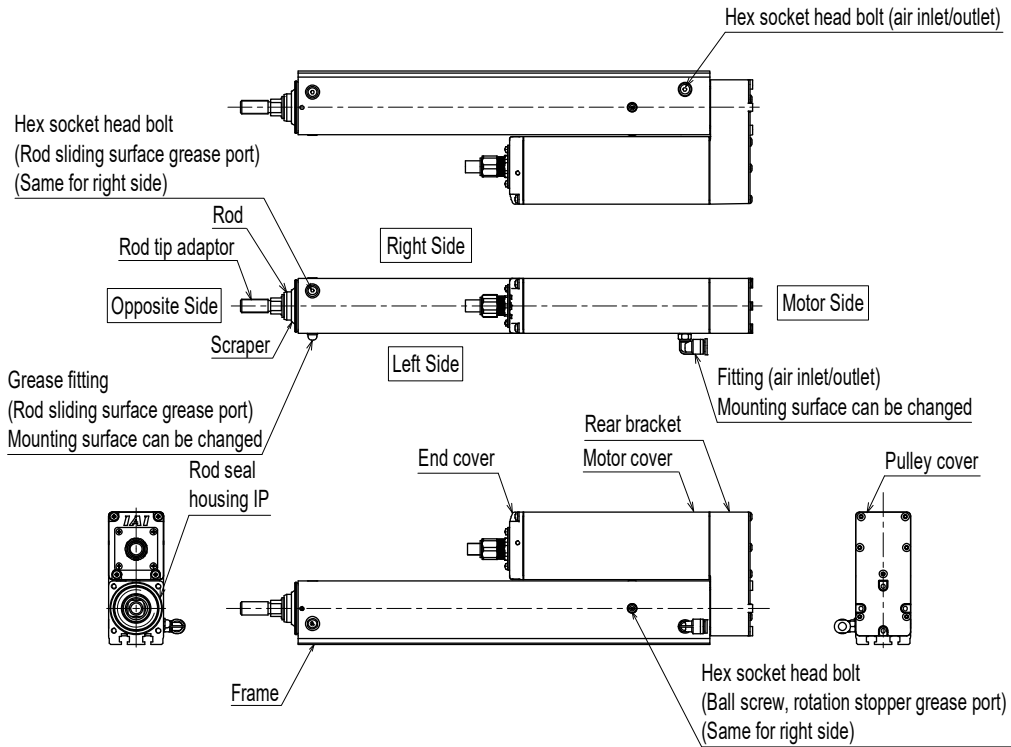


## 1.6 Built-in Controller Specification RCP6SW-RA8C

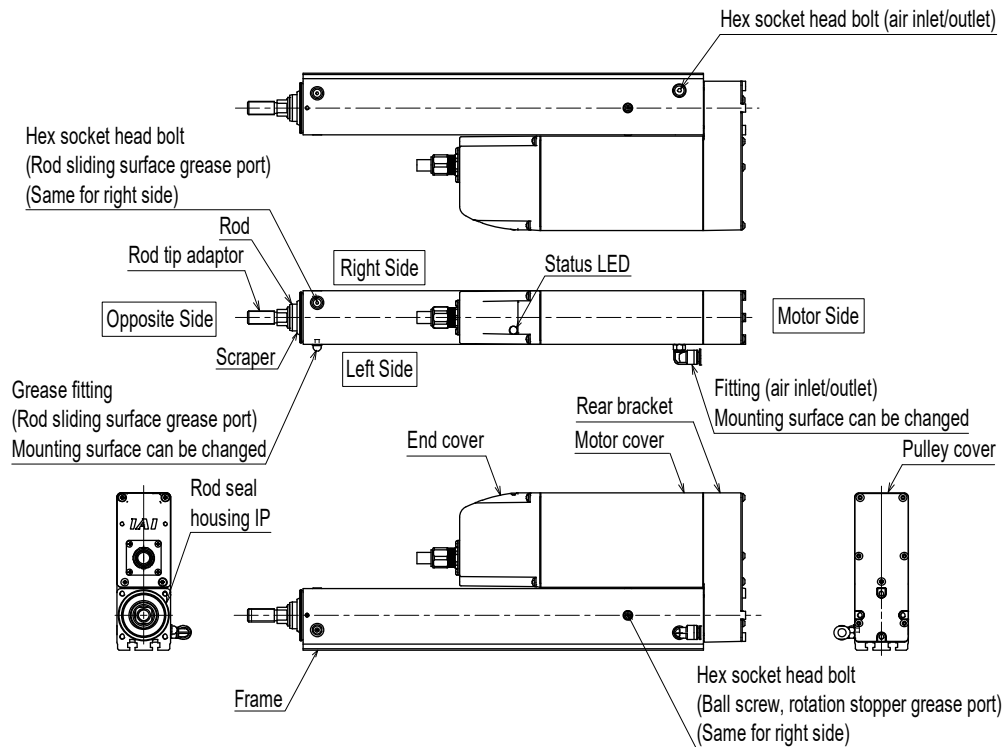


2. Dust-proof/splash-proof specification: Side-mounted type

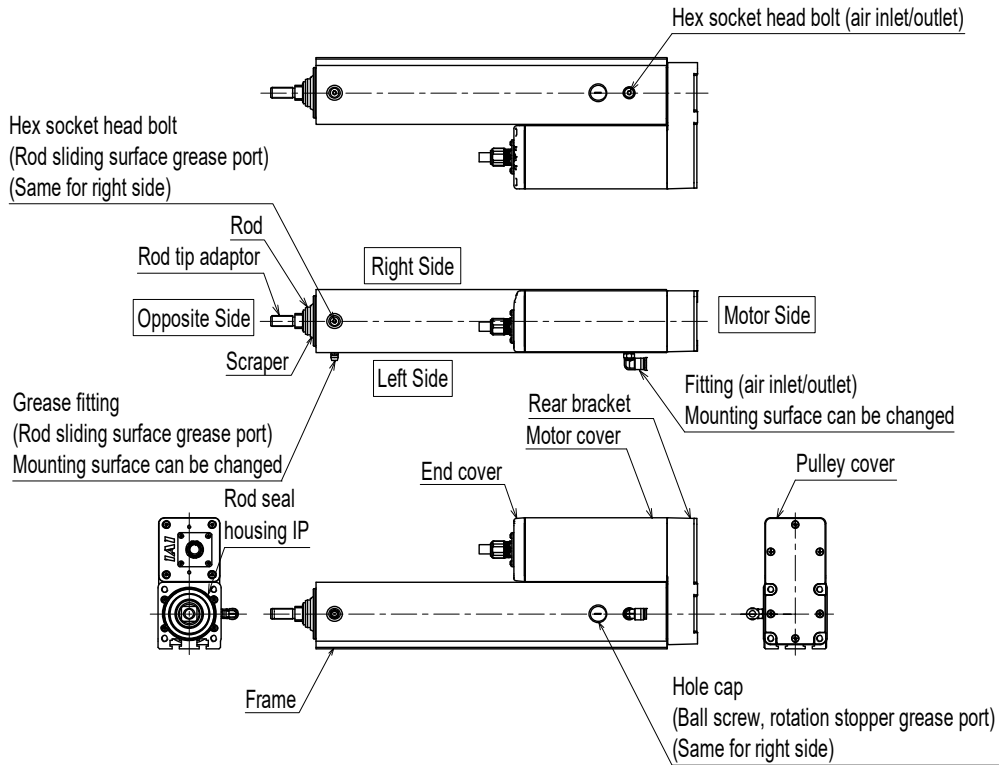
2.1 Standard Specification RCP6W-RA4R



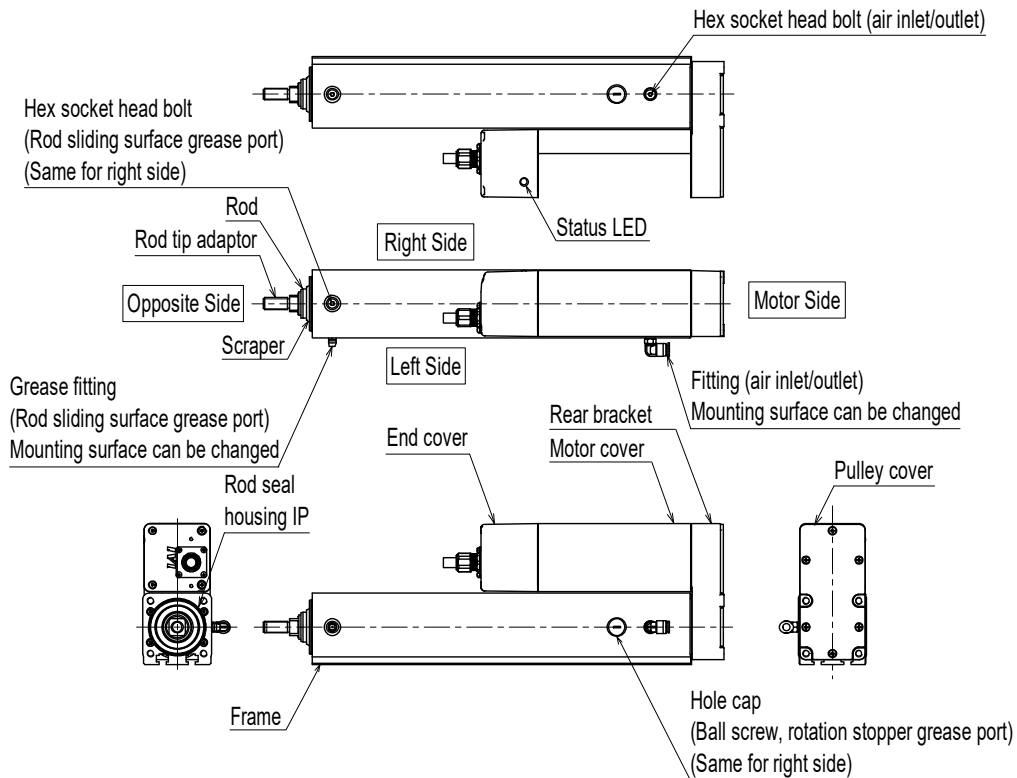
2.2 Built-in Controller Specification RCP6SW-RA4R



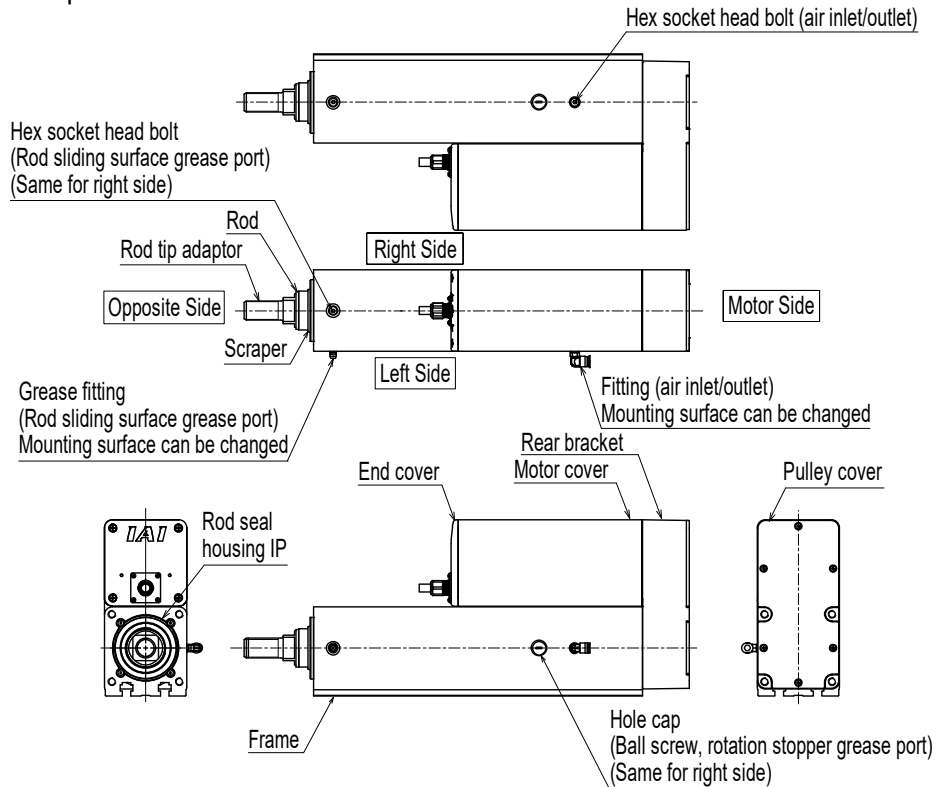
## 2.3 Standard Specification RCP6W-RA6R, RA7R



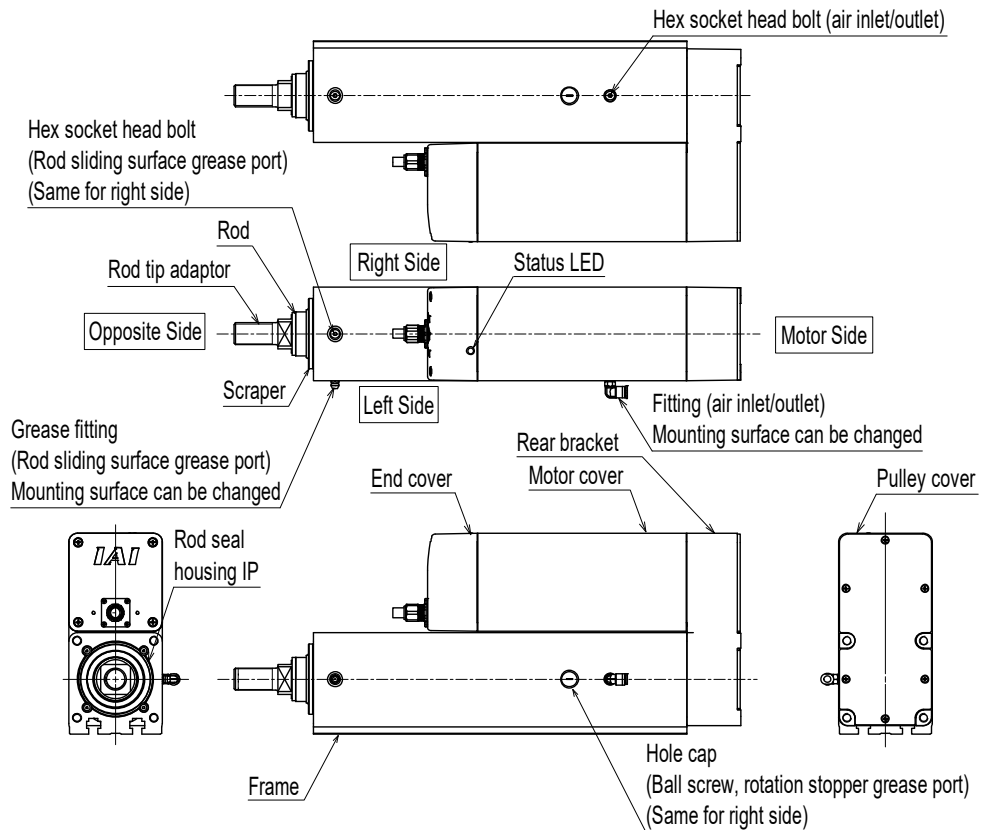
## 2.4 Built-in Controller Specification RCP6SW-RA6R, RA7R



2.5 Standard Specification RCP6W-RA8R



2.6 Built-in Controller Specification RCP6SW-RA8R





## 1. Specifications Check

### 1.1 Checking the Product

The standard configuration of this product is comprised of the following parts.  
See the component list for the details of the enclosed components. If you find any fault or missing parts, contact your local IAI distributor.

#### 1.1.1 Parts

No.	Name	Model number	Quantity	Remarks
1	Actuator	Refer to "How to Read the Model Nameplate" and "How to Read the Model Number."	1	
<b>Accessories</b>				
2	Motor • Encoder Cables <sup>(Note1)</sup>		1	
3	Nut		1	Refer to list below
4	Square Nut		1 set	Refer to list below
5	First Step Guide		1	
6	Instruction Manual (DVD)		1	
7	Safety Guide		1	

Note 1 The motor • encoder cables supplied vary depending on the controller used. [Refer to 1.4, "Motor • Encoder Cables."]

[List of Included Nut Type]

	Nut (M10×1.25)	Nut (M14×1.5)	Nut (M20×1.5)
RA4C, RA4R RA6C, RA6R	1		
RA7C, RA7R		1	
RA8C, RA8R			1

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

[List of Included Square Nut Type]

	Square nut	Quantity
RA4C, RA4R	M4 □7×3.2	4
RA6C, RA6R	M6 □10×5	4
RA7C, RA7R	M6 □10×5	6
RA8C, RA8R	M8 □13×6.5	8

### 1.1.2 Related Instruction Manuals for the Each Controller Supported by This Product

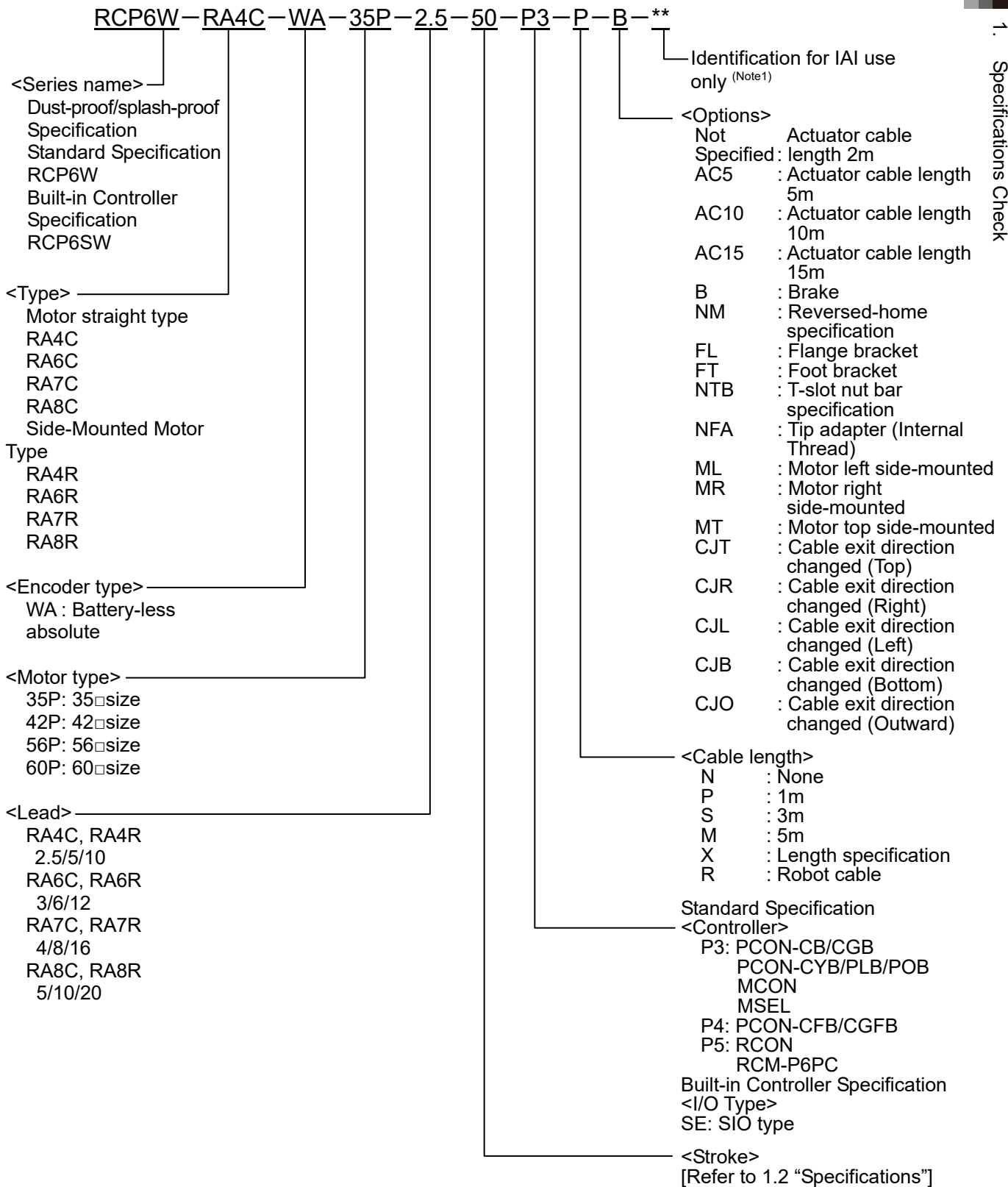
Shown below is a list of the instruction manuals for the controllers related to this product which is recorded in Instruction Manual (DVD).

No.	Name	Control No.
1	Instruction Manual for PCON-CB/CFB Controller	ME0342
2	Instruction Manual for MCON-C/CG Controller	ME0341
3	Instruction Manual for MSEL Controller	ME0336
4	Instruction Manual for RC PC Software RCM-101-MW/RCM-101-USB	ME0155
5	Instruction Manual for XSEL PC Software IA-101-X-MW/IA-101-X-USBMW	ME0154
6	Instruction Manual for Touch Panel Teaching Pendant CON-PTA/PDA/PGA	ME0295
7	Instruction Manual for Touch Panel Teaching Pendant TB-01/01D/01DR Compatible with Position Controller	ME0324
8	Instruction Manual for Touch Panel Teaching Pendant TB-02/02D Compatible with Position controller	ME0355
9	Instruction Manual for Touch Panel Teaching TB-01/01D/01DR Compatible with Programmable Controller	ME0325
10	Instruction Manual for Touch Panel Teaching Pendant TB-02/02D Compatible with Programmable Controller	ME0356

### 1.1.3 How to Read the Model Nameplate

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

### 1.1.4 How to Read the Model Number



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

## 1.2 Specifications

### 1.2.1 Speed

#### [1] Motor Straight Type

[When high-output setting is effective]

The maximum speed is different when the ambient operating temperature is higher than 5°C and when it is 5°C or lower.

(When the ambient operating temperature is 5°C to 40°C)

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal/ Vertical	Stroke [mm]					
				50	100	150	200	-	-
RA4C	35P	2.5	Horizontal	175				-	-
			Vertical	150				-	-
		5	Horizontal	350				-	-
			Vertical	350				-	-
		10	Horizontal	525				-	-
			Vertical	435				-	-
				50	100	150	200	250	300
RA6C	42P	3	Horizontal	210					
			Vertical	210					
		6	Horizontal	420					
			Vertical	370					
		12	Horizontal	630					
			Vertical	525					
				50	100	150	200	250	300
RA7C	56P	4	Horizontal	140					
			Vertical	140					
		8	Horizontal	350					
			Vertical	280					
		16	Horizontal	420					
			Vertical	420					
				50	100	150	200	250	300
RA8C	60P	5	Horizontal	100					
			Vertical	100					
		10	Horizontal	200					
			Vertical	200					
		20	Horizontal	350					
			Vertical	330					

(When the ambient operating temperature is 0°C to 5°C)

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal/ Vertical	Stroke [mm]					
				50	100	150	200	-	-
RA4C	35P	2.5	Horizontal	130			-	-	
			Vertical	130			-	-	
		5	Horizontal	260			-	-	
			Vertical	260			-	-	
		10	Horizontal	435			-	-	
			Vertical	435			-	-	
				50	100	150	200	250	300
RA6C	42P	3	Horizontal	105					
			Vertical	105					
		6	Horizontal	315					
			Vertical	315					
		12	Horizontal	525					
			Vertical	525					
				50	100	150	200	250	300
RA7C	56P	4	Horizontal	105					
			Vertical	105					
		8	Horizontal	140					
			Vertical	140					
		16	Horizontal	280					
			Vertical	280					
				50	100	150	200	250	300
RA8C	60P	5	Horizontal	80					
			Vertical	80					
		10	Horizontal	170					
			Vertical	170					
		20	Horizontal	300					
			Vertical	300					

## [2] Side-Mounted Motor Type

[When high-output setting is effective]

The maximum speed is different when the ambient operating temperature is higher than 5°C and when it is 5°C or lower.

(When the ambient operating temperature is 5°C to 40°C)

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal/ Vertical	Stroke [mm]					
				50	100	150	200	-	-
RA4R	35P	2.5	Horizontal	175			-	-	
			Vertical	150			-	-	
		5	Horizontal	350			-	-	
			Vertical	350			-	-	
		10	Horizontal	525			-	-	
			Vertical	435			-	-	
				50	100	150	200	250	300
RA6R	42P	3	Horizontal	210					
			Vertical	210					
		6	Horizontal	420					
			Vertical	370					
		12	Horizontal	630					
			Vertical	525					
				50	100	150	200	250	300
RA7R	56P	4	Horizontal	140					
			Vertical	140					
		8	Horizontal	350					
			Vertical	280					
		16	Horizontal	420					
			Vertical	420					
				50	100	150	200	250	300
RA8R	60P	5	Horizontal	100					
			Vertical	100					
		10	Horizontal	200					
			Vertical	200					
		20	Horizontal	350					
			Vertical	330					

(When the ambient operating temperature is 0°C to 5°C)

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal/ Vertical	Stroke [mm]					
				50	100	150	200	-	-
RA4R	35P	2.5	Horizontal	130					
			Vertical	130					
		5	Horizontal	260					
			Vertical	260					
		10	Horizontal	435					
			Vertical	435					
				50	100	150	200	250	300
RA6R	42P	3	Horizontal	105					
			Vertical	105					
		6	Horizontal	315					
			Vertical	315					
		12	Horizontal	525					
			Vertical	525					
				50	100	150	200	250	300
RA7R	56P	4	Horizontal	105					
			Vertical	105					
		8	Horizontal	140					
			Vertical	140					
		16	Horizontal	280					
			Vertical	280					
				50	100	150	200	250	300
RA8R	60P	5	Horizontal	80					
			Vertical	80					
		10	Horizontal	170					
			Vertical	170					
		20	Horizontal	300					
			Vertical	300					



Caution: When a speed less than the minimum speed, operation will not made in the set speed.

Do not attempt to set a speed less than the minimum speed.

Figure out the minimum speed using the following formula.

Min. Velocity [mm/s] = Lead Length [mm] / 800 / 0.001 [sec]

## 1.2.2 Maximum Acceleration and Transportable Mass

If the transportable mass is smaller than as specified, the acceleration/deceleration can be raised beyond the applicable level.

The maximum speed is different when the ambient operating temperature is higher than 5°C and when it is 5°C or lower.

### [1] Motor Straight Type

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA4C	35P	2.5	Horizontal	0	40	40	40	35	30
				20	40	40	40	35	30
				40	40	40	40	35	30
				65	40	40	40	30	30
				85	40	40	35	30	30
				105	40	40	35	30	30
				130	40	40	35	30	30
				150	40	35	35	29	24
			175	33	24	22	19	12	
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	6	6	-	-
				130	4	4	4	-	-
		150		2	2	2	-	-	
		5	Horizontal	0	23	23	21	18	18
				40	23	23	21	18	18
				85	23	23	21	18	18
				130	23	23	21	18	18
				175	23	23	21	16	14
				215	23	23	21	14	12
				260	23	22	18	12	8
				305	22	14	8	6	4
			Vertical	350	19	5	1	-	-
				0	4	4	4	-	-
				40	4	4	4	-	-
				85	4	4	4	-	-
				130	4	4	4	-	-
				175	4	4	4	-	-
				215	4	4	4	-	-
260	4			4	4	-	-		
305	3	3	3	-	-				
350	2	1	1	-	-				



[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA4C	35P	10	Horizontal	0	11	11	9	9	7
				85	11	11	9	9	7
				175	11	11	8	7	5
				260	11	11	7	4	2
				350	11	11	7	3	1
				435	11	10	6	3	1
				525	-	4	1	-	-
			Vertical	0	2	2	2	-	-
				85	2	2	2	-	-
				175	2	2	2	-	-
				260	2	2	2	-	-
				350	2	2	2	-	-
				435	1.5	1	1	-	-

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA4C	35P	2.5	Horizontal	0	40	40	40	35	30
				20	40	40	40	35	30
				40	40	40	40	35	30
				65	40	40	40	30	30
				85	40	40	35	30	30
				105	40	40	35	30	30
				130	40	40	35	30	30
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	6	6	-	-
				130	4	4	4	-	-
		5	Horizontal	0	23	23	21	18	18
				40	23	23	21	18	18
				85	23	23	21	18	18
				130	23	23	21	18	18
				175	23	23	21	16	14
				215	23	23	21	14	12
				260	23	22	18	12	8
			Vertical	0	4	4	4	-	-
				40	4	4	4	-	-
				85	4	4	4	-	-
				130	4	4	4	-	-
				175	4	4	4	-	-
				215	4	4	4	-	-
				260	4	4	4	-	-
		10	Horizontal	0	11	11	9	9	7
				85	11	11	9	9	7
				175	11	11	8	7	5
				260	11	11	7	4	2
				350	11	11	7	3	1
				435	11	10	6	3	1
				0	2	2	2	-	-
			Vertical	85	2	2	2	-	-
175	2			2	2	-	-		
260	2			2	2	-	-		
350	2			2	2	-	-		
435	1.5			1	1	-	-		

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA6C	42P	3	Horizontal	0	60	60	50	45	40
				20	60	60	50	45	40
				45	60	60	50	45	40
				70	60	60	50	45	40
				105	60	60	50	45	40
				130	60	60	50	40	30
				155	60	50	40	30	25
			180	60	40	35	25	20	
			210	60	26	22	20	14	
			Vertical	0	20	20	20	-	-
				20	20	20	20	-	-
				45	20	20	20	-	-
				70	20	20	20	-	-
				105	20	20	20	-	-
		130		18	14	10	-	-	
		155		14	10	6	-	-	
		180	9	6	5	-	-		
		210	6	4	4	-	-		
		6	Horizontal	0	40	40	35	30	25
				55	40	40	35	30	25
				105	40	40	35	30	25
				160	40	40	35	25	25
				210	40	40	30	25	20
				265	40	40	27.5	22.5	18
				315	40	35	21	20	14
			370	38	16	10	8	6	
			420	28	7	6	-	-	
			Vertical	0	10	10	10	-	-
55	10			10	10	-	-		
105	10			10	10	-	-		
160	10			10	10	-	-		
210	9			9	9	-	-		
265	8	8		7	-	-			
315	4	4		4	-	-			
370	2	2	2	-	-				

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA6C	42P	12	Horizontal	0	25	25	18	16	12
				105	25	25	18	16	12
				210	25	25	17	14	10
				315	25	25	15	10	6
				420	20	20	10	10	6
				525	15	15	8	6	4.5
				630	-	8	3	2	1
			Vertical	0	4	4	4	-	-
				105	4	4	4	-	-
				210	4	4	4	-	-
				315	4	4	4	-	-
				420	4	4	4	-	-
				525	2	1	1	-	-

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]						
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G	
RA6C	42P	3	Horizontal	0	60	60	50	45	40	
				20	60	60	50	45	40	
				45	60	60	50	45	40	
				70	60	60	50	45	40	
				105	60	60	50	45	40	
			Vertical	0	20	20	20	-	-	
				20	20	20	20	-	-	
				45	20	20	20	-	-	
				70	20	20	20	-	-	
				105	20	20	20	-	-	
			6	Horizontal	0	40	40	35	30	25
					55	40	40	35	30	25
		105			40	40	35	30	25	
		160			40	40	35	25	25	
		210			40	40	30	25	20	
		265			40	40	27.5	22.5	18	
		Vertical		315	40	35	21	20	14	
				0	10	10	10	-	-	
				55	10	10	10	-	-	
				105	10	10	10	-	-	
				160	10	10	10	-	-	
				210	9	9	9	-	-	
		12	Horizontal	265	8	8	7	-	-	
				315	4	4	4	-	-	
				0	25	25	18	16	12	
				105	25	25	18	16	12	
				210	25	25	17	14	10	
				315	25	25	15	10	6	
			Vertical	420	20	20	10	10	6	
				525	15	15	8	6	4.5	
				0	4	4	4	-	-	
				105	4	4	4	-	-	
				210	4	4	4	-	-	
				315	4	4	4	-	-	
		12	Vertical	420	4	4	4	-	-	
				525	2	1	1	-	-	

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA7C	56P	4	Horizontal	0	80	80	70	65	60
				35	80	80	70	65	60
				70	80	80	70	65	60
				105	80	80	60	50	40
			140	67	47	10	6	6	
			Vertical	0	28	28	28	-	-
				35	28	28	28	-	-
				70	28	28	28	-	-
		105		21	20	18	-	-	
		8	Horizontal	140	8	6	6	-	-
				0	60	60	50	45	40
				70	60	60	50	45	40
				140	60	60	50	45	40
			Vertical	210	60	60	40	30	20
				280	60	20	9	6	3
				350	20	-	-	-	-
				0	18	18	18	-	-
		Vertical	70	18	18	18	-	-	
			140	16	16	12	-	-	
			210	8	7	6	-	-	
			280	3	2	1	-	-	
		16	Horizontal	0	50	50	40	35	30
				140	50	50	40	35	30
				280	50	45	32	22	17
420	50			18	9	6	5		
Vertical	0		8	8	8	-	-		
	140		8	8	8	-	-		
	280		6	6	5	-	-		
	420		1.5	1	0.5	-	-		

[When high-output setting for motor straight type is effective]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA7C	56P	4	Horizontal	0	80	80	70	65	60
				35	80	80	70	65	60
				60	80	80	70	65	60
				70	80	80	70	65	60
				105	80	80	60	50	40
			Vertical	0	28	28	28	-	-
				35	28	28	28	-	-
				60	28	28	28	-	-
				70	21	21	21	-	-
				105	8	8	8	-	-
		8	Horizontal	0	60	60	50	45	40
				70	60	60	50	45	40
				140	60	60	50	45	40
				0	18	18	18	-	-
				70	18	18	18	-	-
			Vertical	140	8	8	8	-	-
				0	50	50	40	35	30
				140	50	50	40	35	30
				280	50	45	32	22	17
				0	8	8	8	-	-
		Vertical	140	8	8	8	-	-	
			280	6	6	5	-	-	

[Motor straight type]

The high-output setting bears no relation to RA8C. There is no parameter setting.

When the ambient operating temperature is 5°C to 40°C


Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Velocity [mm/s]	0.1G	0.2G
RA8C	60P	5	Horizontal	0	100	-
				80	100	-
				90	100	-
				100	75	-
			Vertical	0	70	-
				45	70	-
				60	45	-
				70	35	-
				80	25	-
				90	14	-
				100	9	-
				10	Horizontal	0
		160	-			60
		170	-			40
		180	-			25
		190	-			15
		200	-			12
		Vertical	0		-	35
			80		-	35
			90		-	34
			100		-	28
			110		-	23
			120		-	18
		20	Horizontal	130	-	15
				140	-	12
				150	-	10
				160	-	8
				170	-	6
				180	-	4
			Vertical	190	-	3
				200	-	2
				0	-	30
				300	-	30
				350	-	14
				0	-	3
		Vertical	300	-	3	
330	-		1			



[Motor straight type]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Velocity [mm/s]	0.1G	0.2G
RA8C	60P	5	Horizontal	0	100	-
				80	100	-
			Vertical	0	70	-
				45	70	-
				60	35	-
				70	25	-
		80	9	-		
		10	Horizontal	0	-	60
				160	-	60
				170	-	40
			Vertical	0	-	35
				80	-	35
				90	-	34
				100	-	28
				110	-	23
				120	-	18
				130	-	15
				140	-	12
				150	-	10
				160	-	8
				170	-	6
		20	Horizontal	0	-	30
				300	-	30
			Vertical	0	-	3
300	-			3		

 **Caution:** Do not attempt to establish the settings for the acceleration/deceleration above the allowable range. It may cause a vibration, malfunction or shorten the product life. If any acceleration/deceleration equal to or greater than the rated acceleration/deceleration is set, a creep phenomenon or slipped coupling may occur.

