ROBO CYLINDER

ROBO Cylinder
Radial Cylinder
RCP5 Actuator
Rod Type
Instruction Manual

Ninth Edition

Standard Type Motor Straight Type:	RCP5-RA4C, RA6C, RA7C, RA8C, RA10C
Standard Type Motor Reversing Type:	RCP5-RA4R, RA6R, RA7R, RA8R, RA10R
Dustproof/Splash Proof Type Motor Straight Type:	RCP5W-RA6C, RA7C RA8C, RA10C

IAI America, Inc.

ROBO CYLINDER

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.
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- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Table of Contents

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 1before 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	● 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. 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.) ● Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product. ● Do not use it in any of the following environments. 1) Location where there is any inflammable gas, inflammable object or explosive 2) Place with potential exposure to radiation 3) Location with the ambient temperature or relative humidity exceeding the specification range 4) Location where radiant heat is added from direct sunlight or other large heat source 5) Location where condensation occurs due to abrupt temperature changes 6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid) 7) Location exposed to significant amount of dust, salt or iron powder 8) Location subject to direct vibration or impact ● 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.

No.	Operation Description	Description
	Transportation	● When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane. ● 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. ● 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. ● 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. ● Do not step or sit on the package. ● Do not put any heavy thing that can deform the package, on it. ● When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work. ● When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit. ● Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength. ● Do not get on the load that is hung on a crane. ● Do not leave a load hung up with a crane. ● Do not stand under the load that is hung up with a crane.
3	Storage and Preservation	● The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation. ● Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.
4	Installation and Start	(1) Installation of Robot Main Body and Controller, etc. ● 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. ● 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. ● When using the product in any of the places specified below, provide a sufficient shield. 1) Location where electric noise is generated 2) Location where high electrical or magnetic field is present 3) Location with the mains or power lines passing nearby 4) Location where the product may come in contact with water, oil or chemical droplets

No.	Operation Description	Description
4	Installation and Start	(2) Cable Wiring ● Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. ● 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. ● Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. ● 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. ● 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. ● 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.
		(3) Grounding ● 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. ● 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^2 (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). ● Perform Class D Grounding (former Class 3 Grounding with ground resistance 100Ω or below).

No.	Operation Description	Description
4	Installation and Start	(4) Safety Measures ● 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. ● 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. ● Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation. ● 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. ● 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. ● 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. ● Take the measure so that the work part is not dropped in power failure or emergency stop. ● Wear protection gloves, goggle or safety shoes, as necessary, to secure safety. ● 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. ● 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.
5	Teaching	● 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. ● 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. ● 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. ● 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. ● Place a sign "Under Operation" at the position easy to see. ● 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. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.

No.	Operation Description	Description
6	Trial Operation	● 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. ● After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation. ● 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. ● 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. ● 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.
7	Automatic Operation	● Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence. ● Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication. ● Make sure to operate automatic operation start from outside of the safety protection fence. ● 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. ● 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.

No.	Operation Description	Description
8	Maintenance and Inspection	● 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. ● 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. ● When the work is to be performed inside the safety protection fence, basically turn OFF the power switch. ● 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. ● 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. ● Place a sign “Under Operation” at the position easy to see. ● For the grease for the guide or ball screw, use appropriate grease according to the instruction manual for each model. ● Do not perform the dielectric strength test. Failure to do so may result in a damage to the product. ● 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. ● 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. ● 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. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.
9	Modification and Dismantle	● Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.
10	Disposal	● When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste. ● When removing the actuator for disposal, pay attention to drop of components when detaching screws. ● Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.
11	Other	● 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. ● See Overseas Specifications Compliance Manual to check whether complies if necessary. ● For the handling of actuators and controllers, follow the dedicated instruction manual of each unit to ensure the safety.

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.	 Danger
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	 Warning
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.	 Caution
Notice	This indicates lower possibility for the injury, but should be kept to use this product properly.	 Notice

Caution in Handling

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. Set the allowable load of the move on rod tip within the allowable range.
   An operation with the load beyond the allowable load of the move on rod tip may cause an abnormal noise, vibration, malfunction or shortened life. If it is extreme, flaking may occur on the guide.

6. Set the load offset distance within the allowable range.
   Attaching a load with an load offset distance above the allowable range may cause vibration and abnormal noise.

7. If back and forth operations are performed repeatedly in short distance, it may wear out the film of grease.
   Continuous back and forth operation within a distance less than 30 mm may cause wear of grease. 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.

8. Do not attempt to hit the rod against an abstacle with high speed.
   It may destroy the coupling.

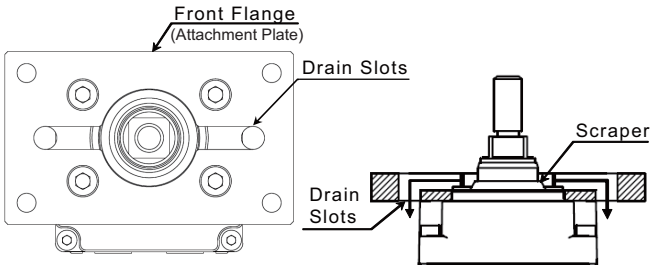
9. Make sure to attach the actuator properly by following this instruction manual.
   Using the product with the actuator not being certainly retained or affixed may cause abnormal noise, vibration, malfunction or shorten the product life.

10. The position will slightly move only in the first time of turning the servo on after the power is supplied.
    In the first time to turn the servo on after the power is supplied only, position adjustment operation will be conducted due to the characteristics of the stepper motor. For this reason, the position will slightly move. The maximum amount of move is 0.025 × lead length [mm].
    Pay attention not to have peripheral equipment interfere.

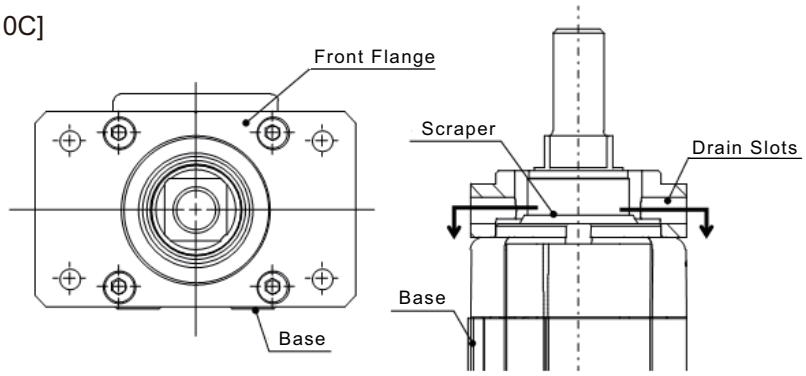
11. Dustproof/splash proof type RCP5W actuator do not apply any liquid with temperature lower than the ambient temperature of the actuator installation.
    It may cause condensation inside the product, which may lead to malfunction.

12. Dustproof/splash proof type RCP5W actuator when installing the unit by mounting on the front bracket with the rod orienting upwards, have drain slots to avoid liquid from remaining around the scraper area.
    On the optional front flange, there are drain slots. Be careful not to block the slots with an attached component.

    [RA6C, RA7C]



    [RA8C, RA10C]



13. Dustproof/splash proof type RCP5W actuator is grease flows out gradually from the tip of the rod.
    For the purpose of maintaining scraper lubrication, the grease flows out gradually.
    Have a protection to the peripheral in case the grease may be applied on it.

14. For PCON-CA and MSEP Controllers (with option: T), it is available to switch over the setting between effective and ineffective of the high output setting in the parameter setting.
    (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]
    The performance of weight capacity at each velocity and acceleration/deceleration setting differs between the high output setting being effective and ineffective. Refer to the applicable performance specification when the high output setting is effective or ineffective in 1.2 Specifications.

Controller	Parameter	Remarks
PCON-CA	No.152 High Output Setting [0: Ineffective, 1: Effective]	
MSEP	No.28 High Output Setting [0: Ineffective, 1: Effective]	Option T: In high output setting, available to have high output setting effective.

International Standards Compliances

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

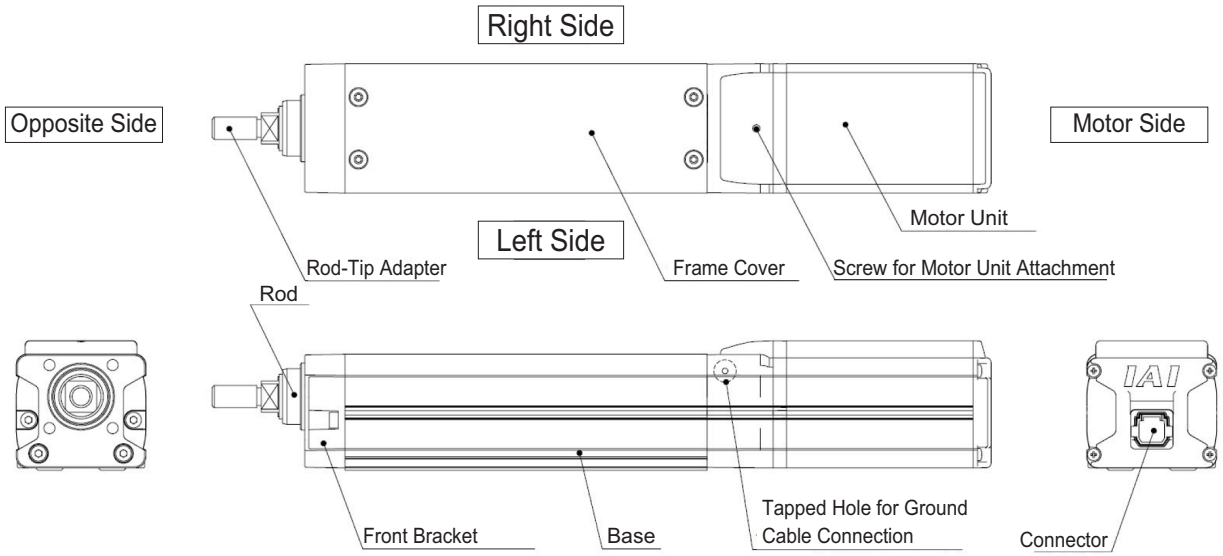
RoHS Directive	CE Marking
○	○

Names of the Parts

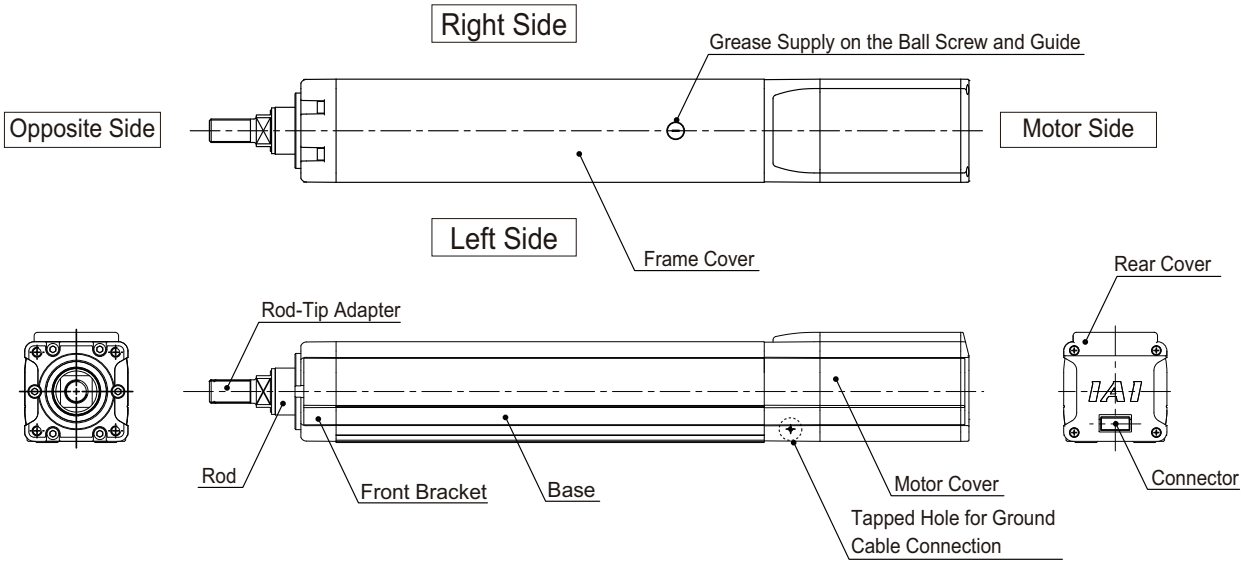
In this Instruction Manual, the left and right sides are indicated by looking at the actuator from the motor end, with the actuator placed horizontally, as shown in the figure below.

1. Standard Type Motor Straight Type RCP5

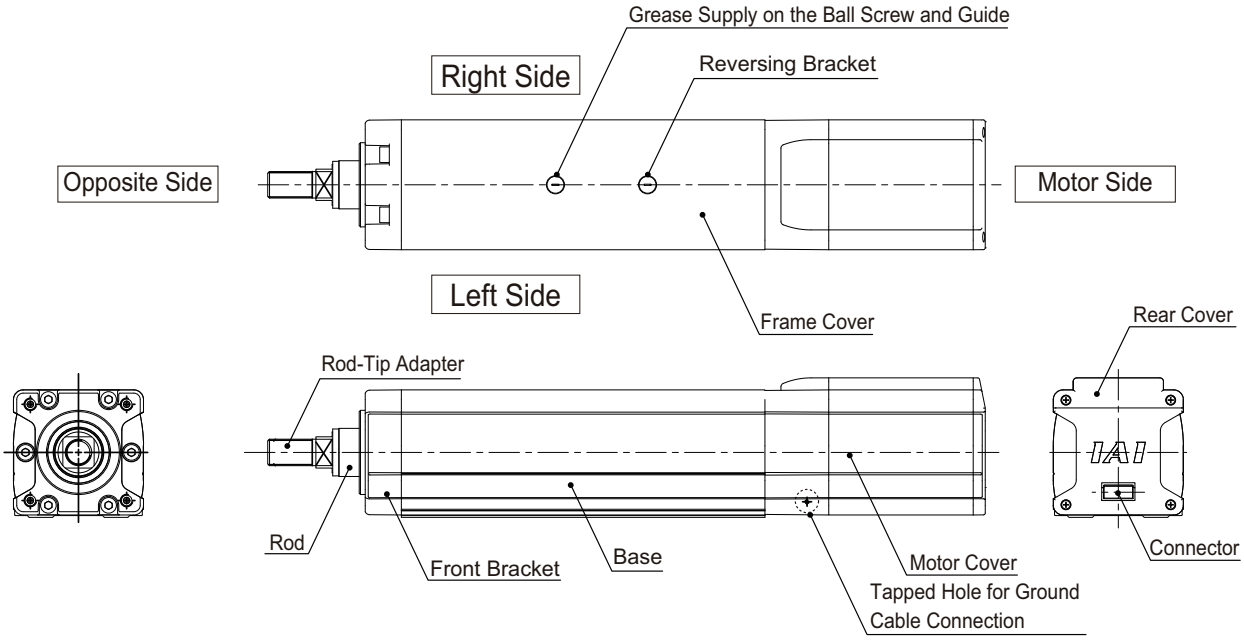
1.1 RA4C, 6C and 7C



1.2 RA8C

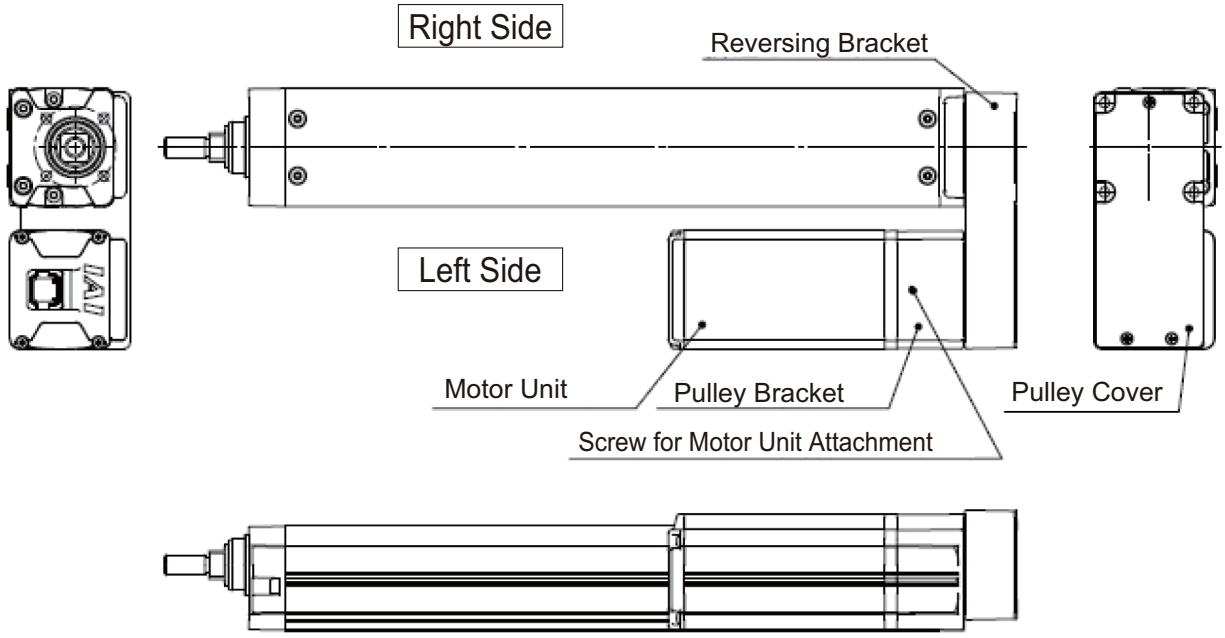


1.3 RA10C



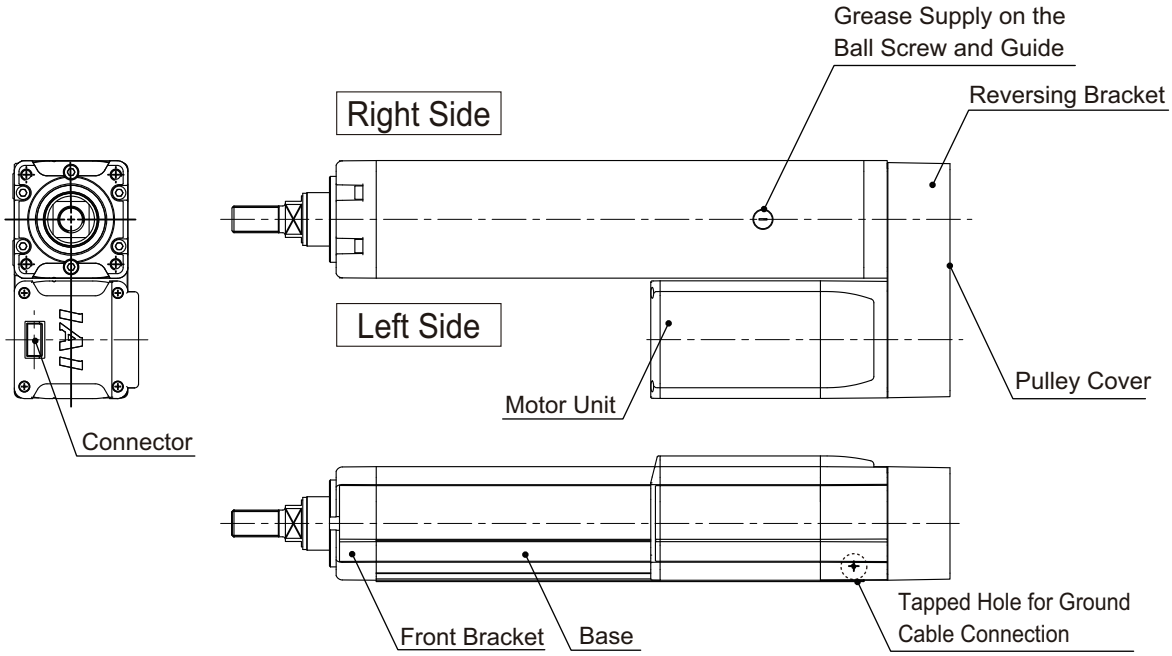
2. Standard Type Motor Reversing Type RCP5

2.1 RA4R, RA6R, RA7R

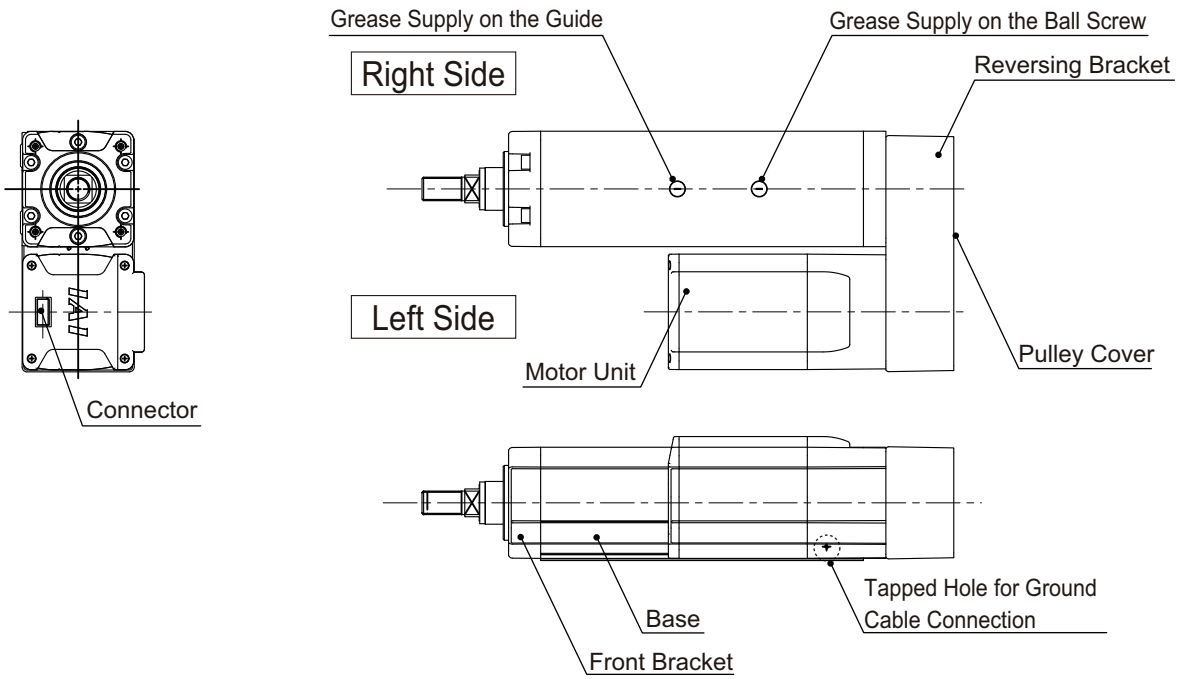


The direction of the motor is either left reversed: ML (shown in figure above, standard) or right reversed: MR (option).