[2] Side-Mounted Motor Type

[When high-output setting for side-mounted motor type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA4R	35P	2.5	Horizontal	0	40	40	40	35	30
				20	40	40	40	35	30
				40	40	40	40	35	30
				65	40	40	40	30	30
				85	40	40	35	30	30
				105	40	40	35	30	30
				130	40	40	35	30	30
			150	40	35	35	29	24	
			175	33	24	22	19	12	
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
		105		10	6	6	-	-	
		130		4	4	4	-	-	
		150	2	2	2	-	-		
		5	Horizontal	0	23	23	21	18	18
				40	23	23	21	18	18
				85	23	23	21	18	18
				130	23	23	21	18	18
				175	23	23	21	16	14
				215	23	23	21	14	12
				260	23	22	18	12	8
			305	22	14	8	6	4	
			350	19	5	1	-	-	
			Vertical	0	4	4	4	-	-
				40	4	4	4	-	-
85	4			4	4	-	-		
130	4			4	4	-	-		
175	4			4	4	-	-		
215	4	4		4	-	-			
260	4	4		4	-	-			
305	3	3	3	-	-				
350	2	1	1	-	-				

[When high-output setting for side-mounted motor type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA4R	35P	10	Horizontal	0	11	11	9	9	7
				85	11	11	9	9	7
				175	11	11	8	7	5
				260	11	11	7	4	2
				350	11	11	7	3	1
				435	11	10	6	3	1
				525	-	4	1	-	-
			Vertical	0	2	2	2	-	-
				85	2	2	2	-	-
				175	2	2	2	-	-
				260	2	2	2	-	-
				350	2	2	2	-	-
				435	1.5	1	1	-	-

[For straight motor type with high-output setting enabled]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA4R	35P	2.5	Horizontal	0	40	40	40	35	30
				20	40	40	40	35	30
				40	40	40	40	35	30
				65	40	40	40	30	30
				85	40	40	35	30	30
				105	40	40	35	30	30
				130	40	40	35	30	30
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	6	6	-	-
				130	4	4	4	-	-
		5	Horizontal	0	23	23	21	18	18
				40	23	23	21	18	18
				85	23	23	21	18	18
				130	23	23	21	18	18
				175	23	23	21	16	14
				215	23	23	21	14	12
				260	23	22	18	12	8
			Vertical	0	4	4	4	-	-
				40	4	4	4	-	-
				85	4	4	4	-	-
				130	4	4	4	-	-
				175	4	4	4	-	-
				215	4	4	4	-	-
				260	4	4	4	-	-
		10	Horizontal	0	11	11	9	9	7
				85	11	11	9	9	7
				175	11	11	8	7	5
				260	11	11	7	4	2
				350	11	11	7	3	1
				435	11	10	6	3	1
				0	2	2	2	-	-
			Vertical	85	2	2	2	-	-
175	2			2	2	-	-		
260	2			2	2	-	-		
350	2			2	2	-	-		
435	1.5			1	1	-	-		

[When high-output setting for side-mounted motor type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA6R	42P	3	Horizontal	0	60	60	50	45	40
				20	60	60	50	45	40
				45	60	60	50	45	40
				70	60	60	50	45	40
				105	60	60	50	45	40
				130	60	60	50	40	30
				155	60	50	40	30	25
			180	60	40	35	25	20	
			210	60	26	22	20	14	
			Vertical	0	20	20	20	-	-
				20	20	20	20	-	-
				45	20	20	20	-	-
				70	20	20	20	-	-
				105	20	20	20	-	-
		130		18	14	10	-	-	
		155		14	10	6	-	-	
		180	9	6	5	-	-		
		210	6	4	4	-	-		
		6	Horizontal	0	40	40	35	30	25
				55	40	40	35	30	25
				105	40	40	35	30	25
				160	40	40	35	25	25
				210	40	40	30	25	20
				265	40	40	27.5	22.5	18
				315	40	35	21	20	14
			370	38	16	10	8	6	
			420	28	7	6	-	-	
			Vertical	0	10	10	10	-	-
55	10			10	10	-	-		
105	10			10	10	-	-		
160	10			10	10	-	-		
210	9			9	9	-	-		
265	8	8		7	-	-			
315	4	4		4	-	-			
370	2	2	2	-	-				

[When high-output setting for side-mounted motor type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA6R	42P	12	Horizontal	0	25	25	18	16	12
				105	25	25	18	16	12
				210	25	25	17	14	10
				315	25	25	15	10	6
				420	20	20	10	10	6
				525	15	15	8	6	4.5
				630	-	8	3	2	1
			Vertical	0	4	4	4	-	-
				105	4	4	4	-	-
				210	4	4	4	-	-
				315	4	4	4	-	-
				420	4	4	4	-	-
				525	2	1	1	-	-

[For straight motor type with high-output setting enabled]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]							
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G		
RA6R	42P	3	Horizontal	0	60	60	50	45	40		
				20	60	60	50	45	40		
				45	60	60	50	45	40		
				70	60	60	50	45	40		
				105	60	60	50	45	40		
			Vertical	0	20	20	20	-	-		
				20	20	20	20	-	-		
				45	20	20	20	-	-		
				70	20	20	20	-	-		
				105	20	20	20	-	-		
			6	Horizontal	0	40	40	35	30	25	
					55	40	40	35	30	25	
		105			40	40	35	30	25		
		160			40	40	35	25	25		
		210			40	40	30	25	20		
		265			40	40	27.5	22.5	18		
		Vertical		315	40	35	21	20	14		
				0	10	10	10	-	-		
				55	10	10	10	-	-		
				105	10	10	10	-	-		
				160	10	10	10	-	-		
				210	9	9	9	-	-		
		12	Horizontal	265	8	8	7	-	-		
				315	4	4	4	-	-		
				0	25	25	18	16	12		
				105	25	25	18	16	12		
				210	25	25	17	14	10		
				315	25	25	15	10	6		
			Vertical	420	20	20	10	10	6		
				525	15	15	8	6	4.5		
				0	4	4	4	-	-		
				105	4	4	4	-	-		
				210	4	4	4	-	-		
				315	4	4	4	-	-		
						420	4	4	4	-	-
						525	2	1	1	-	-

[When high-output setting for side-mounted motor type is effective]

When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RA7R	56P	4	Horizontal	0	80	80	70	65	60
				35	80	80	70	65	60
				70	80	80	70	65	60
				105	80	80	60	50	40
			140	67	47	10	6	6	
			Vertical	0	28	28	28	-	-
				35	28	28	28	-	-
				70	28	28	28	-	-
		105		21	20	18	-	-	
		8	Horizontal	140	8	6	6	-	-
				0	60	60	50	45	40
				70	60	60	50	45	40
				140	60	60	50	45	40
			Vertical	210	60	60	40	30	20
				280	60	20	9	6	3
				350	20	-	-	-	-
				0	18	18	18	-	-
		Vertical	70	18	18	18	-	-	
			140	16	16	12	-	-	
			210	8	7	6	-	-	
			280	3	2	1	-	-	
		16	Horizontal	0	50	50	40	35	30
				140	50	50	40	35	30
				280	50	45	32	22	17
420	50			18	9	6	5		
Vertical	0		8	8	8	-	-		
	140		8	8	8	-	-		
	280		6	6	5	-	-		
	420		1.5	1	0.5	-	-		



[When high-output setting for side-mounted motor type is effective]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]						
				Velocity [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G	
RA7R	56P	4	Horizontal	0	80	80	70	65	60	
				35	80	80	70	65	60	
				70	80	80	70	65	60	
				105	80	80	60	50	40	
			Vertical	0	28	28	28	-	-	
				35	28	28	28	-	-	
				60	28	28	28	-	-	
				70	21	21	21	-	-	
			8	Horizontal	0	60	60	50	45	40
					70	60	60	50	45	40
				Vertical	140	60	60	50	45	40
					0	18	18	18	-	-
		16	Horizontal	70	18	18	18	-	-	
				140	8	8	8	-	-	
				0	50	50	40	35	30	
			Vertical	140	50	50	40	35	30	
				280	50	45	32	22	17	
				0	8	8	8	-	-	
		8	Vertical	140	8	8	8	-	-	
				280	6	6	5	-	-	
				280	6	6	5	-	-	

[When high-output setting for side-mounted motor type is effective]  
 In RA8R there is nothing related to high-thrust setting. There is no parameter setting.


When the ambient operating temperature is 5°C to 40°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Velocity [mm/s]	0.1G	0.2G
RA8R	60P	5	Horizontal	0	100	-
				80	100	-
				90	100	-
				100	75	-
			Vertical	0	70	-
				45	70	-
				60	45	-
				70	35	-
				80	25	-
				90	14	-
				100	9	-
				10	Horizontal	0
		160	-			60
		170	-			40
		180	-			25
		190	-			15
		200	-			12
		Vertical	0		-	35
			80		-	35
			90		-	34
			100		-	28
			110		-	23
			120		-	18
		20	Horizontal	130	-	15
				140	-	12
				150	-	10
				160	-	8
				170	-	6
				180	-	4
			Vertical	190	-	3
				200	-	2
				0	-	30
				300	-	30
				350	-	14
				0	-	3
		Vertical	300	-	3	
330	-		1			

[For straight motor type with high-output setting enabled]

When the ambient operating temperature is 0°C to 5°C

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Velocity [mm/s]	0.1G	0.2G
RA8R	60P	5	Horizontal	0	100	-
				80	100	-
			Vertical	0	70	-
				45	70	-
				60	35	-
				70	25	-
		10	Horizontal	80	9	-
				0	-	60
				160	-	60
			Vertical	170	-	40
				0	-	35
				80	-	35
				90	-	34
				100	-	28
				110	-	23
				120	-	18
				130	-	15
				140	-	12
		20	Horizontal	150	-	10
				160	-	8
			Vertical	170	-	6
				0	-	30
				300	-	30
				0	-	3
300	-	3				

 **Caution:** Do not attempt to establish the settings for the acceleration/deceleration above the allowable range. It may cause a vibration, malfunction or shorten the product life. If any acceleration/deceleration equal to or greater than the rated acceleration/deceleration is set, a creep phenomenon or slipped coupling may occur.

### 1.2.3 Driving System • Position Detector

Type	Motor Type	Lead	No. of Encoder Pulses	Ball Screw Type		
				Type	Diameter	Accuracy
RA4C RA4R	35P	2.5 5 10	8192	Rolled	φ8mm	C10
RA6C RA6R	42P	3 6 12				
RA7C RA7R	56P	4 8 16				
RA8C RA8R	60P	5 10 20		Rolled	φ16mm	C10

### 1.2.4 Positioning Precision

Item	Tolerance
Positioning repeatability	±0.01mm
Lost motion	0.1mm or less

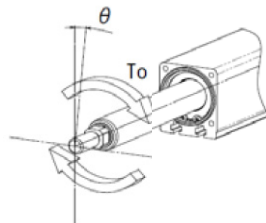
This is an option already attached when it is shipped out from the factory. It does not include the consideration of time-dependent change as it is used.

### 1.2.5 Rod Tip Load

Type	lead	Item	Tolerance
RA4C RA4R	2.5, 5, 10	Rod Tip Static Allowable Torque <sup>(Note 1)</sup>	1.0N·m
		Rod Tip Maximum Displacement Angle <sup>(Note 2)</sup>	±1.0°
RA6C RA6R	3, 6, 12	Rod Tip Static Allowable Torque <sup>(Note 1)</sup>	1.5N·m
		Rod Tip Maximum Displacement Angle <sup>(Note 2)</sup>	±1.0°
RA7C RA7R	4, 8, 16	Rod Tip Static Allowable Torque <sup>(Note 1)</sup>	2.5N·m
		Rod Tip Maximum Displacement Angle <sup>(Note 2)</sup>	±0.8°
RA8C RA8R	5, 10, 20	Rod Tip Static Allowable Torque <sup>(Note 1)</sup>	5.0N·m
		Rod Tip Maximum Displacement Angle <sup>(Note 2)</sup>	±0.8°

Note 1 Static allowable torque around the rod center

Note 2 These are rod tip displacement angles when they are subjected to rod tip allowable torque at the position where the rod is retracted the most.

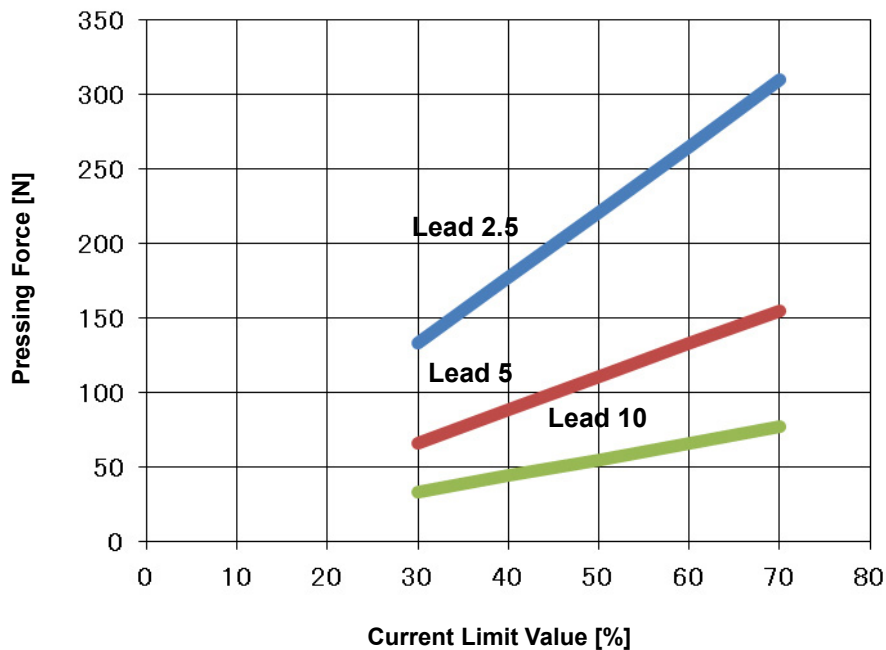


## 1.2.6 Current Limit Value and Pressing Force

### [1] RA4C and RA4R Motor Type 35P

Current Limit Value	Lead 2.5 [N]	Lead 5 [N]	Lead 10 [N]
30%	133	66	33
40%	177	88	44
50%	221	111	55
60%	265	133	66
70%	310	155	77

### RA4C/R Current Limit Value and Pressing Force

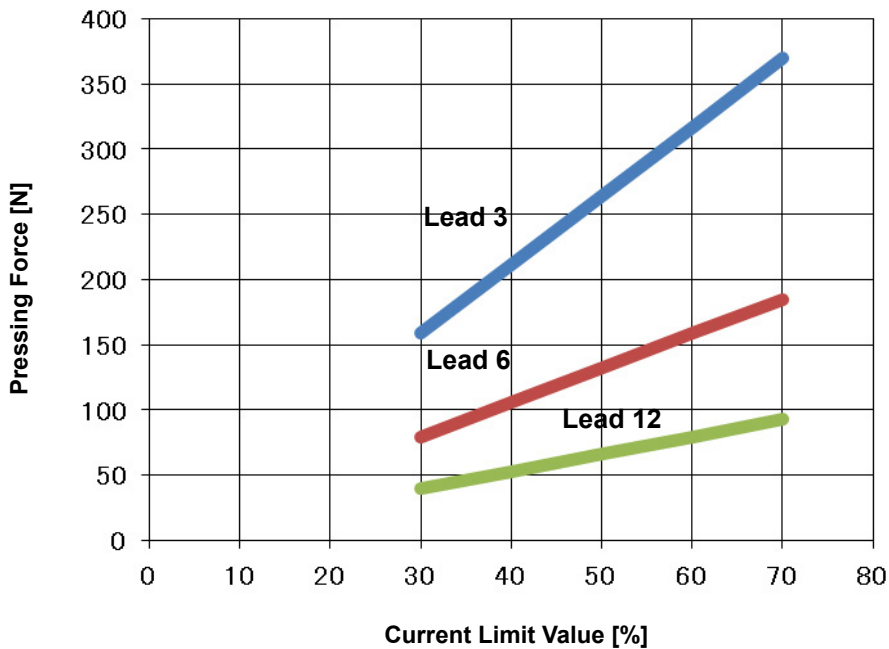


- ⚠ Caution:**
- (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
  - (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
  - (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
  - (4) For CON-system controllers such as PCON, when the approach speed to the pressing start position (setting in the position table) is 20mm/s or less, pressing will be performed with the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.  
For SEL-system controllers, such as MSEL, press at the speed set by PAPER instruction, regardless of the approach speed up to the pressing start position.

## [2] RA6C and RA6R Motor Type 42P

Current Limit Value	Lead 3 [N]	Lead 6 [N]	Lead 12 [N]
30%	159	79	40
40%	211	106	53
50%	264	132	66
60%	317	159	79
70%	370	185	93

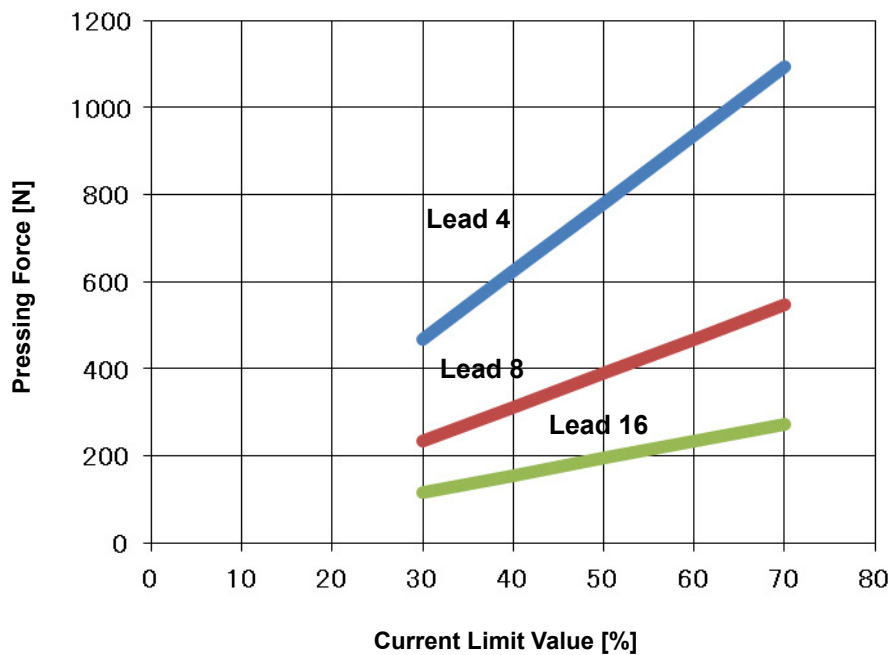
### RA6C/R Current Limit Value and Pressing Force



- ⚠ Caution:
- (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
  - (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
  - (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
  - (4) For CON-system controllers such as PCON, when the approach speed to the pressing start position (setting in the position table) is 20mm/s or less, pressing will be performed with the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.  
For SEL-system controllers, such as MSEL, press at the speed set by PAPR instruction, regardless of the approach speed up to the pressing start position.

## [3] RA7C and RA7R Motor Type 56P

Current Limit Value	Lead 4 [N]	Lead 8 [N]	Lead 16 [N]
30%	469	234	117
40%	625	312	156
50%	781	391	195
60%	937	469	234
70%	1094	547	273

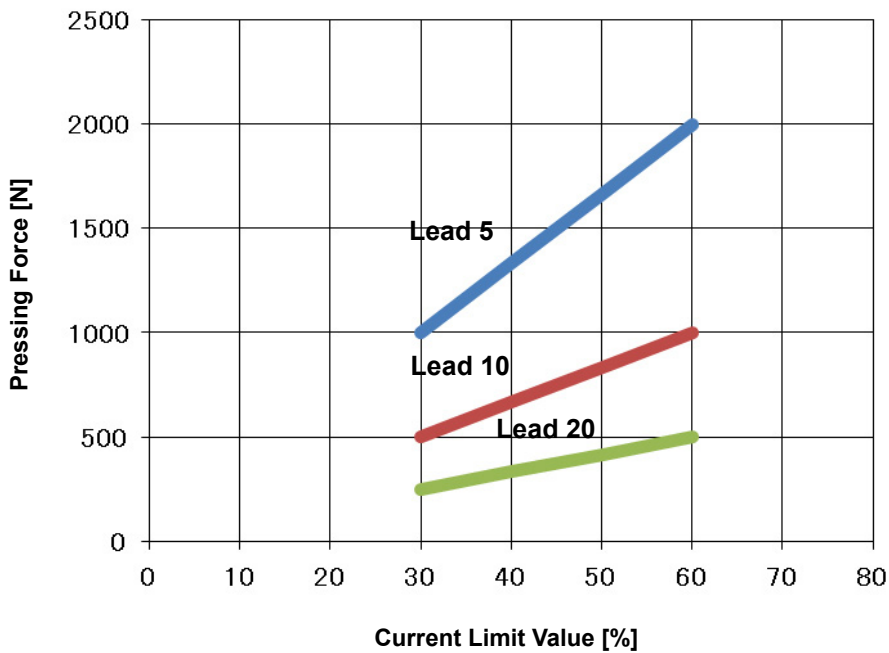
**RA7C/R Current Limit Value and Pressing Force**


- ⚠ Caution:
- (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
  - (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
  - (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
  - (4) For CON-system controllers such as PCON, when the approach speed to the pressing start position (setting in the position table) is 20mm/s or less, pressing will be performed with the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.  
For SEL-system controllers, such as MSEL, press at the speed set by PAPER instruction, regardless of the approach speed up to the pressing start position.

## [4] RA8C and RA8R Motor Type 60P

Current Limit Value	Lead 5 [N]	Lead 10 [N]	Lead 20 [N]
30%	1000	500	250
40%	1333	667	333
50%	1667	833	417
60%	2000	1000	500

### RA8C/R Current Limit Value and Pressing Force



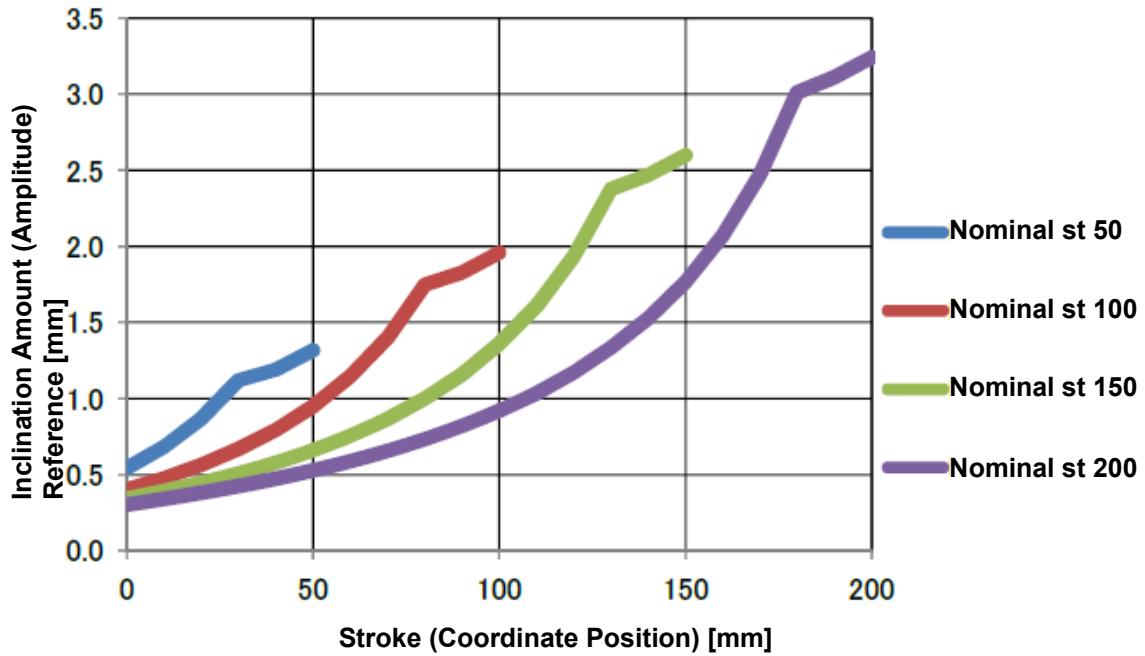
- ⚠ Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 10mm/s.
- (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
- (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 60%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
- (4) For CON-system controllers such as PCON, when the approach speed to the pressing start position (setting in the position table) is 10mm/s or less, pressing will be performed with the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.  
For SEL-system controllers, such as MSEL, press at the speed set by PAPR instruction, regardless of the approach speed up to the pressing start position.



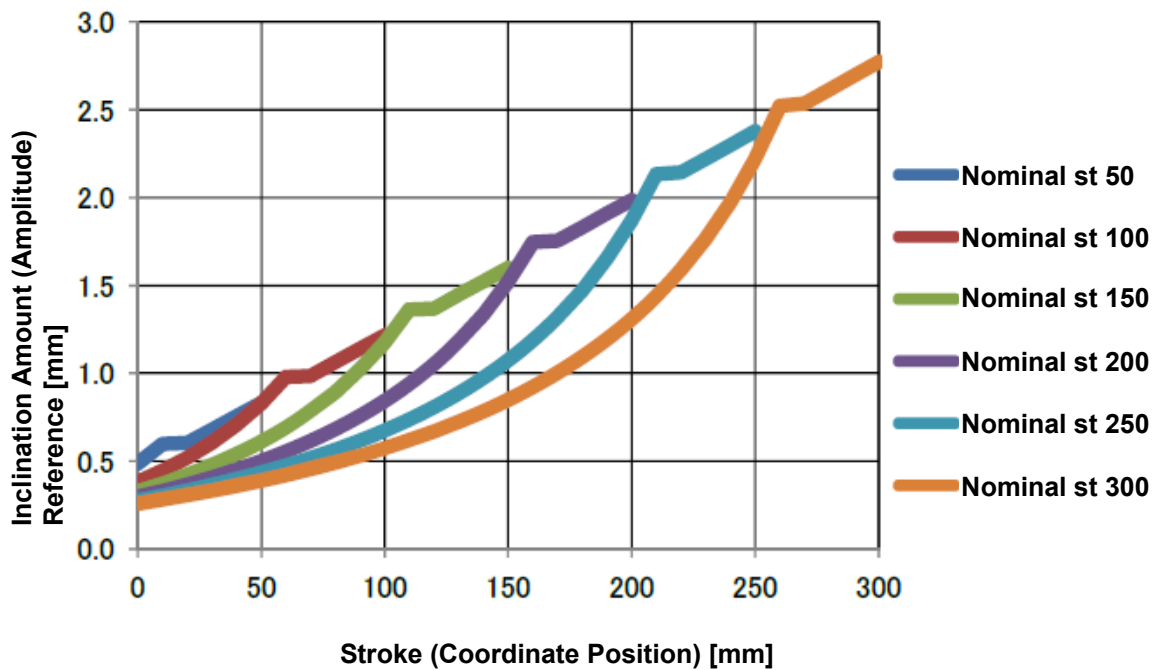
1.2.7 Rod Tip Inclination Amount (reference)

This is a calculated value from the clearances of bearing gaps and whirl-stops.

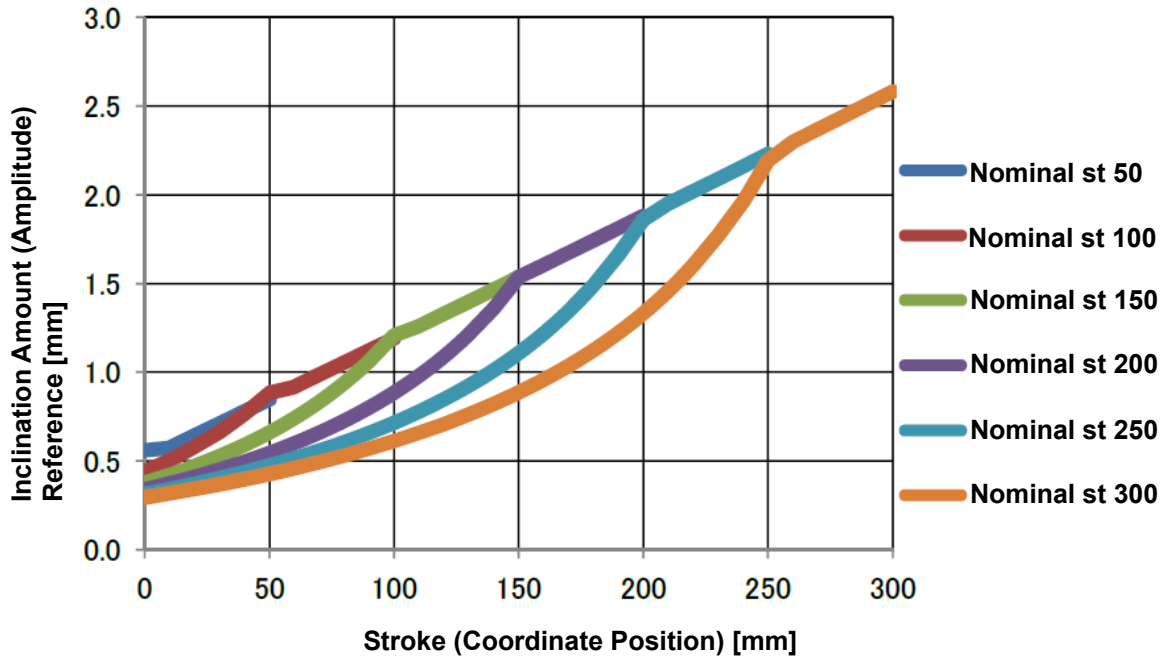
RA4C, RA4R Rod Tip Inclination Amount (Reference)



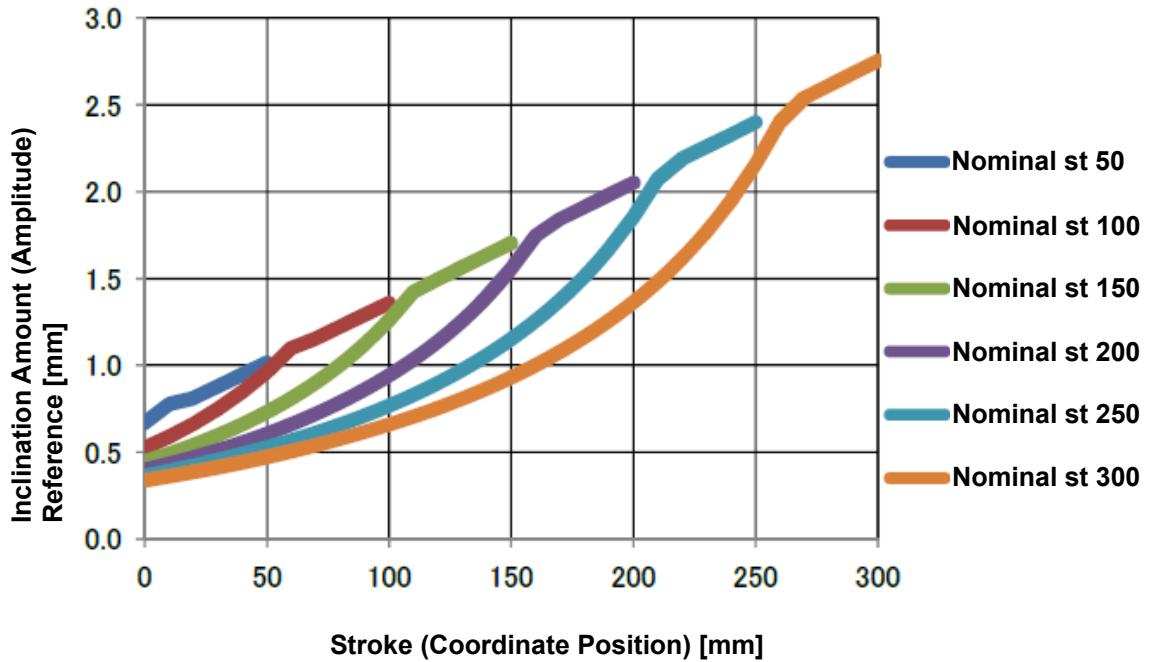
RA6C, RA6R Rod Tip Inclination Amount (Reference)



RA7C, RA7R Rod Flexure (Reference)



RA8C, RA8R Rod Flexure (Reference)



### 1.2.8 Duty Ratio for Continuous Operation

[Standard Specification]

It can operate continuously when the duty ratio is 100%.

[Standard Specification]

It can operate continuously when the duty ratio is 100%.

[Built-in Controller Specification]

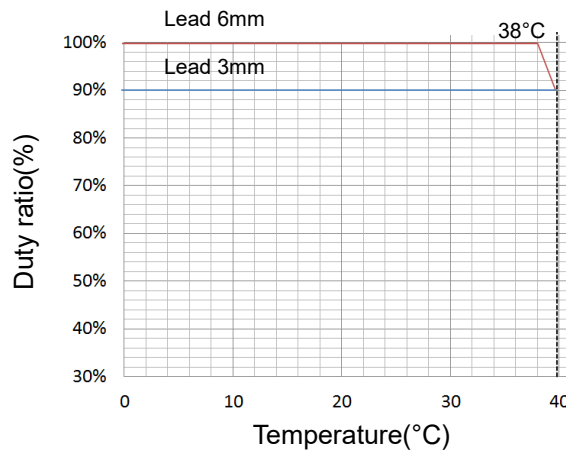
© RCP6SW-RA4C, 4R

It can operate continuously when the duty ratio is 100%.

© RCP6SW-RA6C, 6R

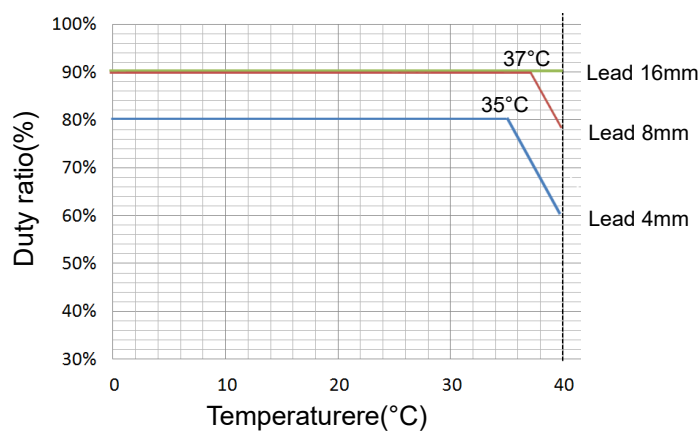
Lead 12mm can operate continuously when the duty ratio is 100%.

Operate with the duty ratio as in the following graph for lead 3mm and 6mm.



© RCP6SW-RA7C, 7R

Operate with the duty ratio as in the following graph for lead 4mm, 8mm, and 16mm.



© RCP6SW-RA8C, 8R  
 Operate with the duty ratio of 70% or less.

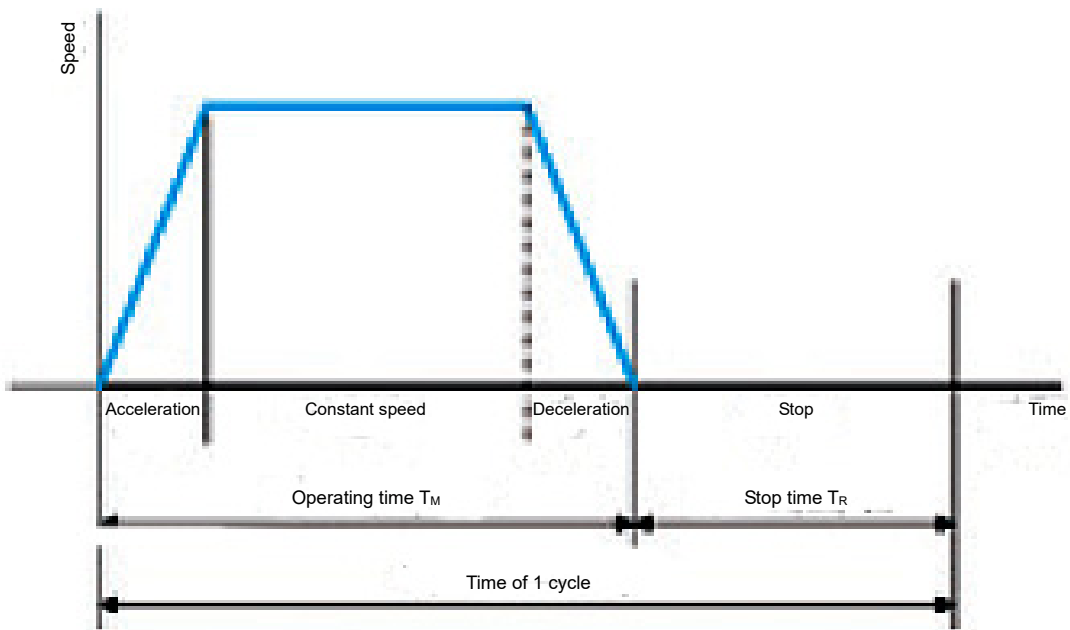
Duty ratio is an operating rate, which indicates the time that the actuator is running in one cycle by percentage.

[Duty ratio]

The duty ratio is the operating rate, shown in %, of the actuator operating time within one cycle.

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

D: Duty  
 T<sub>M</sub>: Operating time  
 (including pressing operation)  
 T<sub>R</sub>: Stop time



### 1.2.9 Degree of protection IP65 (IEC 60529/JIS C 0920)

## 1.3 Options

### 1.3.1 Brake Type (Model: B)

The brake is a mechanism designed to prevent the rod from dropping on a vertically installed actuator when the power or servo is turned OFF. Use the brake to prevent the installed load, etc., from being damaged due to the falling rod.

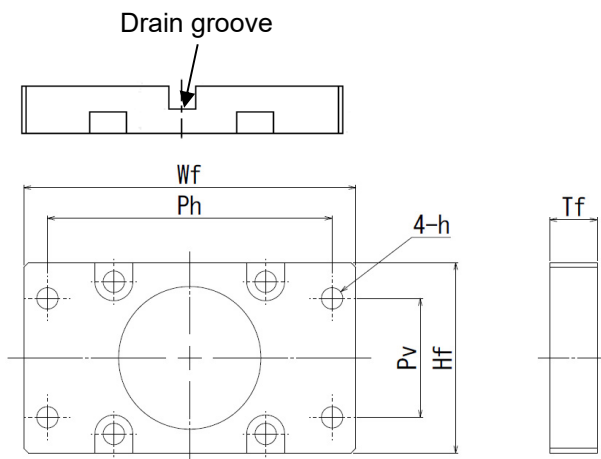
### 1.3.2 Reversed-home Specification (Model: NM)

The standard home position is on the motor side. However, the motor position will be reversed if it is desirable in view of the layout of the system, etc.

(Note) The home position is adjusted at the factory before shipment. If you wish to change the home after the delivery of your actuator, you must return the actuator to IAI for adjustment.

### 1.3.3 Flange Bracket (Front) (Model: FL)

This is the flange bracket to attach on the front of the main unit.



Model	RA4	RA6	RA7	RA8
Model code of single product	RCP6W-FL-RA4	RCP6W-FL-RA6	RCP6W-FL-RA7	RCP6W-FL-RA8
Wf[mm]	70	90	108	135
Hf[mm]	40	56	68	84
Ph[mm]	60	75	90	115
Pv[mm]	25	40	50	65
h[mm]	4.5	6.6	8.5	8.5
Tf[mm]	10	12	16	19

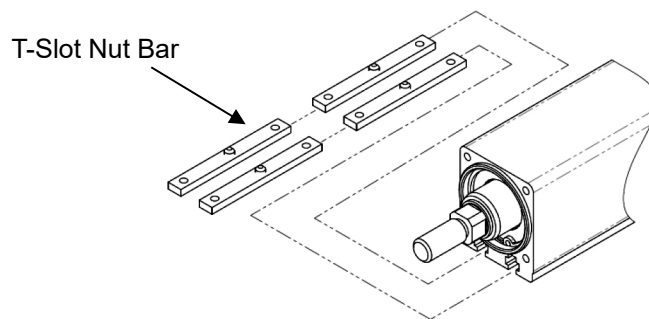
## 1.3.4 Foot Bracket (Model: FT)

This is a bracket for fixing the actuator body from the top with the bolts.  
[For the dimensions, refer to 2.3.2 “Installation of the Main Unit [2] Installation by Using Foot Brackets”]

## 1.3.5 T-slot Nut Bar (Model: NTB)

These are bar-shaped brackets that plug into the actuator's T-slots.  
There is a nut hole in the predetermined position on the T-slot nut bar.