2.2 RA8R

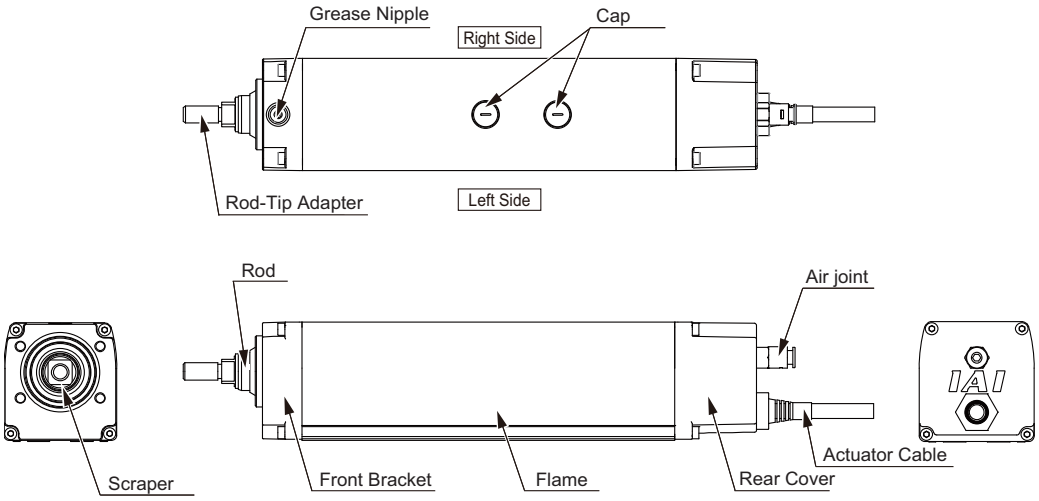


2.3 RA10R

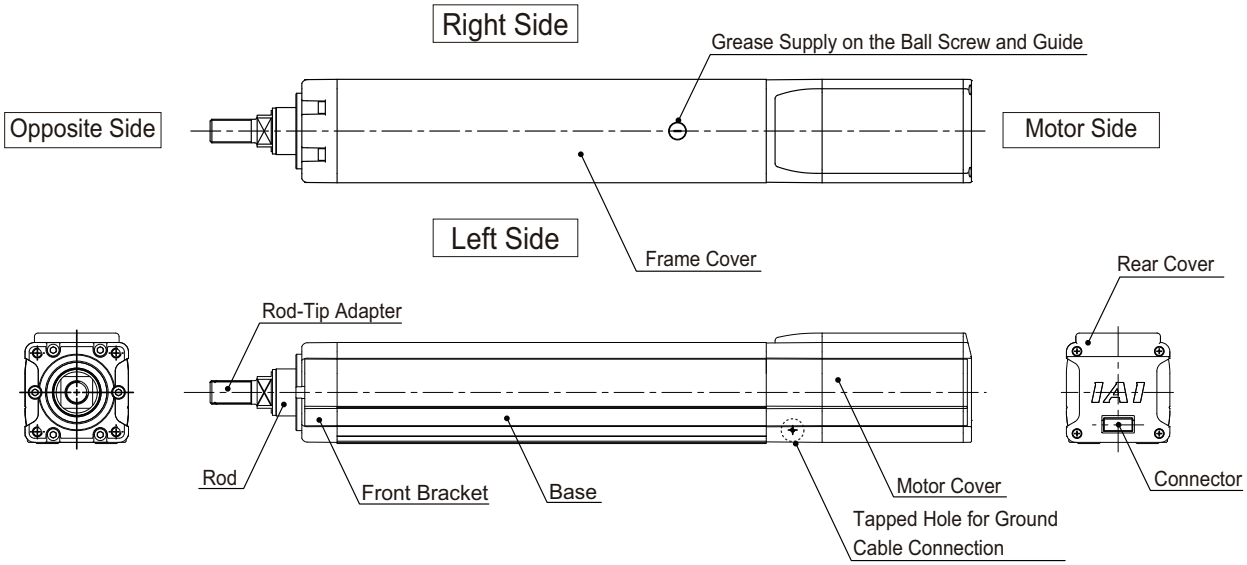


3. Dustproof/Splash Proof Type Motor Straight Type RCP5W

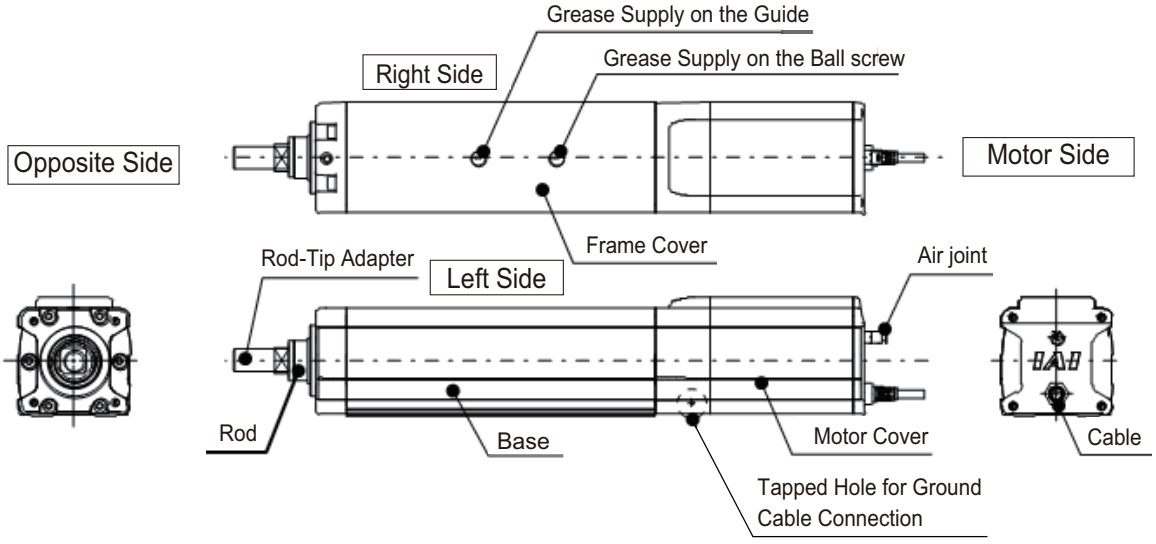
3.1 RA6C, RA7C



3.2 RA8C



3.3 RA10C



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	
Accessories				
2	Motor • Encoder Cables (Note1)		1	
3	Nut		1	Refer to list below
4	Caution and Warning Labels Seal		1 set	Dustproof/Splash Proof Type RCP5W-RA8C, RA10C
5	First Step Guide		1	
6	Instruction Manual (DVD)		1	
7	Safety Guide		1	

Note1 The motor • encoder cables supplied vary depending on the controller used.
[Refer to 1.4, “Motor • Encoder Cables.”]

[List of Included Nut Type]

Model No.	Nut (M10×1.25)	Nut (M14×1.5)	Nut (M20×1.5)	Nut (M22×1.5)
RA4C, RA4R RA6C, RA6R	1			
RA7C, RA7R		1		
RA8C, RA8R			1	
RA10C, RA10R				1

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

The square nut will be enclosed for RCP5W-RA6C and RA7C.

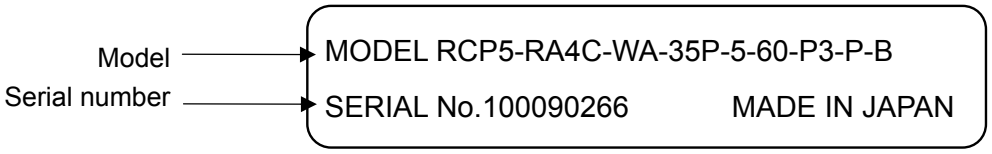
	Square Nut (7×7 M4)	Square Nut (8×8 M5)
RCP5W-RA6C	4	
RCP5W-RA7C		4

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-CA/CFA Controller	ME0289
2	Instruction Manual for MSEP Controller	ME0299
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 Touch Panel Teaching Pendant CON-PTA/PDA/PGA	ME0295
6	Instruction Manual for Touch Panel Teaching Pendant TB-01/01D/01DR Applicable for Position Controller	ME0324

1.1.3 How to Read the Model Nameplate



1.1.4 How to Read the Model Number

RCP5 − RA4C − WA − 35P − 5 − 60 − P3 − P − B − **

<Series name>
Standard type
RCP5
Dustproof/Splash proof type
RCP5W

<Type>
Motor straight type
RA4C
RA6C
RA7C
RA8C
RA10C
Motor reversing type
RA4R
RA6R
RA7R
RA8R
RA10R

<Encoder type>
WA : Battery-less absolute

<Motor type>
35P : 35□size
42P : 42□size
42SP : 42□size
56P : 56□size
56SP : 56□size
60P : 60□size
80P : 80□size

<Lead>
RA4C, RA4R
2.5/5/10/16
RA6C, RA6R (Note 1)
3/6/12/20
RA7C, RA7R (Note 1)
4/8/16/24
RA8C, 8R
5/10/20
RA10C, 10R
2.5/5/10

Identification for IAI use only (Note1)

<Options>
B : Brake
NM : Reversed-home specification
FFA : Tip adapter (Flange)
NFA : Tip adapter (Internal Thread)
KFA : Tip adapter (Keyway)
FL : Flange bracket
FT : Foot bracket
ML : Motor left reversed (Standard)
MR : Motor right reversed
CJT : Cable exit direction changed (Top)
CJR : Cable exit direction changed (Right)
CJL : Cable exit direction changed (Left)
CJO : Cable exit direction changed (Outward)
CJB : Cable exit direction changed (Bottom)
AT : Cable exit direction (Top)
A3 : Cable exit direction (Right)
A1 : Cable exit direction (Left)

<Cable length>
N : None
P : 1m
S : 3m
M : 5m
X□□ : Length specification
R□□ : Robot cable

<Controller>
P3 : PCON-CA
MSEP
MSEL
MCON
P4 : PCON-CFA

<Stroke>
[Refer to 1.2 Specifications]

*1 Identification for IAI use only: It may be displayed for IAI use. It is not a code to show the model type.
Note 1 There is no RCP5W-RA6C Lead 20 and RCP5W-RA7C Lead 24.
(Note) The motor types RCP5W-RA6C 42SP and RCP5W-RA7C 56SP are equipped with a brake in standard. There is no option without brake.

1.2 Specifications

1.2.1 Speed

[1] Motor Straight Type

◎Standard Type
[When high-output setting is effective]

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]									
					60	110	160	210	260	310	360	410	-	-
RCP5-RA4C	35P	2.5	Horizontal	3.125	175							170	-	-
			Vertical	3.125	175							170	-	-
		5	Horizontal	6.25	350							340	-	-
			Vertical	6.25	350							340	-	-
		10	Horizontal	12.5	700							685	-	-
			Vertical	12.5	700							685	-	-
		16	Horizontal	20	1120							1080	-	-
			Vertical	20	1120							1080	-	-
					65	115	165	215	265	315	365	415	-	-
RCP5-RA6C	42P	3	Horizontal	3.75	225							220	-	-
			Vertical	3.75	225							220	-	-
		6	Horizontal	7.5	450								-	-
			Vertical	7.5	450								-	-
		12	Horizontal	15	700								-	-
			Vertical	15	700								-	-
		20	Horizontal	25	800								-	-
			Vertical	25	800								-	-
					70	120	170	220	270	320	370	420	470	520
RCP5-RA7C	56P	4	Horizontal	5	210									
			Vertical	5	210									
		8	Horizontal	10	420									
			Vertical	10	420									
		16	Horizontal	20	700									
			Vertical	20	560									
		24	Horizontal	30	800									
			Vertical	30	600									

◎Standard Type
[When high-output setting is ineffective]

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]									
					60	110	160	210	260	310	360	410	-	-
RCP5-RA4C	35P	2.5	Horizontal	3.125	175								-	-
			Vertical	3.125	175								-	-
		5	Horizontal	6.25	350								-	-
			Vertical	6.25	350								-	-
		10	Horizontal	12.5	700								-	-
			Vertical	12.5	700								-	-
		16	Horizontal	20	840								-	-
			Vertical	20	840								-	-
					65	115	165	215	265	315	365	415	-	-
RCP5-RA6C	42P	3	Horizontal	3.75	125								-	-
			Vertical	3.75	125								-	-
		6	Horizontal	7.5	250								-	-
			Vertical	7.5	250								-	-
		12	Horizontal	15	500								-	-
			Vertical	15	500								-	-
		20	Horizontal	25	640								-	-
			Vertical	25	640								-	-
					70	120	170	220	270	320	370	420	470	520
RCP5-RA7C	56P	4	Horizontal	5	140									
			Vertical	5	140									
		8	Horizontal	10	210									
			Vertical	10	210									
		16	Horizontal	20	420									
			Vertical	20	420									
		24	Horizontal	30	600									
			Vertical	30	400									

◎ Dustproof/Splash Proof Type

[When high-output setting is effective]
The ambient temperature range over 5°C is different from that an operating ambient temperature range 5°C or less.

(Operation Ambient Temperature Range：5°C to 40°C or less)

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Max. Speed									
					Stroke [mm]									
					50	100	150	200	250	300	350	400	450	500
RCP5W-RA6C	42P	3	Horizontal	3.75	180								-	
			Vertical	3.75	180								-	
		6	Horizontal	7.5	360								-	
			Vertical	7.5	360								-	
		12	Horizontal	15	500	560							-	
			Vertical	15	500								-	
	42SP	3	Vertical	3.75	70								-	
RCP5W-RA7C	56P	4	Horizontal	5	170									
			Vertical	5	140									
		8	Horizontal	10	340									
			Vertical	10	280									
		16	Horizontal	20	500	560								
			Vertical	20	400									
	56SP	4	Vertical	5	80									

(Operation Ambient Temperature Range：0 to 5°C or less)

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Max. Speed									
					Stroke [mm]									
					50	100	150	200	250	300	350	400	450	500
RCP5W-RA6C	42P	3	Horizontal	3.75	150								-	
			Vertical	3.75	150								-	
		6	Horizontal	7.5	300								-	
			Vertical	7.5	300								-	
		12	Horizontal	15	450								-	
			Vertical	15	400								-	
	42SP	3	Vertical	3.75	70								-	
RCP5W-RA7C	56P	4	Horizontal	5	150									
			Vertical	5	125									
		8	Horizontal	10	300									
			Vertical	10	250									
		16	Horizontal	20	450									
			Vertical	20	300									
	56SP	4	Vertical	5	80									

[When high-output setting is ineffective]
(Note) There is no high-output setting in RA7C-56SP to operate with PCON-CFA Controller.

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Max. Speed									
					Stroke [mm]									
					50	100	150	200	250	300	350	400	450	500
RCP5W-RA6C	42P	3	Horizontal	3.75	125								–	
			Vertical	3.75	125								–	
		6	Horizontal	7.5	250								–	
			Vertical	7.5	250								–	
		12	Horizontal	15	500								–	
			Vertical	15	400								–	
	42SP	3	Vertical	3.75	60								–	
RCP5W-RA7C	56P	4	Horizontal	5	140									
			Vertical	5	110									
		8	Horizontal	10	210									
			Vertical	10	210									
		16	Horizontal	20	420									
			Vertical	20	350									

In RA8C and RA10C, there is nothing related to high-output setting. There is no parameter setting.

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]															
					50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
RCP5-RA8C	60P	5	Horizontal	6.25	150							130	110	90	80	70	60	55	-	-
			Vertical	6.25	150							130	110	90	80	70	60	55	-	-
		10	Horizontal	12.5	280	300						260	220	180	160	140	120	110	-	-
			Vertical	12.5	250								220	180	160	140	120	110	-	-
		20	Horizontal	25	280	405	505	585	600			520	440	360	320	280	240	220	-	-
			Vertical	25	280	405	450						440	360	320	280	240	220	-	-
RCP5-RA10C	86P	2.5	Horizontal	3.125	63										55	50	45	40	35	30
			Vertical	3.125	63										55	50	45	40	35	30
		5	Horizontal	6.25	83	125							110	90	80	70	60	55	50	45
			Vertical	6.25	83	125							110	90	80	70	60	55	50	45
		10	Horizontal	12.5	117	167	200	250							220	200	180	160	140	120
			Vertical	12.5	117	167												160	140	120

◎ Dustproof/Splash Proof Type

(Note) RCP5W-RA8C is the top speed for operation an ambient temperature range over 5°C is different from that an operating ambient temperature range 5°C or less.

Operation Ambient Temperature Range：Over 5 to 40°C

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]															
					50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
RCP5W-RA8C	60P	5	Horizontal	6.25	120								100	90	80	70	60	55	—	—
			Vertical	6.25	100									90	80	70	60	55	—	—
		10	Horizontal	12.5	240								220	180	160	140	120	110	—	—
			Vertical	12.5	200									180	160	140	120	110	—	—
		20	Horizontal	25	280	405	480						440	360	320	280	240	220	—	—
			Vertical	25	280	360									320	280	240	220	—	—

Operation Ambient Temperature Range：0 to 5°C or less

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]															
					50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
RCP5W-RA8C	60P	5	Horizontal	6.25	100									90	80	70	60	55	—	—
			Vertical	6.25	75											70	60	55	—	—
		10	Horizontal	12.5	210									180	160	140	120	110	—	—
			Vertical	12.5	175										160	140	120	110	—	—
		20	Horizontal	25	280	405	480						440	360	320	280	240	220	—	—
			Vertical	25	280	360									320	280	240	220	—	—

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]															
					50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
RCP5W-RA10C	86P	2.5	Horizontal	3.125	50												45	40	35	30
			Vertical	3.125	50												45	40	35	30
		5	Horizontal	6.25	83	100								90	80	70	60	55	50	45
			Vertical	6.25	83	100								90	80	70	60	55	50	45
		10	Horizontal	12.5	117	167	200										180	160	140	120
			Vertical	12.5	117	130														120

[2] Motor Reversing Type

[When high-output setting is effective]

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]									
					60	110	160	210	260	310	360	410	-	-
RCP5-RA4R	35P	2.5	Horizontal	3.125	175							170	-	-
			Vertical	3.125	175							170	-	-
		5	Horizontal	6.25	350							340	-	-
			Vertical	6.25	350							340	-	-
		10	Horizontal	12.5	610								-	-
			Vertical	12.5	610								-	-
		16	Horizontal	20	840								-	-
			Vertical	20	840								-	-
					65	115	165	215	265	315	365	415	-	-
RCP5-RA6R	42P	3	Horizontal	3.75	225							220	-	-
			Vertical	3.75	225							220	-	-
		6	Horizontal	7.5	450								-	-
			Vertical	7.5	450								-	-
		12	Horizontal	15	700								-	-
			Vertical	15	700								-	-
		20	Horizontal	25	800								-	-
			Vertical	25	800								-	-
					70	120	170	220	270	320	370	420	470	520
RCP5-RA7R	56P	4	Horizontal	5	175									
			Vertical	5	175									
		8	Horizontal	10	420									
			Vertical	10	350									
		16	Horizontal	20	560									
			Vertical	20	560									
		24	Horizontal	30	800									
			Vertical	30	600									

[When high-output setting is ineffective]

Speed limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]									
					60	110	160	210	260	310	360	410	-	-
RCP5-RA4R	35P	2.5	Horizontal	3.125	130								-	-
			Vertical	3.125	130								-	-
		5	Horizontal	6.25	260								-	-
			Vertical	6.25	260								-	-
		10	Horizontal	12.5	525								-	-
			Vertical	12.5	525								-	-
		16	Horizontal	20	560								-	-
			Vertical	20	560								-	-
					65	115	165	215	265	315	365	415	-	-
RCP5-RA6R	42P	3	Horizontal	3.75	125								-	-
			Vertical	3.75	125								-	-
		6	Horizontal	7.5	250								-	-
			Vertical	7.5	250								-	-
		12	Horizontal	15	500								-	-
			Vertical	15	500								-	-
		20	Horizontal	25	640								-	-
			Vertical	25	640								-	-
					70	120	170	220	270	320	370	420	470	520
RCP5-RA7R	56P	4	Horizontal	5	140									
			Vertical	5	140									
		8	Horizontal	10	210									
			Vertical	10	210									
		16	Horizontal	20	420									
			Vertical	20	420									
		24	Horizontal	30	600									
			Vertical	30	400									

In RA8R and RA10R, there is nothing related to high-output setting. There is no parameter setting.

◎ Standard Type

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Min. Speed	Stroke [mm]														
					50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
RCP5-RA8C	60P	5	Horizontal	6.25	100									90	80	70	60	55	-	-
			Vertical	6.25	100									90	80	70	60	55	-	-
		10	Horizontal	12.5	200									180	160	140	120	110	-	-
			Vertical	12.5	200									180	160	140	120	110	-	-
		20	Horizontal	25	280	400								360	320	280	240	220	-	-
			Vertical	25	280	400								360	320	280	240	220	-	-
RCP5-RA10C	86P	2.5	Horizontal	3.125	50												45	40	35	30
			Vertical	3.125	50												45	40	35	30
		5	Horizontal	6.25	83	100								90	80	70	60	55	50	45
			Vertical	6.25	83	100								90	80	70	60	55	50	45
		10	Horizontal	12.5	117	167	200										180	160	140	120
			Vertical	12.5	117	140														120

⚠ Caution: When a speed less than the min. speed, operation will not made in the set speed. Do not attempt to set a speed less than the min. speed. Figure out the minimum speed using the following formula.

Min. Speed [mm/s] = Lead Length [mm] / Number of Encoder Pulse / 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.