[For the dimensions, refer to 2.3.2 “Installation of the Main Unit [1] Using the T-slot on the Bottom of the Base”]

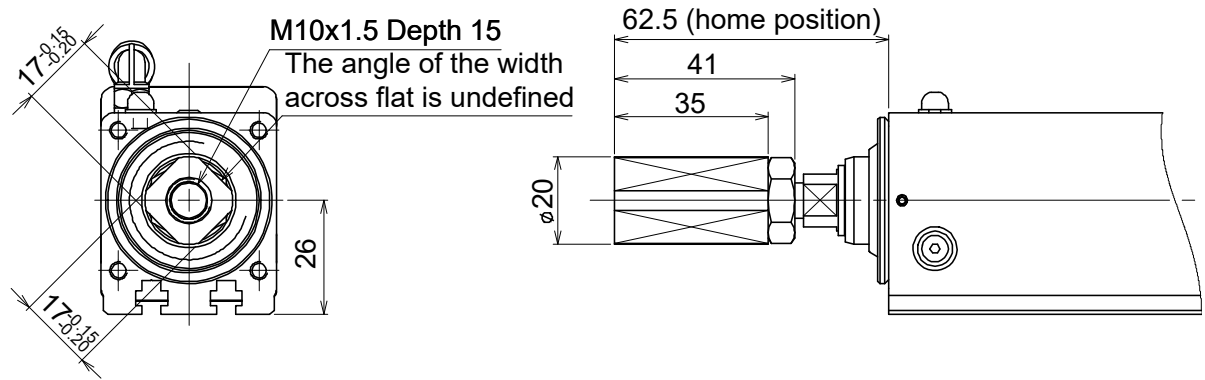


1.3.6 Tip Adapter (Internal Thread) (Model: NFA)

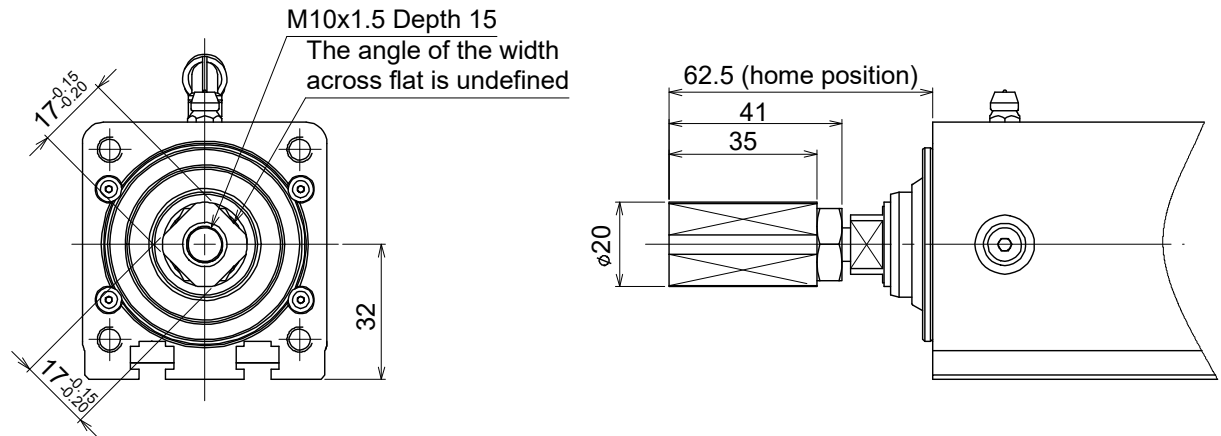
Applicable Units : RA4C, RA4R, RA6C, RA6R, RA7C, RA7R, RA8C, RA8R

This is an adapter to attach on the rod end an object such as a fixture with one screw.

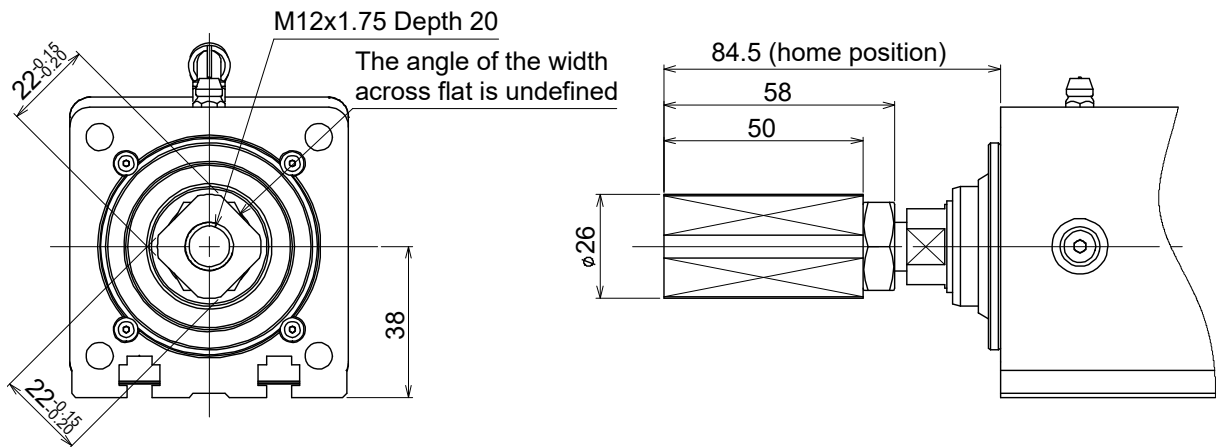
- ◎ RA4C and RA4R  
[Model code of single product : RCP6-NFA-RA4]



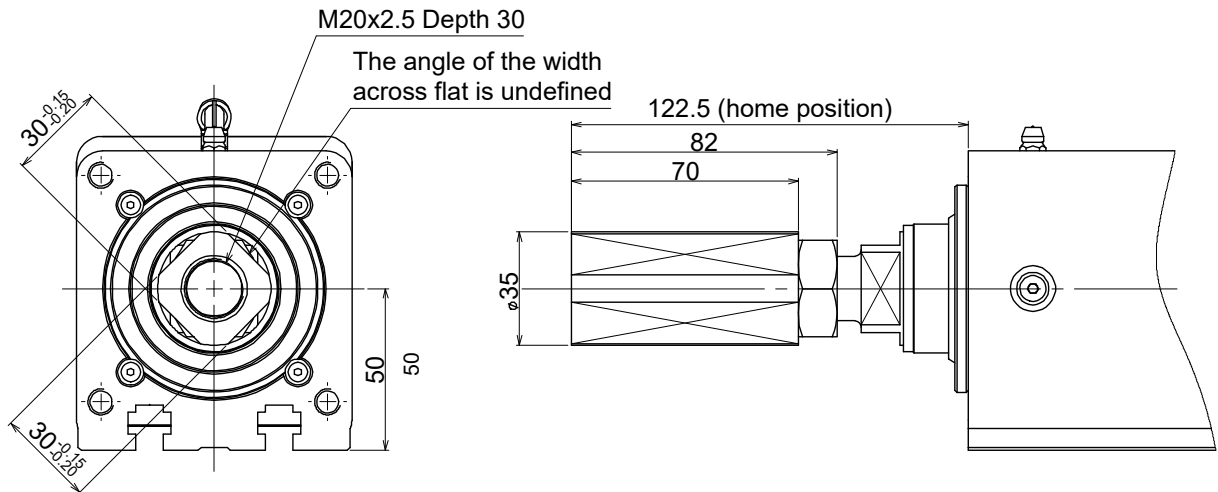
- ◎ RA6C and RA6R  
[Model code of single product : RCP6-NFA-RA6]



◎ RA7C and RA7R  
[Model code of single product : RCP6-NFA-RA7]



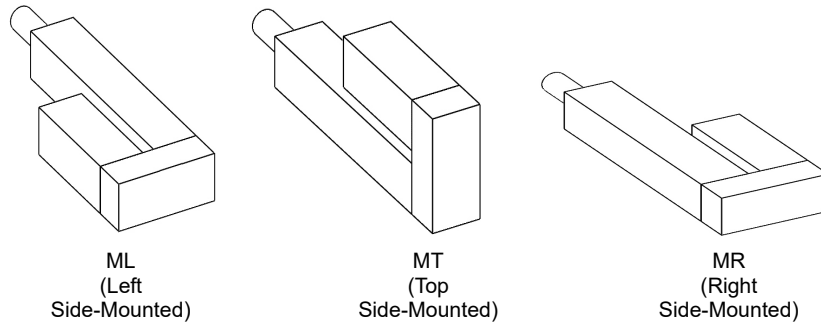
◎ RA8C and RA8R  
[Model code of single product : RCP6-NFA-RA8]





### 1.3.7 Motor Left Side-Mounted, Motor Top Side-Mounted, Motor Right Side-Mounted (Model: ML, MT, MR)

From the view of the motor side, the type with the motor side-mounted to the left is ML, the motor side-mounted to the top is MT, and the motor side-mounted to the right is MR.



### 1.3.8 Cable Exit Direction Changed (Model: CJT, CJR, CJL, CJB, CJO)

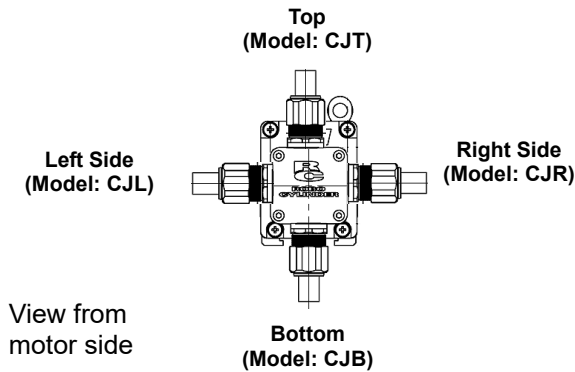
Changes to the specified cable exit direction.

The exit directions are top (model: CJT), right (model: CJR), left (model: CJL), bottom (model: CJB) and outside (model: CJO). For the straight type, only CJT, CJR, CJL and CJB can be selected.

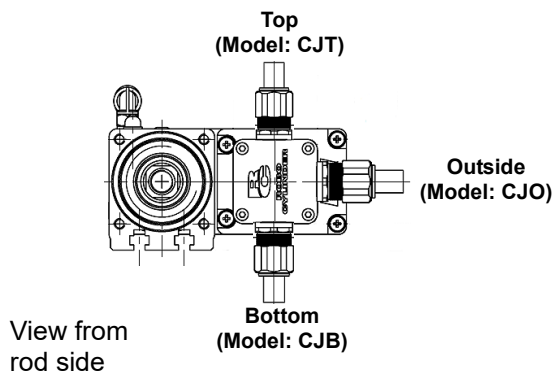
For the right side-mounted motor (MR) and left side-mounted motor (ML) types, only CJT, CJB and CJO can be selected.

For the top side-mounted motor (MT) type, only CJR, CJL and CJO can be selected.

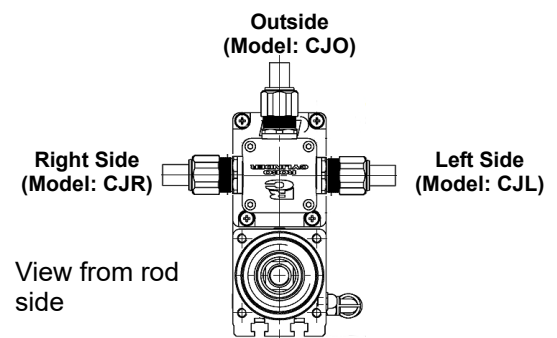
☉ Straight type



☉ Motor right side-mounted (MR), motor left side-mounted (ML)



☉ Motor top side-mounted (MT)



### 1.3.9 Change of Actuator Cable Length (models: AC5, AC10, AC15)

The standard length is 2m. For a longer actuator cable, specify the length as follows.

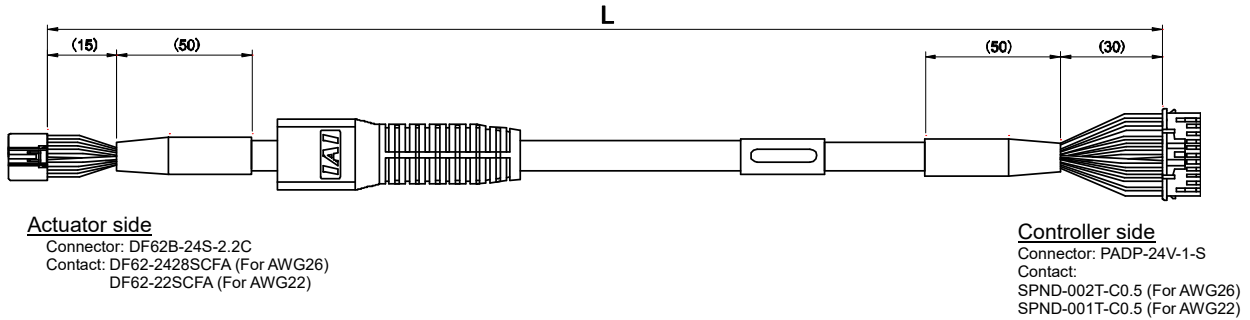
- AC5: 5m
- AC10: 10m
- AC15: 15m

## 1.4 Motor • Encoder Cables

### 1.4.1 Dedicated connection cable for other than RCON and RCM-P6PC

#### [1] Motor • Encoder Integrated Cables (RA4, RA6 and RA7)

CB-CAN-MPA□□□ □□□ indicates the cable length (L) (Example: 030=3m), Max.18m



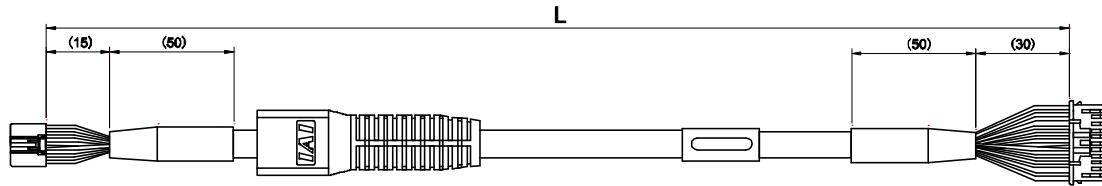
Connection diagram

Actuator side				Controller side			
Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	$\phi$ A	3	1	$\phi$ A	Blue	AWG22/19
AWG22/19	Orange	VMM	5	2	VMM	Orange	AWG22/19
AWG22/19	Brown	$\phi$ B	10	3	$\phi$ B	Brown	AWG22/19
AWG22/19	Gray	VMM	9	4	VMM	Gray	AWG22/19
AWG22/19	Green	$\phi$ _A	4	5	$\phi$ _A	Green	AWG22/19
AWG22/19	Red	$\phi$ _B	15	6	$\phi$ _B	Red	AWG22/19
AWG26	Black	LS+	8	7	LS+	Black	AWG26
AWG26	Yellow	LS-	14	8	LS-	Yellow	AWG26
AWG26	Blue	SA	12	11	SA	Blue	AWG26
AWG26	Orange	SB	17	12	SB	Orange	AWG26
AWG26	Green	A+	1	13	A+	Green	AWG26
AWG26	Brown	A-	6	14	A-	Brown	AWG26
AWG26	Gray	B+	11	15	B+	Gray	AWG26
AWG26	Red	B-	16	16	B-	Red	AWG26
AWG26	Blue	BK+	20	9	BK+	Blue	AWG26
AWG26	Orange	BK-	2	10	BK-	Orange	AWG26
AWG26	Gray	VCC	21	17	VCC	Gray	AWG26
AWG26	Red	GND	7	19	GND	Red	AWG26
AWG26	Brown	VPS	18	18	VPS	Brown	AWG26
AWG26	Green	LS_GND	13	20	LS_GND	Green	AWG26
-	-	-	19	22	-	-	-
AWG26	Pink	-	22	21	-	Pink	AWG26
-	-	-	23	23	-	-	-
AWG26	Black	FG	24	24	FG	Black	AWG26

(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

[2] Motor • Encoder Integrated Cables Robot Type (RA4, RA6 and RA7)  
 CB-CAN-MPA□□□-RB □□□ indicates the cable length (L) (Example: 030=3m), Max.18m



**Actuator side**

Connector: DF62B-24S-2.2C  
 Contact: DF62-2428SCFA (For AWG26)  
 DF62-22SCFA (For AWG22)

**Controller side**

Connector: PADP-24V-1-S  
 Contact: SPND-002T-C0.5 (For AWG26)  
 SPND-001T-C0.5 (For AWG22)

Connection diagram

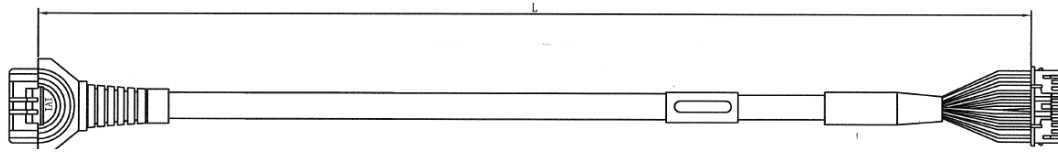
Actuator side				Controller side			
Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	$\phi$ A	3	1	$\phi$ A	Blue	AWG22/19
AWG22/19	Orange	VMM	5	2	VMM	Orange	AWG22/19
AWG22/19	Brown	$\phi$ B	10	3	$\phi$ B	Brown	AWG22/19
AWG22/19	Gray	VMM	9	4	VMM	Gray	AWG22/19
AWG22/19	Green	$\phi$ _A	4	5	$\phi$ _A	Green	AWG22/19
AWG22/19	Red	$\phi$ _B	15	6	$\phi$ _B	Red	AWG22/19
AWG26	Black	LS+	8	7	LS+	Black	AWG26
AWG26	Yellow	LS-	14	8	LS-	Yellow	AWG26
AWG26	Blue	SA	12	11	SA	Blue	AWG26
AWG26	Orange	SB	17	12	SB	Orange	AWG26
AWG26	Green	A+	1	13	A+	Green	AWG26
AWG26	Brown	A-	6	14	A-	Brown	AWG26
AWG26	Gray	B+	11	15	B+	Gray	AWG26
AWG26	Red	B-	16	16	B-	Red	AWG26
AWG26	Blue	BK+	20	9	BK+	Blue	AWG26
AWG26	Orange	BK-	2	10	BK-	Orange	AWG26
AWG26	Gray	VCC	21	17	VCC	Gray	AWG26
AWG26	Red	GND	7	19	GND	Red	AWG26
AWG26	Brown	VPS	18	18	VPS	Brown	AWG26
AWG26	Green	LS_GND	13	20	LS_GND	Green	AWG26
-	-	-	19	22	-	-	-
AWG26	Pink	-	22	21	-	Pink	AWG26
-	-	-	23	23	-	-	-
AWG26	Green	FG	24	24	FG	Green	AWG26

(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

[3] Motor • Encoder Integrated Cables (RA8)

CB-CFA3-MPA□□□ □□□ indicates the cable length (L) (Example: 030=3m), Max.18m



**Actuator side**

Connector: 1-1827863-1  
Contact: 1827570-2

**Controller side**

Connector: PADP-24V-1-S  
Contact:  
SPND-002T-C0.5 (For AWG26)  
SPND-001T-C0.5 (For AWG22)

**Connection diagram**

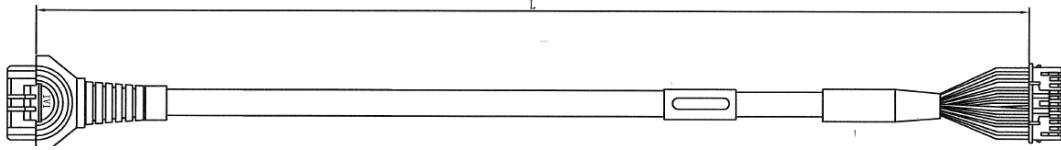
Actuator side				Controller side			
Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	$\phi$ A	A1	1	$\phi$ A	Blue	AWG22/19
AWG22/19	Orange	VMM	B1	2	VMM	Orange	AWG22/19
AWG22/19	Green	$\phi$ _A	A2	5	$\phi$ _A	Green	AWG22/19
AWG22/19	Brown	$\phi$ B	B2	3	$\phi$ B	Brown	AWG22/19
AWG22/19	Gray	VMM	A3	4	VMM	Gray	AWG22/19
AWG22/19	Red	$\phi$ _B	B3	6	$\phi$ _B	Red	AWG22/19
AWG26	Black	LS+	A4	7	LS+	Black	AWG26
AWG26	Yellow	LS-	B4	8	LS-	Yellow	AWG26
AWG26	Blue	SA	A6	11	SA	Blue	AWG26
AWG26	Orange	SB	B6	12	SB	Orange	AWG26
AWG26	Green	A+	A7	13	A+	Green	AWG26
AWG26	Brown	A-	B7	14	A-	Brown	AWG26
AWG26	Gray	B+	A8	15	B+	Gray	AWG26
AWG26	Red	B-	B8	16	B-	Red	AWG26
AWG26	Blue	BK+	A5	9	BK+	Blue	AWG26
AWG26	Orange	BK-	B5	10	BK-	Orange	AWG26
AWG26	Green	LS_GND	A9	20	LS_GND	Green	AWG26
AWG26	Brown	VPS	B9	18	VPS	Brown	AWG26
AWG26	Gray	VCC	A10	21	VCC	Gray	AWG26
AWG26	Red	GND	B10	19	GND	Red	AWG26
-	-	-	A11	17	-	-	-
AWG26	Black	FG	B11	22	-	-	AWG26
				23	-	-	-
				24	FG	Black	AWG26

(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 3m or less, and AWG19 when longer than 3m.

## [4] Motor • Encoder Integrated Cables (RA8)

CB-CFA3-MPA□□□-RB indicates the cable length (L) (Example: 030=3m), Max.18m



### Actuator side

Connector: 1-1827863-1  
Contact: 1827570-2

### Controller side

Connector: PADP-24V-1-S  
Contact:  
SPND-002T-C0.5 (For AWG26)  
SPND-001T-C0.5 (For AWG22)

Connection diagram

Actuator side				Controller side			
Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	$\phi$ A	A1	1	$\phi$ A	Blue	AWG22/19
AWG22/19	Orange	VMM	B1	2	VMM	Orange	AWG22/19
AWG22/19	Green	$\phi$ _A	A2	5	$\phi$ _A	Green	AWG22/19
AWG22/19	Brown	$\phi$ B	B2	3	$\phi$ B	Brown	AWG22/19
AWG22/19	Gray	VMM	A3	4	VMM	Gray	AWG22/19
AWG22/19	Red	$\phi$ _B	B3	6	$\phi$ _B	Red	AWG22/19
AWG26	Black	LS+	A4	7	LS+	Black	AWG26
AWG26	Yellow	LS-	B4	8	LS-	Yellow	AWG26
AWG26	Blue	SA	A6	11	SA	Blue	AWG26
AWG26	Orange	SB	B6	12	SB	Orange	AWG26
AWG26	Green	A+	A7	13	A+	Green	AWG26
AWG26	Brown	A-	B7	14	A-	Brown	AWG26
AWG26	Gray	B+	A8	15	B+	Gray	AWG26
AWG26	Red	B-	B8	16	B-	Red	AWG26
AWG26	Blue	BK+	A5	9	BK+	Blue	AWG26
AWG26	Orange	BK-	B5	10	BK-	Orange	AWG26
AWG26	Green	LS_GND	A9	20	LS_GND	Green	AWG26
AWG26	Brown	VPS	B9	18	VPS	Brown	AWG26
AWG26	Gray	VCC	A10	21	VCC	Gray	AWG26
AWG26	Red	GND	B10	19	GND	Red	AWG26
-	-	-	A11	17	-	-	-
AWG26	Green	FG	B11	22	-	-	AWG26
				23	-	-	-
				24	FG	Green	AWG26

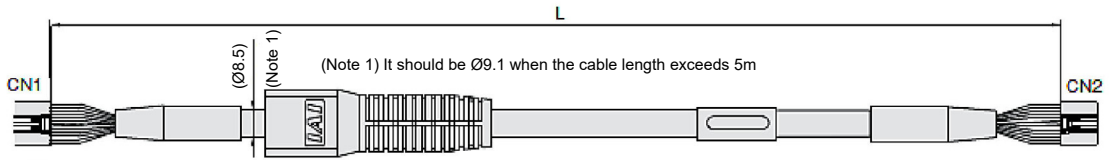
(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 3m or less, and AWG19 when longer than 3m.

### 1.4.2 Dedicated connection cable for RCON and RCM-P6PC

#### [1] Motor • Encoder Integrated Cables

CB-ADPC-MPA□□□ (□□□ indicates the cable length L, Example: 030=3m), Max.20m



**Actuator side**  
 Connector: DF62B-24S-2.2C  
 Contact: DF62-2428SCFA  
 (For AWG26)  
 DF62-22SCFA (For AWG22)

**Controller side**  
 Connector: DF62B-24S-2.2C  
 Contact: DF62-2428SCFA  
 (For AWG26)  
 DF62-22SCFA (For AWG22)

Connection diagram

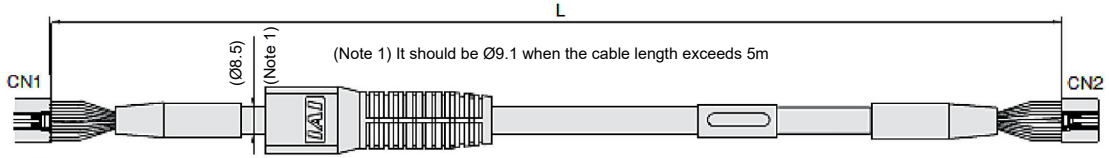
Actuator side				Controller side			
Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	$\phi A$	3	3	$\phi A$	Blue	AWG22/19
AWG22/19	Orange	VMM	5	5	VMM	Orange	AWG22/19
AWG22/19	Brown	$\phi B$	10	10	$\phi B$	Brown	AWG22/19
AWG22/19	Gray	VMM	9	9	VMM	Gray	AWG22/19
AWG22/19	Green	$\phi_A$	4	4	$\phi_A$	Green	AWG22/19
AWG22/19	Red	$\phi_B$	15	15	$\phi_B$	Red	AWG22/19
AWG26	Black	LS+	8	8	LS+	Black	AWG26
AWG26	Yellow	LS-	14	14	LS-	Yellow	AWG26
AWG26	Blue	SA	12	12	SA	Blue	AWG26
AWG26	Orange	SB	17	17	SB	Orange	AWG26
AWG26	Green	A+	1	1	A+	Green	AWG26
AWG26	Brown	A-	6	6	A-	Brown	AWG26
AWG26	Gray	B+	11	11	B+	Gray	AWG26
AWG26	Red	B-	16	16	B-	Red	AWG26
AWG26	Blue	BK+	20	20	BK+	Blue	AWG26
AWG26	Orange	BK-	2	2	BK-	Orange	AWG26
AWG26	Gray	VCC	21	21	VCC	Gray	AWG26
AWG26	Red	GND	7	7	GND	Red	AWG26
AWG26	Brown	VPS	18	18	VPS	Brown	AWG26
AWG26	Green	LS_GND	13	13	LS_GND	Green	AWG26
-	-	-	19	19	-	-	-
AWG26	Pink	-	22	22	-	Pink	AWG26
-	-	-	23	23	-	-	-
AWG26	Black	FG	24	24	FG	Black	AWG26

(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

## [2] Motor • Encoder Integrated Cables Robot Type

CB-ADPC-MPA□□□-RB (□□□ indicates the cable length L, Example: 030=3m), Max.20m



### Actuator side

Connector: DF62B-24S-2.2C  
 Contact: DF62-2428SCFA  
 (For AWG26)  
 DF62-22SCFA (For AWG22)

### Controller side

Connector: DF62B-24S-2.2C  
 Contact: DF62-2428SCFA  
 (For AWG26)  
 DF62-22SCFA (For AWG22)

### Connection diagram

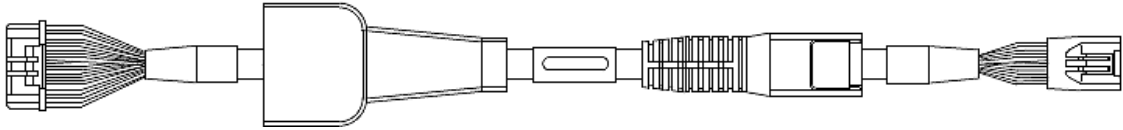
Actuator side				Controller side			
Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	$\phi$ A	3	3	$\phi$ A	Blue	AWG22/19
AWG22/19	Orange	VMM	5	5	VMM	Orange	AWG22/19
AWG22/19	Brown	$\phi$ B	10	10	$\phi$ B	Brown	AWG22/19
AWG22/19	Gray	VMM	9	9	VMM	Gray	AWG22/19
AWG22/19	Green	$\phi$ _A	4	4	$\phi$ _A	Green	AWG22/19
AWG22/19	Red	$\phi$ _B	15	15	$\phi$ _B	Red	AWG22/19
AWG26	Black	LS+	8	8	LS+	Black	AWG26
AWG26	Yellow	LS-	14	14	LS-	Yellow	AWG26
AWG26	Blue	SA	12	12	SA	Blue	AWG26
AWG26	Orange	SB	17	17	SB	Orange	AWG26
AWG26	Green	A+	1	1	A+	Green	AWG26
AWG26	Brown	A-	6	6	A-	Brown	AWG26
AWG26	Gray	B+	11	11	B+	Gray	AWG26
AWG26	Red	B-	16	16	B-	Red	AWG26
AWG26	Blue	BK+	20	20	BK+	Blue	AWG26
AWG26	Orange	BK-	2	2	BK-	Orange	AWG26
AWG26	Gray	VCC	21	21	VCC	Gray	AWG26
AWG26	Red	GND	7	7	GND	Red	AWG26
AWG26	Brown	VPS	18	18	VPS	Brown	AWG26
AWG26	Green	LS_GND	13	13	LS_GND	Green	AWG26
-	-	-	19	19	-	-	-
AWG26	Pink	-	22	22	-	Pink	AWG26
-	-	-	23	23	-	-	-
AWG26	Green	FG	24	24	FG	Green	AWG26

(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.



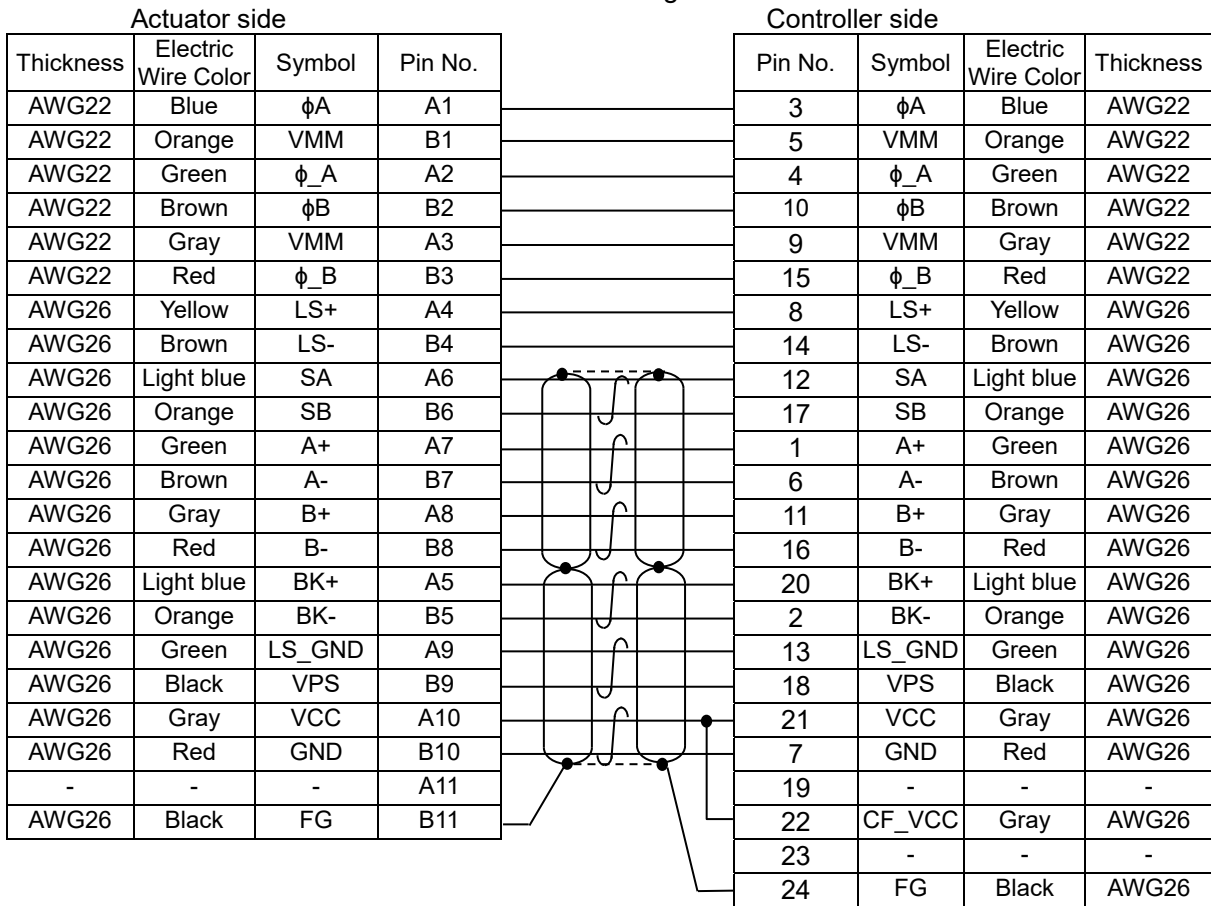
## [3] Conversion Cable CB-CAN-AJ002 length 0.2m



**Actuator side**  
Connector: 1-1827863-1  
Contact: 1827570-2

**Controller side**  
Connector: DF62B-24EP-2.2C  
Contact:  
DF62-EP2428PCFA (For AWG26)  
DF62-EP22PCFA (For AWG22)

Connection diagram



## 2. Installation

### 2.1 Transportation

#### [1] Handling of Robot

##### (1) Handling the Packed Unit

Unless otherwise specified, the actuator is shipped with each axis packaged separately.

- Do not damage or drop. No special treatment is conducted on this package to endure a drop or impact on it.
- Do not attempt to carry a heavy package with only one worker. Consider an appropriate method for transportation.
- Keep the unit in horizontal orientation when placing it on the ground or transporting. Follow the instruction if there is any for the packaging condition.
- Do not step or sit on the package.
- Do not put any load that may cause a deformation or breakage of the package.

##### (2) Handling the Actuator After Unpacking

- Do not carry an actuator by motor cover and a cable or attempt to move it by pulling the cable.
- Be careful not to bump the actuator into anything when moving it.
- Hold the body frame when transporting the actuator.
- Do not apply an excessive force to each part of the actuator.

Supplement) For the names of each part of the actuator, refer to “Names of the Parts”

## [2] Handling in the Assembled Condition

This is the case when the product is delivered from our factory under a condition that it is assembled with other actuators. The combined axes are delivered in a package that the frame is nailed on the lumber base. Fix the rod so that would not accidentally move during transportation. The actuators are also fixed so the tip of it would not shake due to the external vibration.

### (1) Handling the Packed Unit

- Do not hit or drop the package. No special treatment is conducted on this package to endure a drop or impact on it.
- Do not attempt to carry a heavy package with only one worker. Also, have an appropriate method for transportation.
- When hanging up with ropes, support on the reinforcement frame on the bottom of the lumber base. When bringing up the package with a forklift, also support on the bottom of the lumber base.
- Handle with care when putting the package down to avoid impact or bounce.
- Do not step on the package.
- Do not put any load that may cause a deformation or breakage of the package.

### (2) How to Handle after Unpackaged

- Secure the rods to prevent sudden movement during transport.
- If the tip of an actuator is overhanging, have an appropriate way to fix it to avoid shake due to the external vibration. In the transportation without the tip being fixed, do not apply any impact with 0.3G or more.
- When hanging up with ropes, have appropriate cushioning to avoid any deformation of the actuator body. Also keep it in stable horizontal orientation. Make a fixture utilizing the attachment holes and the tapped holes on the actuator body if necessary.
- Do not attempt to apply load on the actuators or the connector box. Also pay attention not to pinch cables and bend or deform them forcefully.

## [3] Handling in Condition of being assembled in Machinery Equipment (System)

These are some caution notes for when transporting the actuator being assembled in the machinery equipment (system):

- Secure the rods to prevent sudden movement during transport.
- If the tip of an actuator is overhanging, have an appropriate way to fix it to avoid shake due to the external vibration. In the transportation without the tip being fixed, do not apply any impact with 0.3G or more.
- When hanging up the machinery equipment (system) with ropes, do not attempt to apply load on the actuators or the connector box. Also pay attention not to pinch cables and bend or deform them forcefully.

## 2.2 Installation and Storage • Preservation Environment

### [1] Installation Environment

The actuator should be installed in a location other than those specified below.

In general, the installation environment should be one in which an operator can work without protective gear.

Also provide sufficient work space required for maintenance inspection.

- Where the actuator 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 IP65 degree of protection is not adequate.  
IP65: Solids: Total protection of the interior from dust ingress.  
Water: No harmful effects from direct water jets from any direction.
- Where the actuator receives direct sunlight
- Where the actuator is exposed to corrosive or combustible gases
- Where the ambient air contains a large amount of powder dust, salt or iron (at level exceeding what is normally expected in an assembly plant)
- Where the unit is subject to splashed oil (including oil mist or cutting fluid) or chemical solutions (Note) Please contact us regarding oil (including oil mist or cutting fluid).
- Where the actuator receives impact or vibration
- Where the altitude is more than 2000m

If the actuator is used in any of the following locations, provide sufficient shielding measures:

- Where noise generates due to static electricity, etc.
- Where the actuator is subject to a strong electric or magnetic field
- Where the actuator is subject to ultraviolet ray or radiation

### [2] Storage • 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 absorbency 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.
- Storage and preservation should be performed in the horizontal condition. In the case it is stored in the packaged condition, follow the posture instruction if any displayed on the package.

## 2.3 How to Install

This chapter explains how to install the actuator on your mechanical system.


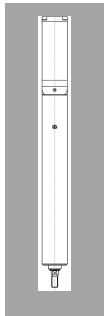
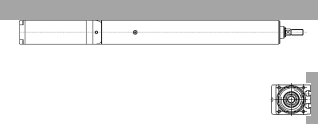

### 2.3.1 Installation

Follow the information below when installing the actuator, as a rule.  
Do pay attention to these items (except with custom-order models).

○ : Possible    △ : Daily inspection is required    × : Not possible

Model	Horizontal installation	Vertical installation	Sideway installation	Ceiling mount installation
RA4C, RA4R RA6C, RA6R RA7C, RA7R RA8C, RA8R	○	○	○	○

#### Installation Orientation

Horizontal	Vertical	Sideways	Ceiling mount
			

**⚠ Note:**

- Grease has been applied to the outer periphery of the rod. Protect the peripheral equipments if they are affected by grease adhesion.
- When the unit is installed vertically oriented, Motor straight type is attempt to put the motor up unless there is a special reason. · Putting the motor on the lower side would not cause a problem in an ordinary operation. However, it may rarely cause a problem, when it is not operated for a long period, depending on the surrounding environment (especially high temperature), caused by the grease being separated and the base oil flowing into the motor unit.

## 2.3.2 Installation of the Main Unit

The surface to mount the main unit should be a machined surface or a plane that possesses an equivalent accuracy and the flatness should be within 0.05mm/m. Also, the platform should have a structure stiff enough to install the unit so it would not generate vibration or other abnormality.

Also consider enough space necessary for maintenance work such as actuator replacement and inspection.

T-slots are provided on the back of the actuator.

Nut holes are provided on the actuator frame front and the side-mounted motor type rear bracket.

Using these parts, the following installations can be realized.

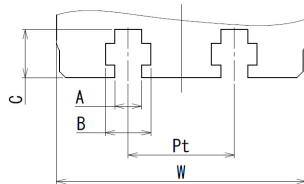
- Installation by using T-slots
- Installation by using foot brackets (option: model FT)
- Installing main unit frame front
- Installation by using flange (option: model FL)
- Installation by using rear bracket for side-mounted motor types

### [1] Using the T-slot on the Bottom of the Base

This actuator has T-slot for mounting so it can be fixed from the bottom of the base.

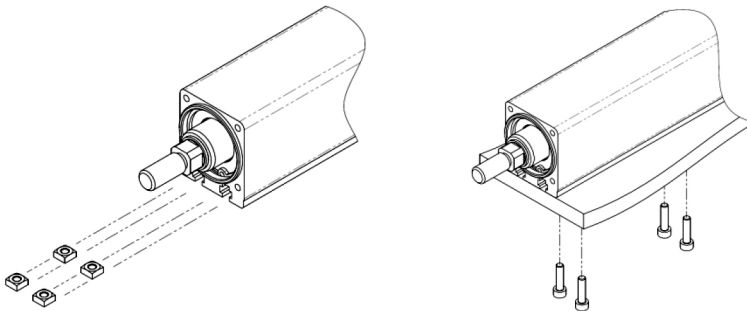
There are two methods of installation: using square T-nuts into T-slots or using optional T-slot nut bars (model: NTB).

#### (1) T-slots Dimensions



	RA4	RA6	RA7	RA8
W[mm]	40	58	70	85
Pt[mm]	17	25	35	40
A[mm]	4.3	6.3	6.3	8.5
B[mm]	7.3	10.3	10.3	13.3
C[mm]	7.7	9	10.5	14

## (2) Installation by Square Nuts



Square nuts prescribed in JIS B 1163 can be used for the T-slots.  
Quantities of the square nuts enclosed at the time of shipment are as follows.

	RA4	RA6	RA7	RA8
Quantities Enclosed	4	4	6	8
Attachment Bolts	M4	M6	M6	M8

(Note) When optional T-slot nut bars (model: NTB) are selected, the square nuts are not enclosed.

Adjust the screw length from the base bottom according to the following table to ensure the fitting length of the nut and the screw.

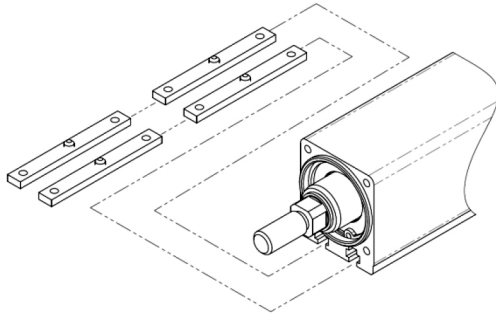
	RA4	RA6	RA7	RA8
Screw Length [mm] From the Base Bottom	5 to 7	7.5 to 8.5	8 to 10	11 to 13

Install them according to the minimum fixing number of bolts and the tightening torque in the following table.

		RA4	RA6	RA7	RA8
Minimum Fixing Number (Bolts)		4	4	6	8
Tightening Torque[Nm]	When the bolt seating surface is steel	3.59	12.34	12.34	29.9
	When the bolt seating surface is aluminum	1.76	5.36	5.36	11.48

**⚠ Caution:** Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the tapped holes may be damaged, actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

### (3) Installation by T-Slot Nut Bar (Option Model: NTB)



Four T-slot nut bars (option model: NTB) are shipped in a built-in-state in all sizes. Before you use them, loosen the hexagonal socket head fixing screws in the center of the nuts to move them to the desired positions. Do not overly tighten the hexagonal socket head fixing screws, for they are used only for positioning. Use the nut bars in a pitch as wide as possible to stabilize the mounting.

Adjust the screw length from the base bottom according to the following table to ensure the fitting length of the nut and the screw.

	RA4	RA6	RA7	RA8
Screw Length [mm] From the Base Bottom	5 to 7	7.5 to 8.5	8 to 10	11 to 13

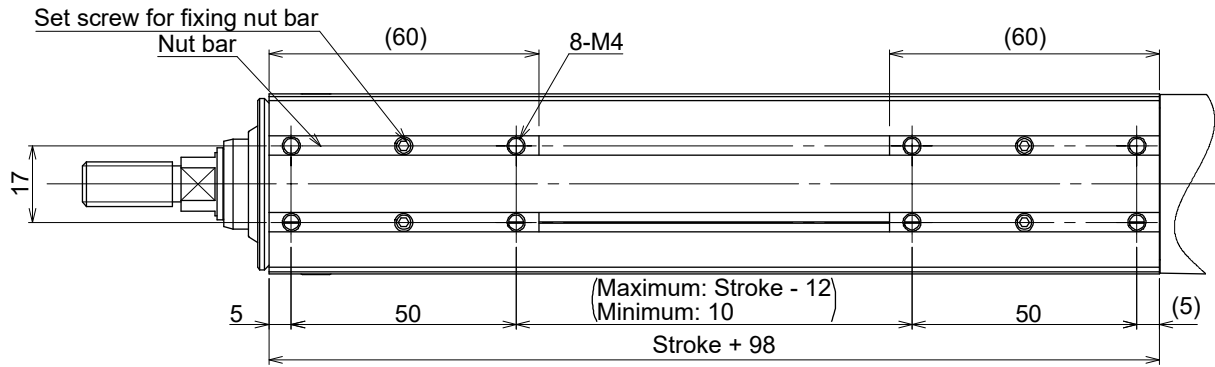
Install them according to the minimum fixing number of bolts and the tightening torque in the following table.

		RA4	RA6	RA7	RA8
Minimum Fixing Number (Bolts)		4	4	6	8
Tightening Torque[Nm]	When the bolt seating surface is steel	3.59	12.34	12.34	29.9
	When the bolt seating surface is aluminum	1.76	5.36	5.36	11.48

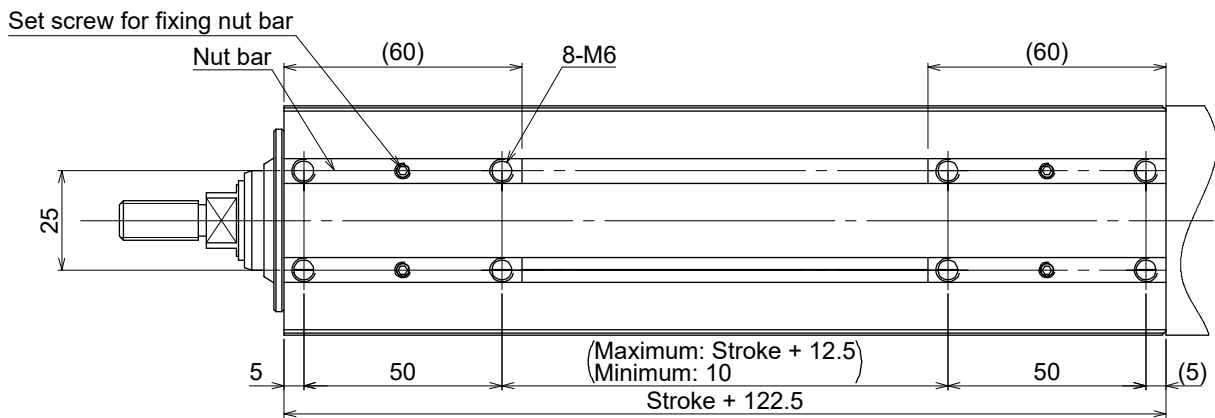
**⚠ Caution:** Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the tapped holes may be damaged, actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.



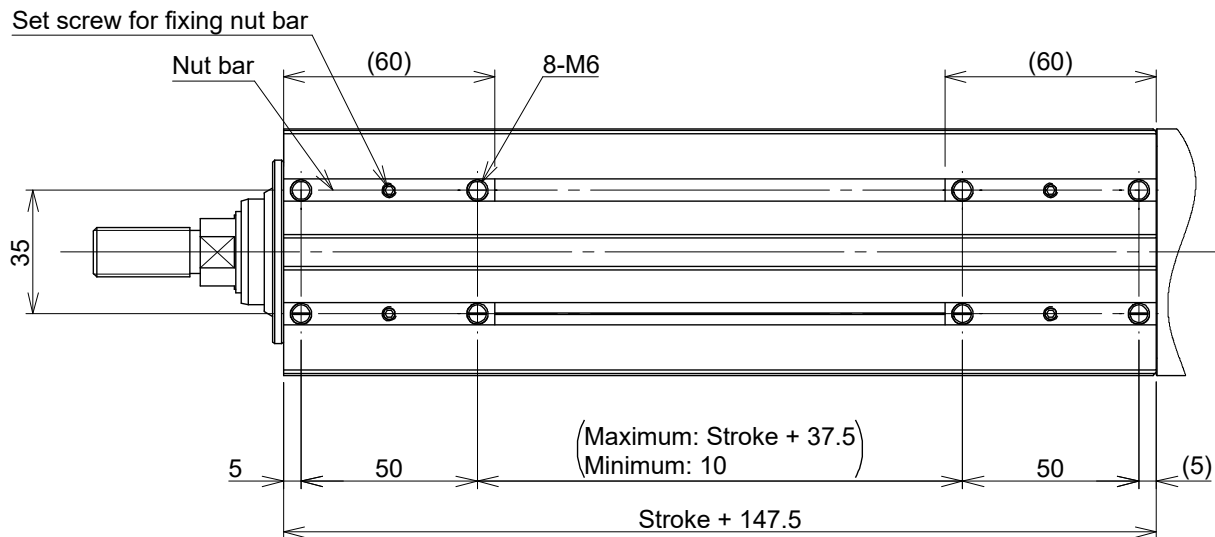
The attachable positions of T-Slot nut bars (model: NTB) are as follows.



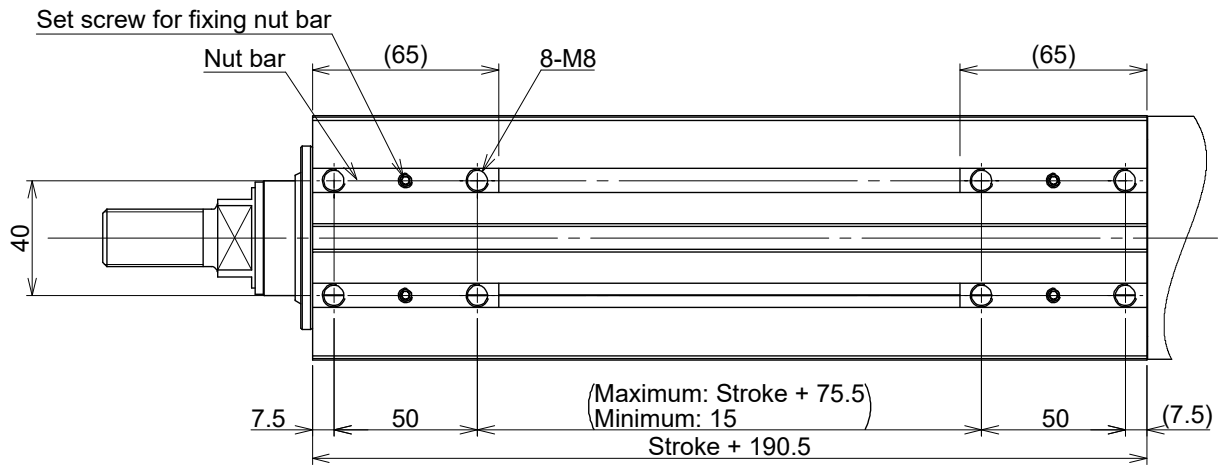
RA4  
(Model number of single product: RCP6W-NTB-RA4)



RA6  
(Model number of single product: RCP6W-NTB-RA6)



RA7  
(Model number of single product: RCP6W-NTB-RA7)

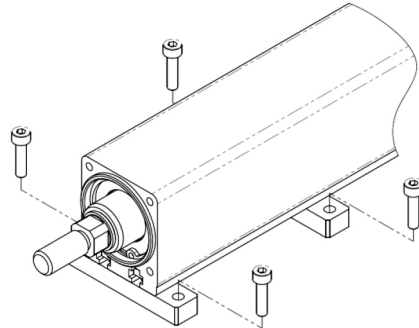


RA8

(Model number of single product: RCP6W-NTB-RA8)

## [2] When Utilizing Foot Brackets for Installation

Actuators can be installed by using the foot brackets (option: model FT).



Foot brackets are shipped in the state fixed to the both ends of the actuator frame. Before use, loosen the bolts fixing the foot brackets and move them to the desired positions.

[Width direction pitch of foot bracket, attachment bolts and others]  
Straight Type, Motor Top Side-Mounted Type (Model: MT)

	RA4	RA6	RA7	RA8
Width Direction Hole Pitch [mm]	50	72	85	100
Thickness [mm]	8	10	12	16
Material	Steel	Steel	Steel	Steel
Attachment Bolts	M4	M6	M6	M8

Motor Left Side-Mounted (Model: ML), Motor Right Side-Mounted (Model: MR) Except RCP6S-RA4R

	RA4	RA6	RA7	RA8
Width Direction Hole Pitch [mm]	100	132	160	190
Thickness [mm]	8	10	12	16
Material	Steel	Steel	Steel	Steel
Attachment Bolts	M4	M6	M6	M8

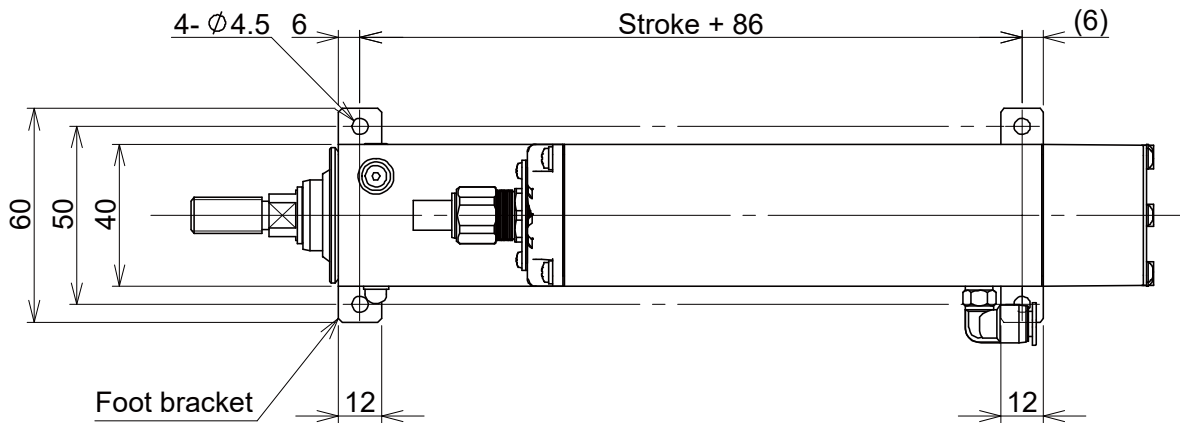
Motor Left Side-Mounted (Model: ML), Motor Right Side-Mounted (Model: MR) of RCP6S-RA4R

	RA4	RA6	RA7	RA8
Width Direction Hole Pitch [mm]	121	/	/	/
Thickness [mm]	8			
Material	Steel			
Attachment Bolts	M4			

[Tightening Torque]

Model	Screw Nominal Diameter	In the case that steel is used for the bolt seating surface:
RA4	M4	3.59N·m(0.37kgf·m)
RA6, RA7	M6	12.3N·m(1.26kgf·m)
RA8	M8	30N·m(3.1kgf·m)

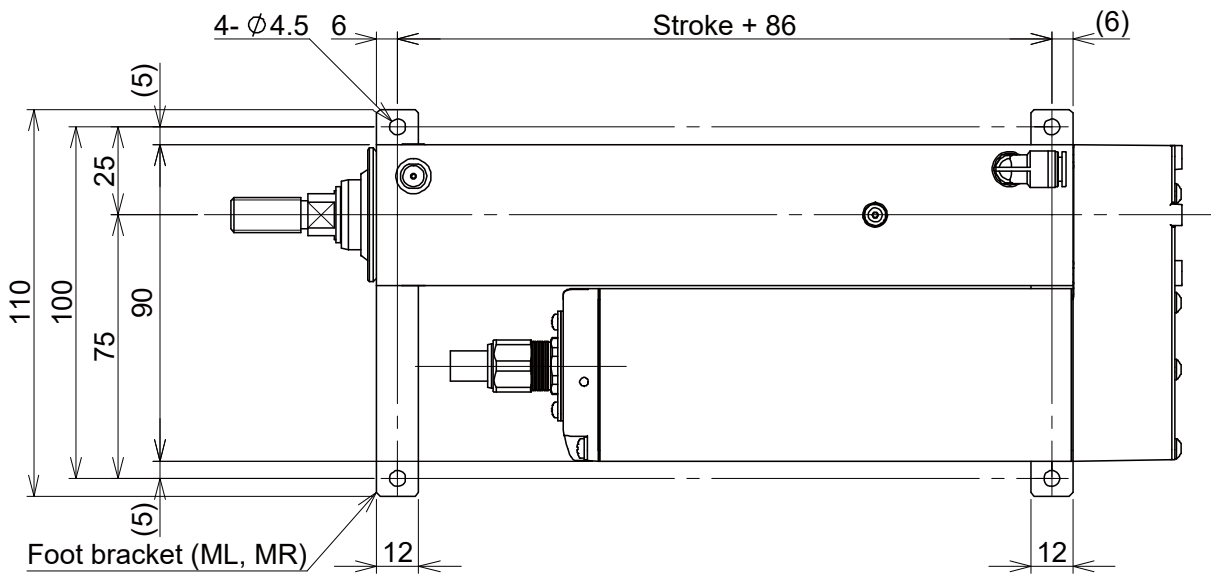
The attachment positions of foot brackets (model: FT) at the shipment are as follows.



RCP6(S)W-RA4C, RCP6(S)W-RA4R Motor Top Side-Mounted Type (Model: MT)

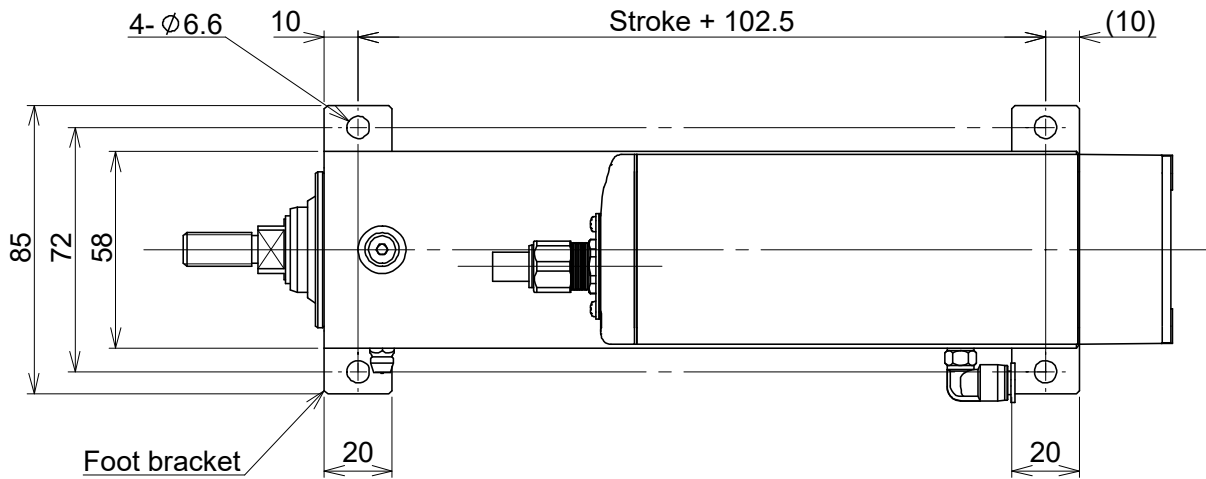
(Model number of single product: RCP6W-FT-RA4C)

(Model number of single product: RCP6W-FT-RA4R-1(for MT))



RCP6(S)W-RA4R Motor Left Side-Mounted (ML), Motor Right Side-Mounted (MR)

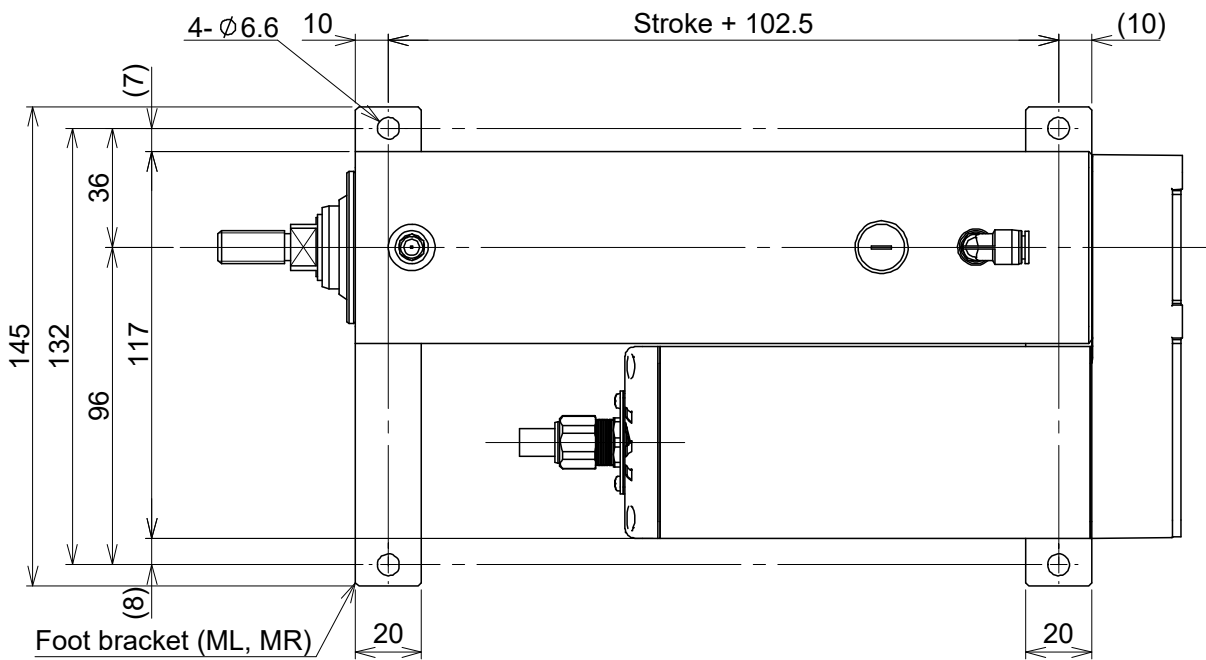
(Model number of single product: RCP6W-FT-RA4R-2(for ML/MR))



RCP6(S)W-RA6C, RCP6(S)W-RA6R Motor Top Side-Mounted Type (Model: MT)

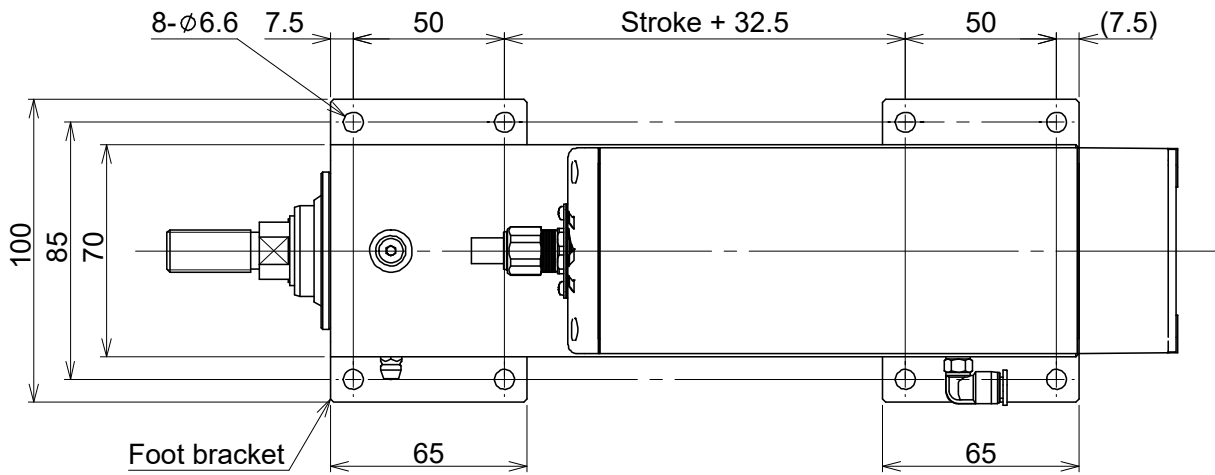
(Model number of single product: RCP6W-FT-RA6C)

(Model number of single product: RCP6W-FT-RA6R-1(for MT))



RCP6(S)W-RA6R Motor Left Side-Mounted (ML), Motor Right Side-Mounted (MR)

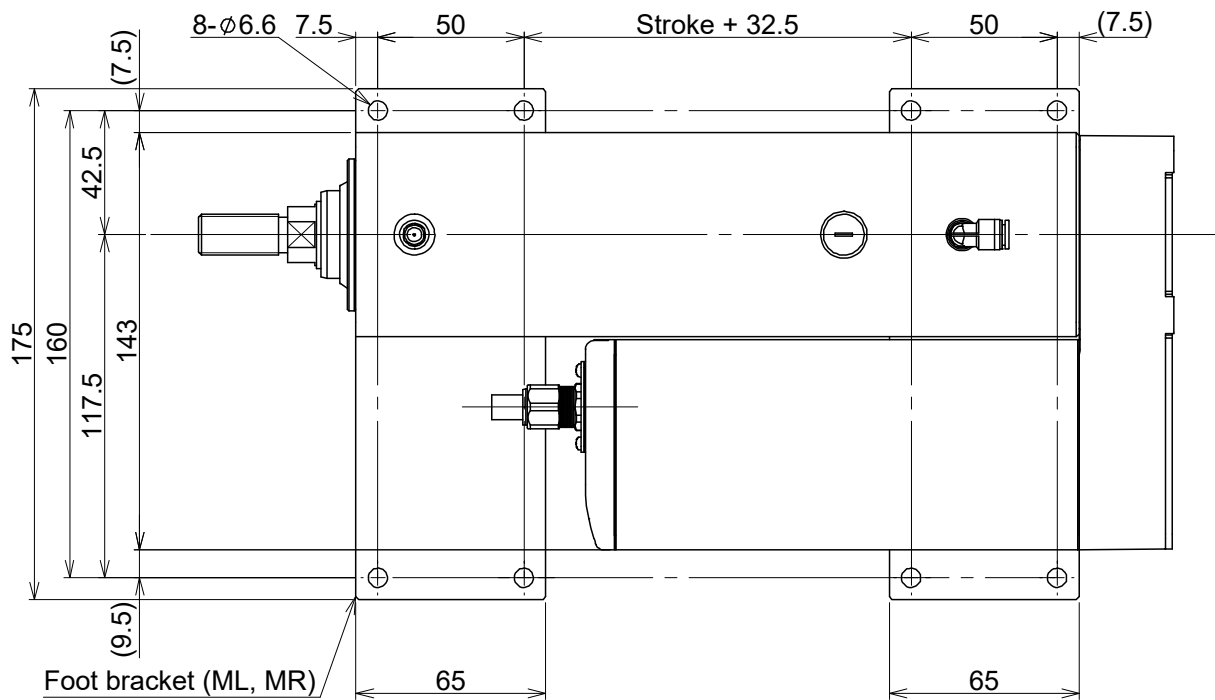
(Model number of single product: RCP6W-FT-RA6R-2(for ML/MR))



RCP6(S)W-RA7C, RCP6(S)W-RA7R-MT Motor Top Side-Mounted Type (Model: MT)

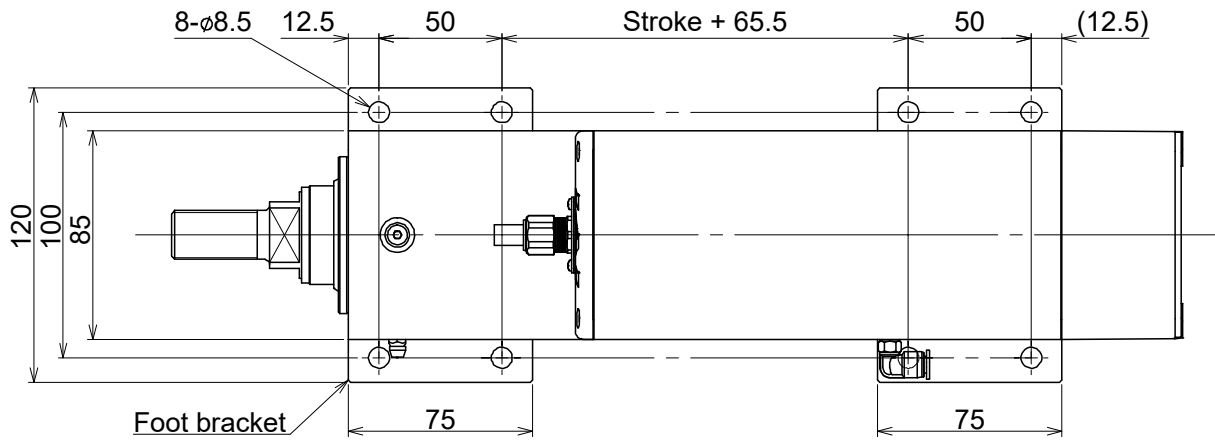
(Model number of single product: RCP6W-FT-RA7C)

(Model number of single product: RCP6W-FT-RA7R-1(for MT))



RCP6(S)W-RA7R Motor Left Side-Mounted (ML), Motor Right Side-Mounted (MR)

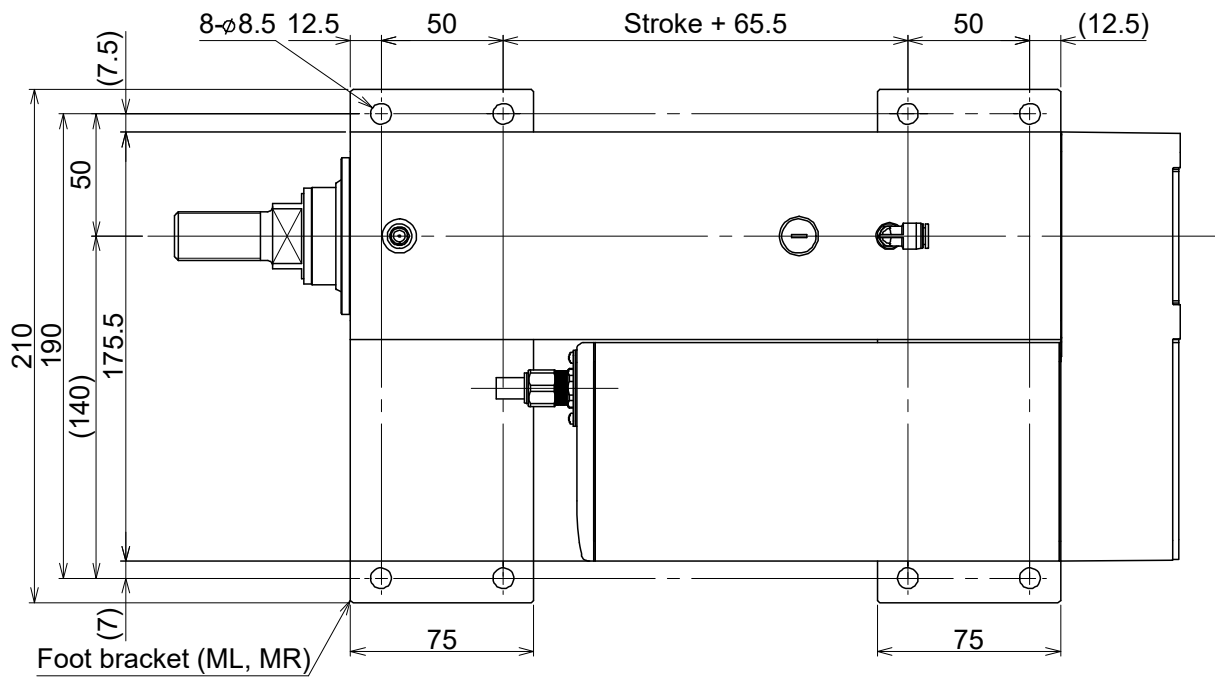
(Model number of single product: RCP6W-FT-RA7R-2(for ML/MR))



RCP6(S)W-RA8C, RCP6(S)W-RA8R Motor Top Side-Mounted Type (Model: MT)

(Model number of single product: RCP6W-FT-RA8C)

(Model number of single product: RCP6W-FT-RA8R-1(for MT))




RCP6(S)W-RA8R Motor Left Side-Mounted (ML), Motor Right Side-Mounted (MR)

(Model number of single product: RCP6W-FT-RA8R-2(for ML/MR))

## Tightening Screws

- Use hexagonal socket head bolts for the male threads for installing the base.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- For the effective engagement length between the bolt and female thread, provide at least the applicable value specified below:  
Female thread is made of steel material → Same length as the nominal diameter  
Female thread is made of aluminum → 1.8 times of nominal diameter

 **Caution:** Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.



### [3] When using frame front tapped holes

The frame front has tapped holes for mounting.  
Utilize these tapped holes for installation.  
The effective depth for the attachment screws is as shown below;

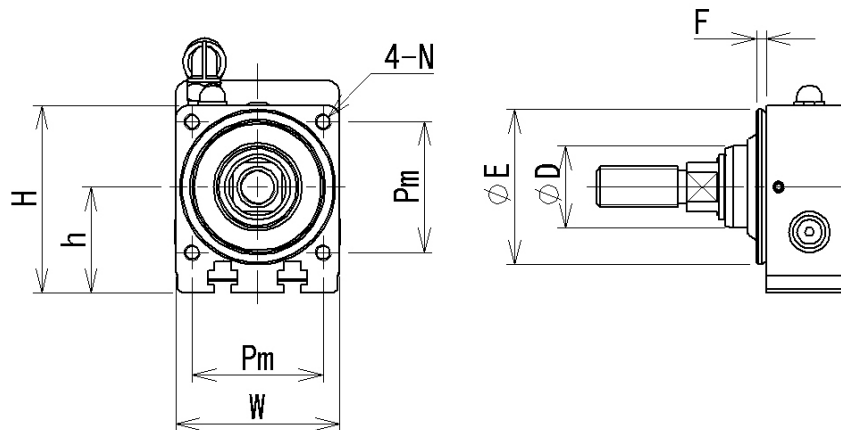


Figure 2-2-1

	RA4	RA6	RA7	RA8
W[mm]	40	58	70	85
h[mm]	26	32	38	50
H[mm]	46	61	73	92.5
Pm[mm]	32	45	55	70
N	M4 Depth 8	M6 Depth 12	M8 Depth 16	M8 Depth 16
D[mm]	ø20	ø25	ø30	ø40
E[mm]	ø38h9	ø46h9	ø52h9	ø64h9
F[mm]	2.5	2.5	3	4


#### [Tightening Torque]

Model	Screw Nominal Diameter	In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:
RA4	M4	3.59N·m(0.37kgf·m)	1.76N·m(0.18kgf·m)
RA6	M6	12.3N·m(1.26kgf·m)	5.4N·m(0.55kgf·m)
RA7, RA8	M8	30N·m(3.1kgf·m)	11.5N·m(1.2kgf·m)

Be certain to observe the “Ⓢ Precautions for frame front and front flange mounting”.

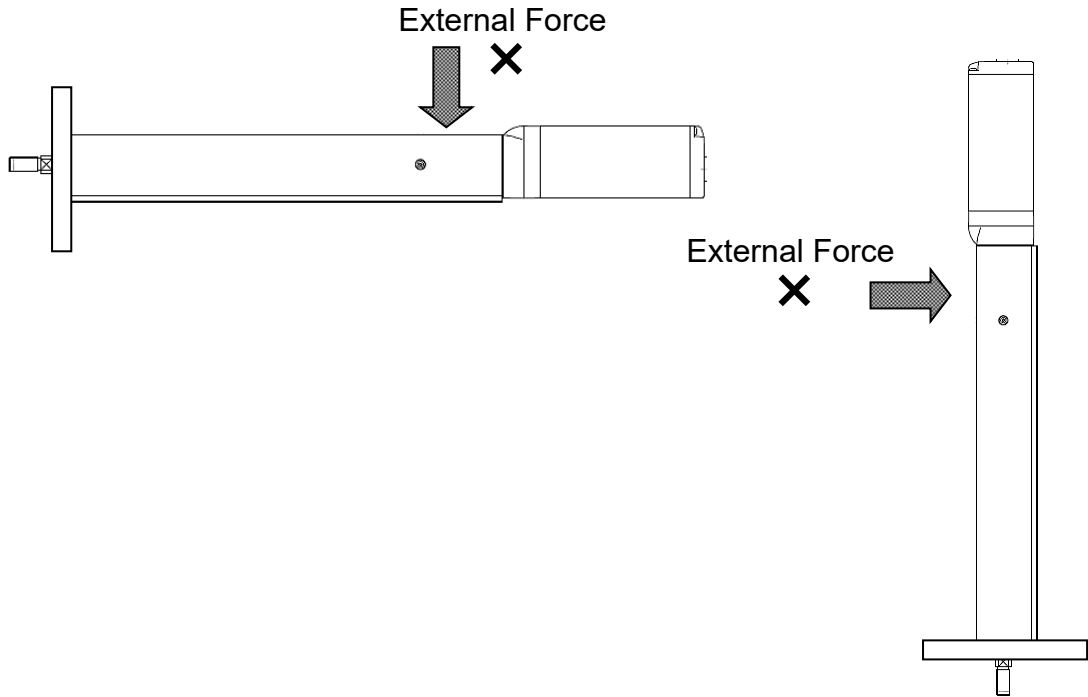
#### Tightening screws

- Use hexagonal socket head bolts for the male threads for installing the base.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- Have the length of thread engagement approximately 1.8 times of the nominal diameter.