[1] Motor Straight Type

◎ Standard Type
[When high–output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-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	35	30
				85	40	40	40	35	30
				105	40	40	35	35	30
				130	40	40	35	30	30
				150	40	35	35	30	30
				175	40	35	35	30	25
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	10	10	-	-
				130	10	10	9	-	-
				150	10	9	8	-	-
				175	9	8	7	-	-
		5	Horizontal	0	28	25	22	20	20
				40	28	25	22	20	20
				85	28	25	22	20	20
				130	28	25	22	20	20
				175	28	25	22	20	20
				215	28	25	22	20	20
				260	28	25	22	20	18
				305	28	22	20	18	16
				350	28	20	16	14	12
			Vertical	0	5	5	5	-	-
				40	5	5	5	-	-
				85	5	5	5	-	-
				130	5	5	5	-	-
				175	5	5	5	-	-
				215	5	5	5	-	-
				260	5	5	5	-	-
				305	5	5	4.5	-	-
				350	5	4	3.5	-	-

◎ Standard Type
[When high–output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA4C	35P	10	Horizontal	0	15	15	13	13	12
				85	15	15	13	13	12
				175	15	15	13	13	12
				260	15	15	13	13	12
				350	15	15	13	13	10
				435	15	15	13	11	9
				525	14	14	10	8	7
				610	-	9	7	5	4
				700	-	6	5	3	2
			Vertical	0	2.5	2.5	2.5	-	-
				85	2.5	2.5	2.5	-	-
				175	2.5	2.5	2.5	-	-
				260	2.5	2.5	2.5	-	-
				350	2.5	2.5	2.5	-	-
				435	2.5	2.5	2.5	-	-
				525	2.5	2.5	2.5	-	-
				610	-	2.5	2.5	-	-
				700	-	2	2	-	-
		16	Horizontal	0	6	6	6	5	3.5
				140	6	6	6	5	3.5
				280	6	6	6	5	3.5
				420	6	6	6	5	3.5
				560	-	6	6	5	3.5
				700	-	5.5	5	4	2.5
				840	-	4.5	3.5	3	2
				980	-	-	2.5	2	1.5
				1120			2	1.5	1
			Vertical	0	1.5	1.5	1.5	-	-
				140	1.5	1.5	1.5	-	-
				280	1.5	1.5	1.5	-	-
				420	1	1	1	-	-
				560	1	1	1	-	-
				700	-	1	1	-	-
				840	-	1	1	-	-
				980	-	1	1	-	-
				1120	-	-	0.75	-	-

◎ Standard Type
[When high–output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA6C	42P	3	Horizontal	0	60	60	50	45	40
				25	60	60	50	45	40
				50	60	60	50	45	40
				75	60	60	50	45	40
				100	60	60	50	45	40
				125	60	60	50	40	30
				150	60	50	40	30	25
				175	60	40	35	25	20
				200	60	35	30	20	14
				225	40	16	16	10	6
			Vertical	0	20	20	20	-	-
				25	20	20	20	-	-
				50	20	20	20	-	-
				75	20	20	20	-	-
				100	20	20	20	-	-
				125	18	14	10	-	-
				150	14	10	6	-	-
				175	12	6	5	-	-
				200	8	5	4.5	-	-
				225	5	5	4	-	-
		6	Horizontal	0	40	40	35	30	25
				50	40	40	35	30	25
				100	40	40	35	30	25
				150	40	40	35	25	25
				200	40	40	30	25	20
				250	40	40	27.5	22.5	18
				300	40	35	25	20	14
				350	40	30	14	12	10
				400	30	18	10	6	5
				450	25	8	3	-	-
			Vertical	0	10	10	10	-	-
				50	10	10	10	-	-
				100	10	10	10	-	-
				150	10	10	10	-	-
				200	10	10	10	-	-
				250	10	9	8	-	-
				300	6	6	6	-	-
				350	5	5	5	-	-
				400	4	3	3	-	-
				450	2	2	1	-	-

◎ Standard Type
[When high–output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA6C	42P	12	Horizontal	0	25	25	18	16	12
				100	25	25	18	16	12
				200	25	25	18	16	10
				300	25	25	18	12	8
				400	20	20	14	10	6
				500	15	15	8	6	4
				600	10	10	6	3	2
				700	-	6	2	-	-
			Vertical	0	4	4	4	-	-
				100	4	4	4	-	-
				200	4	4	4	-	-
				300	4	4	4	-	-
				400	4	4	4	-	-
				500	4	3.5	3	-	-
				600	4	3	2	-	-
				700	-	2	1	-	-
		20	Horizontal	0	6	6	6	5	5
				160	6	6	6	5	5
				320	6	6	6	5	3
				480	6	6	6	5	3
				640	-	6	4	3	2
				800	-	4	3	-	-
			Vertical	0	1.5	1.5	1.5	-	-
				160	1.5	1.5	1.5	-	-
				320	1.5	1.5	1.5	-	-
				480	1.5	1.5	1.5	-	-
				640	-	1.5	1.5	-	-
				800	-	1	1	-	-

◎ Standard Type
[When high–output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-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	80	50	30	20	15
				175	50	15	-	-	-
				210	20	-	-	-	-
			Vertical	0	28	28	28	-	-
				35	28	28	28	-	-
				70	28	28	28	-	-
				105	22	20	18	-	-
				140	16	12	10	-	-
				175	9	4	-	-	-
				210	2	-	-	-	-
		8	Horizontal	0	60	60	50	45	40
				70	60	60	50	45	40
				140	60	60	50	45	40
				210	60	60	40	31	26
				280	60	34	22	15	11
				350	60	14	5	1	-
				420	15	1	-	-	-
			Vertical	0	18	18	18	-	-
				70	18	18	18	-	-
				140	16	16	12	-	-
				210	10	10	9	-	-
				280	8	7	6	-	-
				350	3	3	2	-	-
				420	2	-	-	-	-
		16	Horizontal	0	50	50	40	35	30
				140	50	50	40	35	30
				280	50	50	35	25	20
				420	50	25	18	14	10
				560	12	10	5	3	2
				700	3	2	-	-	-
			Vertical	0	8	8	8	-	-
				140	8	8	8	-	-
				280	8	7	7	-	-
				420	6	4.5	4	-	-
				560	4	2	1	-	-
				700	-	-	-	-	-
		24	Horizontal	0	20	20	18	15	12
				200	20	20	18	15	12
				400	20	20	18	15	10
				600	15	14	9	7	4
				800	-	5	1	1	-
			Vertical	0	3	3	3	-	-
				200	3	3	3	-	-
				400	3	3	3	-	-
				600	3	3	2	-	-
				800	-	-	-	-	-

◎ Standard Type
[When high–output setting for motor straight type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA4C	35P	2.5	Horizontal	0	36	36	36	32	30
				20	36	36	36	32	30
				40	36	36	36	32	30
				65	36	36	36	32	30
				85	36	36	36	32	30
				105	36	36	32	32	30
				130	36	32	32	30	30
				150	32	32	28	24	20
				175	28	18	16	12	12
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	10	10	-	-
				130	9	9	8	-	-
				150	5	5	5	-	-
				175	2	2	2	-	-
		5	Horizontal	0	28	25	22	20	20
				40	28	25	22	20	20
				85	28	25	22	20	20
				130	28	25	22	20	20
				175	28	25	22	20	20
				215	28	25	22	20	20
				260	28	20	17	16	15
				305	28	16	12	10	8.5
				350	17	11	7	6	4
			Vertical	0	5	5	5	-	-
				40	5	5	5	-	-
				85	5	5	5	-	-
				130	5	5	5	-	-
				175	5	5	5	-	-
				215	5	5	5	-	-
				260	4.5	4.5	4	-	-
				305	3	3	3	-	-
				350	2	2	2	-	-

◎ Standard Type
[When high–output setting for motor straight type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA4C	35P	10	Horizontal	0	15	15	13	12	12
				85	15	15	13	12	12
				175	15	15	13	12	12
				260	15	15	13	12	12
				350	15	15	13	12	10
				435	12	12	12	7	7
				525	11	8	8	4	4
				610	-	6	4	3	2
				700	-	3	2.5	1.5	1
			Vertical	0	2.5	2.5	2.5	-	-
				85	2.5	2.5	2.5	-	-
				175	2.5	2.5	2.5	-	-
				260	2.5	2.5	2.5	-	-
				350	2.5	2.5	2.5	-	-
				435	2.25	2.25	2.25	-	-
				525	2	2	2	-	-
				610	-	1	1	-	-
				700	-	0.5	0.5	-	-
		16	Horizontal	0	6	6	6	5	3.5
				140	6	6	6	5	3.5
				280	6	6	6	5	3.5
				420	6	6	6	5	3.5
				560	-	6	5.5	4.5	3.5
				700	-	5	4	3.5	2
				840	-	4	2.5	1.5	1
			Vertical	0	1.5	1.5	1.5	-	-
				140	1.5	1.5	1.5	-	-
				280	1.5	1.5	1.5	-	-
				420	1	1	1	-	-
				560	1	1	1	-	-
				700	-	1	1	-	-
				840	-	1	0.75	-	-

◎ Standard Type
[When high–output setting for motor straight type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.2G	0.3G	0.5G	0.7G
RCP5-RA6C	42P	3	Horizontal	0	-	40	-	-	-
				25	-	40	-	-	-
				50	-	40	-	-	-
				75	-	40	-	-	-
				100	-	40	-	-	-
				125	-	40	-	-	-
			Vertical	0	-	20	-	-	-
				25	-	20	-	-	-
				50	-	16	-	-	-
				75	-	12	-	-	-
				100	-	9	-	-	-
				125	-	5	-	-	-
		6	Horizontal	0	-	40	-	-	-
				50	-	40	-	-	-
				100	-	40	-	-	-
				150	-	40	-	-	-
				200	-	35	-	-	-
				250	-	10	-	-	-
			Vertical	0	-	10	-	-	-
				50	-	10	-	-	-
				100	-	10	-	-	-
				150	-	8	-	-	-
				200	-	5	-	-	-
				250	-	3	-	-	-
		12	Horizontal	0	-	25	-	-	-
				100	-	25	-	-	-
				200	-	25	-	-	-
				300	-	20	-	-	-
				400	-	10	-	-	-
				500	-	5	-	-	-
			Vertical	0	-	4	-	-	-
				100	-	4	-	-	-
				200	-	4	-	-	-
				300	-	3	-	-	-
				400	-	2	-	-	-
				500	-	1	-	-	-
		20	Horizontal	0	-	6	-	-	-
				160	-	6	-	-	-
				320	-	6	-	-	-
				480	-	4	-	-	-
				640	-	3	-	-	-
			Vertical	0	-	1.5	-	-	-
				160	-	1.5	-	-	-
				320	-	1.5	-	-	-
				480	-	1	-	-	-
				640	-	0.5	-	-	-

◎ Standard Type
[When high–output setting for motor straight type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.2G	0.3G	0.5G	0.7G
RCP5-RA7C	56P	4	Horizontal	0	-	55	-	-	-
				35	-	55	-	-	-
				70	-	55	-	-	-
				105	-	55	-	-	-
				140	-	35	-	-	-
			Vertical	0	-	26	-	-	-
				35	-	26	-	-	-
				70	-	15	-	-	-
				105	-	4	-	-	-
				140	-	2	-	-	-
		8	Horizontal	0	-	50	-	-	-
				70	-	50	-	-	-
				140	-	50	-	-	-
				210	-	30	-	-	-
			Vertical	0	-	17.5	-	-	-
				70	-	17.5	-	-	-
				140	-	7	-	-	-
				210	-	2	-	-	-
		16	Horizontal	0	-	40	-	-	-
				140	-	40	-	-	-
				280	-	30	-	-	-
				420	-	15	-	-	-
			Vertical	0	-	5	-	-	-
				140	-	5	-	-	-
				280	-	3	-	-	-
				420	-	1	-	-	-
		24	Horizontal	0	-	-	18	-	-
				200	-	-	18	-	-
				400	-	-	10	-	-
				600	-	-	1	-	-
			Vertical	0	-	3	-	-	-
				200	-	3	-	-	-
				400	-	2	-	-	-

◎ Standard Type
[Motor straight type]
In RA8C there is nothing related to high-thrust setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5-RA8C	60P	5	Horizontal	0	100	-
				90	100	-
				120	100	-
				130	90	-
				140	75	-
				150	60	-
			Vertical	0	70	-
				48	70	-
				60	50	-
				70	35	-
				80	25	-
				90	20	-
				100	15	-
				120	10	-
				150	2	-
		10	Horizontal	0	-	60
				150	-	60
				200	-	45
				240	-	40
				300	-	10
			Vertical	0	-	40
				88	-	40
				100	-	33
				110	-	28
				120	-	23
				130	-	18
				140	-	15
				150	-	11
				160	-	10
				170	-	8
				180	-	7
				190	-	5
				200	-	4
				220	-	3
				250	-	2

◎ Standard Type
[Motor straight type]
In RA8C there is nothing related to high-thrust setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5-RA8C	60P	20	Horizontal	0	-	30
				240	-	30
				270	-	30
				300	-	30
				360	-	24
				420	-	16
				450	-	12
				480	-	10
				510	-	8
				540	-	6
				600	-	5
			Vertical	0	-	5
				50	-	5
				100	-	5
				150	-	5
				180	-	5
				200	-	5
				240	-	5
				300	-	5
				360	-	5
				400	-	3
				420	-	2.5
				450	-	2

◎ Standard Type
[Motor straight type]
In RA10C there is nothing related to high-thrust setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]			
				Speed [mm/s]	0.01G	0.02G	0.04G
RCP5-RA10C	86P	2.5	Horizontal	0	300	-	-
				42	300	-	-
				63	300	-	-
			Vertical	0	150	-	-
				20	150	-	-
				30	100	-	-
				35	75	-	-
				37	65	-	-
				50	30	-	-
				55	20	-	-
				63	10	-	-
		5	Horizontal	0	-	150	-
				83	-	150	-
				125	-	150	-
			Vertical	0	-	100	-
				20	-	100	-
				26	-	90	-
				40	-	65	-
				45	-	55	-
				55	-	40	-
				58	-	37	-
				60	-	35	-
				65	-	29	-
				68	-	27	-
				70	-	25	-
				77	-	20	-
				90	-	13	-
				100	-	9	-
				105	-	7	-
				125	-	3	-
		10	Horizontal	0	-	-	80
				100	-	-	80
				175	-	-	80
				200	-	-	80
				225	-	-	38
				240	-	-	20
				250	-	-	15
			Vertical	0	-	-	80
				34	-	-	80
				37	-	-	69
				45	-	-	58
				53	-	-	50
				75	-	-	35
				105	-	-	20
				120	-	-	15
				140	-	-	10
				152	-	-	8
				167	-	-	6

◎ Dustproof/Splash Proof Type

(Note) RCP5W-RA6C and RA7C is the the load capacity an operating ambient temperature over 5°C is different from that an operating ambient temperature 5°C or less.

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

Operation Ambient Temperature Range：Over 5 to 40°C

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]				
				Speed [mm/s]	0.3G	0.5G	0.7G	1.0G
RCP5W-RA6C	42P	3	Horizontal	0	50	45	40	35
				25	50	45	40	35
				100	50	45	40	35
				125	50	45	34	29
				180	30	30	20	15
			Vertical	0	16	16	-	-
				25	16	16	-	-
				100	16	16	-	-
				140	10	10	-	-
				180	4	4	-	-
		6	Horizontal	0	40	35	25	20
				50	40	35	25	20
				150	40	35	25	20
				255	40	23.5	17.5	14
				360	25	12	10	8
			Vertical	0	8	8	-	-
				50	8	8	-	-
				150	8	8	-	-
				255	5	5	-	-
				360	2	2	-	-
		12	Horizontal	0	20	15	12	10
				100	20	15	12	10
				200	20	15	12	10
				350	20	15	8.25	7
				560	7	5	3	2
			Vertical	0	3	3	-	-
				100	3	3	-	-
				200	3	3	-	-
				350	3	3	-	-
				560	1	1	-	-
	42SP	3	Vertical	0	30	30	-	-
				35	30	30	-	-
				70	5	5	-	-

◎ Dustproof/Splash Proof Type
[When high–output setting for motor straight type is effective]

Operation Ambient Temperature Range：0 to 5°C or less

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]				
				Speed [mm/s]	0.3G	0.5G	0.7G	1.0G
RCP5W-RA6C	42P	3	Horizontal	0	50	45	40	35
				25	50	45	40	35
				100	50	45	40	35
				125	40	37.5	30	25
				150	30	30	20	15
			Vertical	0	16	16	-	-
				25	16	16	-	-
				100	16	16	-	-
				150	4	4	-	-
		6	Horizontal	0	40	35	25	20
				50	40	35	25	20
				150	40	35	25	20
				200	40	27.5	20	16
				300	25	12	10	8
			Vertical	0	8	8	-	-
				50	8	8	-	-
				150	8	8	-	-
				300	2	2	-	-
		12	Horizontal	0	20	15	12	10
				100	20	15	12	10
				200	20	15	12	10
				300	20	15	8.5	7
				450	7	5	3	2
			Vertical	0	3	3	-	-
				100	3	3	-	-
				200	3	3	-	-
				300	3	3	-	-
				400	1	1	-	-
	42SP	3	Vertical	0	30	30	-	-
				35	30	30	-	-
				70	5	5	-	-

◎ Dustproof/Splash Proof Type
[When high–output setting for motor straight type is effective]

Operation Ambient Temperature Range：Over 5 to 40°C

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]				
				Speed [mm/s]	0.3G	0.5G	0.7G	1.0G
RCP5W-RA7C	56P	4	Horizontal	0	70	60	50	45
				40	70	60	50	45
				80	70	60	50	45
				110	50	42.5	32.5	28.5
				140	30	25	15	12
				170	10	7.5	-	-
			Vertical	0	25	25	-	-
				40	25	25	-	-
				80	25	25	-	-
				110	16.5	16.5	-	-
				140	8	8	-	-
		8	Horizontal	0	50	45	40	35
				70	50	45	40	35
				140	50	45	40	35
				210	50	30	25	21.5
				280	28.5	15.5	10	8
				340	10	3	-	-
			Vertical	0	15	15	-	-
				70	15	15	-	-
				150	15	15	-	-
				210	9	9	-	-
				280	2	2	-	-
		16	Horizontal	0	40	35	30	25
				140	40	35	30	25
				280	40	24.5	20.5	17
				420	21.5	13.5	11	9
				560	3	3	1.5	1
			Vertical	0	7	7	-	-
				140	7	7	-	-
				250	7	7	-	-
				350	3	3	-	-
				400	1	1	-	-
	56SP	4	Vertical	0	45	45	-	-
				60	45	45	-	-
				80	25	25	-	-

◎ Dustproof/Splash Proof Type
[When high–output setting for motor straight type is effective]

Operation Ambient Temperature Range：0 to 5°C or less

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]				
				Speed [mm/s]	0.3G	0.5G	0.7G	1.0G
RCP5W-RA7C	56P	4	Horizontal	0	70	60	50	45
				40	70	60	50	45
				80	70	60	50	45
				120	35.7	30	15	12
				150	10	7.5	-	-
			Vertical	0	25	25	-	-
				40	25	25	-	-
				80	25	25	-	-
				110	13.5	13.5	-	-
				125	8	8	-	-
		8	Horizontal	0	50	45	40	35
				70	50	45	40	35
				140	50	45	40	35
				180	50	34.5	28	24.2
				240	30	18.75	10	8
				300	10	3	-	-
			Vertical	0	15	15	-	-
				70	15	15	-	-
				100	15	15	-	-
				210	5.5	5.5	-	-
				250	2	2	-	-
		16	Horizontal	0	40	35	30	25
				140	40	35	30	25
				280	40	20.5	17	14
				450	3	3	1.5	1
			Vertical	0	7	7	-	-
				140	7	7	-	-
				250	7	7	-	-
				300	1	1	-	-
	56SP	4	Vertical	0	45	45	-	-
				60	45	45	-	-
				80	25	25	-	-

◎ Dustproof/Splash Proof Type
[When high–output setting for motor straight type is effective]

(Note) There is no high-output setting in RA7C-56SP to operate with PCON-CFA Controller.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]	
				Speed [mm/s]	0.3G
RCP5W-RA6C	42P	3	Horizontal	0	40
				125	40
			Vertical	0	16
				50	16
				125	5
		6	Horizontal	0	40
				200	40
				250	10
			Vertical	0	8
				140	8
				250	2.5
		12	Horizontal	0	20
				350	20
				500	5
			Vertical	0	3
				280	3
				400	1
	42SP	3	Vertical	0	30
				30	30
				60	5
RCP5W-RA7C	56P	4	Horizontal	0	70
				80	70
				140	5
			Vertical	0	25
				40	25
				90	5
				110	2
		8	Horizontal	0	50
				120	50
				210	30
			Vertical	0	15
				80	15
				140	7
				210	2
		16	Horizontal	0	40
				150	40
				420	5
			Vertical	0	5
				220	5
				350	1

◎ Dustproof/Splash Proof Type

(Note) RCP5W-RA8C is the the load capacity an operating ambient temperature over 5°C is different from that an operating ambient temperature 5°C or less.

[Motor straight type]

In RA8C there is nothing related to high-thrust setting. There is no parameter setting.

Operation Ambient Temperature Range：Over 5 to 40°C

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5W-RA8C	60P	5	Horizontal	0	80	-
				70	80	-
				95	80	-
				100	72	-
				110	60	-
				120	48	-
			Vertical	0	56	-
				35	56	-
				45	40	-
				55	28	-
				60	20	-
				70	16	-
				80	12	-
				95	8	-
				100	8	-
		10	Horizontal	0	-	48
				120	-	48
				160	-	36
				190	-	32
				240	-	8
			Vertical	0	-	32
				70	-	32
				80	-	26
				85	-	22
				95	-	18
				100	-	14
				110	-	12
				120	-	8.5
				125	-	8
				135	-	6
				140	-	5.5
				150	-	4
				160	-	3
				175	-	2
				200	-	1.5

◎ Dustproof/Splash Proof Type
[Motor straight type]
In RA8C there is nothing related to high-thrust setting. There is no parameter setting.

Operation Ambient Temperature Range：Over 5 to 40°C

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5W-RA8C	60P	20	Horizontal	0	-	24
				192	-	24
				216	-	24
				240	-	24
				285	-	19
				335	-	12.5
				360	-	9.5
				380	-	8
				405	-	6
				430	-	4.5
				480	-	4
			Vertical	0	-	4
				40	-	4
				80	-	4
				120	-	4
				144	-	4
				160	-	4
				192	-	4
				240	-	4
				285	-	4
				320	-	2
				335	-	2
				360	-	1.5

◎ Dustproof/Splash Proof Type
[Motor straight type]
In RA8C there is nothing related to high-thrust setting. There is no parameter setting.

Operation Ambient Temperature Range：0 to 5°C or less

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5W-RA8C	60P	5	Horizontal	0	80	-
				70	80	-
				95	80	-
				100	72	-
			Vertical	0	56	-
				35	56	-
				45	40	-
				55	28	-
				60	20	-
				70	16	-
				75	12	-
		10	Horizontal	0	-	48
				120	-	48
				160	-	36
				190	-	32
				210	-	20
			Vertical	0	-	32
				70	-	32
				80	-	26
				85	-	22
				95	-	18
				100	-	14
				110	-	12
				120	-	8.5
				125	-	8
				135	-	6
				140	-	5.5
				150	-	4
				160	-	3
				175	-	2

◎ Dustproof/Splash Proof Type
[Motor straight type]
In RA8C there is nothing related to high-thrust setting. There is no parameter setting.

Operation Ambient Temperature Range：0 to 5°C or less

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5W-RA8C	60P	20	Horizontal	0	-	24
				192	-	24
				216	-	24
				240	-	24
				285	-	19
				335	-	12.5
				360	-	9.5
				380	-	8
				405	-	6
				430	-	4.5
				480	-	4
			Vertical	0	-	4
				40	-	4
				80	-	4
				120	-	4
				144	-	4
				160	-	4
				192	-	4
				240	-	4
				285	-	4
				320	-	2
				335	-	2
				360	-	1.5

◎ Dustproof/Splash Proof Type
[Motor straight type]
In RA10C there is nothing related to high-thrust setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]			
				Speed [mm/s]	0.01G	0.02G	0.04G
RCP5W-RA10C	86P	2.5	Horizontal	0	240	-	-
				33.5	240	-	-
				50	240	-	-
			Vertical	0	120	-	-
				16	120	-	-
				24	80	-	-
				28	60	-	-
				30	52	-	-
				40	24	-	-
				44	16	-	-
				50	8	-	-
		5	Horizontal	0	-	120	-
				66	-	120	-
				100	-	120	-
			Vertical	0	-	80	-
				16	-	80	-
				20	-	72	-
				32	-	52	-
				36	-	44	-
				44	-	32	-
				46	-	29.5	-
				48	-	28	-
				52	-	23	-
				54	-	21.5	-
				56	-	20	-
				61	-	16	-
				72	-	10	-
				80	-	7	-
				84	-	5.5	-
				100	-	2	-
		10	Horizontal	0	-	-	64
				80	-	-	64
				140	-	-	64
				160	-	-	64
				180	-	-	30
				190	-	-	16
				200	-	-	12
			Vertical	0	-	-	64
				27	-	-	64
				30	-	-	55
				36	-	-	46
				42	-	-	40
				60	-	-	28
				84	-	-	16
				96	-	-	12
				112	-	-	8
				121	-	-	6
				130	-	-	4.5

⚠ Caution: Do not set speeds and accelerations/decelerations equal to or greater than the respective ratings. Doing so may result in vibration, failure or shorter 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] Motor Reversing Type

[When high–output setting for motor reversing is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-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	35	30
				85	40	40	40	35	30
				105	40	40	35	35	30
				130	40	40	35	30	30
				150	40	35	35	30	30
				175	40	35	35	30	25
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	10	10	-	-
				130	10	10	8	-	-
				150	8	8	7	-	-
				175	7.5	7	6	-	-
		5	Horizontal	0	25	25	22	20	18
				40	25	25	22	20	18
				85	25	25	22	20	18
				130	25	25	22	20	18
				175	25	25	22	20	18
				215	25	25	22	18	16
				260	25	22	20	16	12
				305	22	20	16	12	8
				350	20	16	10	8	6
			Vertical	0	5	5	5	-	-
				40	5	5	5	-	-
				85	5	5	5	-	-
				130	5	5	5	-	-
				175	5	5	5	-	-
				215	5	5	5	-	-
				260	5	5	5	-	-
				305	5	4	4	-	-
				350	3.5	3	3	-	-

[When high–output setting for motor reversing is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA4R	35P	10	Horizontal	0	12	12	10	10	8
				85	12	12	10	10	8
				175	12	12	10	10	6
				260	12	12	10	10	5
				350	12	12	10	8	5
				435	12	10	8	6	4
				525	12	8	6	3	2
				610	-	5	2	-	-
			Vertical	0	2.5	2.5	2.5	-	-
				85	2.5	2.5	2.5	-	-
				175	2.5	2.5	2.5	-	-
				260	2.5	2.5	2.5	-	-
				350	2.5	2.5	2.5	-	-
				435	2.5	2.5	2.5	-	-
				525	2.5	2.5	2	-	-
				610	-	2	1.5	-	-
		16	Horizontal	0	5	5	4.5	3	2.5
				140	5	5	4.5	3	2.5
				280	5	5	4.5	3	2
				420	5	5	4.5	3	2
				560	-	5	4.5	2.5	2
				700	-	4.5	3.5	2	1.5
				840	-	3	2.5	1	0.5
			Vertical	0	1	1	1	-	-
				140	1	1	1	-	-
				280	1	1	1	-	-
				420	1	1	1	-	-
				560	1	1	1	-	-
				700	-	1	1	-	-
				840	-	0.5	0.5	-	-