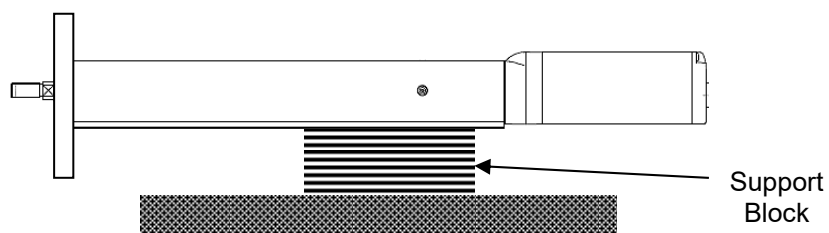
 **Caution:** Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the tapped holes may be damaged, actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

## ◎ Precautions for frame front mounting

Do not attempt to apply any external force to the body when mounting with frame front. External force may cause an operation failure or parts malfunction.



Prepare a support block as shown in the figure below for the horizontal installation of the unit with its stroke more than 150 even if there is no external force applied on the body. Even for those with the stroke less than 150, it is recommended to have a support block to avoid vibration being generated due to the operation condition or installation environment, which may cause an operation failure or parts malfunction.



#### [4] When using Front Flange (Option)

There are tapped holes equipped on the front housing (Option).  
Utilize these holes for installation.

[Refer to 9. "External Dimensions" for the dimensions after attaching the front flange.]

Although this option is ordered along with an actuator, they will be shipped as accessories (not assembled parts). Attach the flange to the actuator using the enclosed bolts with prescribed torque.

(Note) Front flange mounting is not available for 50-stroke standard side-mounted types RCP6W-RA4R, RA6R, RA7R and RA8R.

For the 100-stroke top side-mounted motor type (model: MT), when mounting the front flange vertically (height direction), the cable exit direction cannot be the standard rod direction (forward direction).

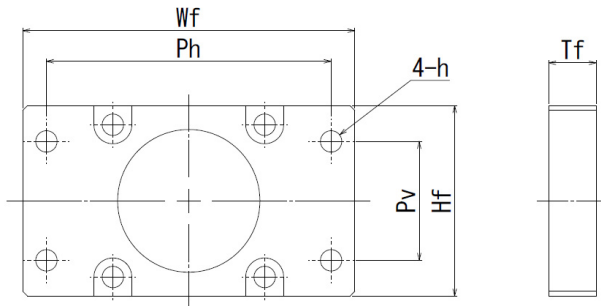
For the 100-stroke left side-mounted motor type (ML) and right side-mounted motor type (MR), when mounting the front flange horizontally (width direction), the cable exit direction cannot be the standard rod direction (forward direction).

(Note) Front flange mounting is not available for 50/100-stroke built-in controller side-mounted types RCP6SW-RA4R, RA6R, RA7R and RA8R.

For the 150-stroke top side-mounted motor type (model: MT), when mounting the front flange vertically (height direction), the cable exit direction cannot be the standard rod direction (forward direction).

For the 150-stroke left side-mounted motor type (ML) and right side-mounted motor type (MR), when mounting the front flange horizontally (width direction), the cable exit direction cannot be the standard rod direction (forward direction).

Flatness of the mounting surface should be less than 0.050mm.  
The dimensions of the front flange are as follows.



	RA4	RA6	RA7	RA8
Wf[mm]	70	90	108	135
Hf[mm]	40	56	68	84
Ph[mm]	60	75	90	115
Pv[mm]	25	40	50	65
h[mm]	4.5	6.6	8.5	8.5
Tf[mm]	10	12	16	19
Material	Steel	Steel	Steel	Steel
Enclosed Bolts	M4x12	M6x15	M8x20	M8x25
Tightening Torque of the Front Flange to the Main Unit [N·m]	2.1	4.2	7.1	17.2

[Tightening Torque]

Model	Screw Nominal Diameter	In the case that steel is used for the bolt seating surface:
RA4	M4	3.59N·m(0.37kgf·m)
RA6	M6	12.3N·m(1.26kgf·m)
RA7, RA8	M8	30N·m(3.1kgf·m)

Be certain to observe the “Ⓢ Precautions for frame front and front flange mounting”.

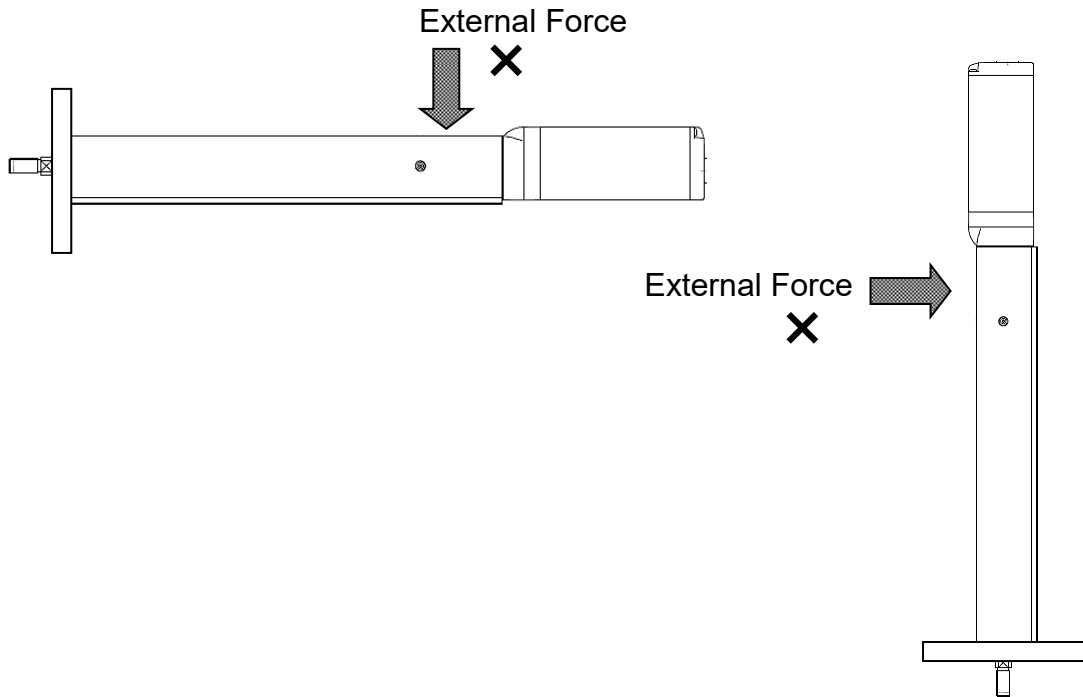
Tightening screws

- Use hexagonal socket head bolts for the male threads for installing the base.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- For the effective engagement length between the bolt and female thread, provide at least the applicable value specified below:  
 Female thread is made of steel material → Same length as the nominal diameter  
 Female thread is made of aluminum → 1.8 times of nominal diameter

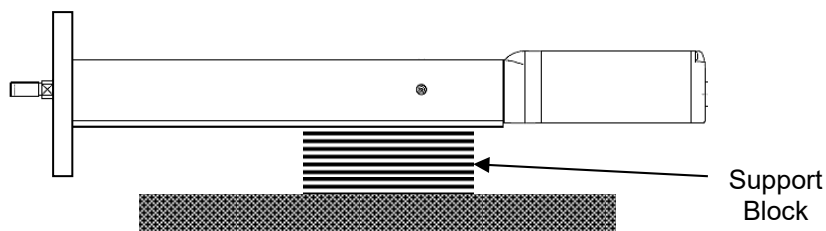
⚠ Caution: Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

## ◎ Precautions for frame front and front flange mounting

Do not attempt to apply any external force to the body when mounting with frame front and front flange (option). External force may cause an operation failure or parts malfunction

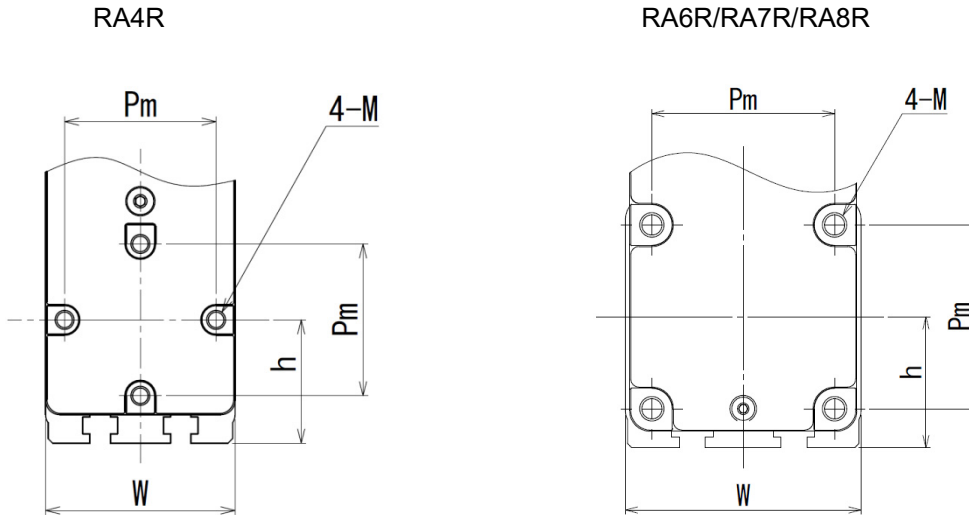


Prepare a support block as shown in the figure below for the horizontal installation of the unit with its stroke more than 150 even if there is no external force applied on the body. Even for those with the stroke less than 150, it is recommended to have a support block to avoid vibration being generated due to the operation condition or installation environment, which may cause an operation failure or parts malfunction.



[5] When Utilizing Attachment Holes on the Rear Bracket for Side-Mounted Motor Type

For RA4R, RA6R, RA7R and RA8R, there are tapped holes prepared on the side-mounted bracket. (See the table below for the detailed dimensions.)



	RA4	RA6	RA7	RA8
W[mm]	40	58	70	85
h[mm]	26	32	38	50
Pm[mm]	32	45	55	70
M	M4 Depth 8	M6 Depth 12	M8 Depth 16	M8 Depth 16

[Tightening Torque]

Model	Screw Nominal Diameter	In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:
RA4	M4	3.59N·m(0.37kgf·m)	1.76N·m(0.18kgf·m)
RA6	M6	12.3N·m(1.26kgf·m)	5.4N·m(0.55kgf·m)
RA7, RA8	M8	30N·m(3.1kgf·m)	11.5N·m(1.2kgf·m)

Tightening Screws

- Use hexagonal socket head bolts for the male threads for installing the base.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- Have the length of thread engagement approximately 1.8 times of the nominal diameter.

**⚠ Caution:** Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the damage of the attachment hole and actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

[Precautions for Attachments]

Please note the following caution notes when installing the unit with using the tapped holes on the side-mounted bracket.

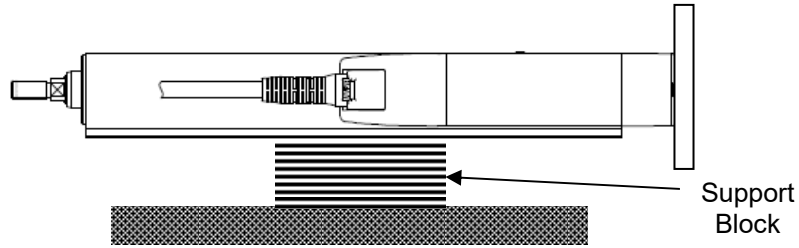
Do not attempt to affix the unit only with the tapped holes on the side-mounted bracket.

Do not apply external force to the main body.

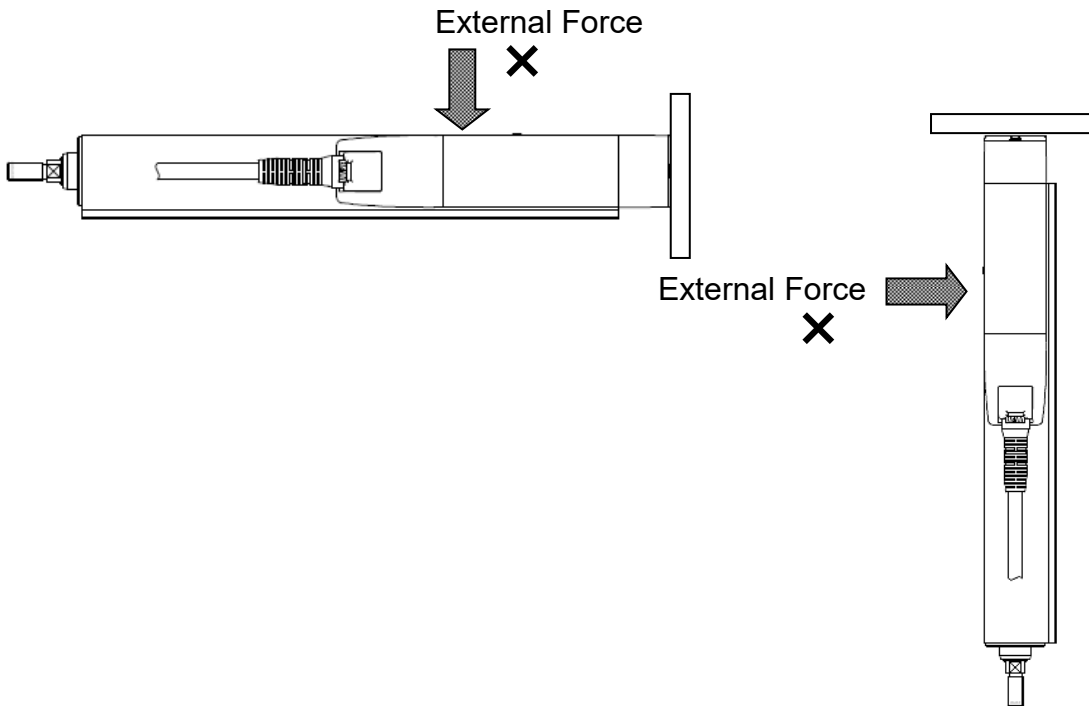
There may be caused vibration due to the operating condition or installation environment, which may result in operational failures or components malfunction.

◎ Caution for Installation using Rear Bracket

Do not try to install rear bracket without any support. Always use a support block or similar to support the main unit.

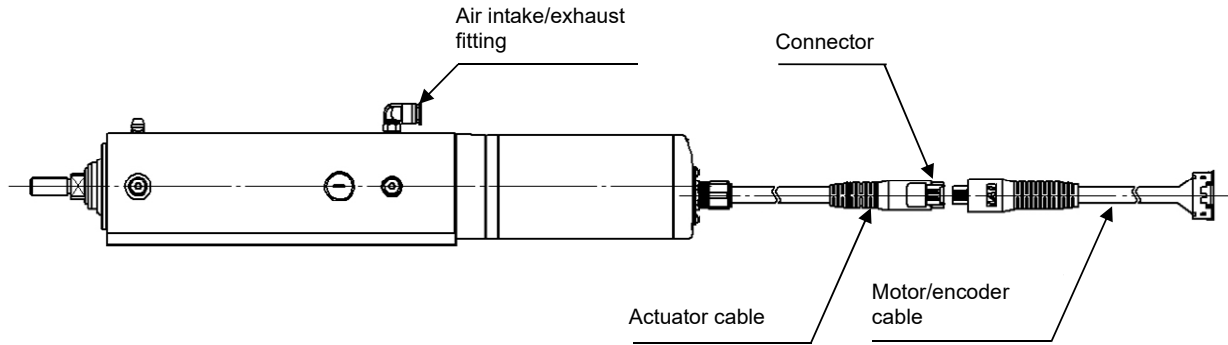


When it is perpendicular installation without support etc., external force does not act, it is not attempt to apply the radial load.



## 2.3.3 Connecting the air tube

Connect a tube with  $\phi 6$  outer diameter to the air intake/exhaust fitting, and extend tube tip on the opposite side to a position not exposed to moisture. Do not purge with air. Note that the actuator cable connector is not waterproofed. Connect it to the motor/encoder cable at a location unaffected by dust, water, etc., or perform waterproofing treatment.



**!** Caution: Make sure moisture is not absorbed from the air intake/exhaust fitting, as this may lead to malfunction.

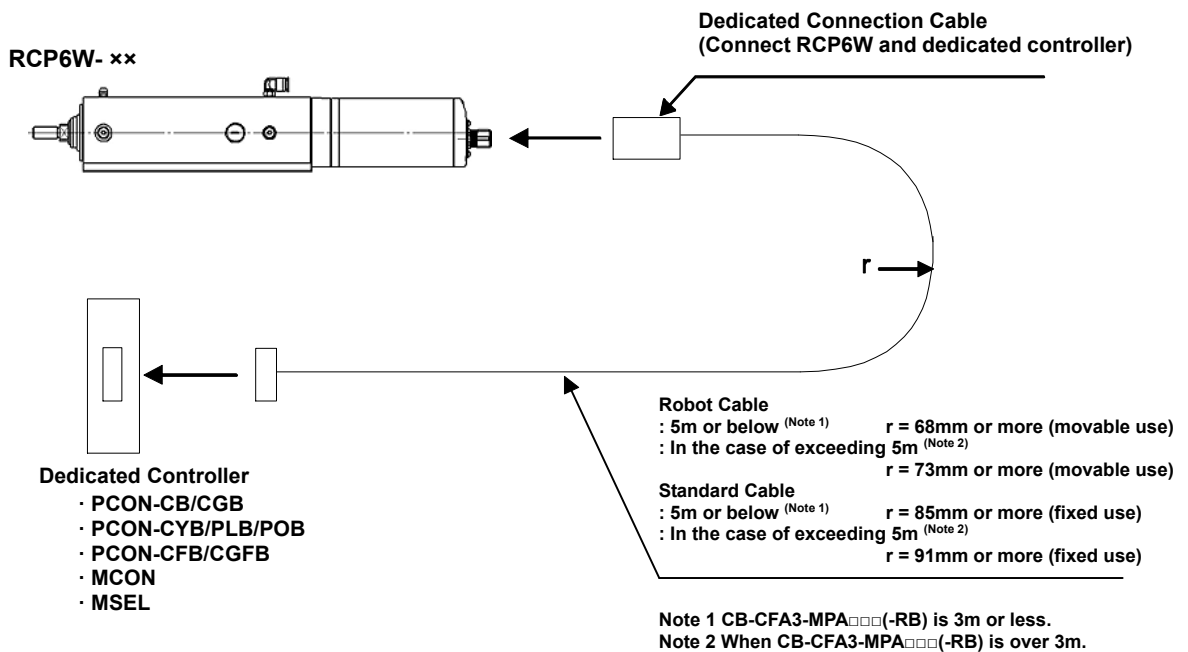


## 3. Connecting with the Controller

As the connection cable for the controller and RCP6W/RCP6SW (this actuator), use the IAI-dedicated controller and dedicated connection cable.  
This section explains the wiring method for a single axis.

- If the dedicated connection cable cannot be secured, reduce the load on the cable by allowing it to deflect only by the weight of the cable or wire it in a self-standing cable hose, etc., having a large radius.
- Do not cut and reconnect the dedicated connection cable for extension or shorten the cable.
- Do not pull on the dedicated connection cable or bend it forcibly.
- The actuator cable coming out of the motor unit is not meant to be bent. Fix the cable so it would not be bent repeatedly

Please consult with IAI if you require a different kind of cable than the one supplied.



### Dedicated Cable

#### RA4, RA6, RA7

- Motor Encoder Integrated Cables: CB-CAN-MPA□□□
- Motor Encoder Integrated Robot Cables: CB-CAN-MPA□□□-RB

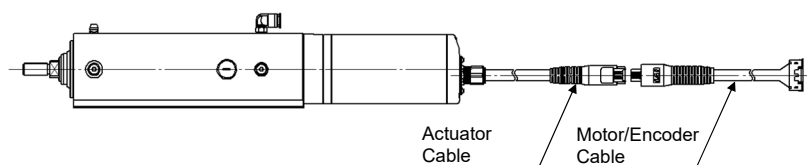
#### RA8

- Motor Encoder Integrated Cables: CB-CFA3-MPA□□□
- Motor Encoder Integrated Robot Cables: CB-CFA3-MPA□□□-RB

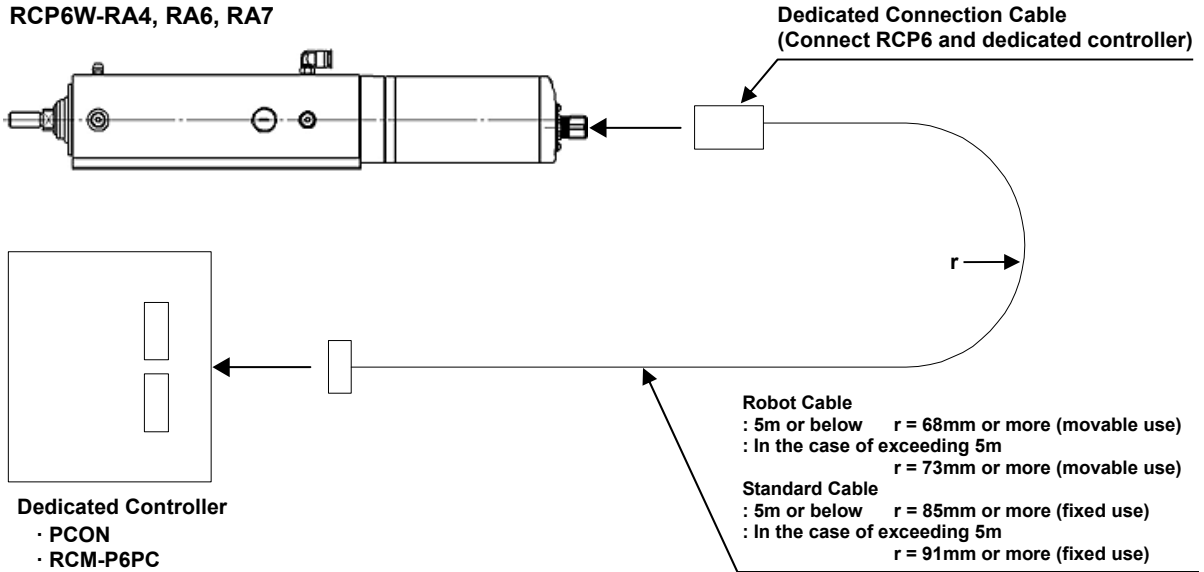
\* □□□ represents the cable length. The longest corresponds to 20m.

Note that the maximum length of motor/encoder cable and actuator cable combined is 20m.

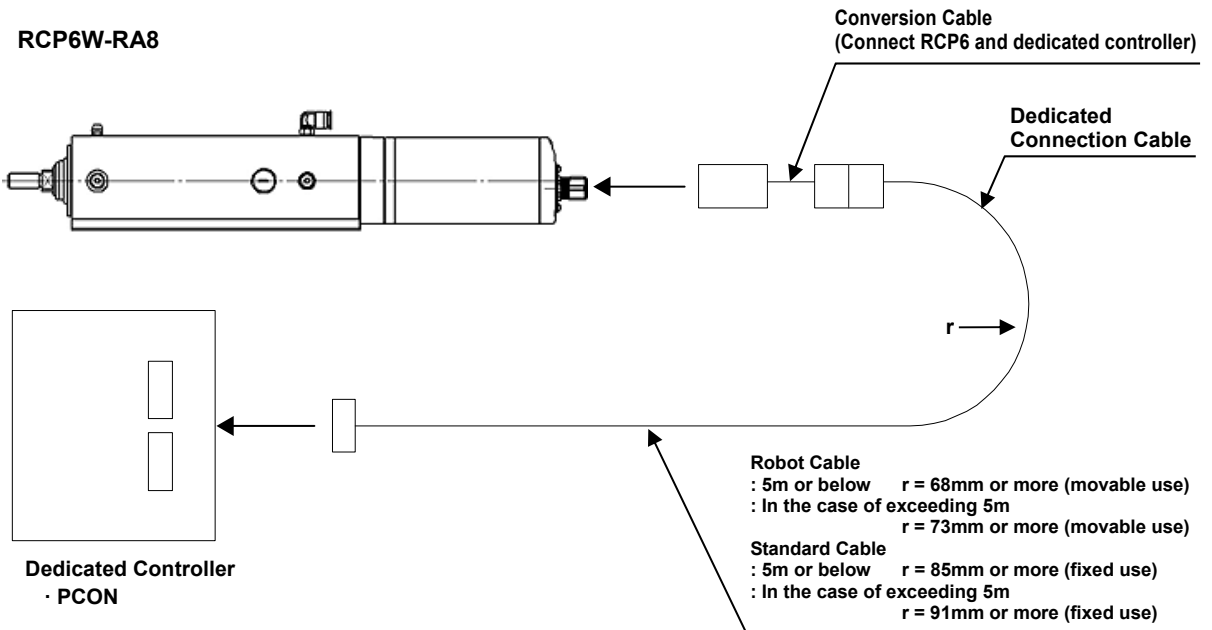
e.g.) 080 = 8m



## RCP6W-RA4, RA6, RA7



## RCP6W-RA8



### Dedicated Cable

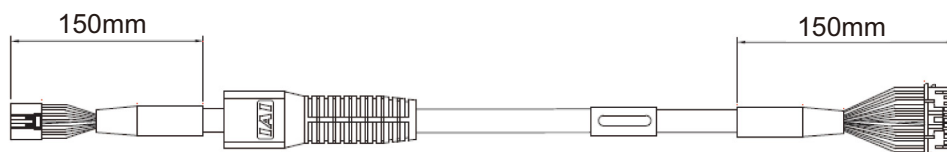
- Motor Encoder Integrated Cables: CB-ADPC-MPA□□□
- Motor Encoder Integrated Robot Cables: CB-ADPC-MPA□□□-RB

\* □□□ represents the cable length. The longest corresponds to 20m.  
Note that the maximum length of motor/encoder cable and actuator cable combined is 20m.  
e.g.) 080 = 8m

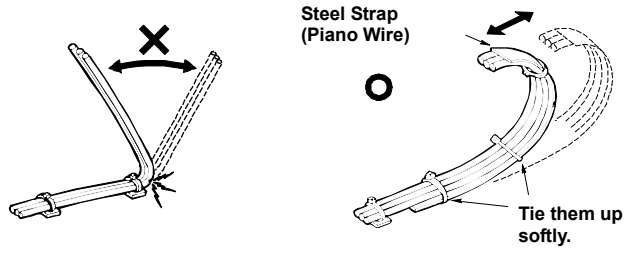
For RA8, connect to the actuator additionally using a conversion cable CB-CAN-AJ0002.

**⚠ Warning:** For wiring, please follow the warnings stated below. When constructing a system as the machinery equipment, pay attention to the wiring and connection of each cable so they are conducted properly. Not following them may cause not only a malfunction such as cable breakage or connection failure, or an operation error, but also electric shock or electric leakage, or may even cause a fire.

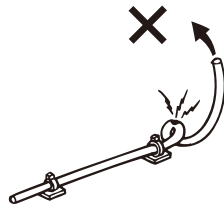
- Use dedicated cables of IAI indicated in this instruction manual. Contact us if you wish to have a change to the specifications of the dedicated cables.
- Make sure to turn the power off in the process of power line or cable connection or disconnection.
- Do not attempt to cut a dedicated cable with connectors on both ends to extend, shorten or re-joint it.
- Hold the dedicated cable to avoid mechanical force being applied to the terminals and connectors.
- Use a cable pipe or duct to have an appropriate protection when there is a possibility of mechanical damage on a dedicated cable.
- In case a dedicated cable is to be used at a moving part, make sure to lay out the cable without applying any force to pull the connector or extreme bend on the cable. Do not attempt to use the cable with a bending radius below the allowable value.
- Make certain that the connectors are plugged properly. Insufficient connection may cause an operation error, thus it is extremely risky.
- Do not lay out the cables to where the machine runs over them.
- Pay attention to the cable layout so it would not hit peripherals during an operation. In case it does, have an appropriate protection such as a cable track.
- When a cable is used hanging on the ceiling, prevent an environment that the cable swings with acceleration or wind velocity.
- Make sure there is not too much friction inside the cable storage equipment.
- Do not apply radiated heat to power line or cables.
- Do not bend the cable in the area from the connector tip inward to 150mm on both ends.  
Motor • Encoder Integrated Cables CB-CAN-MPA□□□, CB-CFA3-MPA□□□,  
CB-ADPC-MPA□□□  
Motor • Encoder Integrated Cables Robot Type CB-CAN-MPA□□□-RB, CB-CFA3-MPA□□□-RB,  
CB-ADPC-MPA□□□-RB



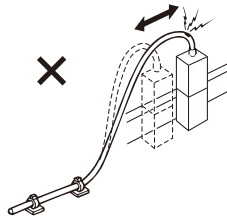
- Have a sufficient radius for bending, and avoid a bend concentrating on one point.



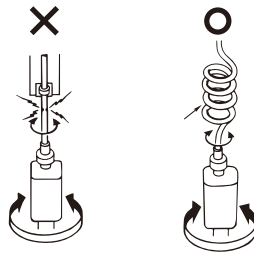
- Do not let the cable bend, kink or twist.



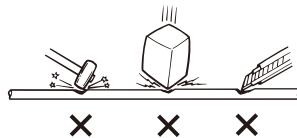
- Do not pull the cable with a strong force.



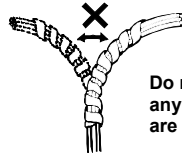
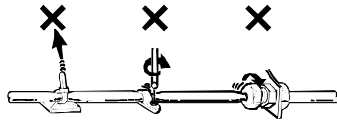
- Pay attention not to concentrate the twisting force to one point on a cable.



- Do not pinch, drop a heavy object onto or cut the cable.

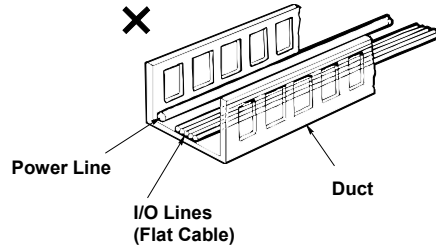


- When a cable is fastened to affix, make sure to have an appropriate force and do not tighten too much.



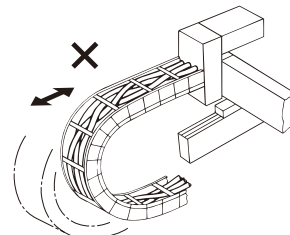
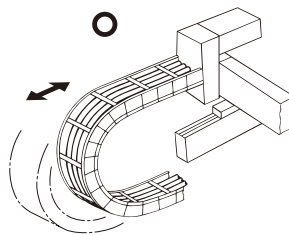
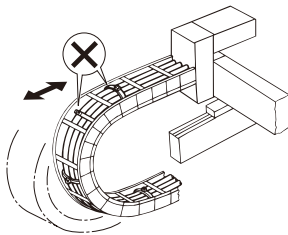
Do not use spiral tube in any position where cables are bent frequently.

- PIO line, communication line, power and driving lines are to be put separately from each other and do not tie them together. Arrange so that such lines are independently routed in the duct.



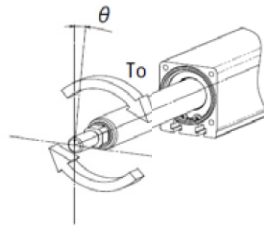
Follow the instructions below when using a cable track.

- 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.



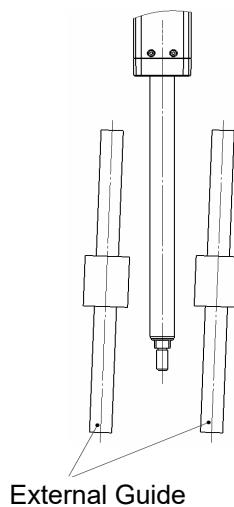
## 4. Caution for Operation

- When you tighten the nut onto the tip bracket threaded part, hold a wrench to width across flat part of the tip bracket with the rod in the most retracted state. Also, avoid that the load is applied to the inside whirl-stop as you tighten the nut.  
As a general rule, it cannot be used to apply a torque to the rod tip. Statically acceptable values and the rod tip maximum displacement angles (initial value reference) expected at that time are shown below. When the reaction force against the pressing operation is the side-way force, make sure it would not exceed the allowable load.



	RA4	RA6	RA7	RA8
$T_o$ [Nm]	1.0	1.5	2.5	5.0
$\theta$ [deg]	$\pm 1.0$	$\pm 1.0$	$\pm 0.8$	$\pm 0.8$

- Do not apply radial load and load moment to the rod. Only the radial direction load that aligns with the rod axis can be applied.  
In the case that radial load and load moment cannot be avoided, attach an external guide (such as a linear guide) in order not to apply any load other than radial direction load to the rod.  
When the gravity center of work is on the rod axis on vertical motions, vibration may still be generated by the clearance of internal whirl-stop. Attachment of an external guide is recommended to suppress such vibration.
- When connecting the rod to external guides, be careful on the parallelism of the guides to the rod. When connecting and fixing the rod to external guides, be careful not to apply excess side-way load to the rod because of the assembly variation.



## 5. Maintenance and Inspection

### 5.1 Inspection Items and Schedule


Follow the maintenance inspection schedule below.

It is assumed that the equipment is operating 8 hours per day.

If the equipment is running continuously night and day or otherwise running at a high operating rate, inspect more often as needed.

	External visual inspection	Internal visual inspection	Greasing
Start of work inspection	○		
1 month inspection	○		
3-month inspection or every 300km traveled	○		○(Scraper) <sup>(Note 2)</sup>
Every 3 months thereafter or every 300km traveled	○		○(Scraper) <sup>(Note 2)</sup>
6-month inspection or every 5000km traveled	○	○	○(Ball screw, Whirl-stop) <sup>(Note 1)</sup>
Every 6 months thereafter	○	○	○(Ball screw, Whirl-stop) <sup>(Note 1)</sup>

- \*1 Continuous return operation within a distance 30mm or less may cause the grease film to degrade. As a guideline, in every 5,000 to 10,000 cycles, have approximately 5 cycles of return operation over a 50mm distance or more. This will regenerate the oil film.
- \*2 In order to maintain the waterproofing, grease the scraper part on a regular basis. Failure to do so may cause malfunction.

 **Caution:**

- An actuator after 6 months of storage may have caused a degradation of the grease.  
Supply grease before start using. [Refer to 5.5 “Grease Supply”]
- Degradation speed of grease may differ depending on the environment of use (temperature, humidity and ambient conditions). It is recommended to shorten the grease supply period if the actuator is used under a bad condition such as in high temperature, high humidity or in dusty ambience.  
Also, it is recommended to improve the environment conditions in case the grease changes its color due to the bad condition of use.

## 5.2 External Visual Inspection

An external visual inspection should check the following things.

Main unit	Loose actuator mounting bolts, other loose items
Rod sliding surface	Lubrication state of grease Drip of grease base oil or other oils Adhesion of dust and other foreign objects
Scraper	Damage, defects, scratches, wear
Cables	Scratches, proper connections
Overall	Irregular noise, vibration

The scraper (rod seal assembly) is a consumable part. It should be replaced every 1,000km traveled or once every year if under 1,000km. Degradation and wear may be accelerated depending on the operating environment and conditions. Replace whenever an abnormality appears.

## 5.3 Cleaning

- Clean exterior surfaces as necessary.
- If there are drips of grease base oil or other oils on the rod sliding surface and the surrounding area, wipe off with with a soft cloth.
- Use a soft cloth to wipe away dirt and buildup.
- Do not blow too hard with compressed air as it may cause dust to get in through the gaps.
- Do not use oil-based solvents as they can harm lacquered and painted surfaces.
- To remove severe buildup, wipe gently with a soft cloth soaked in a neutral detergent or alcohol.



## 5.4 Internal inspection

Turn OFF the power, remove the rod seal assembly and perform visual inspection. When inspecting the interior, check the following items.

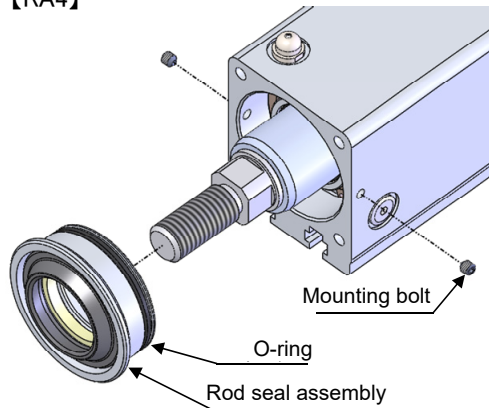
Body	Entry of foreign matter such as liquid or dust
Scraper	Friction, defects, damage
Soft wiper	Wear, defect, damage
Grease	Residue, contamination

Visually inspect the interior of the equipment. Check for the entry of foreign matter and confirm the condition of the seal parts and grease.

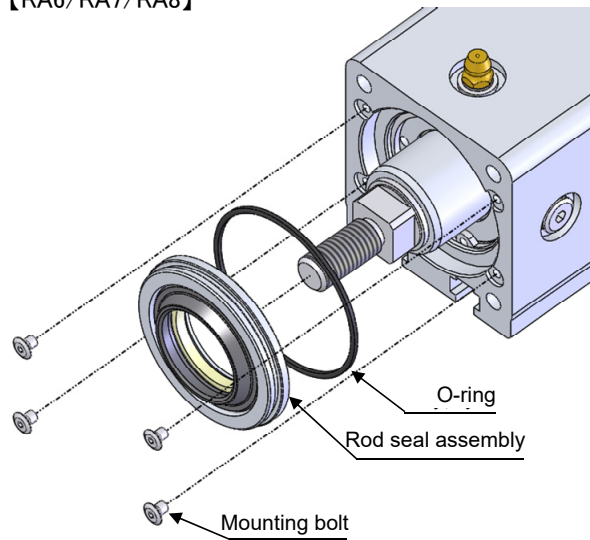
The procedure for internal inspections is outlined below.

(1) Remove the mounting bolt on the rod seal assembly and detach it from the main body.

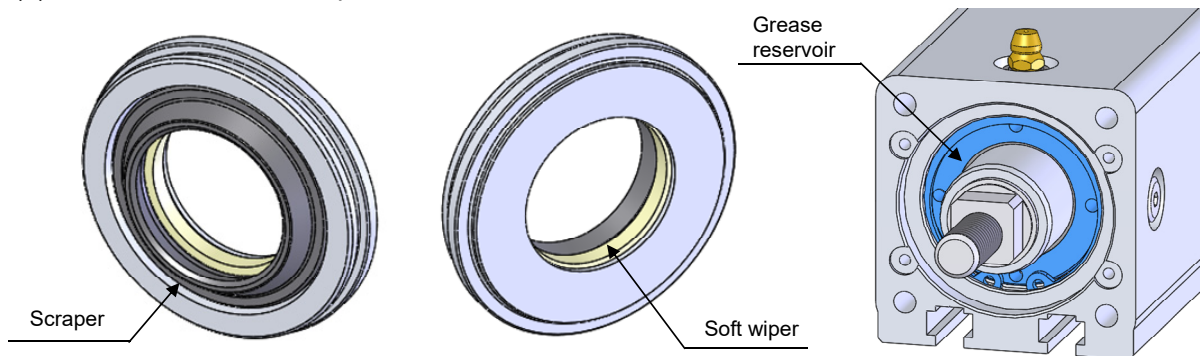
【RA4】



【RA6/RA7/RA8】



(2) Perform the internal inspection.



- (3) After inspection, mount the rod seal assembly and O-ring, and secure with the bolts.  
For RA6/RA7/RA8, insert the O-ring into the main body first.  
Be careful not to snag the O-ring when inserting.

Model	Bolt type	Bolt size	Tightening torque [N•cm]
RA4	Hex socket set screw, hollow tip	M 3×3	29.4
RA6/RA7	Slim head hex socket head bolt	M 3×4	48.5
RA8	Slim head hex socket head bolt	M 4×4	96.9

## 5.5 Grease Supply


### 5.5.1 What Grease to Use

IAI uses the following grease in our plant.

Scraper/sliding bearing part (rod sliding surface)	Kyodo Yushi	Multemp ET-R
Ball Screw	Kyodo Yushi	Multemp ET-R
Rotation stopper (body frame inner wall)	Kyodo Yushi	Multemp ET-R

Use urea grease spray when greasing ball screw and rotation stopper.

NOK KLUEBER	KLÜBER L 701
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 Warning: Never use lithium- or fluorine-based grease. Mixing with urea-based grease not only reduces the performance of the grease, it may even damage the actuator.

## 5.5.2 How to Apply Grease

### [1] Greasing the ball screw and whirl-stop

- (1) For RA4, remove slim hexagonal socket head bolts (M3 × 4) blocking the greasing port by Allen wrench.  
For RA6/RA7/RA8, remove the rubber cap blocking the greasing port.

- (2) Grease the ball screws and the whirl-stop according to the following instructions.

#### [Ball Screw]

Adjust the rod to the home position.

By adjusting it to the home position, the greasing port and the port for ball screws will match inside the main unit.

Connect the controller and adjust it to the home position.

Insert the tip of the spray grease in greasing port and inject it for one second.

One injection time should not exceed one second.

#### [Whirl-stop]

Adjust the rod position above 40mm.

Insert the tip of the spray grease in greasing port and inject it for one second.

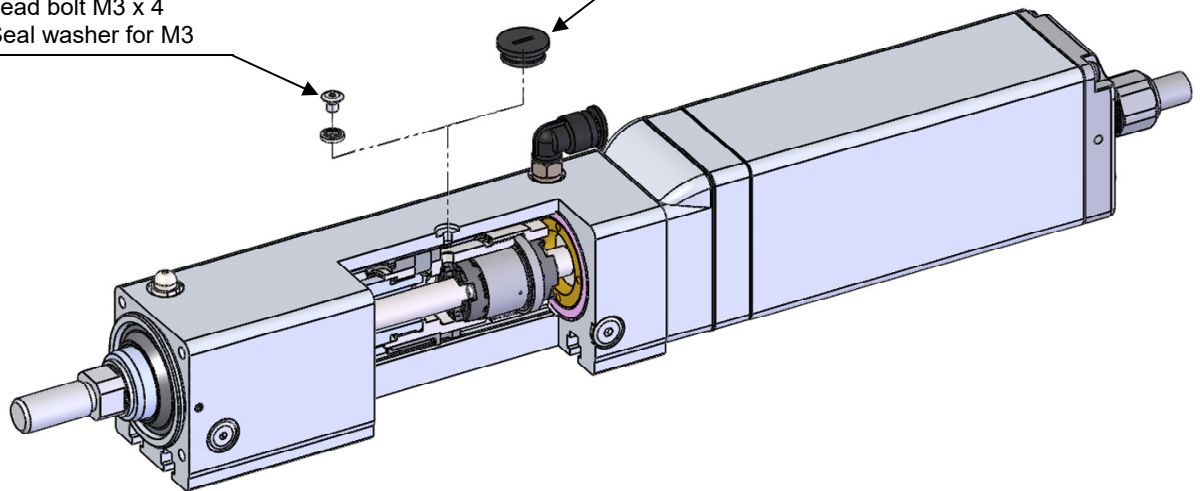
One injection time should not exceed one second.

#### [RA4]

- Slim head hex socket head bolt M3 x 4
- Seal washer for M3

#### [RA6/RA7/RA8]

Hole cap




- (3) Clean up the rod (sliding surface) and apply the grease with hands.

- (4) After greasing, move the rod full-stroke to apply the grease thoroughly.

Once the seal washer has been assembled, its sealing effect is reduced when reassembling due to rubber deformation, so replacement with a new part is recommended.

Model	Location of use	Manufacturer	Model number	Tightening torque [N•cm]
RA4	Seal washer for M3	MUSASHI OIL SEAL MFG.	SWS 3×6.4-A	48.5

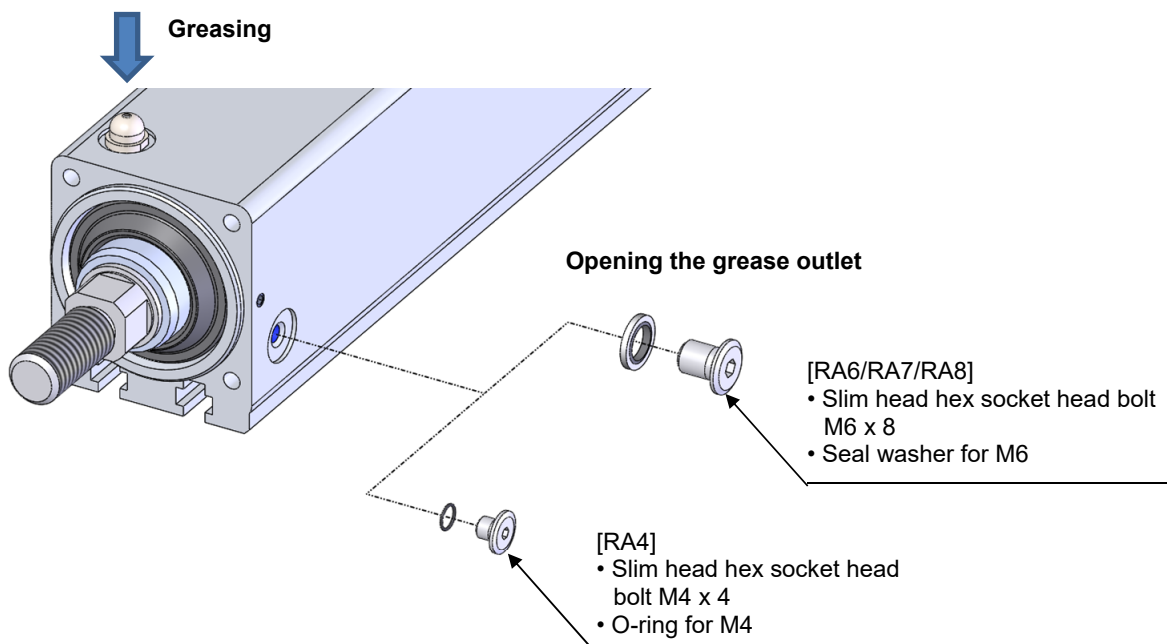
 **Caution:** Supplying too much grease may increase sliding resistance and load to the motor, resulting in a drop of performance.

- In case the grease got into your eye, immediately go see the doctor to get appropriate care. After finishing the grease supply work, wash your hands carefully with water and soap to rinse the grease OFF.



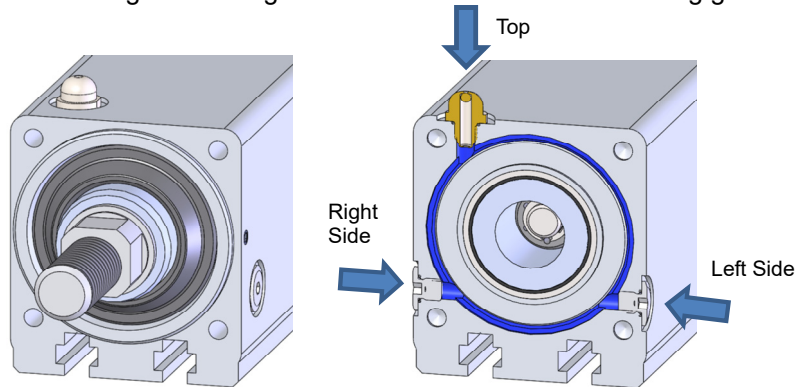
**[2] Greasing the scraper and sliding bearing**  
Grease from the grease fitting on the front of the frame.

- (1) Open one of the grease outlets.
- (2) Press the grease gun against the grease fitting and supply until grease emerges from the discharge port.
- (3) Close the grease outlet again with bolts.
- (4) Open the other grease outlet and repeat (2) and (3) in the same way.
- (5) Move the rod back and forth manually or using controller jog operation to distribute the grease. Clean off any extra grease on the outside.

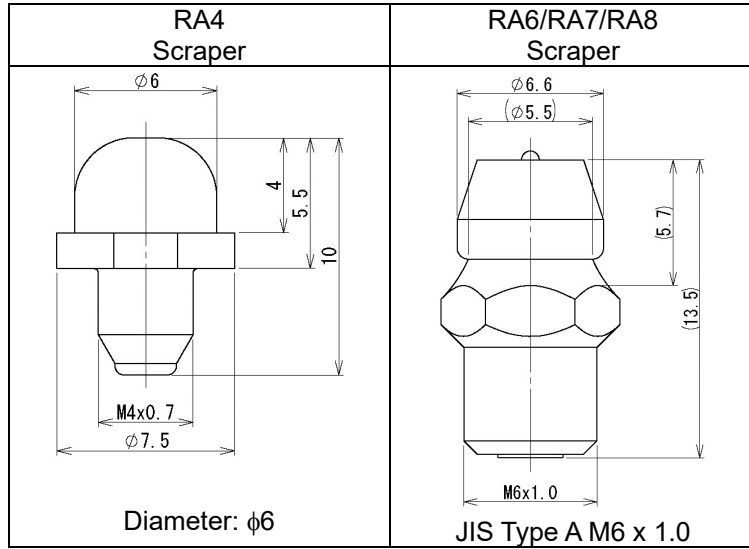


◎ **Placement of grease fitting**

The grease fitting can be attached on the top, left side or right side.  
The two sides without a grease fitting attached will be extra outlets during grease resupply.



© Dimensions of grease fitting



© Grease gun  
[For RA4 (caliber:  $\phi 6$ )]

Grease gun Mounting screws R1/8 (Example) GC-57K	Manufacturer Yamada
--	------------------------

Nozzle	Manufacturer
<p>N type + dedicated nozzle U type</p> <p>N type      Dedicated nozzle U type</p> <p>© Attach N type to the tip of the dedicated nozzle U type, and mount it on the grease gun.</p> <p>N type      Dedicated nozzle U type      Grease gun mounting side Mounting screws R1/8</p>	THK


[For RA6/RA7/RA8 (for JIS A type)]

Nozzle Mounting screws R1/8	Manufacturer
(Example) GC-57K	Yamada

Nozzle Mounting screws R1/8	Manufacturer
HGP NZ1	NSK
H type	THK

Once the seal washer and O-ring have been assembled, their sealing effect is reduced when reassembling due to rubber deformation, so replacement with new parts is recommended.

Model	Location of use	Manufacturer	Model number	Tightening torque [N•cm]
RA4	O-ring for M4	IAI	1146323	96.9
RA6/RA7/RA8	Seal washer for M6	MUSASHI OIL SEAL MFG.	SWS 6x10-A	387.6

 **Caution:**

- Supplying too much grease may increase sliding resistance and load to the motor, resulting in decreased performance.
- If the grease enters your eye, immediately see a specialist physician for appropriate care.

After finishing the grease supply, wash your hands carefully with water and soap to rinse the grease off.



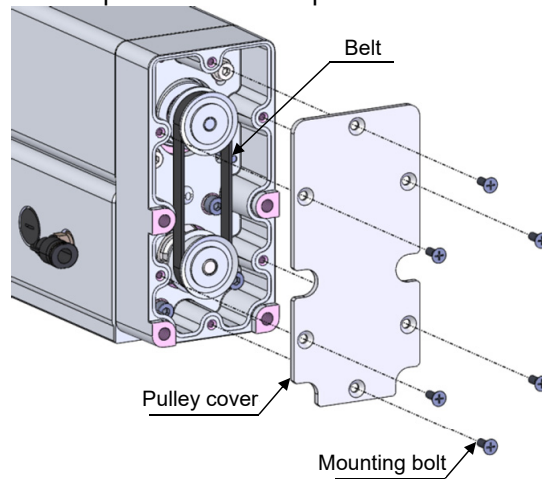
## 5.6 Belt inspection

### 5.6.1 Belt inspection procedure

Applicable models: RA4R, RA6R, RA7R, RA8R

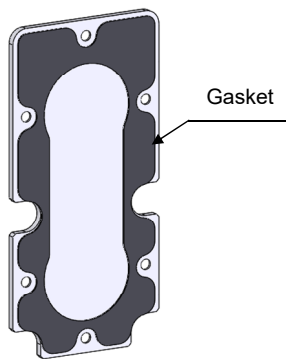
To ensure IP65 performance, customers may not replace the belt or adjust its tension by themselves. Please perform belt inspection only. Contact IAI if the belt needs to be replaced. Make sure to perform inspection in a location unaffected by dust, water, etc.

- (1) Remove the pulley cover and perform visual inspection.

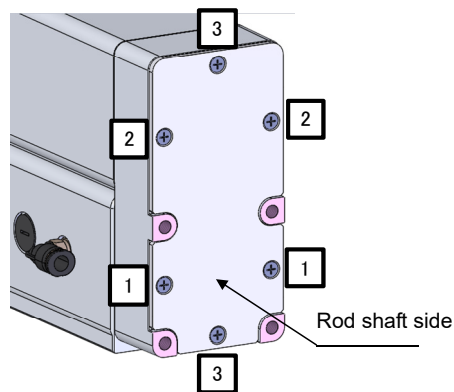


- (2) After inspection, secure it using mounting bolts of the pulley cover. Make sure to avoid any deposit or scratch inside the body and on the gasket. After temporarily tightening all the mounting bolts, fully tighten them in the order shown below and then tighten all locations again. Once the seal gasket has been assembled, its sealing effect is reduced when reassembling due to rubber deformation, so periodic replacement with a new part is recommended.

[Pulley cover interior]



[Final tightening steps]



Model	Bolt type	Bolt size	Tightening torque [N·cm]
RA4	Hex socket head button bolt	M 3×6	73.9
RA6/RA7/RA8	Cross-recessed countersunk screw	M 3×6	51.7

The period of replacement for the belt cannot be clearly defined as the durability of it is impacted so much by the operational conditions.

In generally speaking, it possesses bending life of several million times.

The timing belt gets worn away as the time passes, and it is necessary to have replacement at regular intervals with the following conditions as reference.

- When the gear and belt area show obvious friction.
- When swelling occurs as a result of oil adhesion.
- When damages such as a crack occurs on the belt gear and back side.

Also, for the toothed belt, it is recommended to set the interval of regular replacement cycle when in use under high wire fatigue condition in high acceleration and deceleration because it is difficult to judge the right timing for replacement by checking appearance or looseness of the wires strengthening the belt.

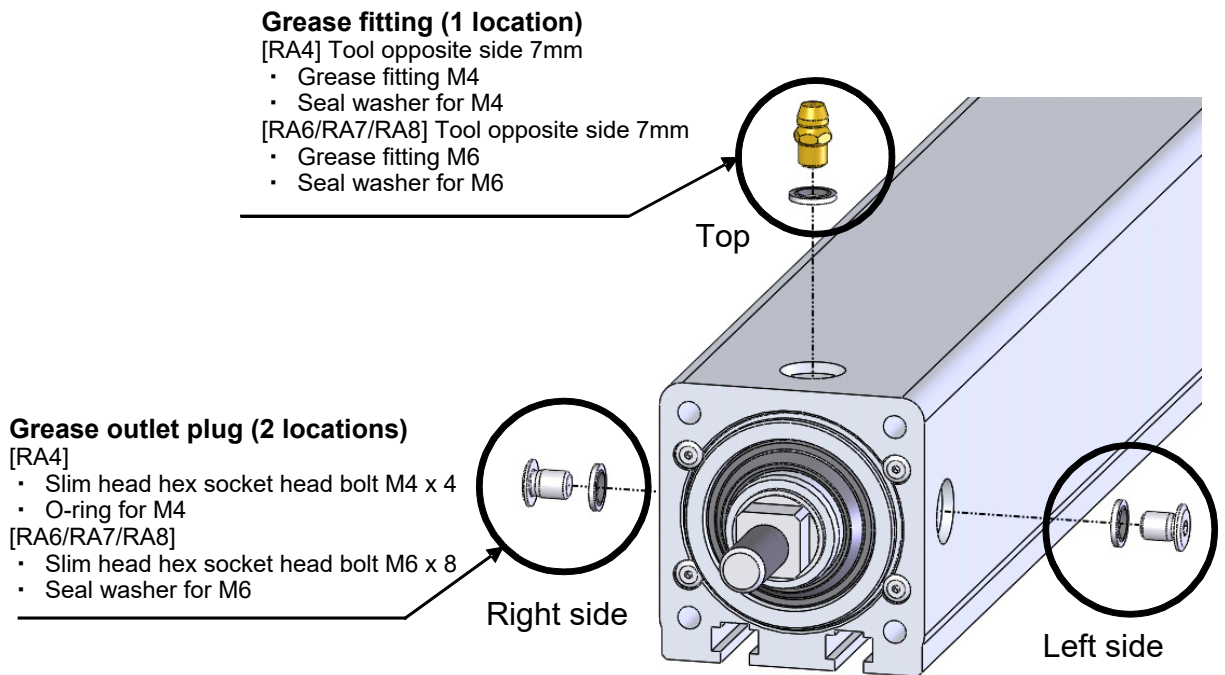
## 5.7 Motor Replacement Process

To ensure IP65 performance, customers may not replace the motor by themselves. Contact IAI if the belt needs to be replaced.

## 5.8 Changing the position of the grease fitting and fitting

### 5.8.1 Changing the position of the grease fitting

The grease fitting can be changed to top, left, or right side positions. Using a spanner-type torque wrench etc. for the grease fitting and a hex torque wrench etc. for the outlet bolt, change the mounting position. Fasten the grease fitting and outlet bolt in accordance with the tightening torque shown in the table. When changing the position, be careful of peripheral interference if you are using a short-stroke actuator or a side-mounted motor specification. After changing the grease fitting, resupply grease and fill the fitting with grease.



Once the seal washer and O-ring have been assembled, their sealing effect is reduced when reassembling due to rubber deformation, so replacement with new parts is recommended.

Maintenance parts

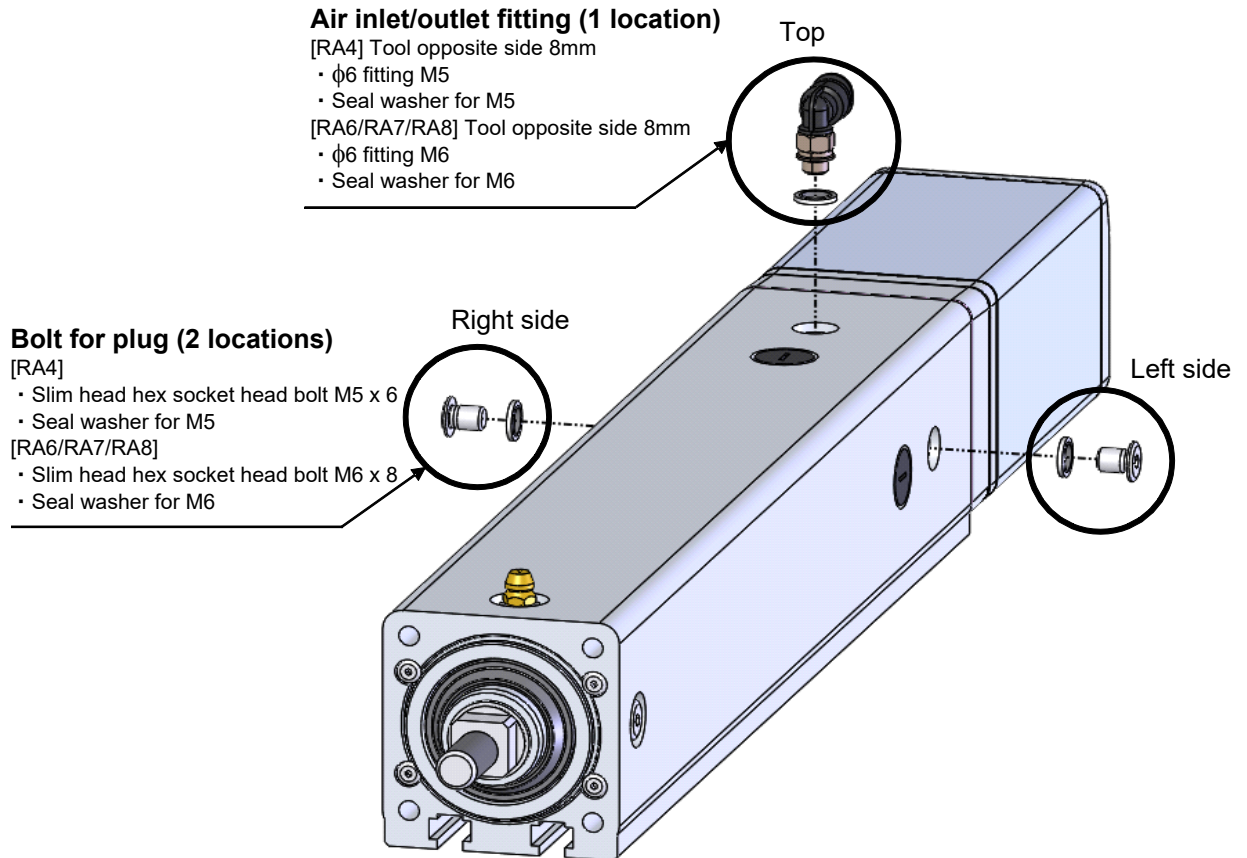
Model	Location of use	Tightening torque [N · cm]	Name	Manufacturer	Model number
RA4	Grease fitting	42	Seal washer	NOK	SUSWF-4
	Grease outlet	96.9	O-ring	IAI	1146323
RA6/RA7/RA8	Grease fitting	167	Seal washer	MUSASHI OIL SEAL MFG.	SWS 6 x 10-A
	Grease outlet	387.6			

## 5.8.2 Changing the position of the air inlet/outlet fitting

The fitting can be changed to top, left, or right side positions.

Using a spanner-type torque wrench etc. for the fitting and a hex torque wrench etc. for the plug bolt, change the mounting position. Fasten the fitting and plug bolt in accordance with the tightening torque shown in the table.

When changing the position, be careful of peripheral interference if you are using a short-stroke actuator or a side-mounted motor specification.



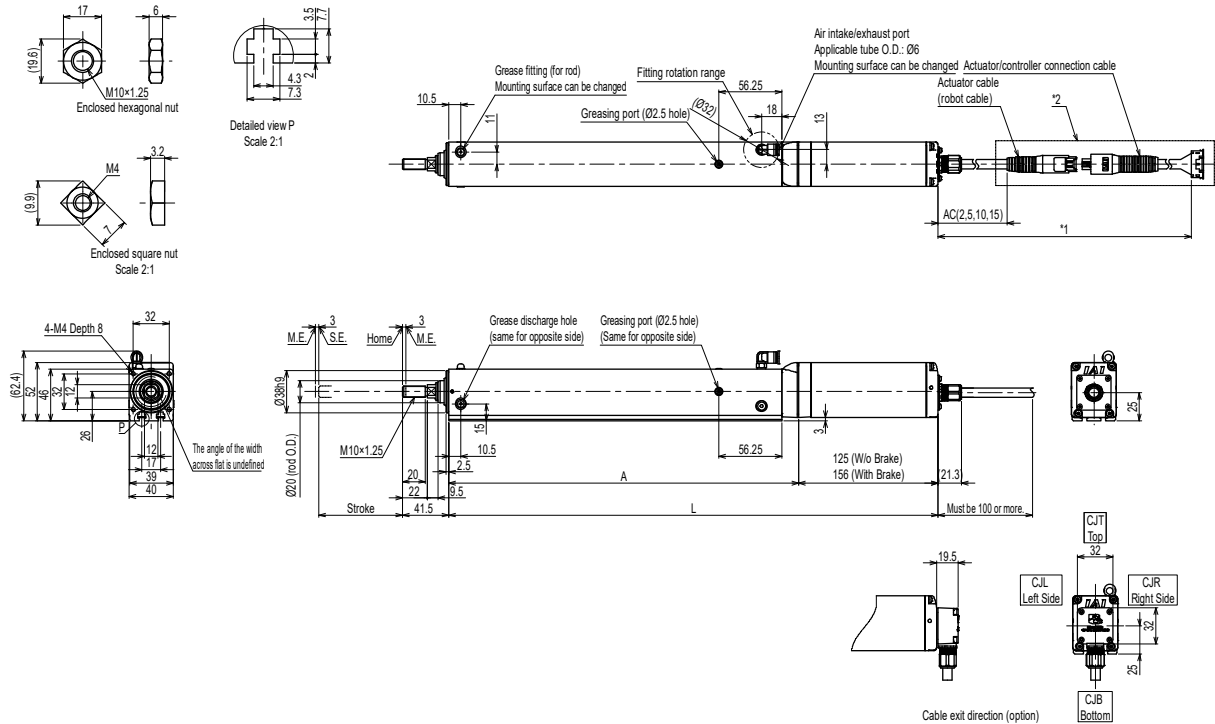
Once the seal washer has been assembled, its sealing effect is reduced when reassembling due to rubber deformation, so replacement with new parts is recommended.

Maintenance parts

Model	Location of use	Tightening torque [N · cm]	Name	Manufacturer	Model number
RA4	Air inlet/outlet fitting	150	Seal washer	MUSASHI OIL SEAL MFG.	SWS 5 x 9-A
	Bolt for plug	193.8			
RA6/RA7/RA8	Air inlet/outlet fitting	250	Seal washer	MUSASHI OIL SEAL MFG.	SWS 6 x 10-A
	Bolt for plug	387.6			

## 6. External Dimensions

### 6.1 Dust-proof/splash-proof specification, standard specification RCP6W-RA4C



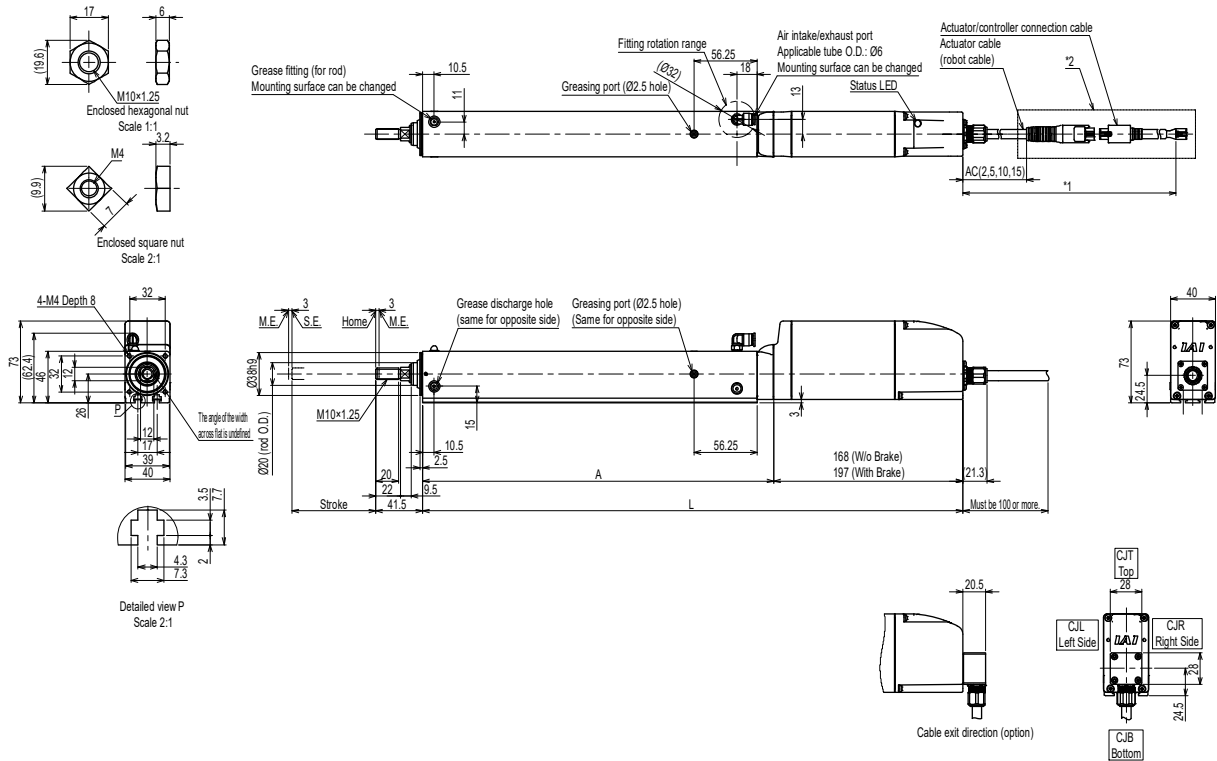
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	288	319	163	1.4	1.5
100	338	369	213	1.6	1.7
150	388	419	263	1.8	1.9
200	438	469	313	2.0	2.1

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 19.5mm.

## 6.2 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA4C



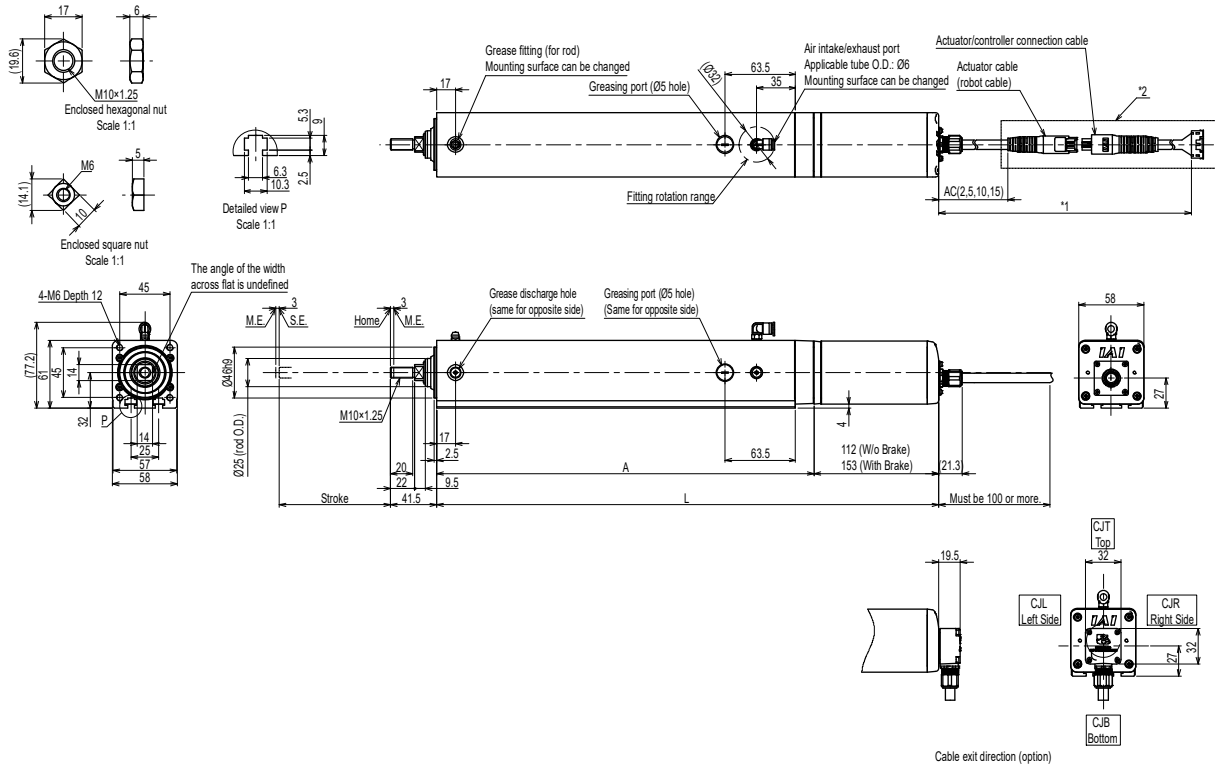
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	331	360	163	1.6	1.7
100	381	410	213	1.8	1.9
150	431	460	263	2.0	2.1
200	481	510	313	2.2	2.3

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 20.5mm.

## 6.3 Dust-proof/splash-proof specification, standard specification RCP6W-RA6C



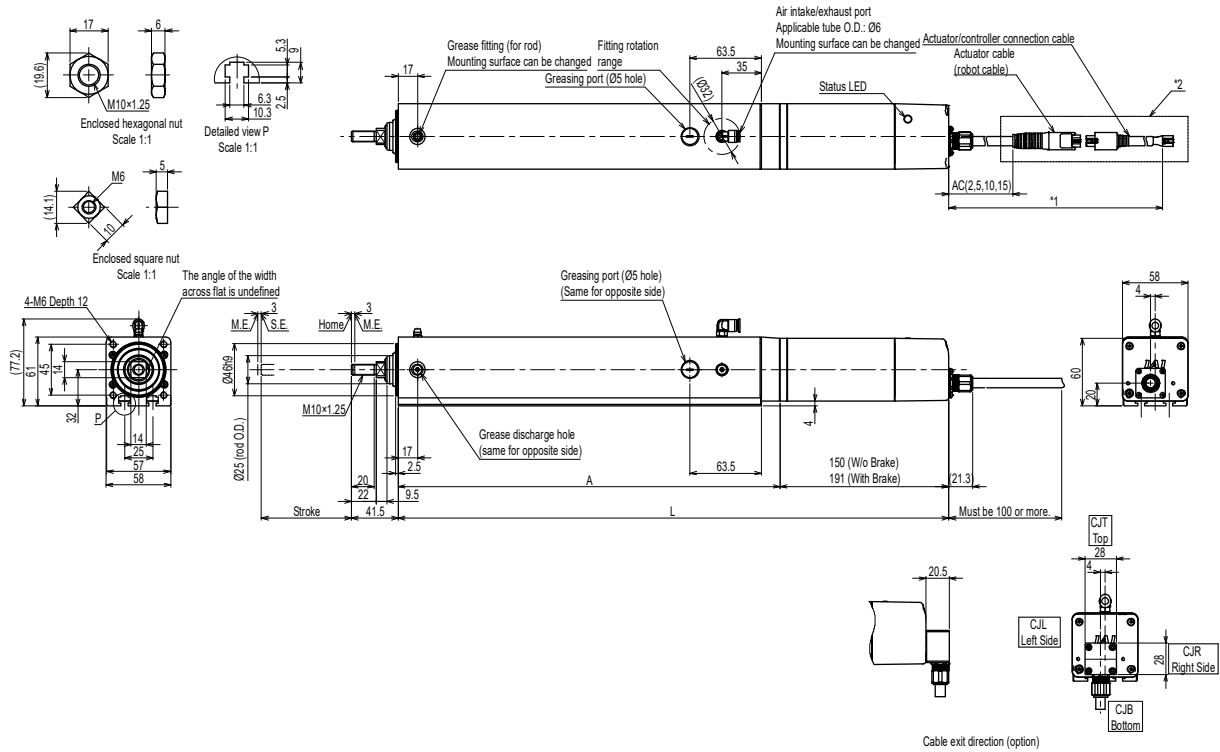
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	301	342	189	2.5	2.8
100	351	392	239	2.9	3.2
150	401	442	289	3.3	3.6
200	451	492	339	3.6	3.9
250	501	542	389	4.0	4.3
300	551	592	439	4.4	4.7

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 19.5mm.