[When high–output setting for motor reversing is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA6R	42P	3	Horizontal	0	60	60	50	45	40
				25	60	60	50	45	40
				50	60	60	50	45	40
				75	60	60	50	45	40
				100	60	60	50	45	40
				125	60	60	50	40	30
				150	60	50	40	30	25
				175	60	40	35	25	20
				200	60	35	30	20	14
				225	40	16	16	10	6
			Vertical	0	20	20	20	-	-
				25	20	20	20	-	-
				50	20	20	20	-	-
				75	20	20	20	-	-
				100	20	20	20	-	-
				125	18	14	10	-	-
				150	14	10	6	-	-
				175	12	6	5	-	-
				200	8	5	4.5	-	-
				225	5	5	4	-	-
		6	Horizontal	0	40	40	35	30	25
				50	40	40	35	30	25
				100	40	40	35	30	25
				150	40	40	35	25	25
				200	40	40	30	25	20
				250	40	40	27.5	22.5	18
				300	40	35	25	20	14
				350	40	30	14	12	10
				400	30	18	10	6	5
				450	25	8	3	-	-
			Vertical	0	10	10	10	-	-
				50	10	10	10	-	-
				100	10	10	10	-	-
				150	10	10	10	-	-
				200	10	10	10	-	-
				250	10	9	8	-	-
				300	6	6	6	-	-
				350	5	5	5	-	-
				400	4	3	3	-	-
				450	2	2	1	-	-

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-RA6R	42P	12	Horizontal	0	25	25	18	16	12
				100	25	25	18	16	12
				200	25	25	18	16	10
				300	25	25	18	12	8
				400	20	20	14	10	6
				500	15	15	8	6	4
				600	10	10	6	3	2
				700	-	6	2	-	-
			Vertical	0	4	4	4	-	-
				100	4	4	4	-	-
				200	4	4	4	-	-
				300	4	4	4	-	-
				400	4	4	4	-	-
				500	4	3.5	3	-	-
				600	4	3	2	-	-
				700	-	2	1	-	-
		20	Horizontal	0	6	6	6	5	5
				160	6	6	6	5	5
				320	6	6	6	5	3
				480	6	6	6	5	3
				640	-	6	4	3	2
				800	-	4	3	-	-
			Vertical	0	1.5	1.5	1.5	-	-
				160	1.5	1.5	1.5	-	-
				320	1.5	1.5	1.5	-	-
				480	1.5	1.5	1.5	-	-
				640	-	1.5	1.5	-	-
				800	-	1	1	-	-

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RCP5-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	80	50	10	6	6
				175	40	5	-	-	-
			Vertical	0	28	28	28	-	-
				35	28	28	28	-	-
				70	28	28	28	-	-
				105	22	20	18	-	-
				140	13	8	3	-	-
				175	4	-	-	-	-
		8	Horizontal	0	60	60	50	45	40
				70	60	60	50	45	40
				140	60	60	50	45	40
				210	60	60	40	31	26
				280	60	26	16	10	8
				350	30	3	-	-	-
				420	2	-	-	-	-
			Vertical	0	18	18	18	-	-
				70	18	18	18	-	-
				140	16	16	12	-	-
				210	10	10	9	-	-
				280	8	5	3	-	-
				350	3	1	-	-	-
				420	-	-	-	-	-
		16	Horizontal	0	50	50	40	35	30
				140	50	50	40	35	30
				280	50	50	35	25	20
				420	50	25	18	14	10
				560	12	10	5	3	2
			Vertical	0	8	8	8	-	-
				140	8	8	8	-	-
				280	8	7	7	-	-
				420	4.5	4.5	4	-	-
				560	2	1	1	-	-
		24	Horizontal	0	20	20	18	15	12
				200	20	20	18	15	12
				400	20	20	18	15	10
				600	15	14	9	7	4
				800	-	3	1	-	-
			Vertical	0	3	3	3	-	-
				200	3	3	3	-	-
				400	3	3	3	-	-
				600	3	3	2	-	-
				800	-	-	-	-	-

[When high–output setting for motor reversing is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.2G	0.3G	0.5G	0.7G
RCP5-RA4R	35P	2.5	Horizontal	0	35	-	35	32	30
				20	35	-	35	32	30
				40	35	-	35	32	30
				65	35	-	35	30	25
				85	35	-	35	25	20
				105	30	-	25	20	15
				130	25	-	20	15	10
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	8	7	-	-
				105	8	7	5	-	-
				130	6	5	4	-	-
		5	Horizontal	0	22	-	22	22	20
				40	22	-	22	22	20
				85	22	-	22	22	20
				130	22	-	22	20	18
				175	22	-	20	18	14
				215	18	-	15	12	10
				260	15	-	12	8	6
			Vertical	0	5	5	5	-	-
				40	5	5	5	-	-
				85	5	5	5	-	-
				130	5	5	5	-	-
				175	5	5	4	-	-
				215	4	4	3	-	-
				260	4	3	2	-	-
		10	Horizontal	0	10	-	10	9	8
				85	10	-	10	9	8
				175	10	-	10	9	8
				260	10	-	9	8	7
				350	8	-	7	6	5
				435	7	-	6	4	3
				525	1	-	1	-	-
			Vertical	0	2	2	2	-	-
				85	2	2	2	-	-
				175	2	2	2	-	-
				260	2	2	2	-	-
				350	2	2	1.5	-	-
				435	1	1	1	-	-
				525	0.5	0.5	0.5	-	-
		16	Horizontal	0	5	-	5	4	3
				140	5	-	5	4	3
				280	5	-	5	4	3
				420	5	-	4	3.5	2.5
				560	-	-	3	2.5	1.5
			Vertical	0	1	1	1	-	-
				140	1	1	1	-	-
				280	1	1	1	-	-
				420	1	0.5	0.5	-	-
				560	0.5	0.5	0.5	-	-

[When high–output setting for motor reversing is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.2G	0.3G	0.5G	0.7G
RCP5-RA6R	42P	3	Horizontal	0	-	40	-	-	-
				25	-	40	-	-	-
				50	-	40	-	-	-
				75	-	40	-	-	-
				100	-	40	-	-	-
				125	-	40	-	-	-
			Vertical	0	-	20	-	-	-
				25	-	20	-	-	-
				50	-	16	-	-	-
				75	-	12	-	-	-
				100	-	9	-	-	-
				125	-	5	-	-	-
		6	Horizontal	0	-	40	-	-	-
				50	-	40	-	-	-
				100	-	40	-	-	-
				150	-	40	-	-	-
				200	-	35	-	-	-
				250	-	10	-	-	-
			Vertical	0	-	10	-	-	-
				50	-	10	-	-	-
				100	-	10	-	-	-
				150	-	8	-	-	-
				200	-	5	-	-	-
				250	-	3	-	-	-
		12	Horizontal	0	-	25	-	-	-
				100	-	25	-	-	-
				200	-	25	-	-	-
				300	-	20	-	-	-
				400	-	10	-	-	-
				500	-	5	-	-	-
			Vertical	0	-	4	-	-	-
				100	-	4	-	-	-
				200	-	4	-	-	-
				300	-	3	-	-	-
				400	-	2	-	-	-
				500	-	1	-	-	-
		20	Horizontal	0	-	-	6	-	-
				160	-	-	6	-	-
				320	-	-	6	-	-
				480	-	-	4	-	-
				640	-	-	3	-	-
			Vertical	0	-	1.5	-	-	-
				160	-	1.5	-	-	-
				320	-	1.5	-	-	-
				480	-	1	-	-	-
				640	-	0.5	-	-	-

[When high–output setting for motor reversing is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.2G	0.3G	0.5G	0.7G
RCP5-RA7R	56P	4	Horizontal	0	-	55	-	-	-
				35	-	55	-	-	-
				70	-	55	-	-	-
				105	-	55	-	-	-
				140	-	5	-	-	-
			Vertical	0	-	26	-	-	-
				35	-	26	-	-	-
				70	-	15	-	-	-
				105	-	4	-	-	-
				140	-	0.5	-	-	-
		8	Horizontal	0	-	50	-	-	-
				70	-	50	-	-	-
				140	-	50	-	-	-
				210	-	30	-	-	-
			Vertical	0	-	17.5	-	-	-
				70	-	17.5	-	-	-
				140	-	7	-	-	-
				210	-	2	-	-	-
		16	Horizontal	0	-	40	-	-	-
				140	-	40	-	-	-
				280	-	30	-	-	-
				420	-	6	-	-	-
			Vertical	0	-	5	-	-	-
				140	-	5	-	-	-
				280	-	3	-	-	-
				420	-	0.5	-	-	-
		24	Horizontal	0	-	-	18	-	-
				200	-	-	18	-	-
				400	-	-	10	-	-
				600	-	-	1	-	-
			Vertical	0	-	3	-	-	-
				200	-	3	-	-	-
				400	-	2	-	-	-

◎ Standard Type
[Motor reversing type]
In RA8R there is nothing related to high-thrust setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RCP5-RA8R	60P	5	Horizontal	0	100	-
				90	100	-
				100	75	-
			Vertical	0	70	-
				45	70	-
				60	45	-
				70	35	-
				80	25	-
				90	16	-
				100	10	-
		10	Horizontal	0	-	60
				160	-	60
				170	-	40
				180	-	25
				190	-	15
				200	-	12
			Vertical	0	-	40
				80	-	40
				90	-	34
				100	-	28
				110	-	23
				120	-	18
				130	-	15
				140	-	12
				150	-	10
				160	-	8
				170	-	6
				180	-	4
				190	-	3
				200	-	2
		20	Horizontal	0	-	30
				300	-	30
				350	-	14
				400	-	6
			Vertical	0	-	5
				300	-	5
				330	-	3.5
				360	-	2
				400	-	0.5

◎ Standard Type
[Motor reversing type]
In RA10R there is nothing related to high-thrust setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Transportable Mass by Acceleration/Deceleration [kg]			
				Speed [mm/s]	0.01G	0.02G	0.04G
RCP5-RA10R	86P	2.5	Horizontal	0	300	-	-
				50	300	-	-
			Vertical	0	150	-	-
				20	150	-	-
				30	95	-	-
				35	70	-	-
				37	60	-	-
				50	6	-	-
		5	Horizontal	0	-	150	-
				100	-	150	-
			Vertical	0	-	100	-
				20	-	100	-
				26	-	90	-
				40	-	65	-
				45	-	55	-
				55	-	40	-
				58	-	37	-
				60	-	35	-
				65	-	29	-
				68	-	27	-
				70	-	25	-
				77	-	20	-
				90	-	13	-
				100	-	9	-
		10	Horizontal	0	-	-	80
				200	-	-	80
			Vertical	0	-	-	80
				34	-	-	80
				37	-	-	69
				45	-	-	58
				53	-	-	50
				75	-	-	35
				105	-	-	20
				120	-	-	15
				140	-	-	10

⚠ Caution: Do not set speeds and accelerations/decelerations equal to or greater than the respective ratings. Doing so may result in vibration, failure or shorter 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	800	Rolled	ϕ8mm	C10
		5				
		10				
		16				
RA6C RA6R	42P	3		Rolled	ϕ10mm	C10
		6				
		12				
		20				
	42SP	3				
RA7C RA7R	56P	4		Rolled	ϕ12mm	C10
		8				
		16				
		24				
	56SP	4				
RA8C RA8R	60P	5		Rolled	ϕ16mm	C10
		10				
		20				
RA10C RA10R	86P	2.5		Rolled	ϕ20mm	C10
		5		Rolled	ϕ16mm	C10
		10		Rolled	ϕ20mm	C10

1.2.4 Positioning Precision

Type	lead	Item	Tolerance
RA4C RA4R	2.5, 5, 10, 16	Positioning repeatability	±0.02mm
		Lost motion	0.1mm or less
RA6C RA6R	3, 6, 12	Positioning repeatability	±0.02mm
		Lost motion	0.1mm or less
	20	Positioning repeatability	±0.03mm
		Lost motion	0.1mm or less
RA7C RA7R	4, 8, 16	Positioning repeatability	±0.02mm
		Lost motion	0.1mm or less
	24	Positioning repeatability	±0.03mm
		Lost motion	0.1mm or less
RA8C RA8R	5, 10, 20	Positioning repeatability	±0.02mm
		Lost motion	0.1mm or less
RA10C RA10R	2.5, 5, 10	Positioning repeatability	±0.02mm
		Lost motion	0.1mm or less

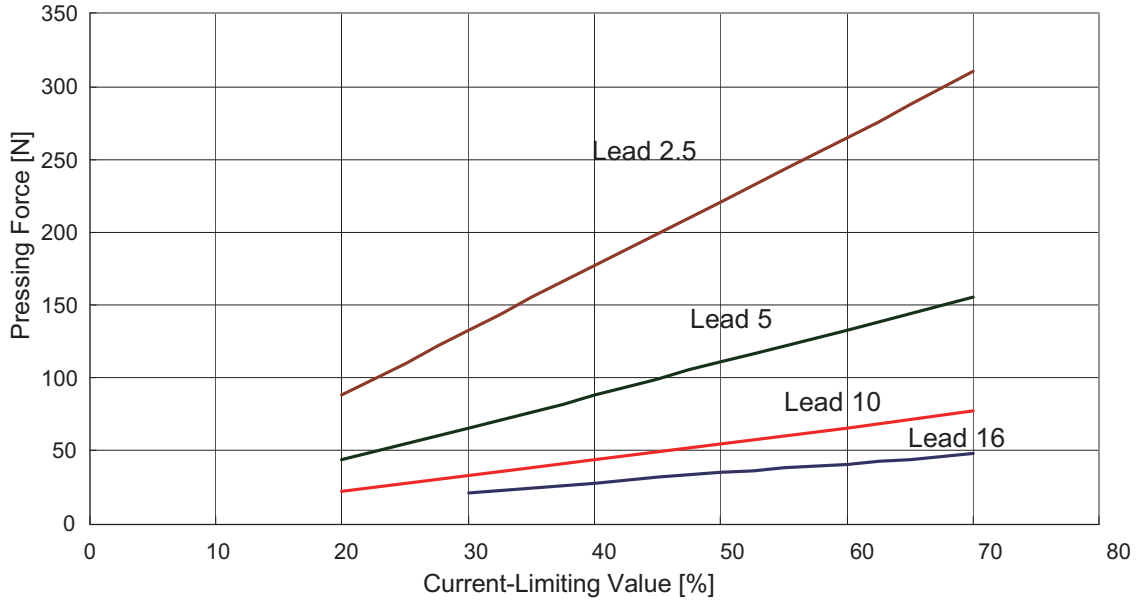
This is an option already attached when it is shipped out from the factory.
It does not include the consideration of time-dependent change as it is used.

1.2.5 Current Limit Value and Pressing Force

[1] Standard Type RCP5-RA4C and RA4R Motor Type 35P

Current Limiting Value	Lead2.5 [N]	Lead5 [N]	Lead10 [N]	Lead16 [N]
20%	88	44	22	-
30%	133	66	33	21
40%	177	88	44	28
50%	221	111	55	35
60%	265	133	66	41
70%	310	155	77	48

RA4C/R Current Limiting Values and Pressing Force

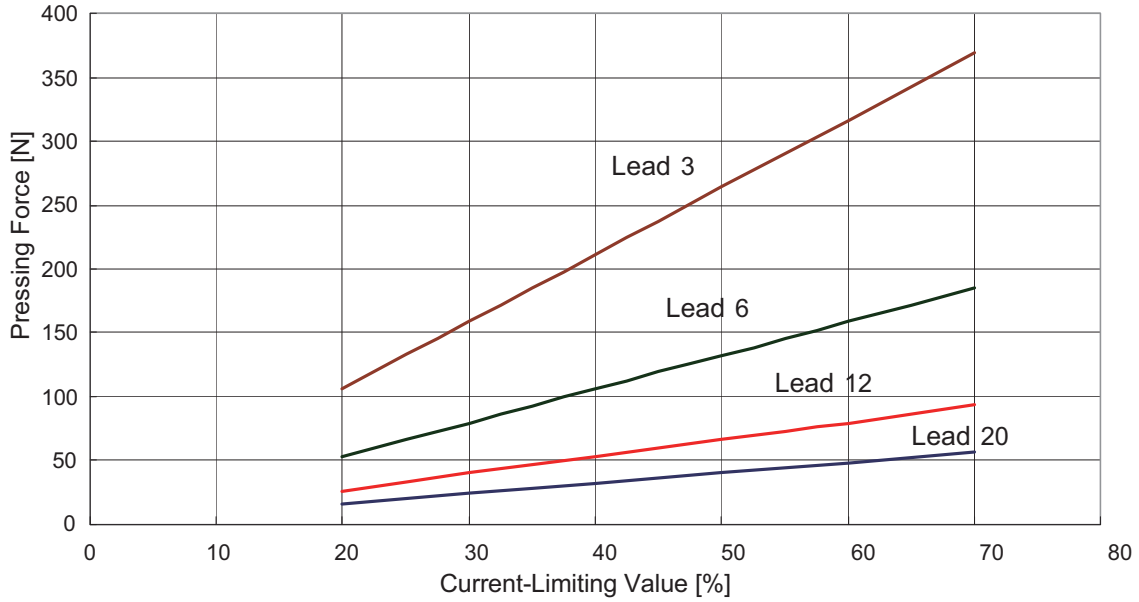


⚠ Caution:
(1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
(2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20% (below 30% for Lead 6). 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 the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

[2] Standard Type RCP5-RA6C and RA6R Motor Type 42P

Current Limiting Value	Lead3 [N]	Lead6 [N]	Lead12 [N]	Lead20 [N]
20%	106	53	26	16
30%	159	79	40	24
40%	211	106	53	32
50%	264	132	66	40
60%	317	159	79	48
70%	370	185	93	56

RA6C/R Current Limiting Values 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.

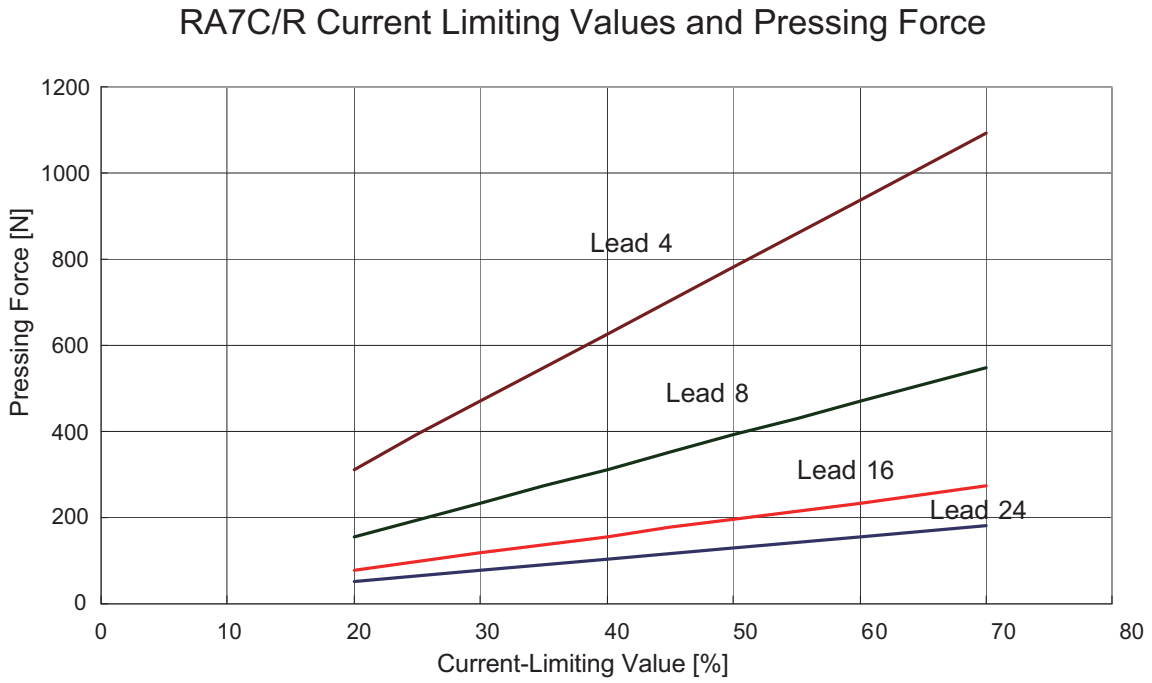
(2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.

(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. 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 the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

[3] Standard Type RCP5-RA7C and RA7R Motor Type 56P

Current Limiting Value	Lead4 [N]	Lead8 [N]	Lead16 [N]	Lead24 [N]
20%	312	156	78	52
30%	469	234	117	78
40%	625	312	156	104
50%	781	391	195	130
60%	937	469	234	156
70%	1094	547	273	182



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.

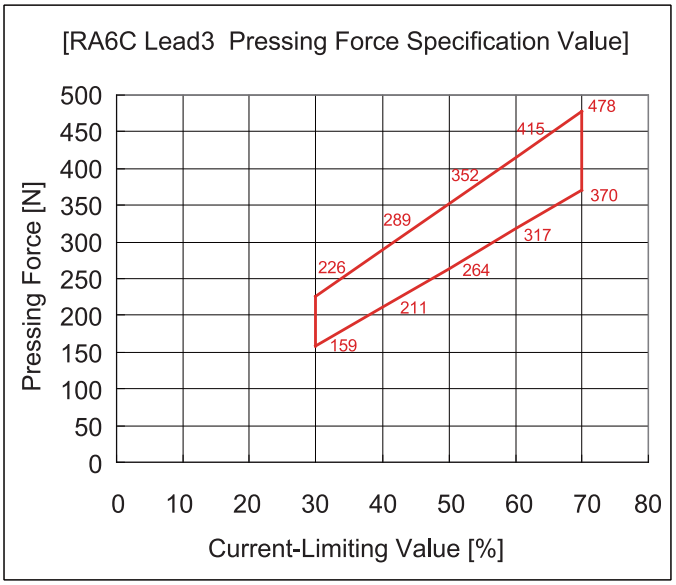
(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.

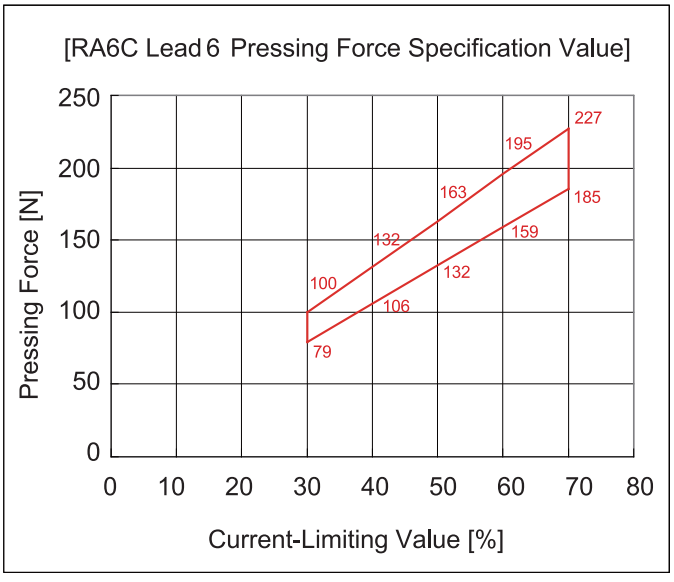
(4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
For the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

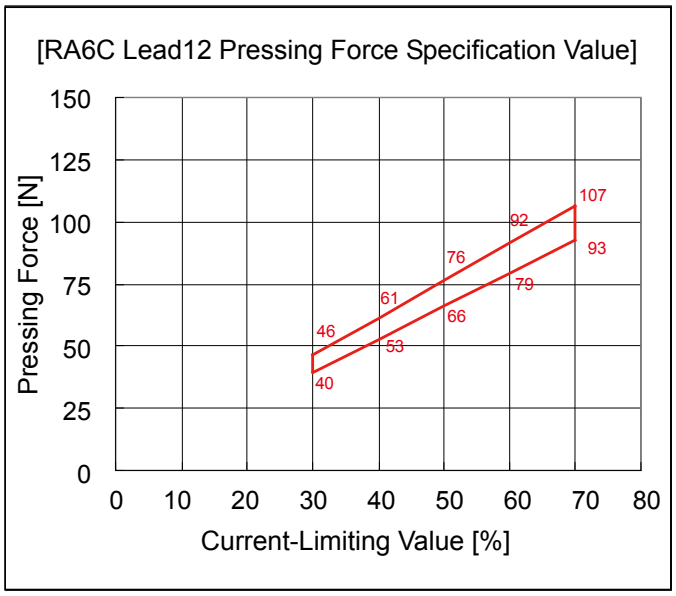
[4] Dustproof/Splash Proof Type RCP5W-RA6C

(1) Motor Type 42P

Current Limiting Value		Lead3 [N]	Lead6 [N]	Lead12 [N]
30%	Upper Limit	226	100	46
	Lower Limit	159	79	40
40%	Upper Limit	289	132	61
	Lower Limit	211	106	53
50%	Upper Limit	352	163	76
	Lower Limit	264	132	66
60%	Upper Limit	415	195	92
	Lower Limit	317	159	79
70%	Upper Limit	478	227	107
	Lower Limit	370	185	93





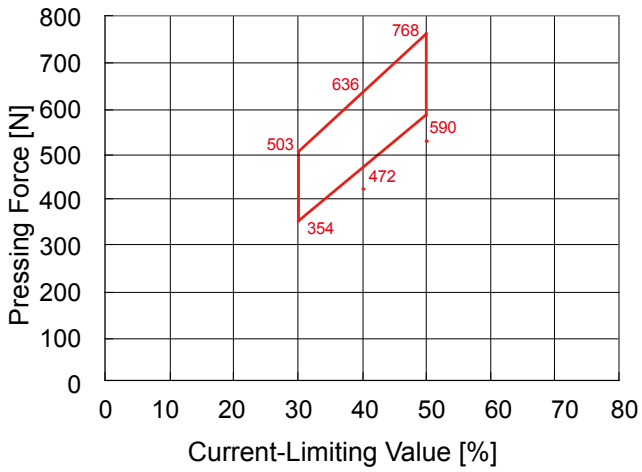


⚠ Caution:
(1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
(2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
(3) Use the product within the range 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 the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

(2) Motor Type 42SP

Current Limiting Value		Lead3 [N]
30%	Upper Limit	503
	Lower Limit	354
40%	Upper Limit	636
	Lower Limit	472
50%	Upper Limit	768
	Lower Limit	590

[RA6 Lead3 High Thrust and Pressing Specification Value]



⚠ 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.

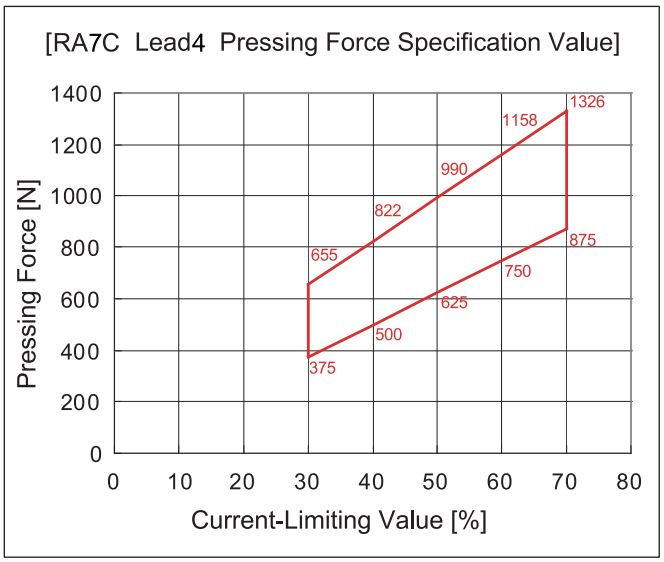
(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 50%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.

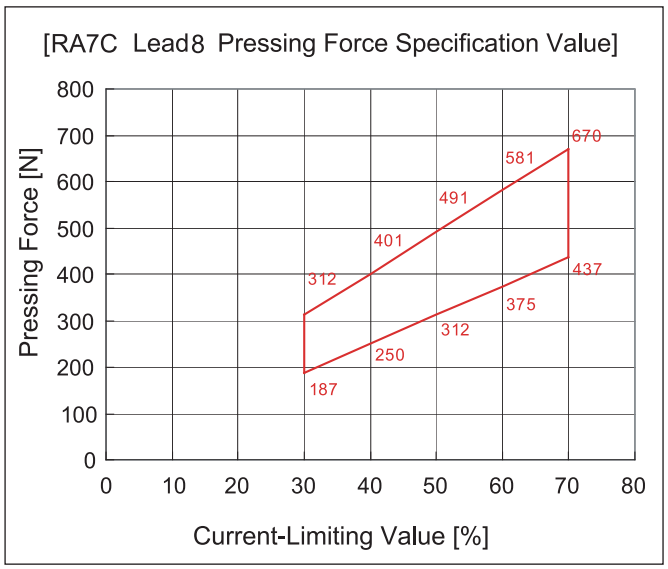
(4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
For the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

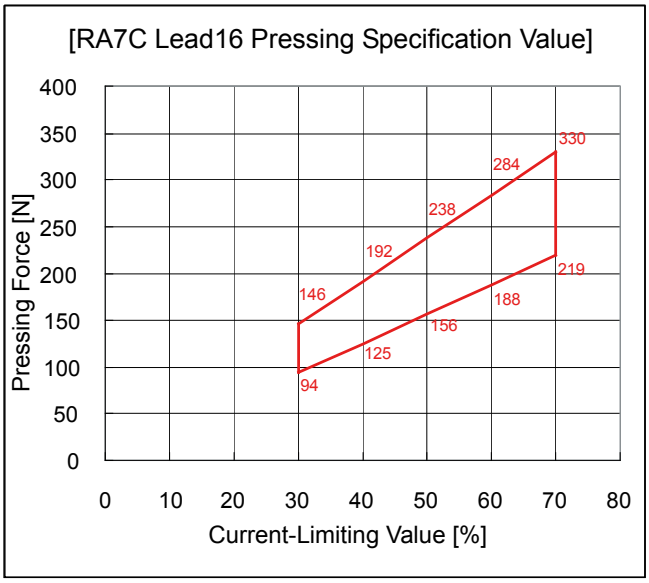
[5] Dustproof/Splash Proof Type RCP5W-RA7C

(1) Motor Type 56P

Current Limiting Value		Lead4 [N]	Lead8 [N]	Lead16 [N]
30%	Upper Limit	655	312	146
	Lower Limit	375	187	94
40%	Upper Limit	822	401	192
	Lower Limit	500	250	125
50%	Upper Limit	990	491	238
	Lower Limit	625	312	156
60%	Upper Limit	1158	581	284
	Lower Limit	750	375	188
70%	Upper Limit	1326	670	330
	Lower Limit	875	437	219







Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.

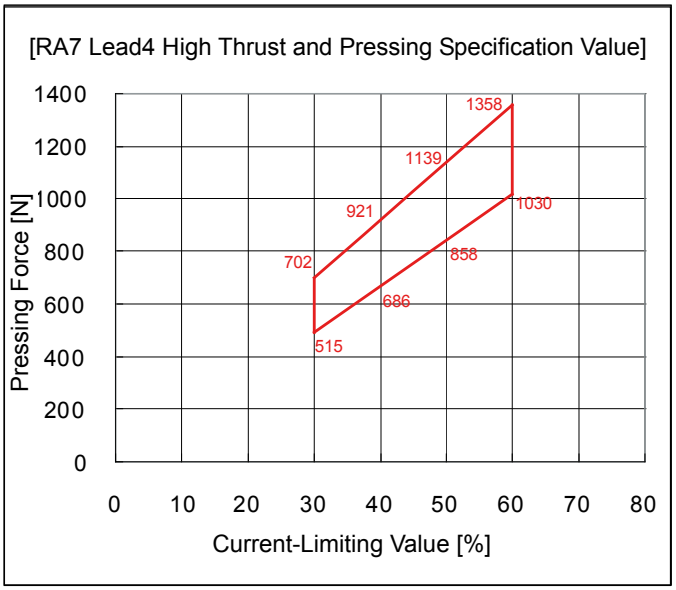
(2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.

(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 the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

(2) Motor Type 56SP

Current Limiting Value		Lead4 [N]
30%	Upper Limit	702
	Lower Limit	515
40%	Upper Limit	921
	Lower Limit	686
50%	Upper Limit	1139
	Lower Limit	858
60%	Upper Limit	1358
	Lower Limit	1030



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.

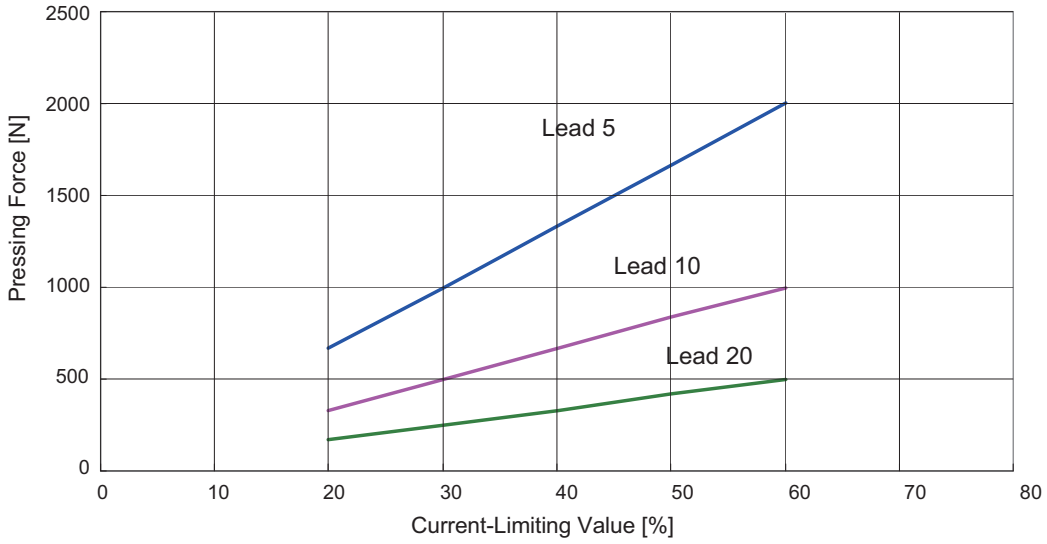
(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 60%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.

(4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

[6] Standard Type RCP5-RA8C and RA8R
Dustproof/Splash Proof Type RCP5W-RA8C Motor Type 60P

Current Limiting Value	Lead5 [N]	Lead10 [N]	Lead20 [N]
20%	667	333	167
30%	1000	500	250
40%	1333	667	333
50%	1667	833	417
60%	2000	1000	500

RA8C/R Current Limiting Values and Pressing Force

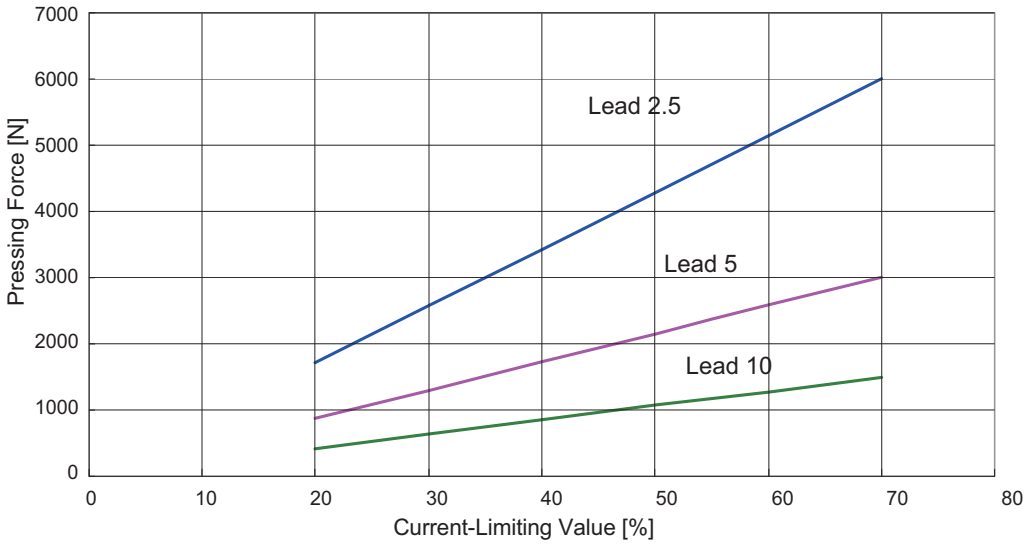


⚠ Caution:
(1) The relation of the current limit and the pressing force is a reference when assuming the speed is 10mm/s.
(2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. 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 the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 10mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

[7] Standard Type RCP5-RA10C and RA10R
Dustproof/Splash Proof Type RCP5W-RA10C Motor Type 86P

Current Limiting Value	Lead2.5 [N]	Lead5 [N]	Lead10 [N]
20%	1714	857	429
30%	2571	1286	643
40%	3429	1714	857
50%	4286	2143	1071
60%	5143	2571	1286
70%	6000	3000	1500

RA10C/R Current Limiting Values and Pressing Force



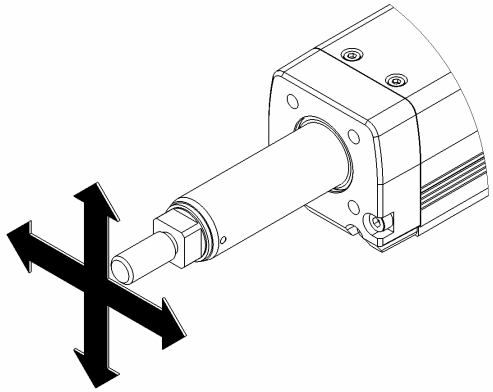
Due to the buckling load of the ball screw, there is a limitation in the pressing force for those with long stroke shown below.

Lead Length	Stroke					
	550mm or less	600mm or less	650mm or less	700mm or less	750mm or less	800mm or less
2.5	Value in graph				5900	5400
5	Value in graph	2900	2500	2200	2000	1800
10	Value in graph					

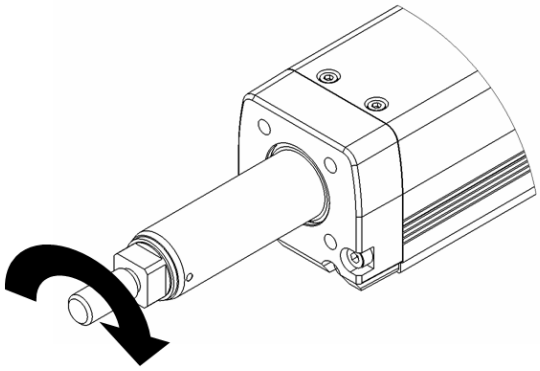
⚠ Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 10mm/s.
(2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
(3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. 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 the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 10mm/s or less, pressing is performed at 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 the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

1.2.6 Allowable Load and Torque on Rod Tip

- Actuator possesses a built–in guide structure that enables it to apply a side–way load (radial load) and torque. Make sure not to exceed the load indicated in the specification table.
  Applying excess load may cause an operation failure, parts malfunction and shortened life.



Should be below allowable load
Do not attempt to apply impact load

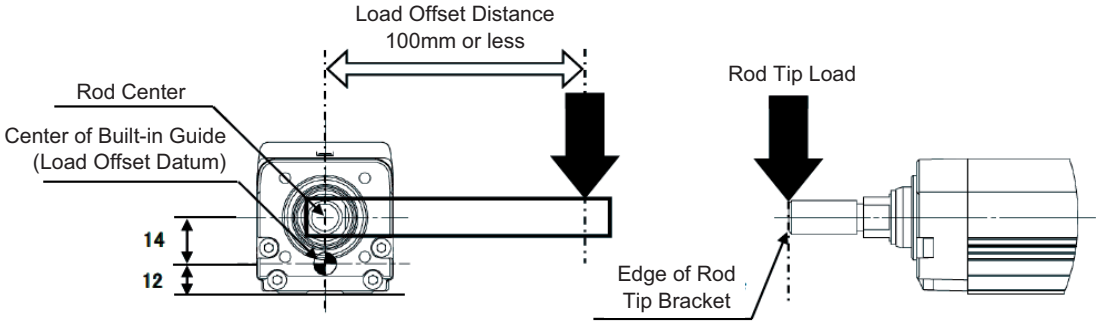


Should be below allowable torque

Standard Type RCP5-RA4C and RA4R

Item		Stroke	60	110	160	210	260	310	360	410
Rod Tip Static Allowable Load	[N]		55.8	44.6	37.1	31.7	27.6	24.3	21.7	19.5
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	25.4	19.5	15.5	12.8	10.8	9.2	7.9	6.9
	[N]	Load Offset Distance 100 mm	16.5	14.5	12.4	10.7	9.2	8.0	7.0	6.2
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less							
Rod Tip Static Allowable Torque	[N•m]		5.6	4.5	3.8	3.2	2.8	2.5	2.3	2.1
Rod Tip Dynamic Allowable Torque	[N•m]		1.7	1.5	1.2	1.1	0.9	0.8	0.7	0.6
Rod Non–Rotation Accuracy (Note 1)	[deg]		0							

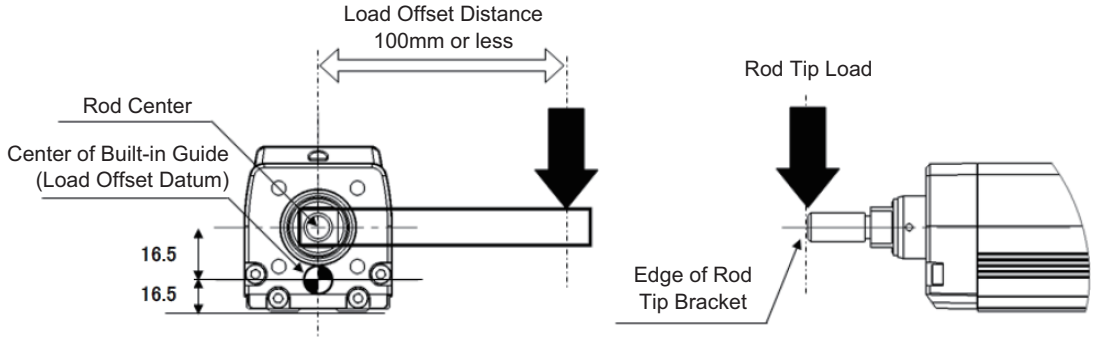
Note 1 It shows the displacement angle in the rod rotational direction at no load.



Standard Type RCP5-RA6C and RA6R

Item		Stroke	65	115	165	215	265	315	365	415
Rod Tip Static Allowable Load	[N]		113.8	92.6	78.0	67.3	59.0	52.5	47.2	42.8
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	45.7	36.3	29.8	25.1	21.6	18.8	16.6	14.7
	[N]	Load Offset Distance 100 mm	32.1	28.3	24.6	21.5	18.9	16.7	14.9	13.4
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less							
Rod Tip Static Allowable Torque	[N•m]		11.5	9.4	7.9	6.8	6.0	5.4	4.9	4.5
Rod Tip Dynamic Allowable Torque	[N•m]		3.2	2.8	2.5	2.1	1.9	1.7	1.5	1.3
Rod Non–Rotation Accuracy (Note 1)	[deg]		0							

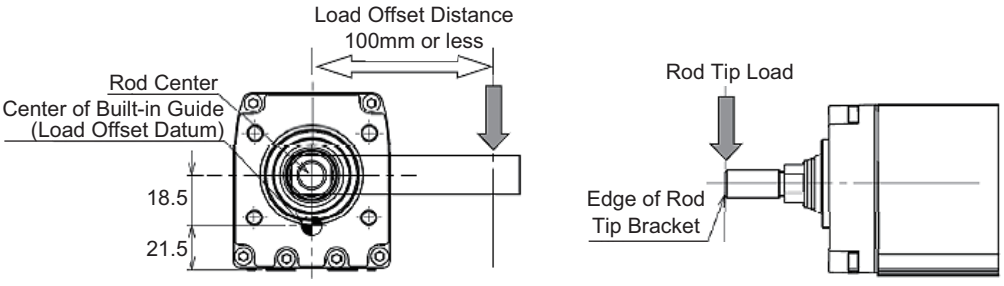
Note 1 It shows the displacement angle in the rod rotational direction at no load.



Dustproof/Splash Proof Type RCP5W-RA6C

Item		Stroke	50	100	150	200	250	300	350	400
Rod Tip Static Allowable Load	[N]		65.6	51.2	41.7	34.9	29.8	25.7	22.4	19.7
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	32.4	23.6	18.1	14.4	11.6	9.5	7.7	6.2
	[N]	Load Offset Distance 100 mm	25.6	19.7	15.7	12.7	10.4	8.6	7.1	5.7
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less							
Rod Tip Static Allowable Torque	[N•m]		6.6	5.2	4.3	3.7	3.2	2.8	2.6	2.3
Rod Tip Dynamic Allowable Torque	[N•m]		2.6	2.0	1.6	1.3	1.0	0.9	0.7	0.6
Rod Non–Rotation Accuracy (Note 1)	[deg]		0							

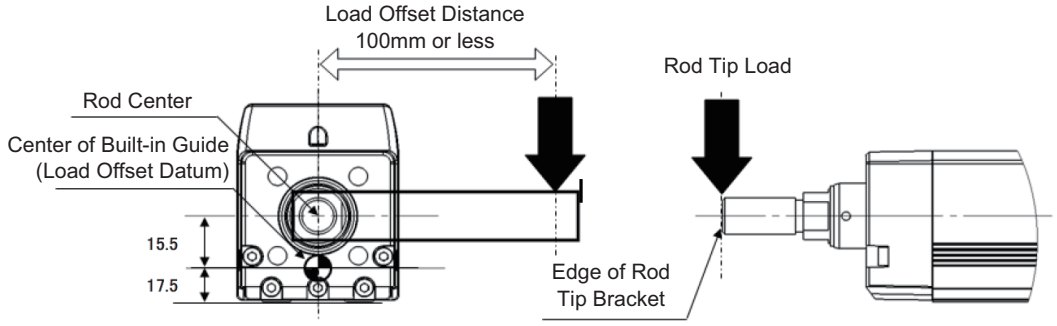
Note 1 It shows the displacement angle in the rod rotational direction at no load.