## 6.4 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA6C



M.E. : Mechanical End  
S.E. : Stroke End

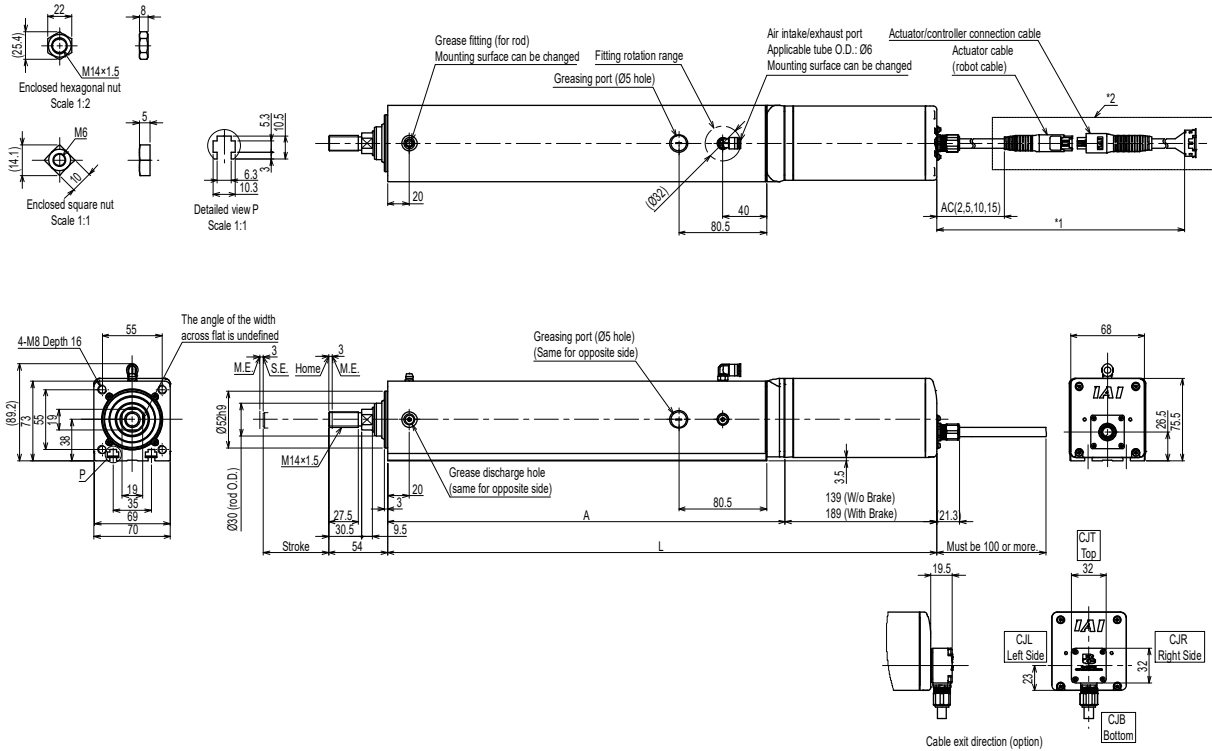
- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	339	380	189	2.7	2.9
100	389	430	239	3.1	3.2
150	439	480	289	3.5	3.7
200	489	530	339	3.8	4.0
250	539	580	389	4.2	4.4
300	589	630	439	4.6	4.8

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 20.5mm.



## 6.5 Dust-proof/splash-proof specification, standard specification RCP6W-RA7C



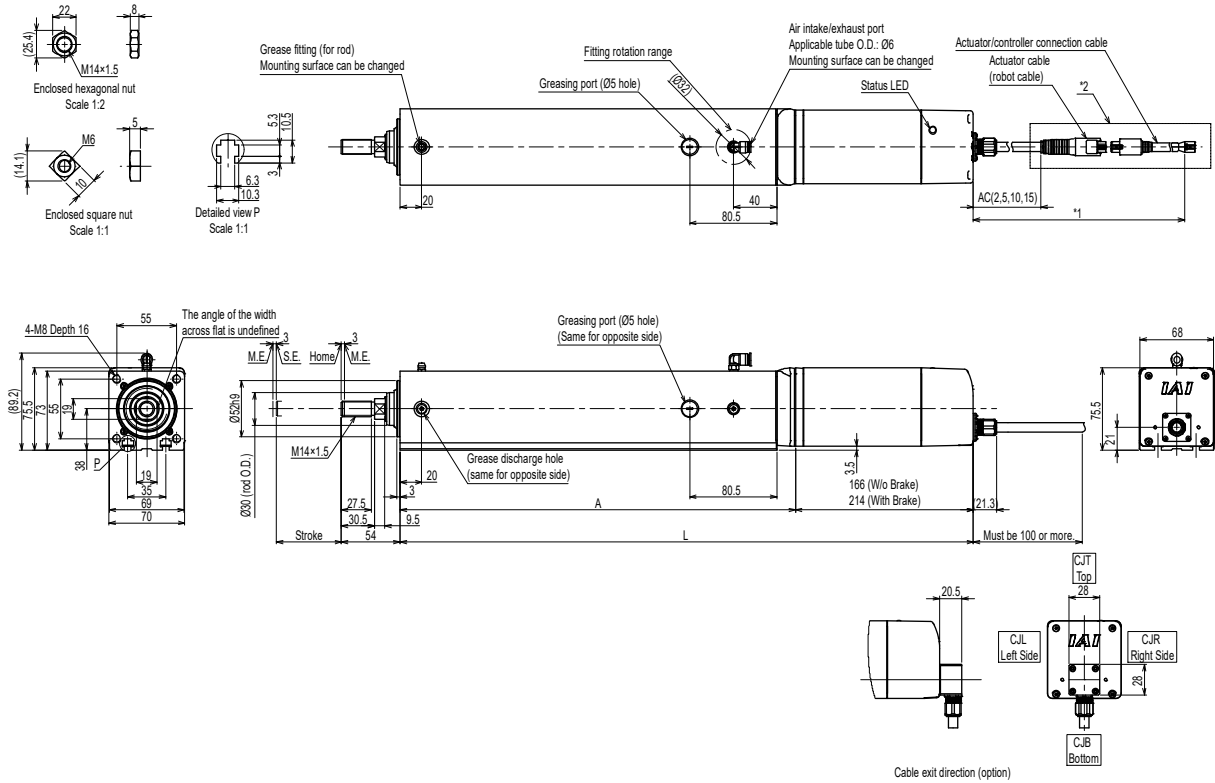
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	353.5	403.5	214.5	4.5	5.0
100	403.5	453.5	264.5	5.1	5.6
150	453.5	503.5	314.5	5.7	6.2
200	503.5	553.5	364.5	6.3	6.8
250	553.5	603.5	414.5	6.8	7.3
300	603.5	653.5	464.5	7.4	7.9

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 19.5mm.

## 6.6 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA7C



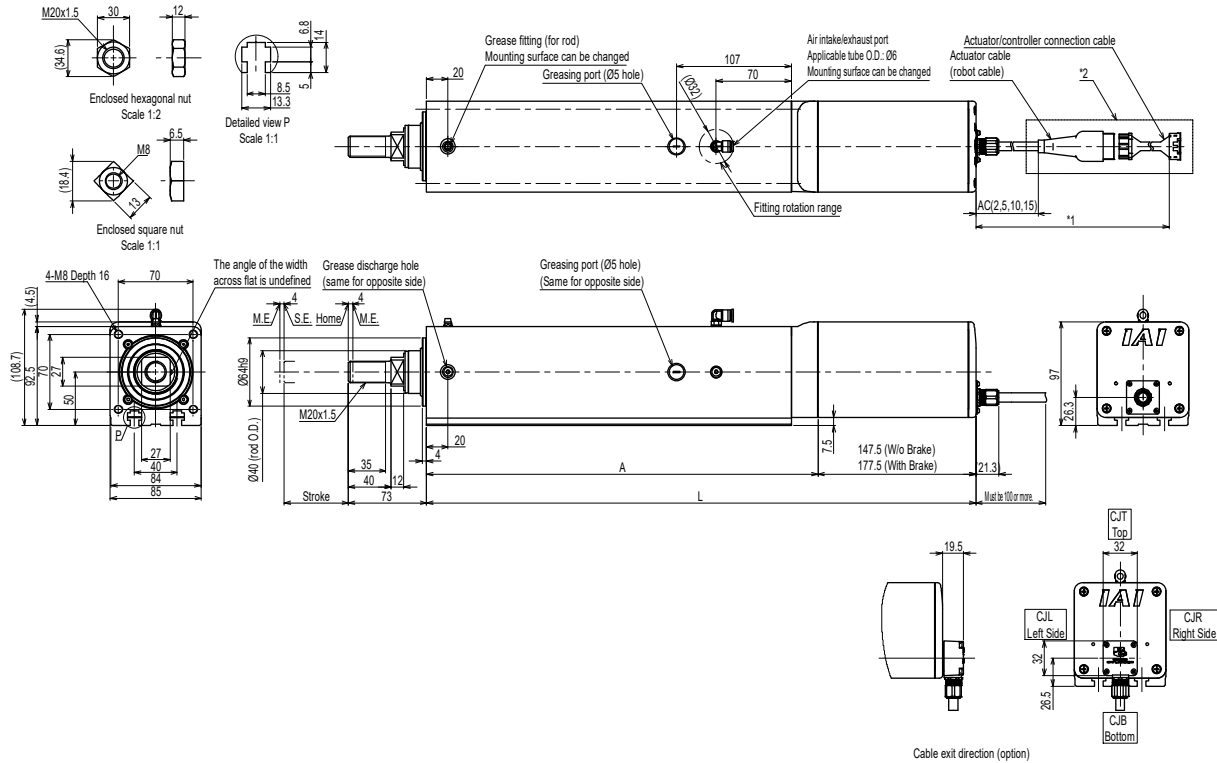
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	380.5	428.5	214.5	4.7	5.1
100	430.5	478.5	264.5	5.3	5.7
150	480.5	528.5	314.5	5.9	6.3
200	530.5	578.5	364.5	6.5	6.9
250	580.5	628.5	414.5	7.0	7.4
300	630.5	678.5	464.5	7.6	8.0

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 20.5mm.

## 6.7 Dust-proof/splash-proof specification, standard specification RCP6W-RA8C



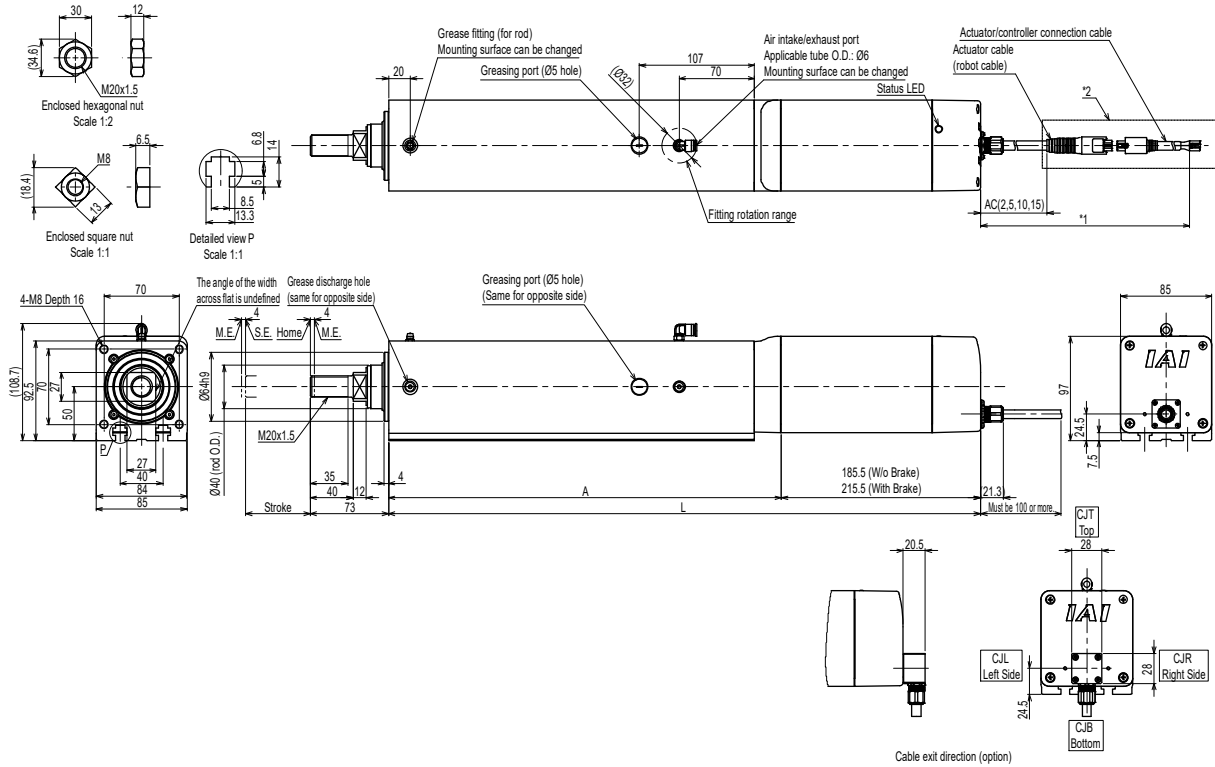
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	413	443	265.5	8.0	8.6
100	463	493	315.5	8.8	9.4
150	513	543	365.5	9.7	10.3
200	563	593	415.5	10.5	11.1
250	613	643	465.5	11.4	12.0
300	663	693	515.5	12.2	12.8

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 19.5mm.

## 6.8 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA8C



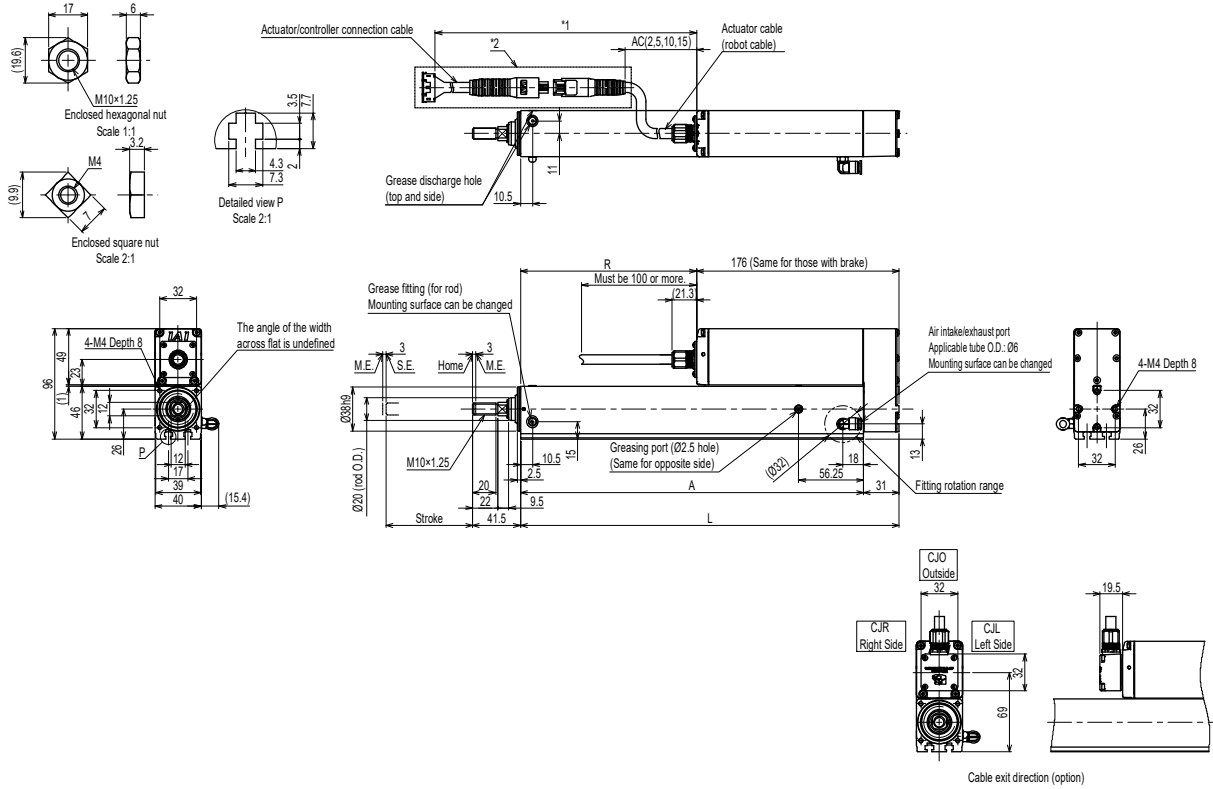
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L		A	Mass [kg]	
	W/o Brake	With Brake		W/o Brake	With Brake
50	451	481	265.5	8.3	8.9
100	501	531	315.5	9.1	9.7
150	551	581	365.5	10.0	10.6
200	601	631	415.5	10.8	11.4
250	651	681	465.5	11.7	12.3
300	701	731	515.5	12.5	13.1

(Note) L dimensions described in the table are those with no cable exit direction (option). For cable exit direction types (option), the dimensions are longer in 20.5mm.

## 6.9 Dust-proof/splash-proof specification, standard specification RCP6W-RA4R Top Side-Mounted (Model: MT)



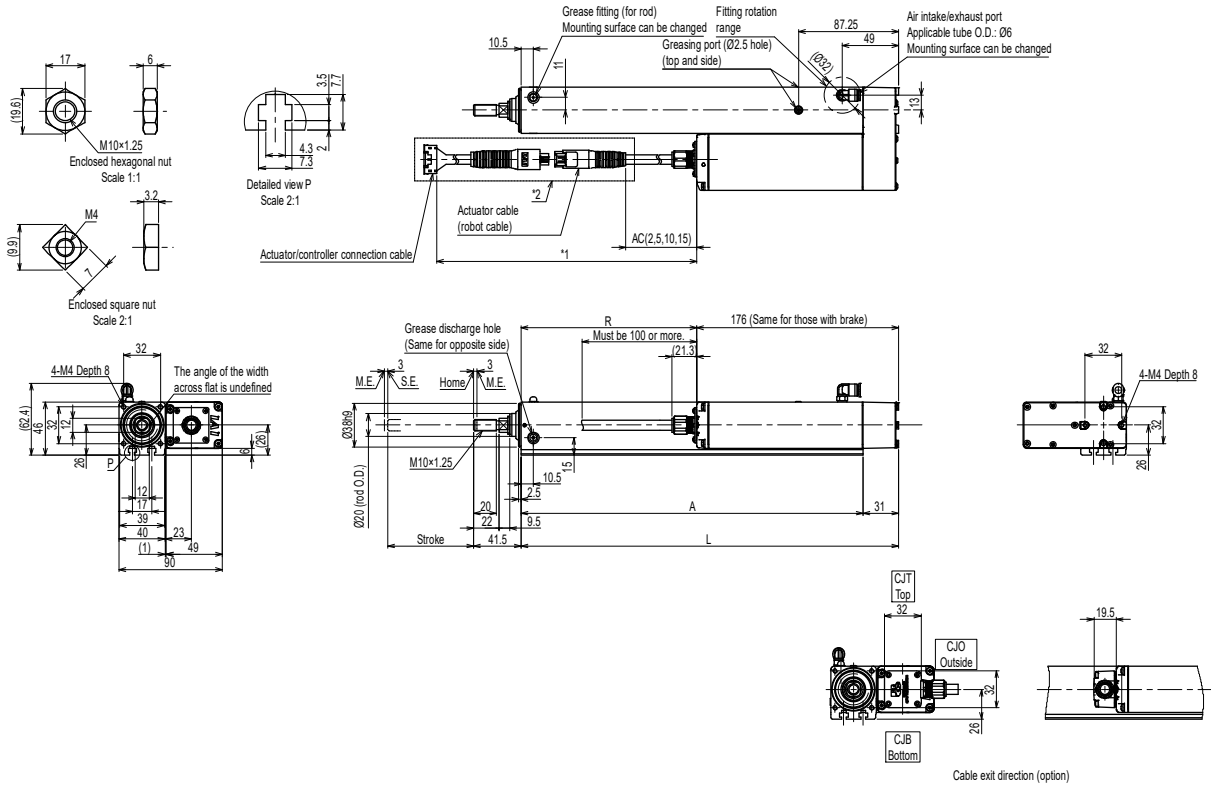
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	S	T	R	Mass [kg]	
				W/o Brake	With Brake
50	179	148	3	1.5	1.6
100	229	198	53	1.7	1.8
150	279	248	103	1.9	2
200	329	298	153	2.1	2.2

## 6.10 Dust-proof/splash-proof specification, standard specification RCP6W-RA4R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.

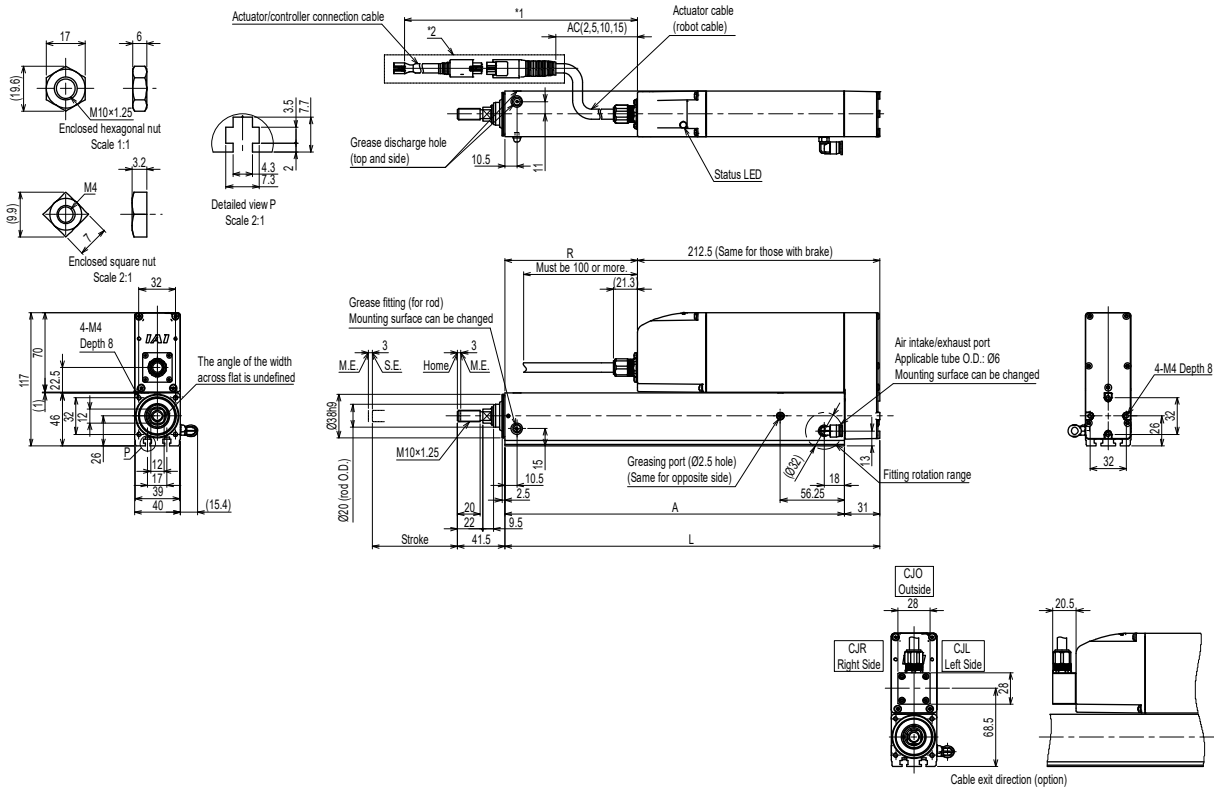


M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	179	148	3	1.5	1.6
100	229	198	53	1.7	1.8
150	279	248	103	1.9	2
200	329	298	153	2.1	2.2

## 6.11 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA4R Top Side-Mounted (Model: MT)



M.E. : Mechanical End  
S.E. : Stroke End

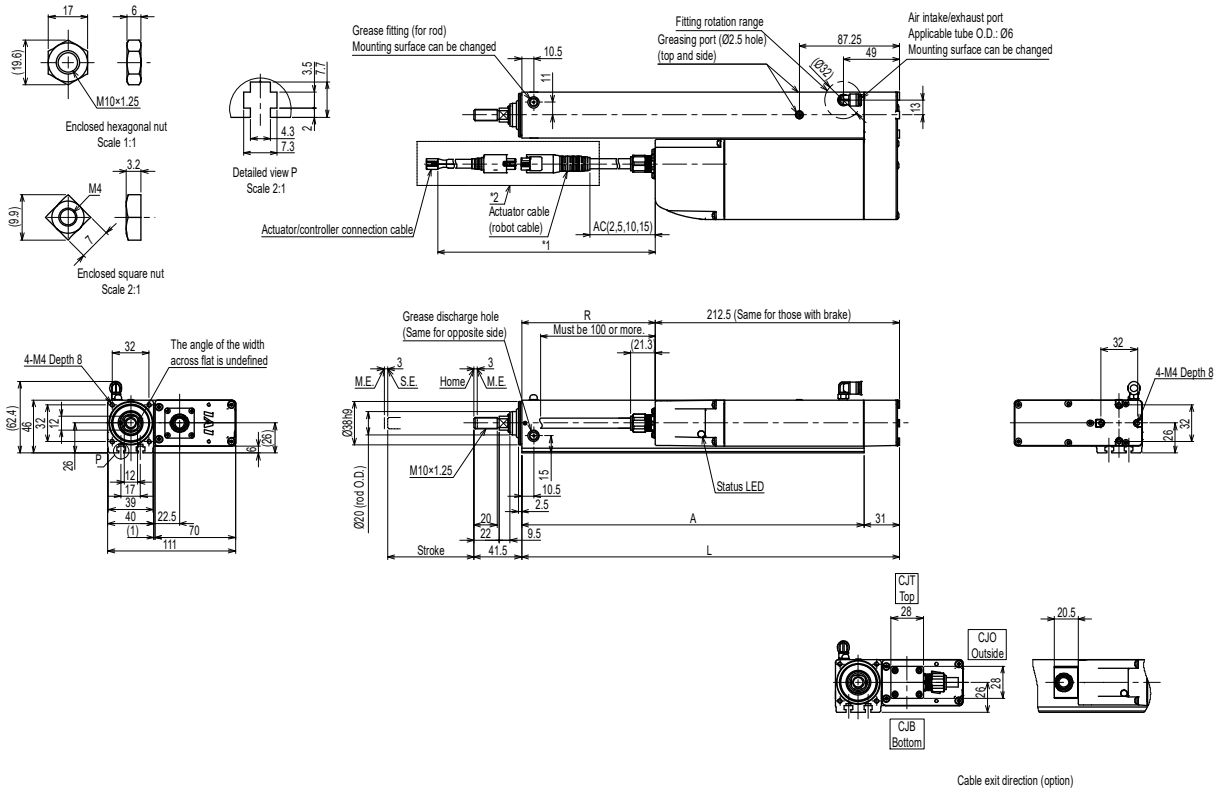
- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	S	T	R	Mass [kg]	
				W/o Brake	With Brake
50	179	148	-33.5	1.7	1.8
100	229	198	16.5	1.9	2.0
150	279	248	66.5	2.1	2.2
200	329	298	116.5	2.3	2.4

(Note) When R dimension is negative, the end of the motor unit is located before the base end surface.

## 6.12 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA4R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.



M.E. : Mechanical End  
S.E. : Stroke End

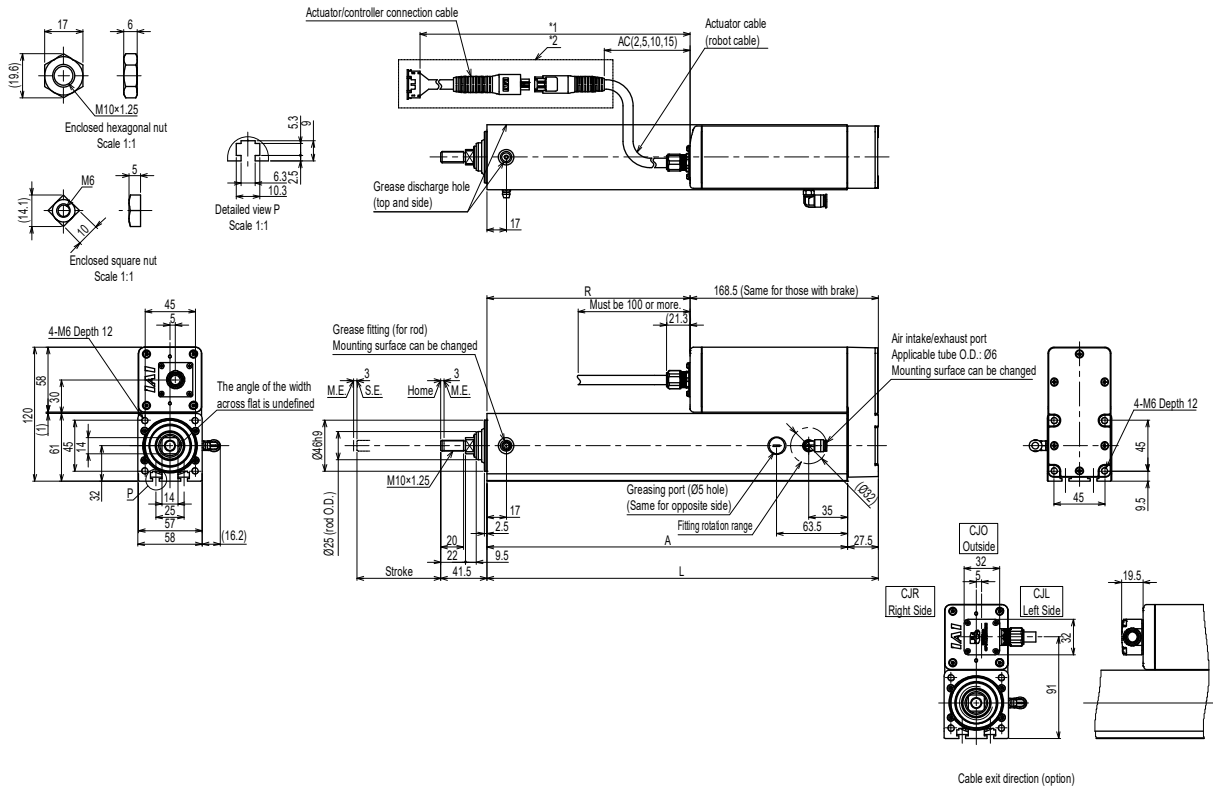
- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	179	148	-33.5	1.7	1.8
100	229	198	16.5	1.9	2.0
150	279	248	66.5	2.1	2.2
200	329	298	116.5	2.3	2.4

(Note) When R dimension is negative, the end of the motor unit is located before the base end surface.



## 6.13 Dust-proof/splash-proof specification, standard specification RCP6W-RA6R Top Side-Mounted (Model: MT)



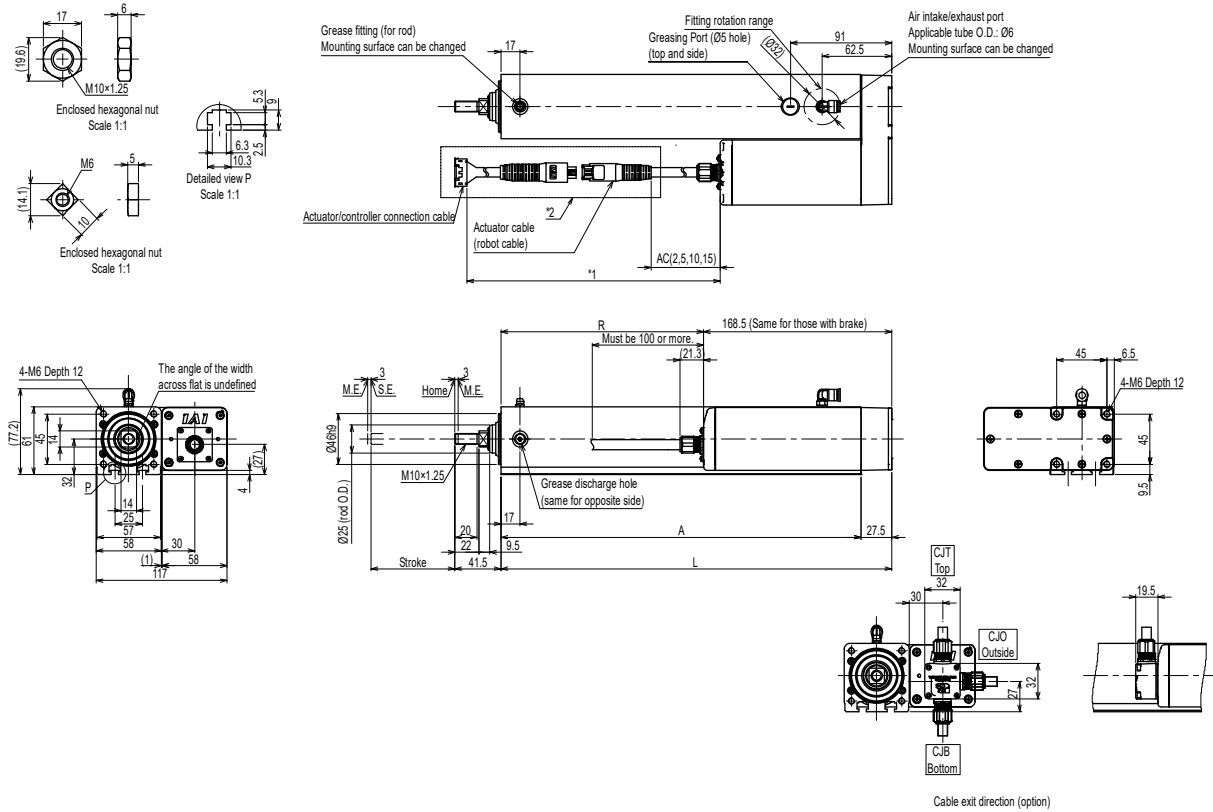
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	200	172.5	31.5	2.8	2.9
100	250	222.5	81.5	3.2	3.3
150	300	272.5	131.5	3.6	3.7
200	350	322.5	181.5	3.9	4.0
250	400	372.5	231.5	4.3	4.4
300	450	422.5	281.5	4.7	4.8

## 6.14 Dust-proof/splash-proof specification, standard specification RCP6W-RA6R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.

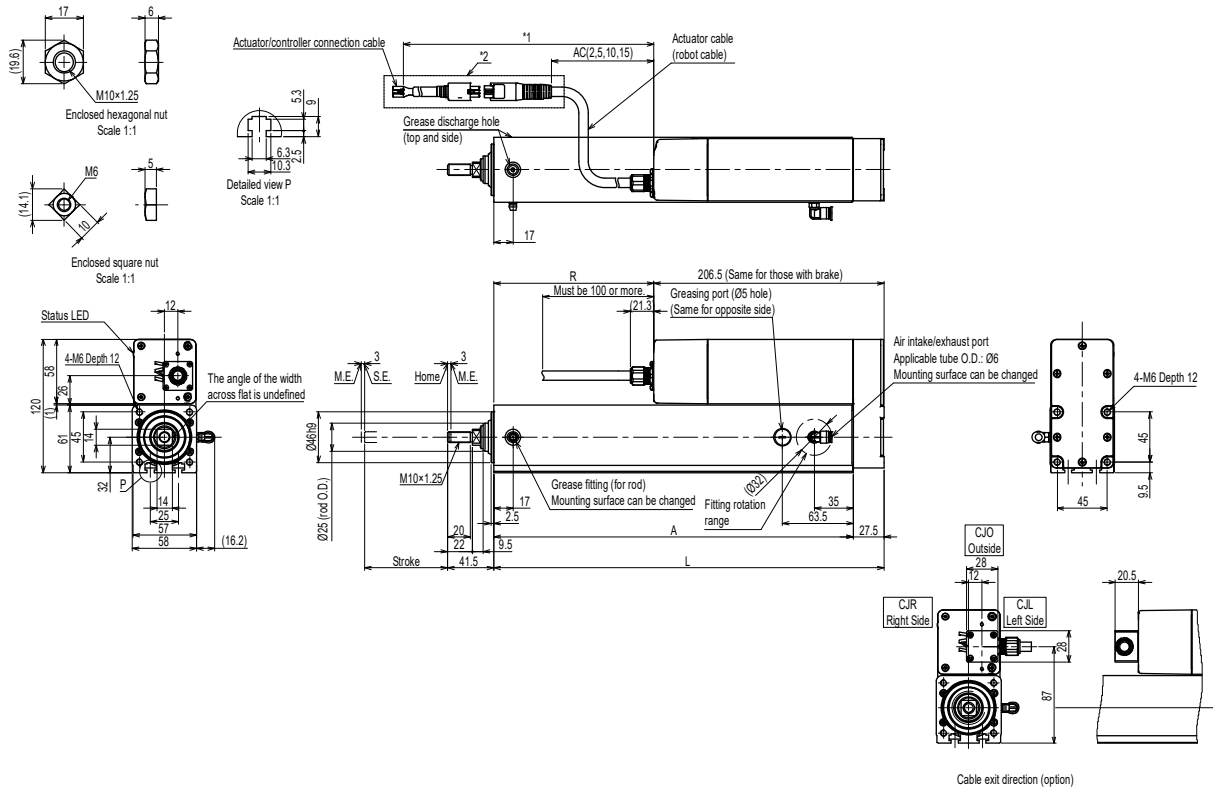


M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	200	172.5	31.5	2.8	2.9
100	250	222.5	81.5	3.2	3.3
150	300	272.5	131.5	3.6	3.7
200	350	322.5	181.5	3.9	4.0
250	400	372.5	231.5	4.3	4.4
300	450	422.5	281.5	4.7	4.8

## 6.15 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA6R Top Side-Mounted (Model: MT)



M.E. : Mechanical End  
S.E. : Stroke End

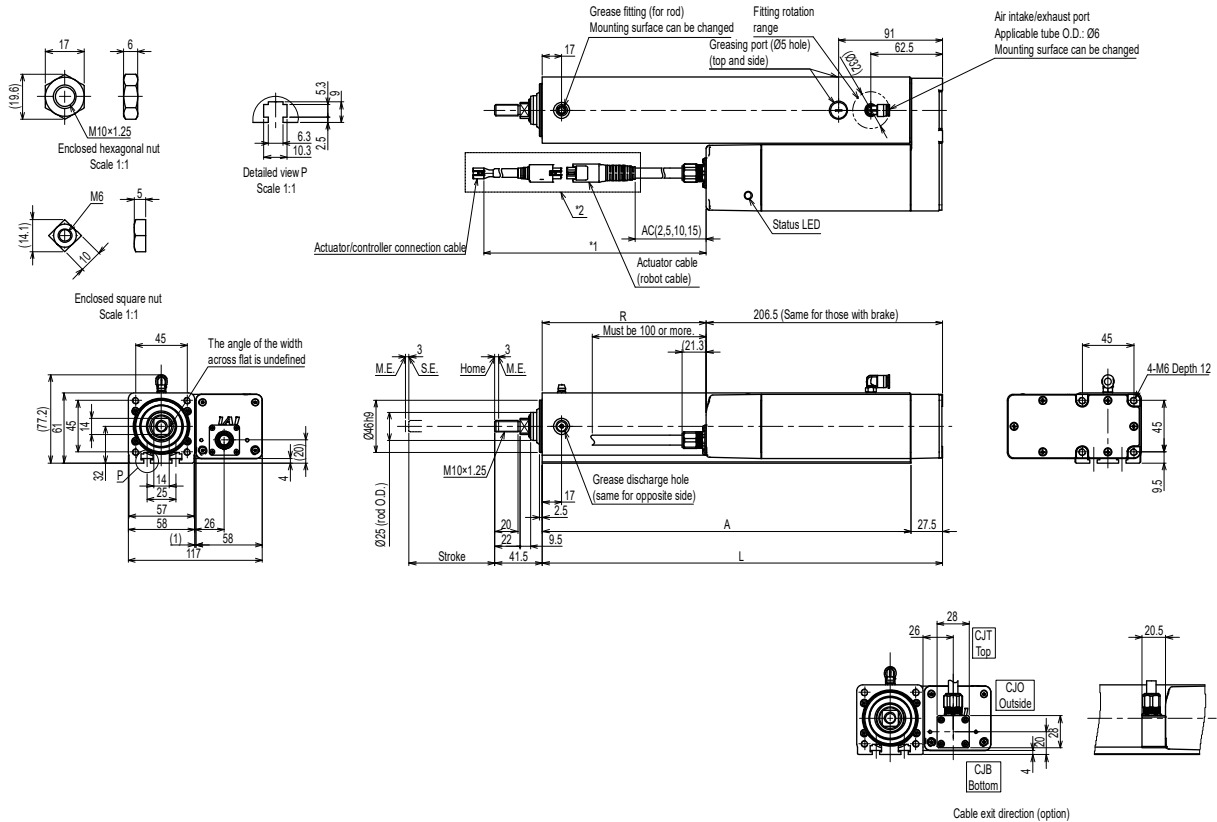
- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	200	172.5	-6.5	3.0	3.1
100	250	222.5	43.5	3.4	3.5
150	300	272.5	93.5	3.8	3.9
200	350	322.5	143.5	4.1	4.2
250	400	372.5	193.5	4.5	4.6
300	450	422.5	243.5	4.9	5.0

(Note) When R dimension is negative, the end of the motor unit is located before the base end surface.