Standard Type RCP5-RA7C and RA7R

Item		Stroke	70	120	170	220	270	320	370	420	470	520
Rod Tip Static Allowable Load	[N]		119.2	97.7	82.8	71.6	63.0	56.2	50.6	46.0	42.2	38.8
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	44.3	35.7	29.6	25.2	21.7	19.0	16.8	15.0	13.6	12.2
	[N]	Load Offset Distance 100 mm	33.9	29.7	25.7	22.4	19.7	17.4	15.5	14.0	12.8	11.5
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less									
Rod Tip Static Allowable Torque	[N•m]		12.1	10.0	8.5	7.4	6.5	5.9	5.3	4.9	4.5	4.1
Rod Tip Dynamic Allowable Torque	[N•m]		3.4	3.0	2.6	2.2	2.0	1.7	1.6	1.4	1.3	1.2
Rod Non–Rotation Accuracy (Note 1)	[deg]		0									

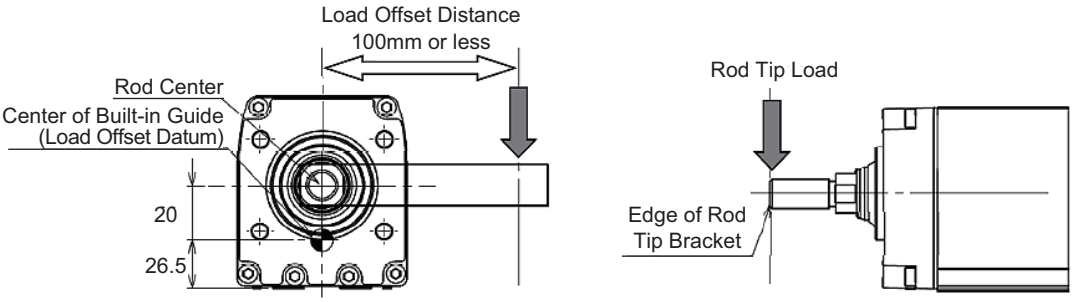
Note 1 It shows the displacement angle in the rod rotational direction at no load.



Dustproof/Splash Proof Type RCP5W-RA7C

Item		Stroke	50	100	150	200	250	300	350	400	450	500
Rod Tip Static Allowable Load	[N]		112.7	91.5	76.7	65.7	57.2	50.4	44.8	40.2	36.2	32.7
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	49.0	37.4	29.9	24.5	20.4	17.1	14.5	12.3	10.3	8.6
	[N]	Load Offset Distance 100 mm	38.7	31.0	25.5	21.4	18.1	15.4	13.2	11.2	9.5	8.0
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less									
Rod Tip Static Allowable Torque	[N•m]		11.4	9.3	7.9	6.8	6.0	5.4	4.9	4.5	4.1	3.8
Rod Tip Dynamic Allowable Torque	[N•m]		3.9	3.1	2.5	2.1	1.8	1.5	1.3	1.1	1.0	0.8
Rod Non–Rotation Accuracy (Note 1)	[deg]		0									

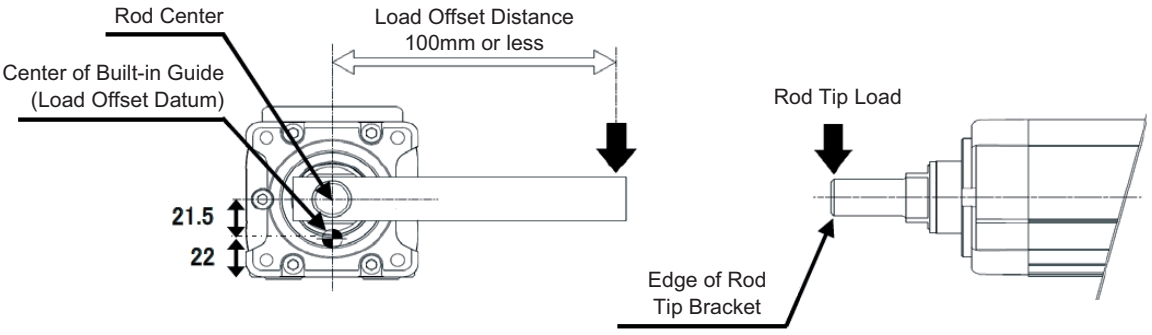
Note 1 It shows the displacement angle in the rod rotational direction at no load.



Standard Type RCP5-RA8C and RA8R　Dustproof/Splash Proof Type RCP5W-RA8C

Item		Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700
Rod Tip Static Allowable Load	[N]		180.0	150.3	128.9	112.7	99.9	89.7	81.3	74.3	68.3	63.1	58.6	54.6	51.1	47.9
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	73.6	60.3	51.0	44.1	38.7	34.3	30.7	27.7	25.2	23.0	21.1	19.4	17.8	16.5
	[N]	Load Offset Distance 100 mm	57.0	48.6	42.5	37.8	33.8	30.5	27.6	25.2	23.1	21.2	19.5	18.1	16.7	15.5
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less													
Rod Tip Static Allowable Torque	[N•m]		18.1	15.2	13.0	11.4	10.2	9.2	8.4	7.7	7.1	6.6	6.1	5.8	5.4	5.1
Rod Tip Dynamic Allowable Torque	[N•m]		5.7	4.9	4.3	3.8	3.4	3.0	2.8	2.5	2.3	2.1	2.0	1.8	1.7	1.5
Rod Non–Rotation Accuracy (Note 1)	[deg]		0													

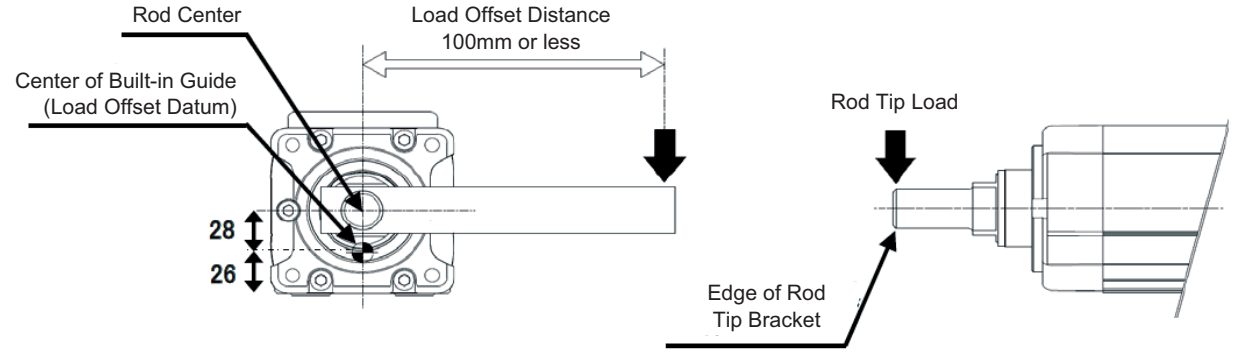
(Note 1) It shows the displacement angle in the rod rotational direction at no load.



Standard Type RCP5-RA10C and RA10R　Dustproof/Splash Proof Type RCP5W-RA10C

Item		Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Rod Tip Static Allowable Load	[N]		316.9	268.4	232.6	205.1	183.4	165.7	151.0	138.6	128.1	119.0	111.0	103.9	97.7	92.1	87.0	82.5
Rod Tip Dynamic Allowable Load (Operating life 5000km Remaining Probability 90%)	[N]	Load Offset Distance 0 mm	119.1	99.1	84.7	73.8	65.3	58.5	52.8	48.1	44.0	40.5	37.5	34.8	32.4	30.2	28.3	26.5
	[N]	Load Offset Distance 100 mm	100.7	85.9	74.9	66.3	59.3	53.6	48.8	44.7	41.2	38.1	35.4	32.9	30.8	28.8	27.0	25.4
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less															
Rod Tip Static Allowable Torque	[N•m]		31.8	27.0	23.4	20.7	18.5	16.8	15.3	14.1	13.1	12.2	11.4	10.7	10.1	9.6	9.1	8.6
Rod Tip Dynamic Allowable Torque	[N•m]		10.1	8.6	7.5	6.6	5.9	5.4	4.9	4.5	4.1	3.8	3.5	3.3	3.1	2.9	2.7	2.5
Rod Non–Rotation Accuracy (Note 1)	[deg]		0															

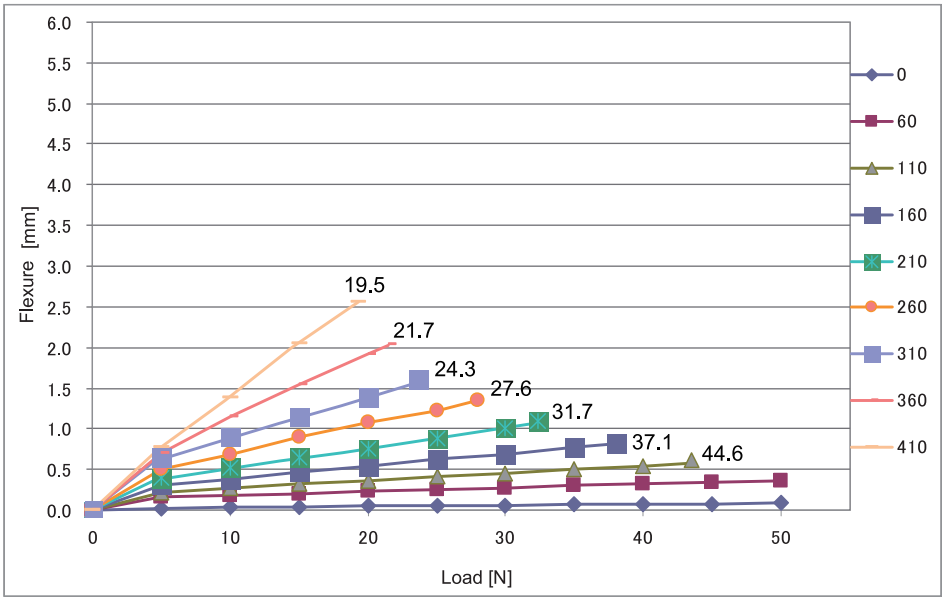
(Note 1) It shows the displacement angle in the rod rotational direction at no load.



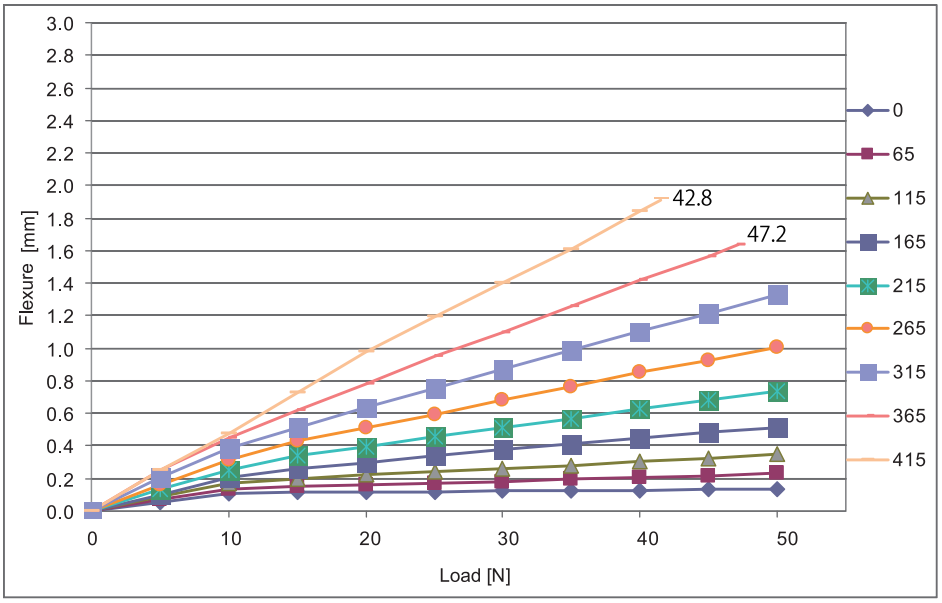
1.2.7 Rod Flexure (Reference)

(Note) This is the flexure of the rod when the actuator is installed holizontally.
It does not include the flexure caused by the weight of itself.

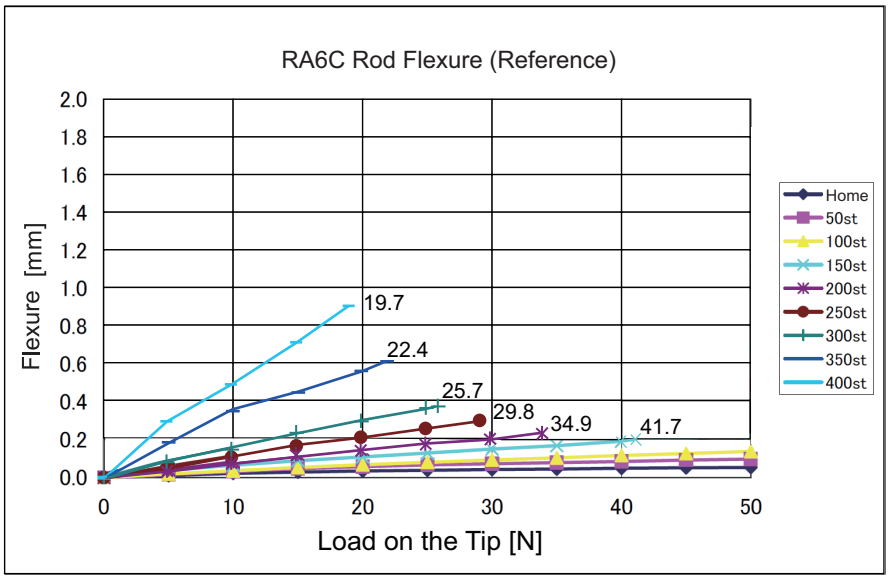
Standard Type RCP5-RA4C, RA4R Rod Flexure (Reference)



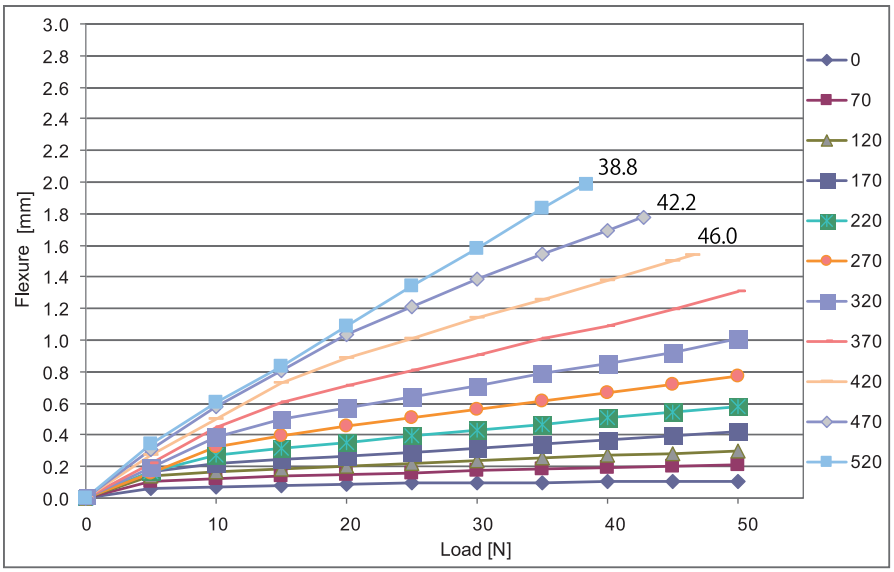
Standard Type RCP5-RA6C, RA6R Rod Flexure (Reference)



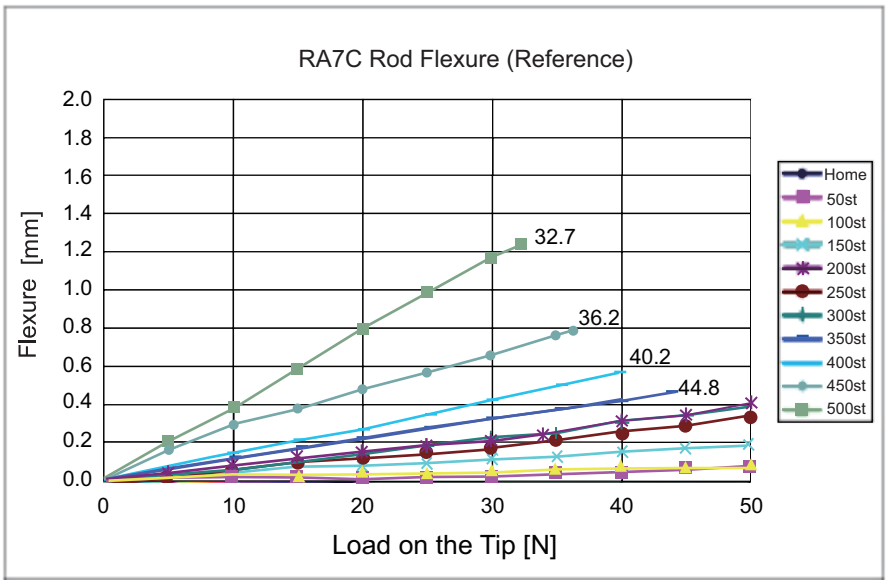
Dustproof/Splash Proof Type RCP5W-RA6C Rod Flexure (Reference)



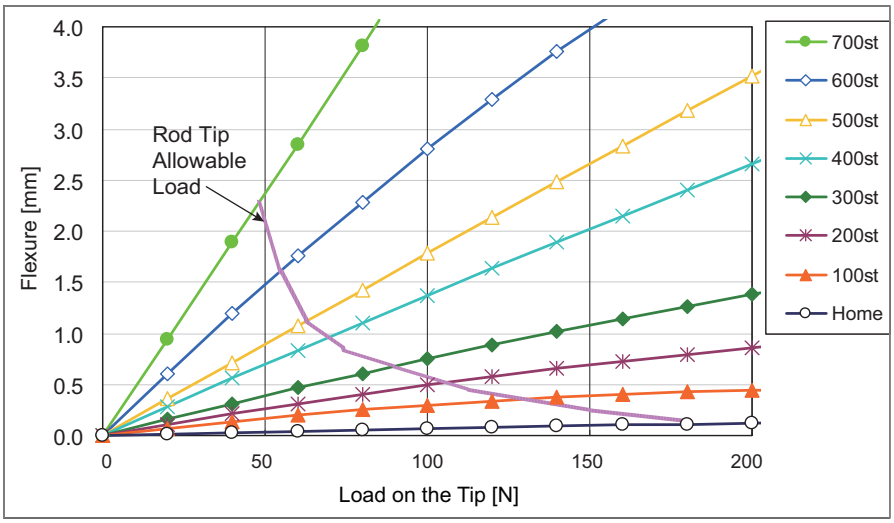
Standard Type RCP5-RA7C, RA7R Rod Flexure (Reference)



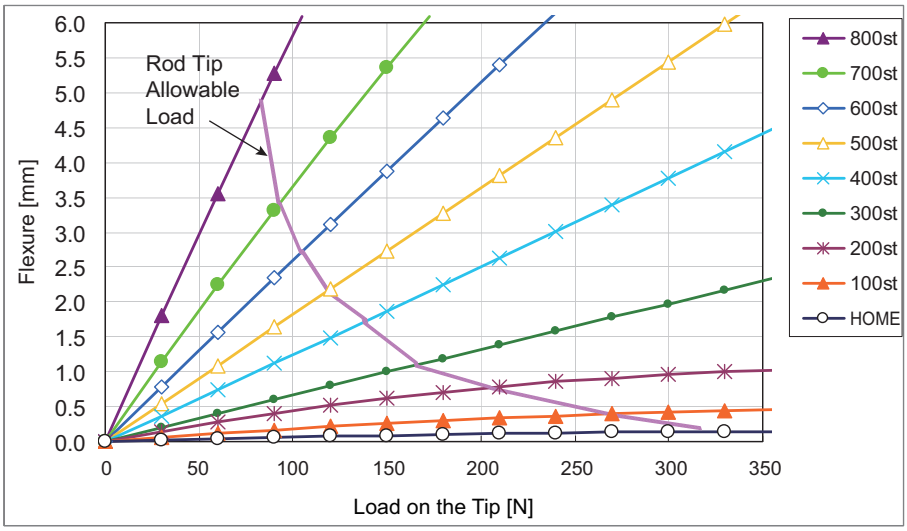
Dustproof/Splash Proof Type RCP5W-RA7C Rod Flexure (Reference)



Standard Type RCP5-RA8C, RA8R Dustproof/Splash Proof Type RCP5W-RA8C
Rod Flexure (Reference)



Standard Type RCP5-RA10C, RA10R Dustproof/Splash Proof Type RCP5W-RA10C
Rod Flexure (Reference)



1.2.8 Continuous Operation Duty

Continuous operation is available with the duty ratio 100%.
Duty ratio is the rate of operation expressed in % that presents the time of the actuator being operated in 1 cycle of operation.

1.2.9 Protection Class

Model	Class
RCP5W-RA6C, RA7C	IP67
RCP5W-RA8C, RA10C	IP65

⚠ Caution: The actuator cannot be operated under the water.

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.

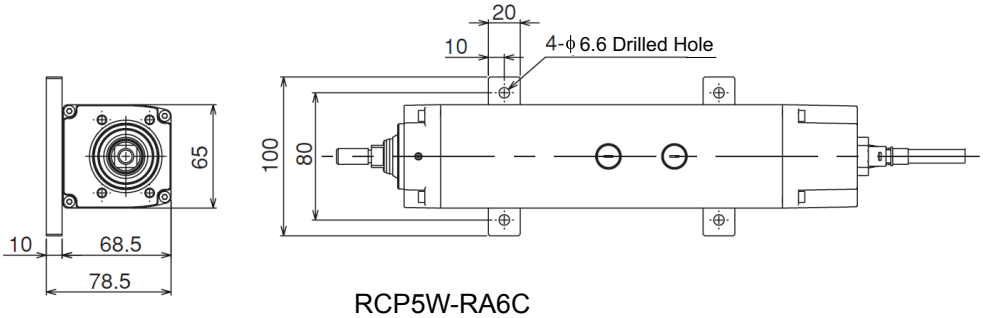
1.3.2 Reversed-home Specification (Model : NM)

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 Foot Bracket (Model: FT)

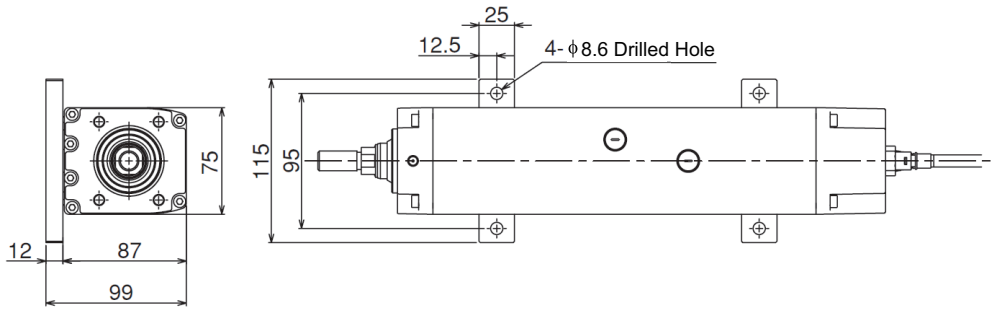
Applicable Units: Dustproof/Splash Proof Type RCP5W-RA6C, RA7C
It is a bracket to attach on the bottom of the actuator body and affix the actuator with bolts from the top side.

[Model code of single product : RCP5W-FT-RA6]



RCP5W-RA6C

[Model code of single product : RCP5W-FT-RA7]

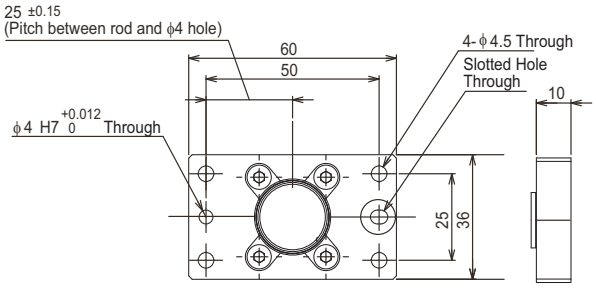


RCP5W-RA7C

1.3.4 Flange Bracket (Front) (Model: FL)

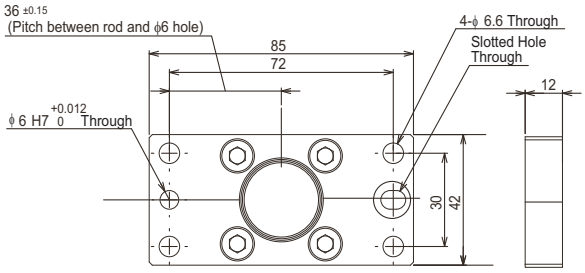
This is the flange bracket to attach on the front of the main unit.

[Model code of single product : RCP5-FL-RA4]



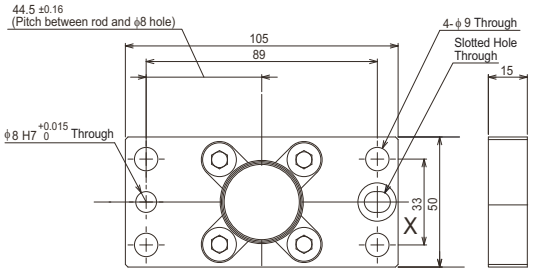
RCP5-RA4C and RA4R

[Model code of single product : RCP5-FL-RA6]



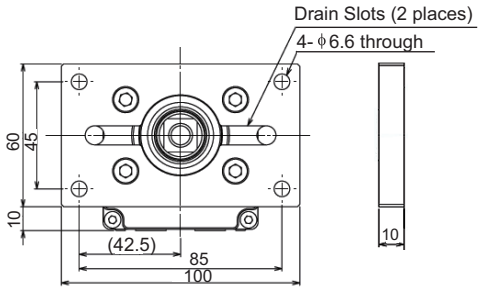
RCP5-RA6C and RA6R

[Model code of single product : RCP5-FL-RA7]



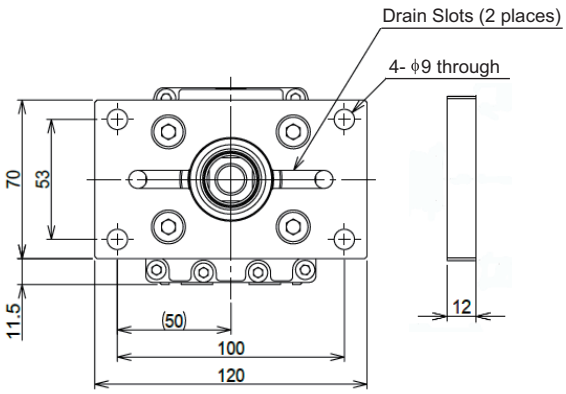
RCP5-RA7C and RA7R

[Model code of single product : RCP5W-FL-RA6]



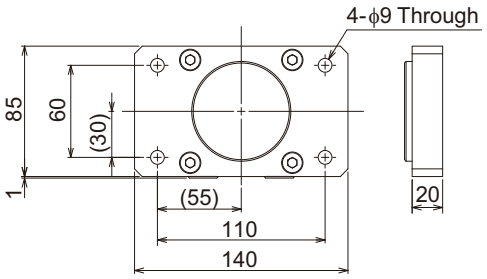
RCP5W-RA6C

[Model code of single product : RCP5W-FL-RA7]



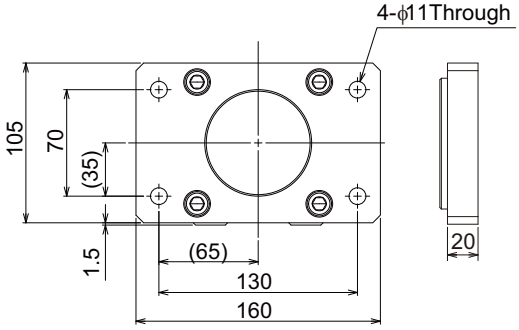
RCP5W-RA7C

[Model code of single product : RCP5-FL-RA8]



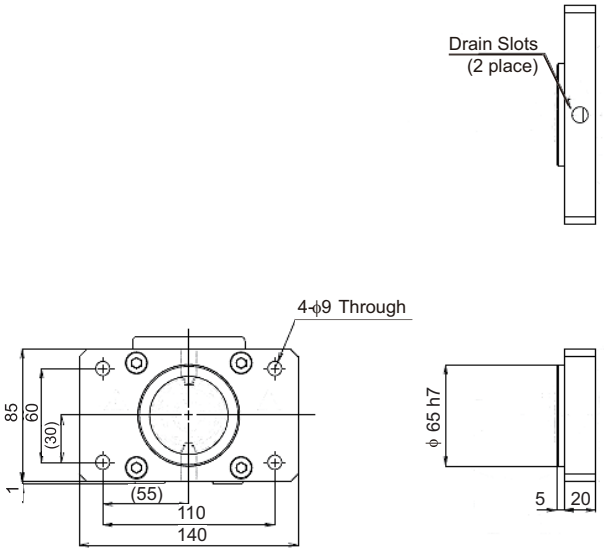
RCP5-RA8C and RA8R

[Model code of single product : RCP5-FL-RA10]



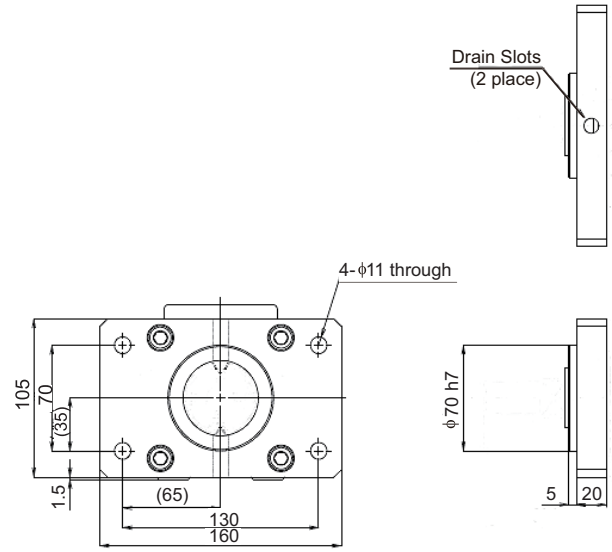
RCP5-RA10C and RA10R

[Model code of single product : RCP5W-FL-RA8]



RCP5W-RA8C

[Model code of single product : RCP5W-FL-RA10]



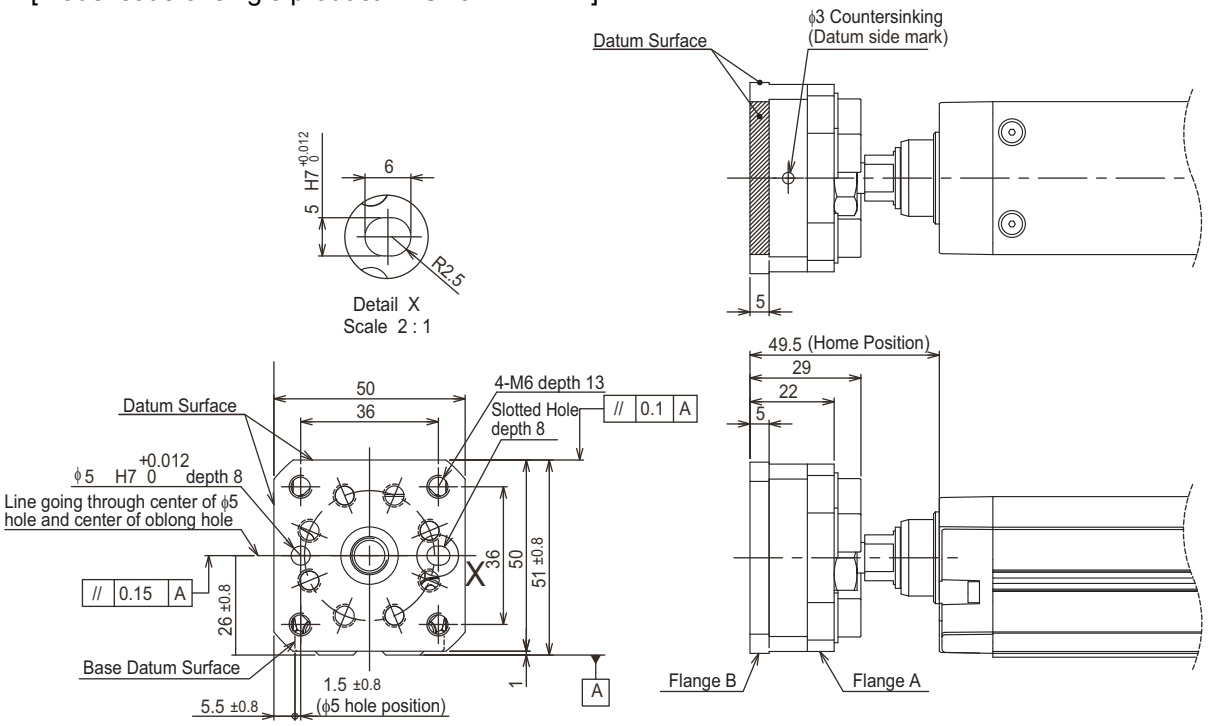
RCP5W-RA10C

1.3.5 Tip Adapter (Flange) (Model No. : FFA)

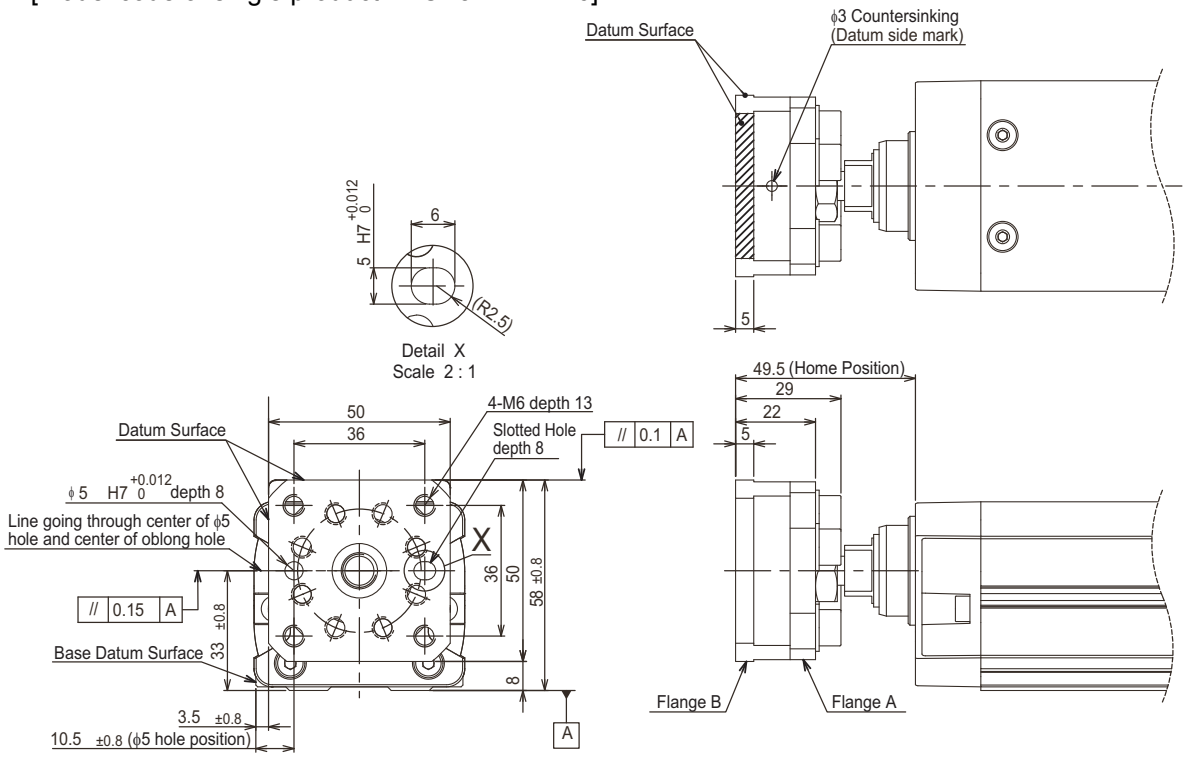
Applicable Units: Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R

This is an adapter to attach on the rod end an object such as a fixture with four screws.
(Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
(Note) In the delivery of IAI, the screws are glued.

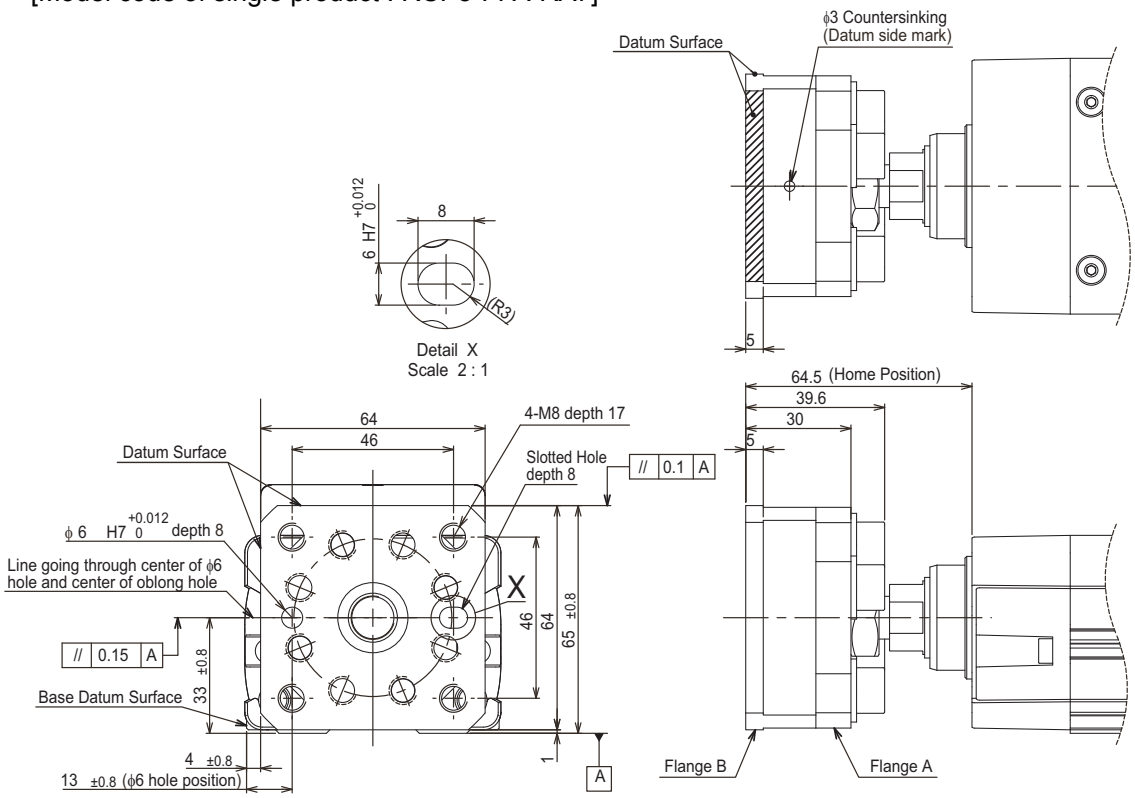
◎RA4C and RA4R
[Model code of single product : RCP5-FFA-RA4]



◎RA6C and RA6R
[Model code of single product : RCP5-FFA-RA6]



◎RA7C and RA7R
[Model code of single product : RCP5-FFA-RA7]

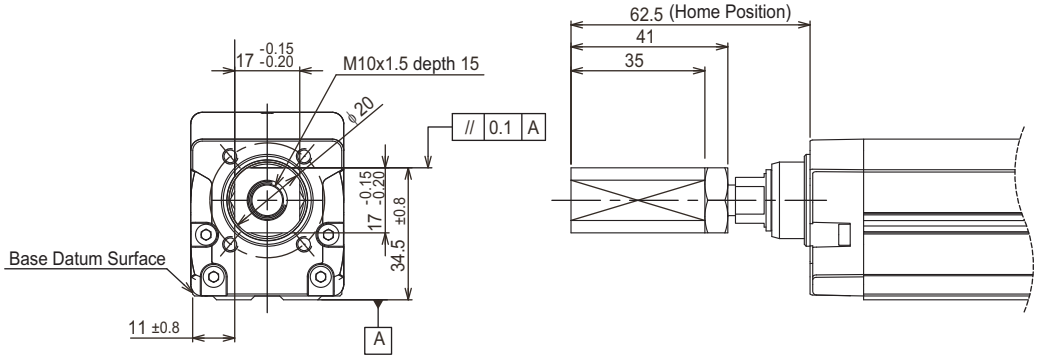


1.3.6 Tip Adapter (Internal Thread) (Model No. : NFA)

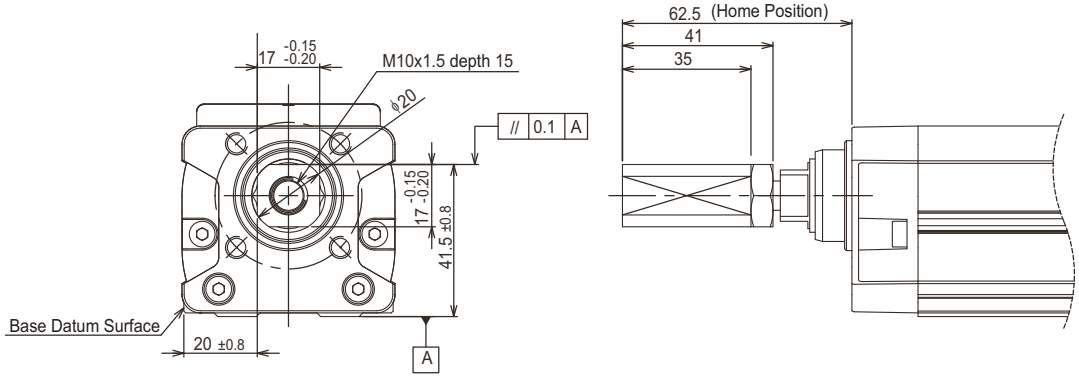
Applicable Units: Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R

This is an adapter to attach on the rod end an object such as a fixture with one screw.
(Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
(Note) In the delivery of IAI, the screws are glued.

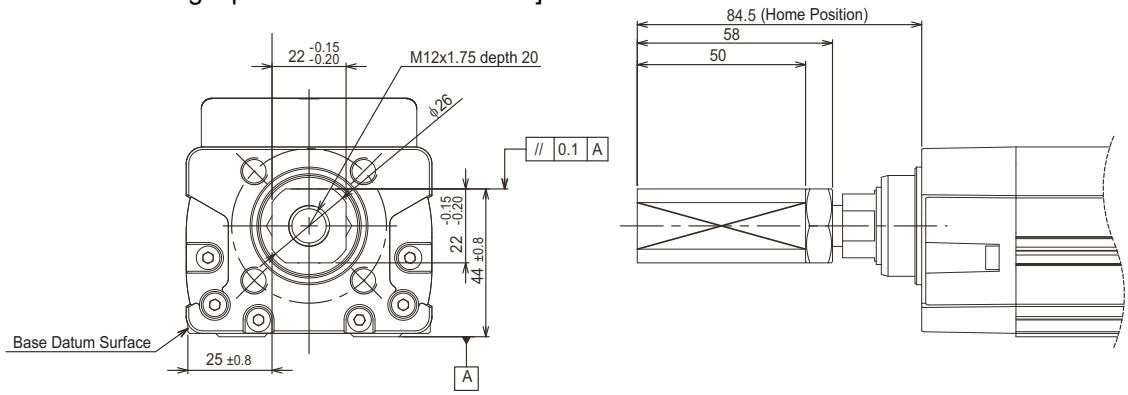
◎RA4C and RA4R
[Model code of single product : RCP5-NFA-RA4]



◎RA6C and RA6R
[Model code of single product : RCP5-NFA-RA6]



◎RA7C and RA7R
[Model code of single product : RCP5-NFA-RA7]

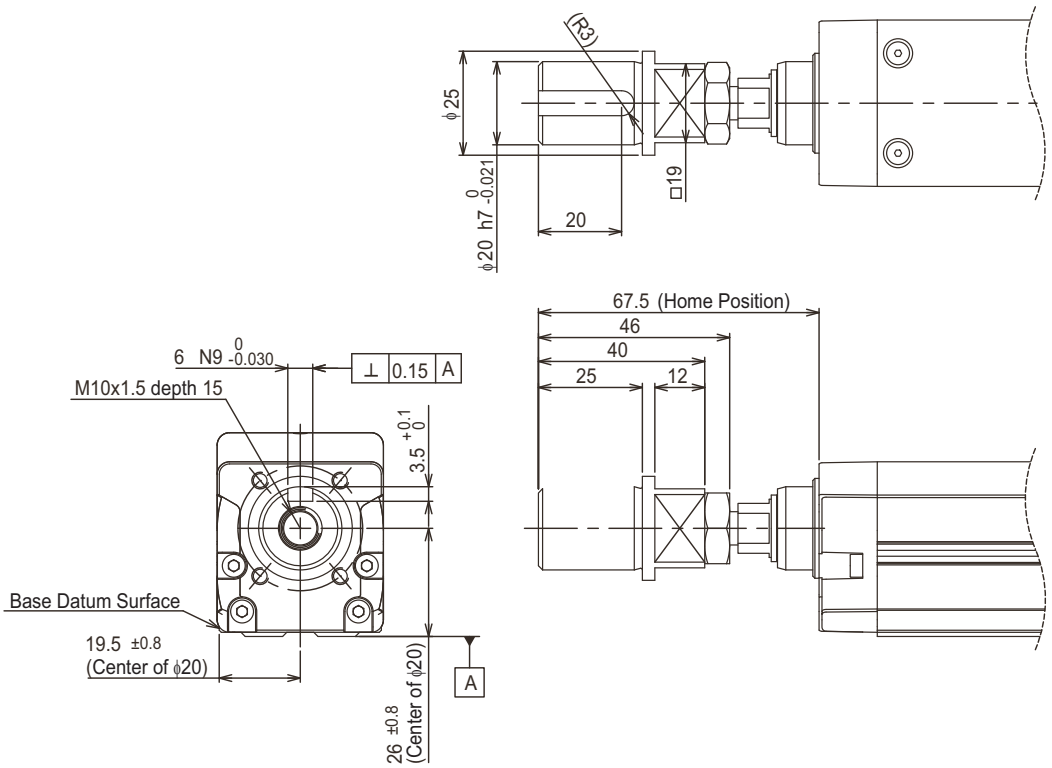


1.3.7 Tip Adapter (Keyway) (Model No. : KFA)

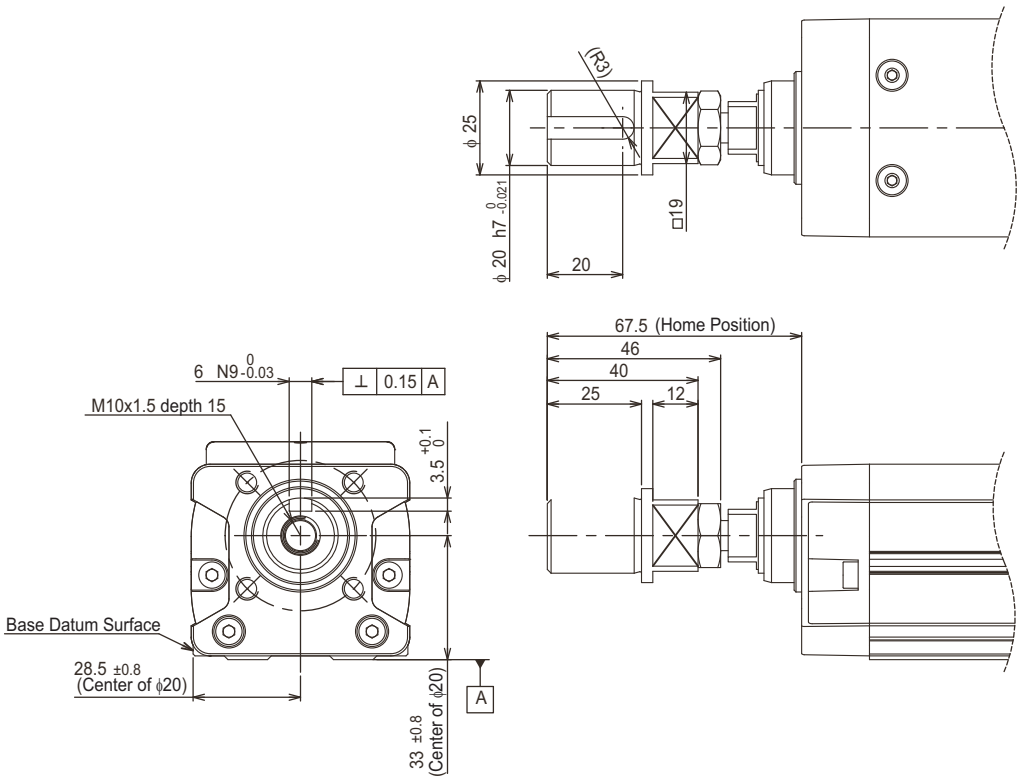
Applicable Units: Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R

This is an adapter to attach on the rod end an object such as a fixture with one screw and a parallel key.
(Note) In the delivery of IAI, the perpendicularity is secured in the way described in the figure.
(Note) In the delivery of IAI, the screws are glued.