## 6.16 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA6R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.



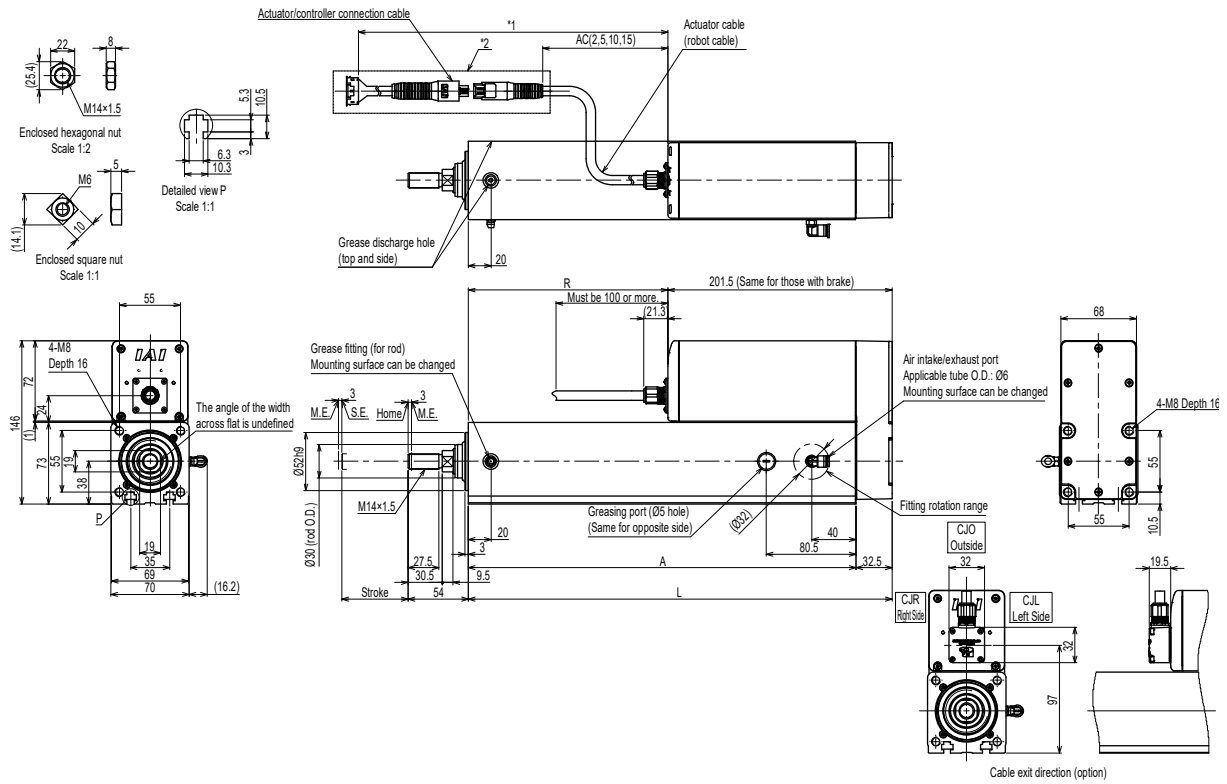
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	200	172.5	-6.5	3.0	3.1
100	250	222.5	43.5	3.4	3.5
150	300	272.5	93.5	3.8	3.9
200	350	322.5	143.5	4.1	4.2
250	400	372.5	193.5	4.5	4.6
300	450	422.5	243.5	4.9	5.0

(Note) When R dimension is negative, the end of the motor unit is located before the base end surface.

## 6.17 Dust-proof/splash-proof specification, standard specification RCP6W-RA7R Top Side-Mounted (Model: MT)



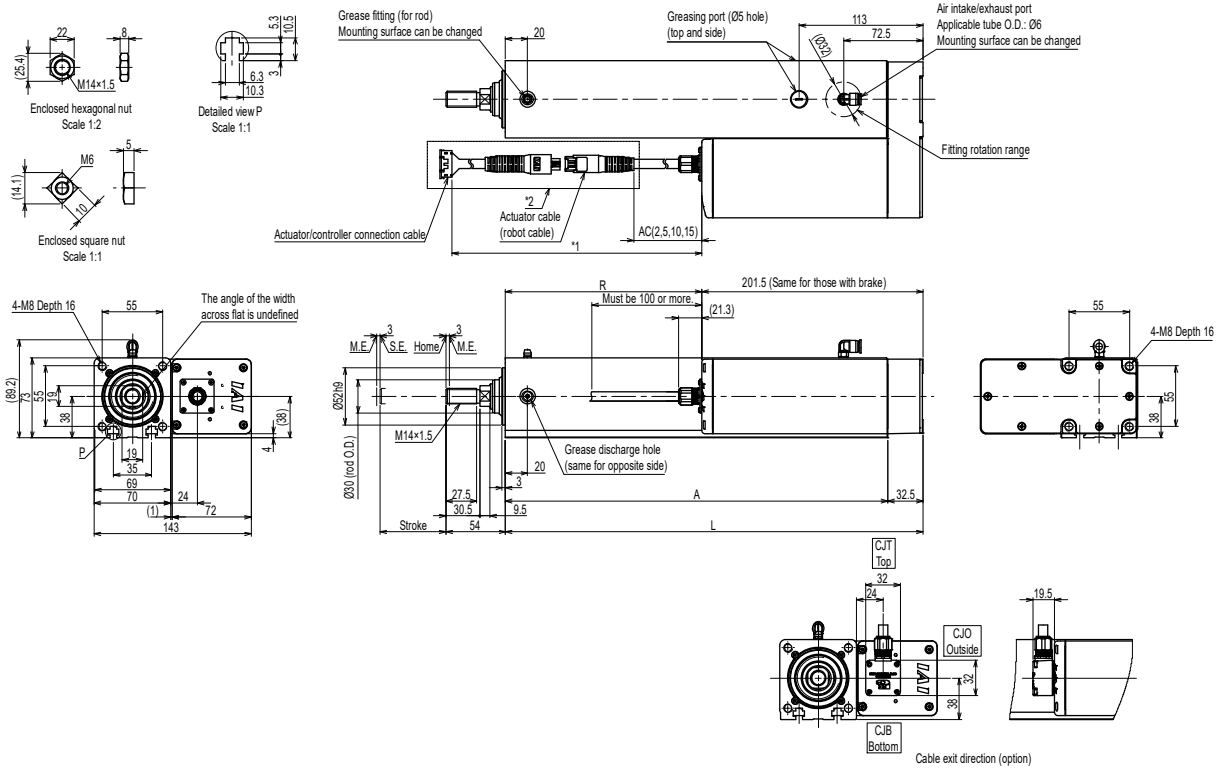
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.  
\*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	230	197.5	26.5	5.2	5.3
100	280	247.5	76.5	5.8	5.9
150	330	297.5	126.5	6.4	6.5
200	380	347.5	176.5	7.0	7.1
250	430	397.5	226.5	7.5	7.6
300	480	447.5	276.5	8.1	8.2

## 6.18 Dust-proof/splash-proof specification, standard specification RCP6W-RA7R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.

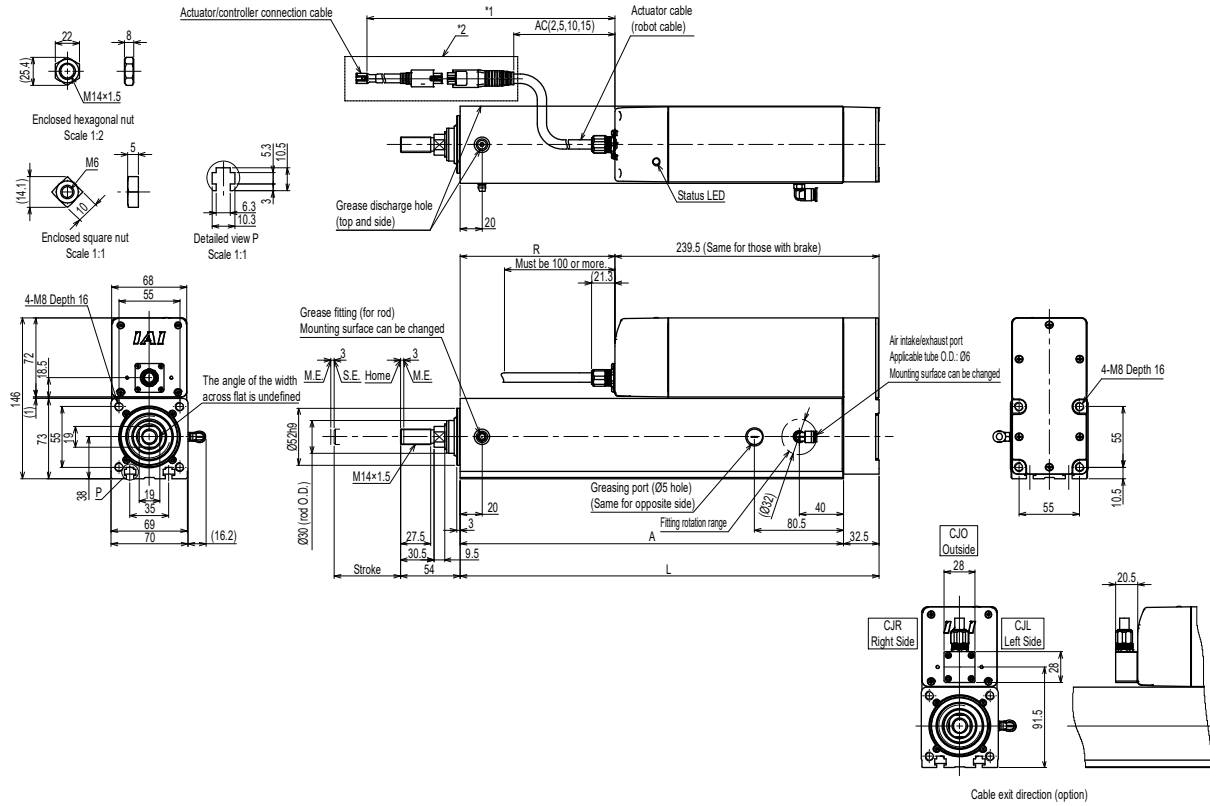


M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	230	197.5	26.5	5.2	5.3
100	280	247.5	76.5	5.8	5.9
150	330	297.5	126.5	6.4	6.5
200	380	347.5	176.5	7.0	7.1
250	430	397.5	226.5	7.5	7.6
300	480	447.5	276.5	8.1	8.2

## 6.19 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA7R Top Side-Mounted (Model: MT)



M.E. : Mechanical End  
S.E. : Stroke End

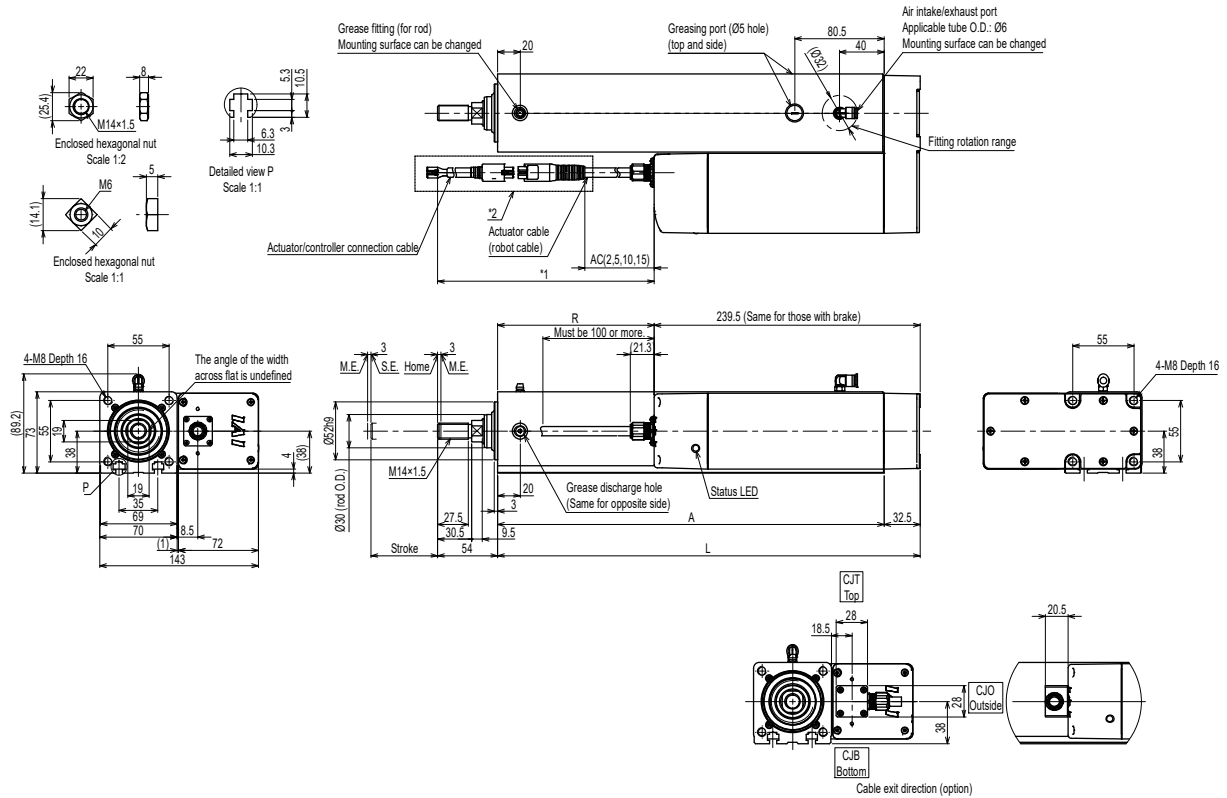
- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	230	197.5	-7.5	5.4	5.5
100	280	247.5	40.5	6.0	6.1
150	330	297.5	90.5	6.6	6.7
200	380	347.5	140.5	7.2	7.3
250	430	397.5	190.5	7.7	7.8
300	480	447.5	240.5	8.3	8.4

(Note) When R dimension is negative, the end of the motor unit is located before the base end surface.

## 6.20 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA7R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.



M.E. : Mechanical End  
S.E. : Stroke End

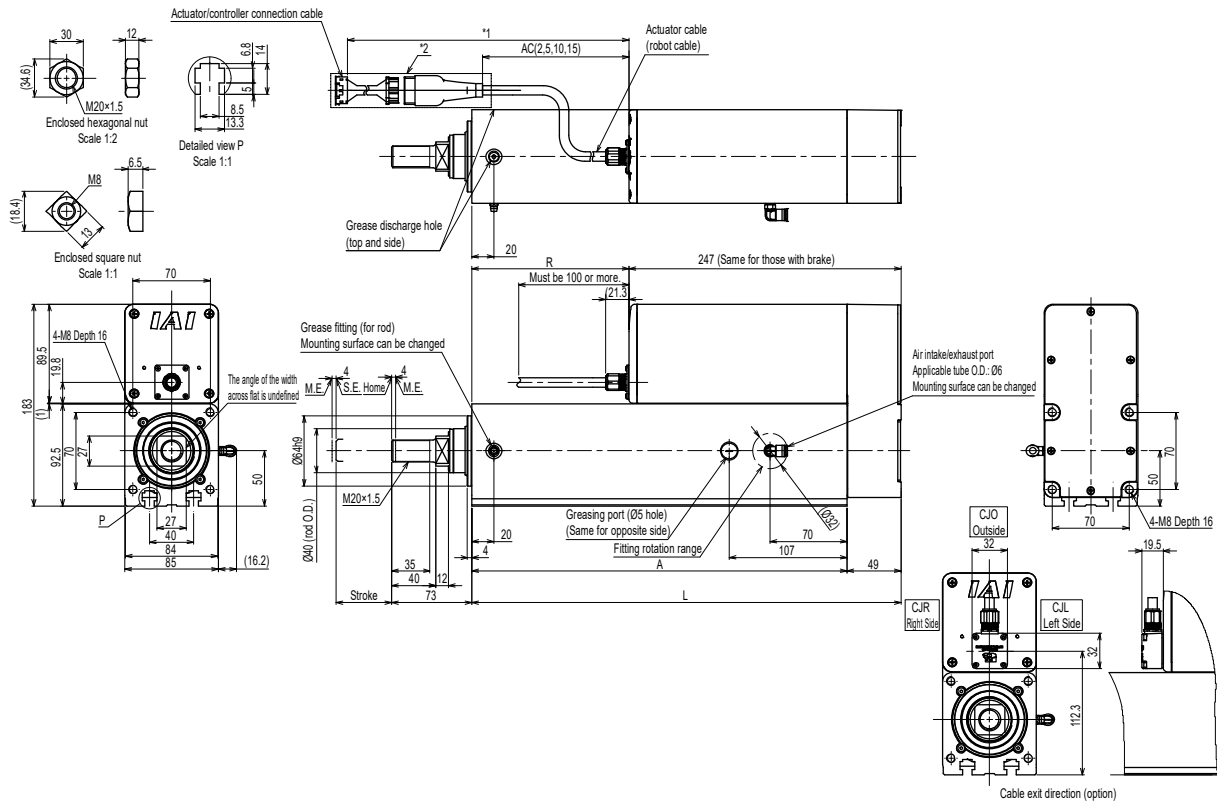
- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	230	197.5	-9.5	5.4	5.5
100	280	247.5	40.5	6.0	6.1
150	330	297.5	90.5	6.6	6.7
200	380	347.5	140.5	7.2	7.3
250	430	397.5	190.5	7.7	7.8
300	480	447.5	240.5	8.3	8.4

(Note) When R dimension is negative, the end of the motor unit is located before the base end surface.



## 6.21 Dust-proof/splash-proof specification, standard specification RCP6W-RA8R Top Side-Mounted (Model: MT)



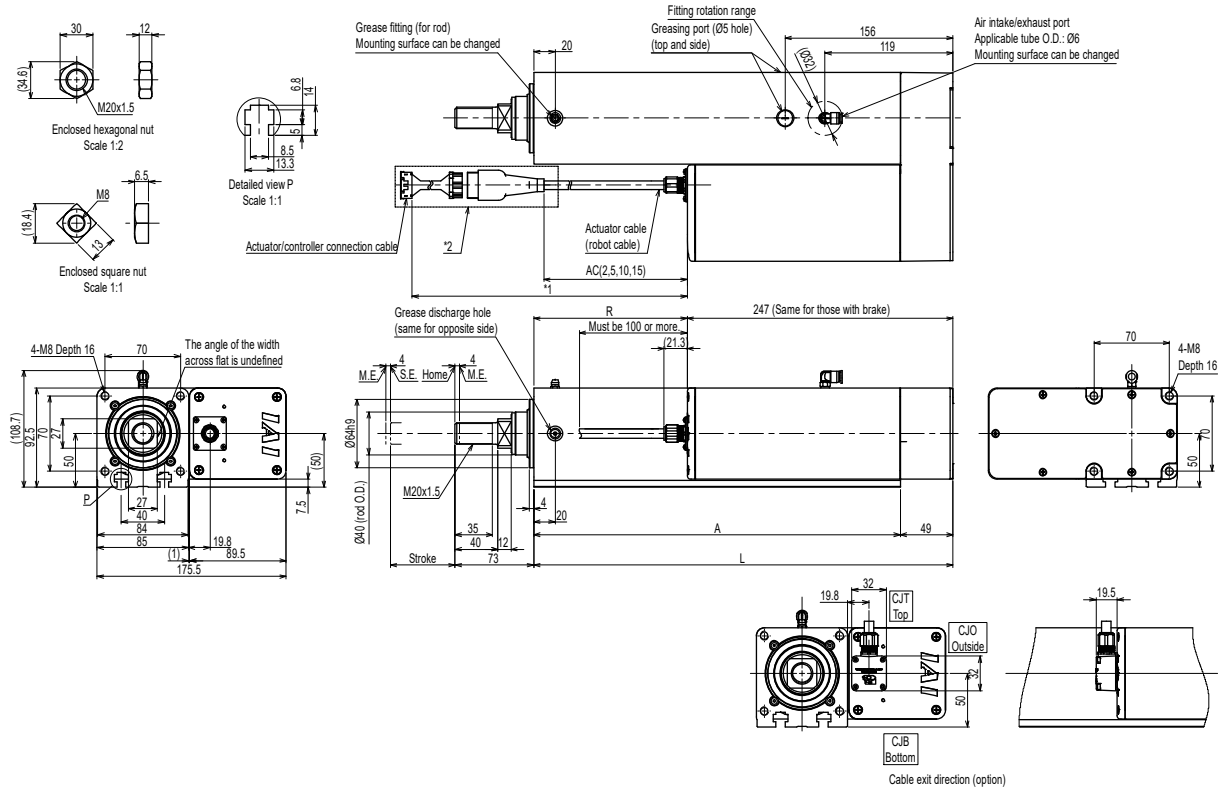
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	289.5	240.5	42.5	9.2	9.5
100	339.5	290.5	92.5	10.0	10.3
150	389.5	340.5	142.5	10.9	11.2
200	439.5	390.5	192.5	11.7	12.0
250	489.5	440.5	242.5	12.6	12.9
300	539.5	490.5	292.5	13.4	13.7

## 6.22 Dust-proof/splash-proof specification, standard specification RCP6W-RA8R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.



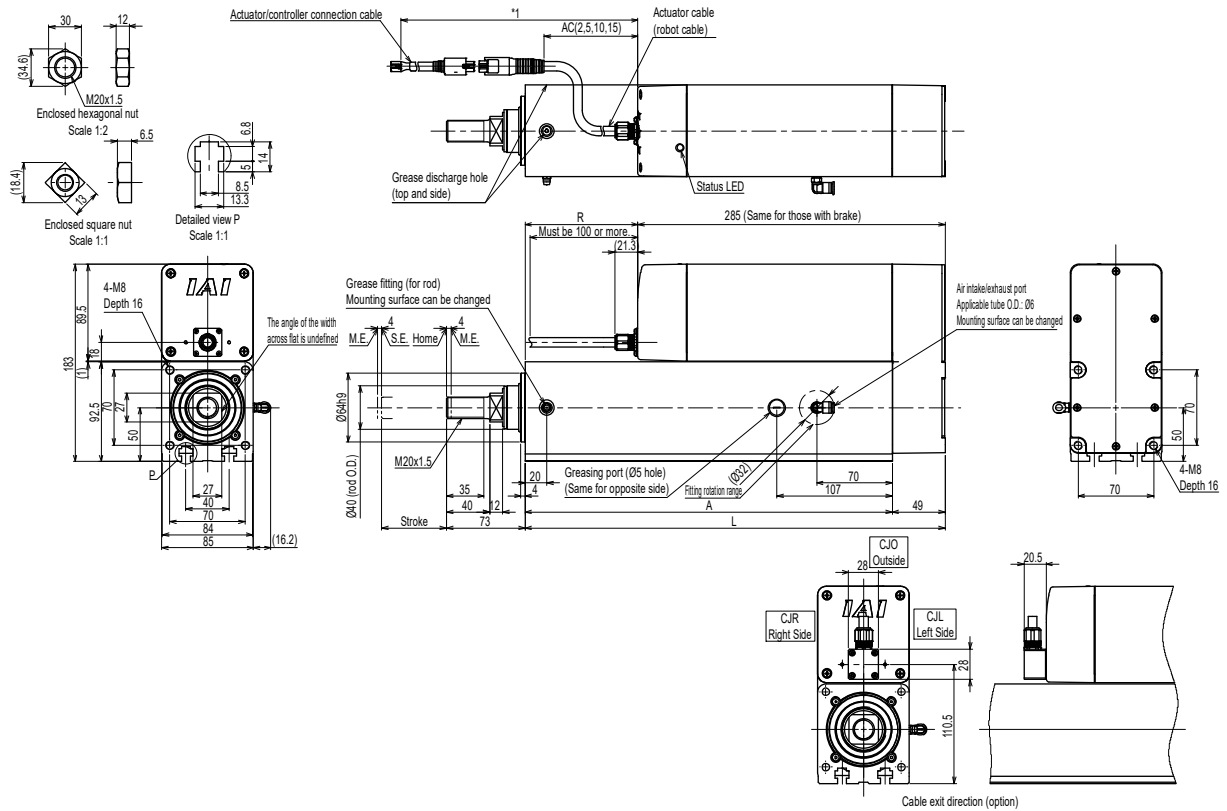
M.E. : Mechanical End  
S.E. : Stroke End

\*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.

\*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	289.5	240.5	42.5	9.2	9.5
100	339.5	290.5	92.5	10.0	10.3
150	389.5	340.5	142.5	10.9	11.2
200	439.5	390.5	192.5	11.7	12.0
250	489.5	440.5	242.5	12.6	12.9
300	539.5	490.5	292.5	13.4	13.7

## 6.23 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA8R Top Side-Mounted (Model: MT)



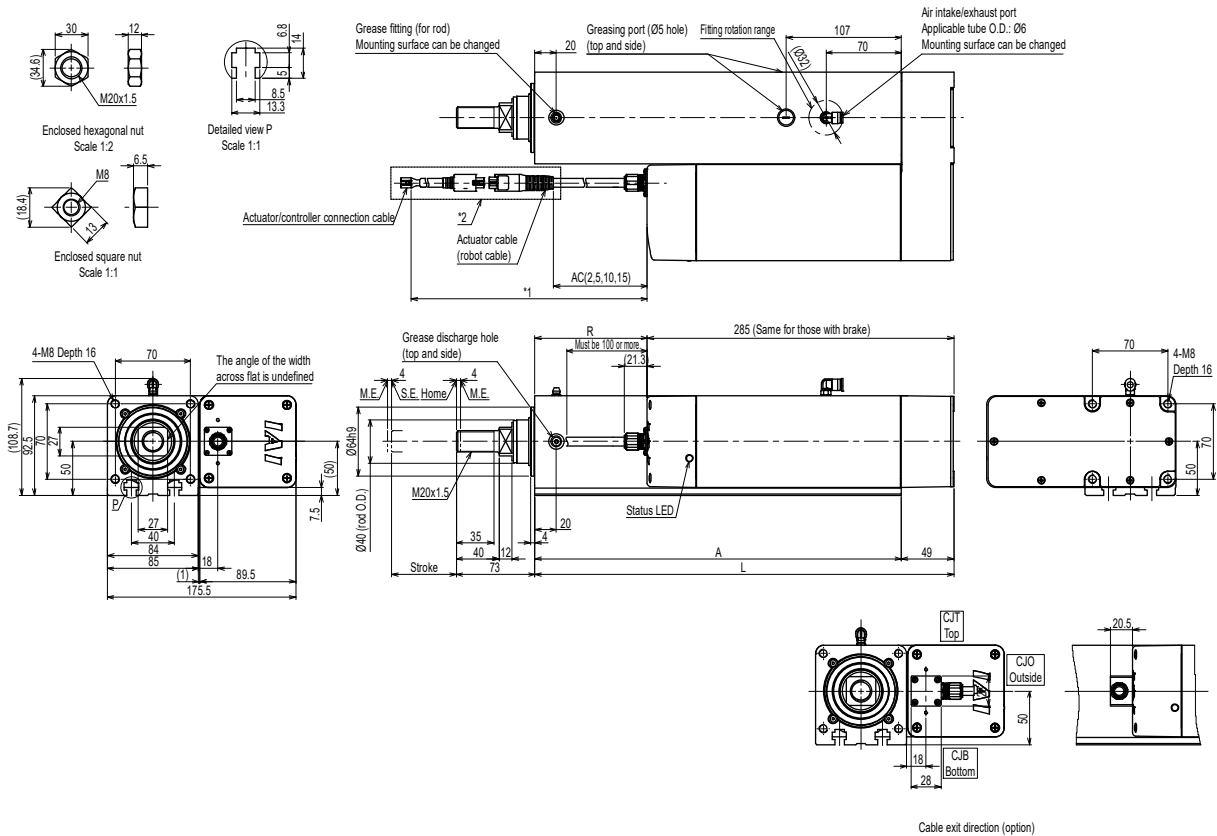
M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	289.5	240.5	4.5	9.5	9.8
100	339.5	290.5	54.5	10.3	10.6
150	389.5	340.5	104.5	11.2	11.5
200	439.5	390.5	154.5	12.0	12.3
250	489.5	440.5	204.5	12.9	13.2
300	539.5	490.5	254.5	13.7	14.0

## 6.24 Dust-proof/splash-proof specification, built-in controller specification RCP6SW-RA8R Left Side-Mounted (Model: ML)

(Note) For Right Side-Mounted (model: MR), side-mounted motor will be on the right side in the drawing beneath.



M.E. : Mechanical End  
S.E. : Stroke End

- \*1 Make sure that the total length of the actuator cable and actuator/controller connection cable is 20m or less.
- \*2 The cable relay section within the dotted line is not splash-proof.

Stroke	L	A	R	Mass [kg]	
				W/o Brake	With Brake
50	289.5	240.5	4.5	9.5	9.8
100	339.5	290.5	54.5	10.3	10.6
150	389.5	340.5	104.5	11.2	11.5
200	439.5	390.5	154.5	12.0	12.3
250	489.5	440.5	204.5	12.9	13.2
300	539.5	490.5	254.5	13.7	14.0

## 7. Life

The scraper, a replacement part, is not included in the life.

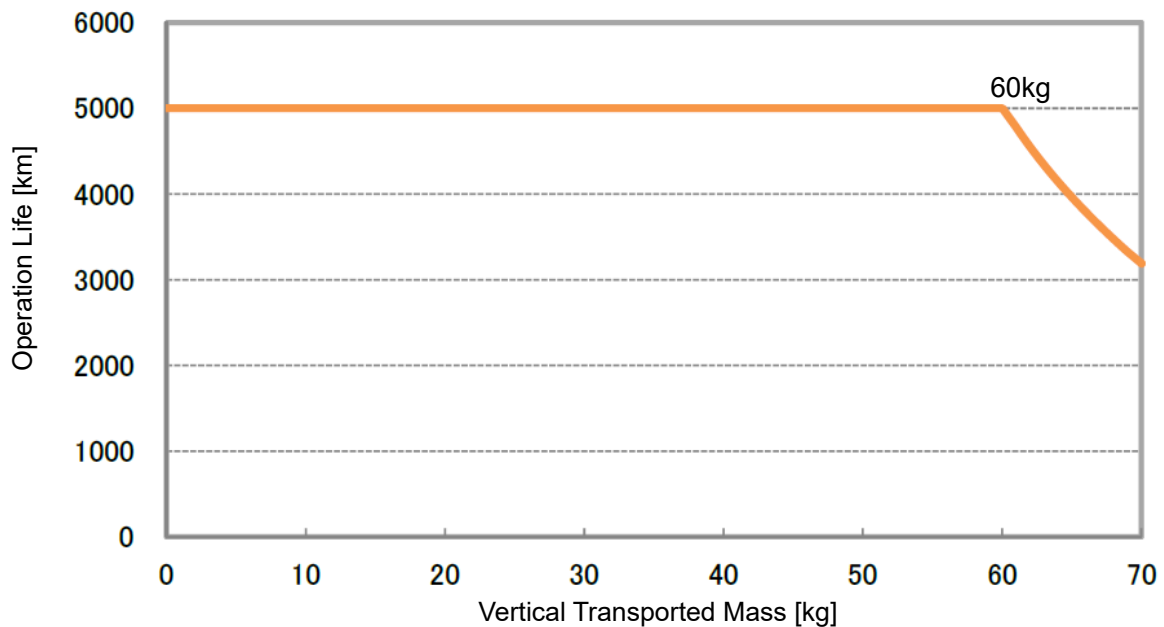
### 7.1 RA4C, RA4R, RA6C, RA6R, RA7C, RA7R

The life is assumed under condition of operation with maximum transported mass and maximum acceleration/deceleration, and it is 5,000km (reference).

### 7.2 RA8C, RA8R

The life in the standard horizontal orientation is assumed under condition of operation with maximum transported mass and maximum acceleration/deceleration, and it is 5,000km (reference).

The life in the vertical orientation may change depending on the transported mass. The graph below shows the relation of transported mass and life.



## 8. Warranty

### 8.1 Warranty Period

One of the following periods, whichever is shorter:

- 18 months after shipment from IAI
- 12 months after delivery to the specified location
- 2,500 hours of operation

### 8.2 Scope of the Warranty

Our products are covered by warranty when all of the following conditions are met. Faulty products covered by warranty will be replaced or repaired free of charge:

- (1) The breakdown or problem in question pertains to our product as delivered by us or our authorized dealer.
- (2) The breakdown or problem in question occurred during the warranty period.
- (3) The breakdown or problem in question occurred while the product was in use for an appropriate purpose under the conditions and environment of use specified in the instruction manual and catalog.
- (4) The breakdown of problem in question was caused by a specification defect or problem, or by a quality issue with our product.

Note that breakdowns due to any of the following reasons are excluded from the scope of warranty:

- [1] Anything other than our product
- [2] Modification or repair performed by a party other than us (unless we have approved such modification or repair)
- [3] Anything that could not be easily predicted with the level of science and technology available at the time of shipment from our company
- [4] A natural disaster, man-made disaster, incident or accident for which we are not liable
- [5] Natural fading of paint or other symptoms of aging
- [6] Wear, depletion or other expected result of use
- [7] Operation noise, vibration or other subjective sensation not affecting function or maintenance

Note that the warranty only covers our product as delivered and that any secondary loss arising from a breakdown of our product is excluded from the scope of warranty.

### 8.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.

## 8.4 Limited Liability

- (1) We shall assume no liability for any special damage, consequential loss or passive loss such as a loss of expected profit arising from or in connection with our product.
- (2) We shall not be liable for any program or control method created by the customer to operate our product or for the result of such program or control method.

## 8.5 Conditions of Conformance with Applicable Standards/Regulations, Etc., and Applications

- (1) If our product is combined with another product or any system, device, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules. The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc. In such a case we will not be liable for the conformance of our product with the applicable standards, etc.
- (2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact us if you must use our product for any of these applications:
  - 1) Medical equipment used to maintain, control or otherwise affect human life or physical health.
  - 2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility)
  - 3) Important safety parts of machinery (Safety device, etc.)
  - 4) Equipment used to handle cultural assets, art or other irreplaceable items
- (3) Contact us at the earliest opportunity if our product is to be used in any condition or environment that differs from what is specified in the catalog or instruction manual.

## 8.6 Other Items Excluded from Warranty

The price of the product delivered to you does not include expenses associated with programming, the dispatch of engineers, etc. Accordingly, a separate fee will be charged in the following cases even during the warranty period:

- [1] Guidance for installation/adjustment and witnessing of test operation
- [2] Maintenance and inspection
- [3] Technical guidance and education on operating/wiring methods, etc.
- [4] Technical guidance and education on programming and other items related to programs

## Change History

Revision Date	Description of Revision
May 2017	First edition
July 2017	Edition 1B <ul style="list-style-type: none"> <li>• Pg. 86            Added information for when CB-CFA3-MPA□□□(-RB) is 3m or less, or over 3m</li> <li>• Added 5.8 Changing the position of the grease fitting and fitting</li> </ul>
August 2017	Edition 1C <ul style="list-style-type: none"> <li>• Added RC logo in the header section</li> </ul>
December 2017	Edition 1D <ul style="list-style-type: none"> <li>• Pg. 85            Added "Do not purge with air."</li> <li>• Pg. 107, 108    Changed motor unit length for specification with brake</li> <li>• Pg. 110           Changed motor unit length for specification without brake</li> </ul>
July 2018	Edition 1E <ul style="list-style-type: none"> <li>• Added description for RCON</li> </ul>







## ***IAI Corporation***

Head Office: 577-1 Obane Shimizu-ku Shizuoka City Shizuoka 424-0103, Japan  
TEL +81-54-364-5105 FAX +81-54-364-2589  
website: [www.iai-robot.co.jp/](http://www.iai-robot.co.jp/)

Technical Support available in USA, Europe and China

## ***IAI America, Inc.***

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

## ***IAI Industrieroboter GmbH***

Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany  
TEL 06196-88950 FAX 06196-889524

## ***IAI (Shanghai) Co., Ltd.***

SHANGHAI JIAHUA BUSINESS CENTER A8-303, 808, Hongqiao Rd. Shanghai 200030, China  
TEL 021-6448-4753 FAX 021-6448-3992  
website: [www.iai-robot.com](http://www.iai-robot.com)

## ***IAI Robot (Thailand) Co., Ltd.***

825, PhairojKijja Tower 7th Floor, Bangna-Trad RD., Bangna, Bangkok 10260, Thailand  
TEL +66-2-361-4458 FAX +66-2-361-4456