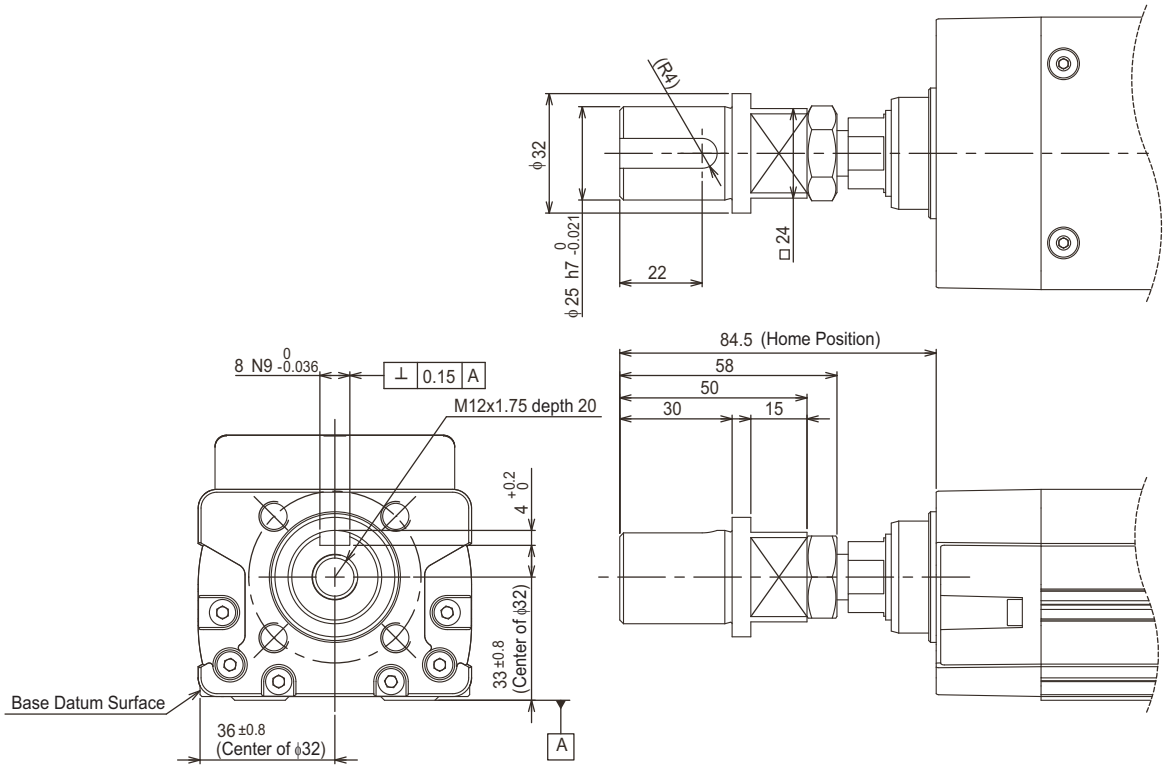
◎RA4C and RA4R
[Model code of single product : RCP5-KFA-RA4]



◎RA6C and RA6R
[Model code of single product : RCP5-KFA-RA6]



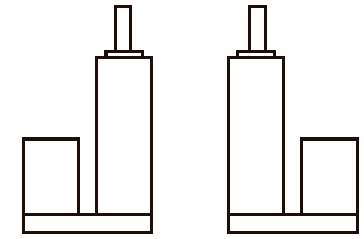
◎RA7C and RA7R
[Model code of single product : RCP5-KFA-RA7]



1.3.8 Motor Left Reversed, Motor Right Reversed (Model No. : ML, MR)

Applicable Units: RA4R, RA6R, RA7R, RA8R and RA10R

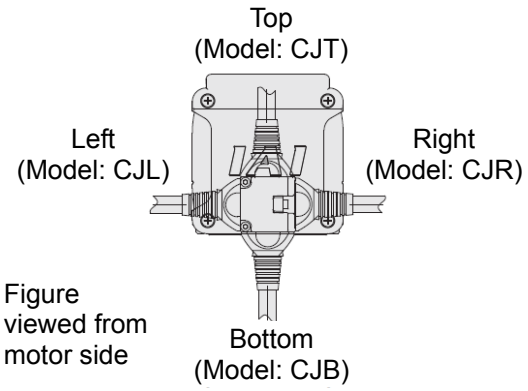
From the view of the motor side, the type with the motor reversed to the left is ML, and the motor reversed to the right is MR.

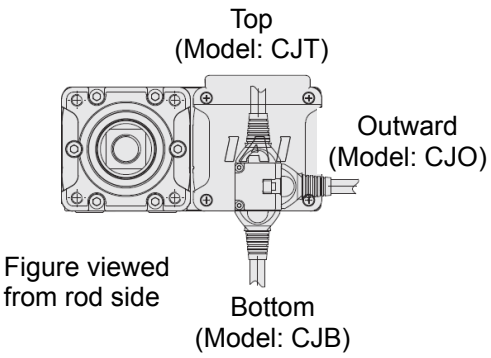


1.3.9 Cable Eject Direction Changed (Model No. : CJT, CJR, CJL, CJB, CJO)

Applicable Units: Standard Type RCP5

If a change in the cable ejection direction is made, the direction of cable ejection will be changed. There are ejection directions, top (model code: CJT), right (model code: CJR), left (model code: CJL), bottom (model code: CJB) and outward (model code: CJO). CJO can be selected only in RA4R, RA6R, RA7R, RA8C, RA8R, RA10C and RA10R.

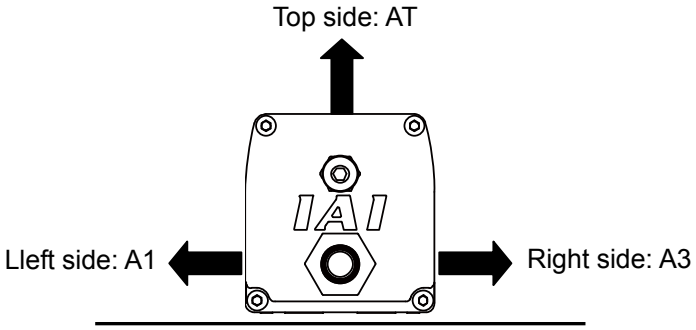




1.3.10 Cable Eject Direction Changed (Model No. : Top Side AT, Right Side A3, Left Side A1)

Applicable Units: Dustproof/Splash Proof Type RCP5W-RA6C, RA7C

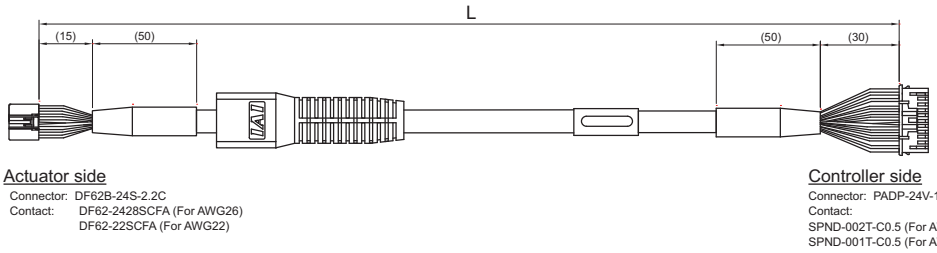
The direction of cable ejection is changed.
There are three types of ejection directions, top side (model code: AT), right side (model code: A3), left side (model code: A1).



1.4 Motor • Encoder Cables

1.4.1 Motor • Encoder Integrated Cables (RA4, RA6 and RA7)

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



Connection diagram

Actuator side

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

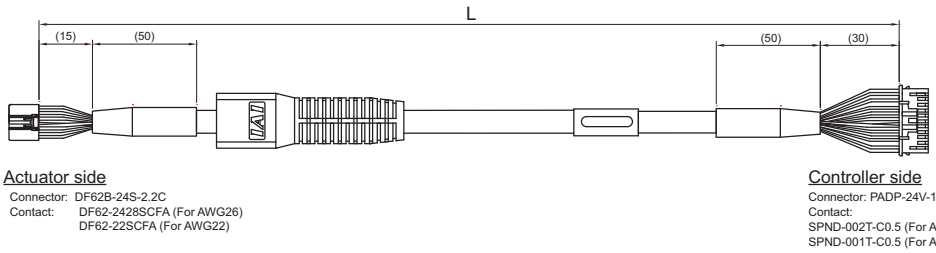
Controller side

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

1.4.2 Motor • Encoder Integrated Cables Robot Type (RA4, RA6 and RA7)

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

Connection diagram

Actuator side

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

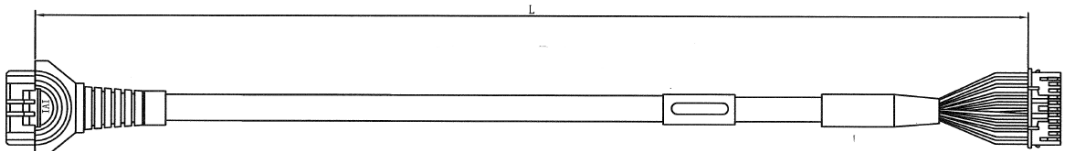
Controller side

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

1.4.3 Motor • Encoder Integrated Cables (RA8 and RA10)

CB-CFA3-MPA□□□
□□□ indicates the cable length (L) (Example: 030=3m), Max.20m



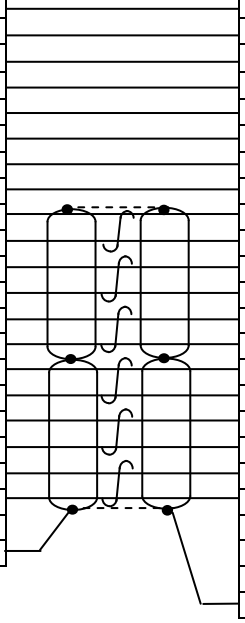
Actuator side
Connector: 1-1827863-1
Contact: 1827570-2

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

Connection diagram

Actuator side

Thickness	Electric Wire Color	Symbol	Pin No.
AWG22/19	Blue	ϕA	A1
AWG22/19	Orange	VMM	B1
AWG22/19	Green	ϕ_A	A2
AWG22/19	Brown	ϕB	B2
AWG22/19	Gray	VMM	A3
AWG22/19	Red	ϕ_B	B3
AWG26	Black	LS+	A4
AWG26	Yellow	LS-	B4
AWG26	Blue	SA	A6
AWG26	Orange	SB	B6
AWG26	Green	A+	A7
AWG26	Brown	A-	B7
AWG26	Gray	B+	A8
AWG26	Red	B-	B8
AWG26	Blue	BK+	A5
AWG26	Orange	BK-	B5
AWG26	Green	LS_GND	A9
AWG26	Brown	VPS	B9
AWG26	Gray	VCC	A10
AWG26	Red	GND	B10
-	-		A11
AWG26	Black	FG	B11



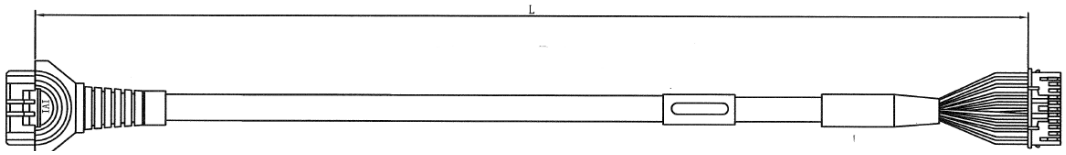
Controller side

Pin No.	Symbol	Electric Wire Color	Thickness
1	ϕA	Blue	AWG22/19
2	VMM	Orange	AWG22/19
5	ϕ_A	Green	AWG22/19
3	ϕB	Brown	AWG22/19
4	VMM	Gray	AWG22/19
6	ϕ_B	Red	AWG22/19
7	LS+	Black	AWG26
8	LS-	Yellow	AWG26
11	SA	Blue	AWG26
12	SB	Orange	AWG26
13	A+	Green	AWG26
14	A-	Brown	AWG26
15	B+	Gray	AWG26
16	B-	Red	AWG26
9	BK+	Blue	AWG26
10	BK-	Orange	AWG26
20	LS_GND	Green	AWG26
18	VPS	Brown	AWG26
21	VCC	Gray	AWG26
19	GND	Red	AWG26
17	-	-	-
22	-		AWG26
23	-	-	-
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.

1.4.4 Motor • Encoder Integrated Cables Robot Type (RA8 and RA10)

CB-CFA3-MPA□□□-RB
□□□ indicates the cable length (L) (Example: 030=3m), Max.20m



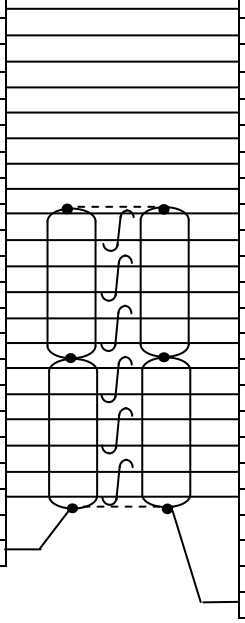
Actuator side
Connector: 1-1827863-1
Contact: 1827570-2

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

Connection diagram

Actuator side

Thickness	Electric Wire Color	Symbol	Pin No.
AWG22/19	Blue	ϕA	A1
AWG22/19	Orange	VMM	B1
AWG22/19	Green	ϕ_A	A2
AWG22/19	Brown	ϕB	B2
AWG22/19	Gray	VMM	A3
AWG22/19	Red	ϕ_B	B3
AWG26	Black	LS+	A4
AWG26	Yellow	LS-	B4
AWG26	Blue	SA	A6
AWG26	Orange	SB	B6
AWG26	Green	A+	A7
AWG26	Brown	A-	B7
AWG26	Gray	B+	A8
AWG26	Red	B-	B8
AWG26	Blue	BK+	A5
AWG26	Orange	BK-	B5
AWG26	Green	LS_GND	A9
AWG26	Brown	VPS	B9
AWG26	Gray	VCC	A10
AWG26	Red	GND	B10
-	-		A11
AWG26	Black	FG	B11



Controller side

Pin No.	Symbol	Electric Wire Color	Thickness
1	ϕA	Blue	AWG22/19
2	VMM	Orange	AWG22/19
5	ϕ_A	Green	AWG22/19
3	ϕB	Brown	AWG22/19
4	VMM	Gray	AWG22/19
6	ϕ_B	Red	AWG22/19
7	LS+	Black	AWG26
8	LS-	Yellow	AWG26
11	SA	Blue	AWG26
12	SB	Orange	AWG26
13	A+	Green	AWG26
14	A-	Brown	AWG26
15	B+	Gray	AWG26
16	B-	Red	AWG26
9	BK+	Blue	AWG26
10	BK-	Orange	AWG26
20	LS_GND	Green	AWG26
18	VPS	Brown	AWG26
21	VCC	Gray	AWG26
19	GND	Red	AWG26
17	-	-	-
22	-		AWG26
23	-	-	-
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. 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. The package is not applied with any special treatment that enables it to resist an impact caused by a drop or crash.
- Transport a heavy package with at least more than two operators. Consider an appropriate method for transportation.
- 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 unit 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 base when transporting the actuator.
- Do not apply an excessive force to each part of the actuator. Inparticular, prevent the motor unit and rear bracket from receiving an unnecessary force.

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 accidently move during transportation.The actuators are also fixed so the tip of it would not shake due to the external vibration.

(1) How to Handle the Package

- 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 anything on the package that could deform or damage it.

(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):

- Fix the rod so that it would not move during transportation.
- 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
- Dustproof/splash proof type RCP5W possesses the protection structure against dust and water equivalent to IP65.
- 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)
  (Dustproof/splash proof type RCP5W-RA6C and RA7C possesses the protection structure against dust equivalent to IP67.)
  (Dustproof/splash proof type RCP5W-RA8C and RA10C possesses the protection structure against dust equivalent to IP65.)
- Where the actuator is subject to splashed water, oil (including oil mist or cutting fluid) or chemical solutions
  (Dustproof/splash proof type RCP5W-RA6C and RA7C possesses the protection structure against water equivalent to IP67.)
  (Dustproof/splash proof type RCP5W-RA8C and RA10C possesses the protection structure against water equivalent to IP65.)
- 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

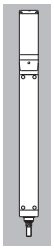
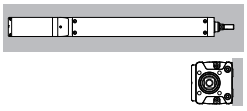
Follow the information below when installing the actuator, as a rule.
Do pay attention to these items (except with custom-order models).

○ : 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 RA10C, RA10R	○	○	○	○

(Note) The motor types 42SP and 56SP for Dustproof/Splash Proof Type RCP5W-RA6C and RA7C are dedicated for vertical orientation. They are equipped with a brake in standard.

Installation Orientation

Horizontal	Vertical	Sideways	Ceiling mount
			

⚠ Caution: 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

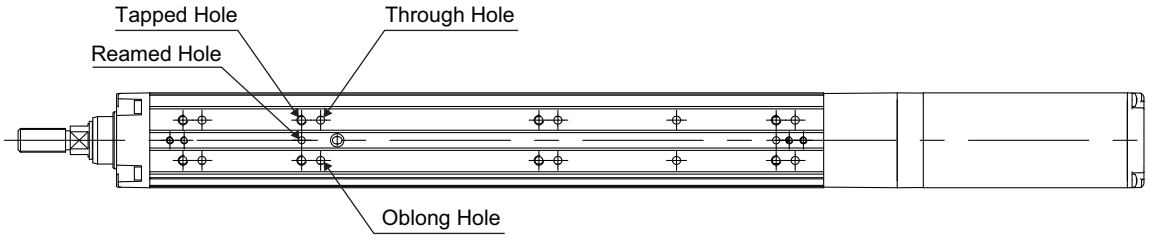
The surface to mount the main unit should be a machined surface or a plane that possesses an equivalent accuracy and the flatness should be within 0.05mm/m. Also, the platform should have a structure stiff enough to install the unit so it would not generate vibration or other abnormality.

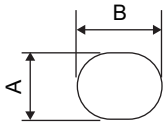
Also consider enough space necessary for maintenance work such as actuator replacement and inspection.
On the base there is a datum surface prepared for the attachment slotted holes.
On the back side of the actuator, there are attachment tapped holes, through holes (Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R), T-slot (Dustproof/Splash Proof Type RCP5W-RA6C and RA7C), positioning reamed holes and slotted holes. For the details of the positions and dimensions, check in the appearance drawings. [Refer to 6. “External Dimensions”]
When repeatability in re-attaching is required after it is detached, utilize the reamed holes. Please note, however, that a consideration is necessary such as to use only one point on the motor side of the reamed holes when a fine-tuning such as perpendicularity is required.

[1] Using the Tapped Holes on the Bottom of the Base

This actuator has tapped holes for mounting so it can be fixed from the bottom of the base.
(Note that the tapped holes size depends on the model. Please see the diagrams below and 6. “External Dimensions”)
Also, there are reamed holes and a oblong hole for positioning pins.

- Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R

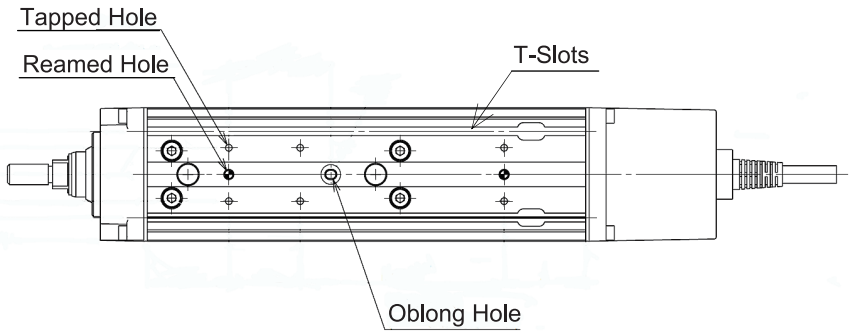


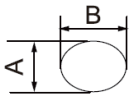


Oblong Hole

Model Name	Tapped Hole Size	Tapped Holes Depth	Tightening Torque		Reamed Hole [mm]	Oblong Hole
			In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:		
RCP5-RA4C RA4R	M4	Through (screwed depth should be 6mm max.)	3.59N•m (0.37kgf·m)	1.76N•m (0.18kgf•m)	ϕ3H7 Depth 4	A:3 $^{+0.010}_{0}$ B:4 Depth 4mm or less
RCP5-RA6C RA6R	M5	Through (screwed depth should be 10mm max.)	7.27N•m (0.74kgf•m)	3.42N•m (0.35kgf•m)	ϕ4H7 Depth 5.5	A:4 $^{+0.012}_{0}$ B:5 Depth 5.5mm or less
RCP5-RA7C RA7R	M5	9mm	7.27N•m (0.74kgf•m)	3.42N•m (0.35kgf•m)	ϕ4H7 Depth 6	A:4 $^{+0.012}_{0}$ B:5 Depth 6mm or less

- Dustproof/Splash Proof Type RCP5W-RA6C and RA7C

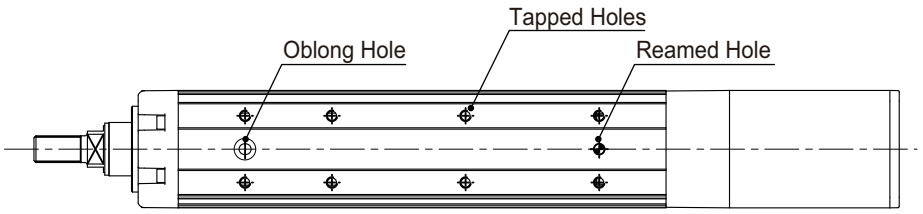


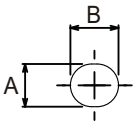


Oblong Hole

Model Name	Tapped Hole Size	Tapped Holes Depth	Tightening Torque		Reamed Hole [mm]	Oblong Hole
			In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:		
RCP5W-RA6C	M4	6mm	2.07N·m (0.21kgf·m)	2.07N·m (0.21kgf·m)	ϕ4H7depth 6.5	A:4 $^{+0.012}_{0}$ B:5 Depth 6.5mm or less
RCP5W-RA7C	M5	7.5mm	4.17N·m (0.426kgf·m)	4.11N·m (0.419kgf·m)	ϕ4H7depth 6.5	A:4 $^{+0.012}_{0}$ B:5 Depth 6.5mm or less

- Standard Type RCP5-RA8C, RA8R, RA10C and RA10R, Dustproof/Splash Proof Type RCP5W-RA8C and RA10C





Oblong Hole

◎ Standard Type

Model Name	Tapped Hole Size	Tapped Holes Depth	Tightening Torque		Reamed Hole [mm]	Oblong Hole
			In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:		
RCP5-RA8C RA8R	M8	Through (screwed depth should be 12mm max.)	30.0N•m (3.06kgf･m)	11.4N•m (1.17kgf•m)	ϕ8H7 Depth 6.5	A:8 $^{+0.015}_{0}$ B:9 Depth 6.5mm or less
RCP5-RA10C RA10R	M10	Through (screwed depth should be 15mm max.)	59.3N•m (6.06kgf•m)	23.3N•m (2.38kgf•m)	ϕ10H7 Depth 6.5	A:10 $^{+0.015}_{0}$ B:11 Depth 6.5mm or less

◎ Dustproof/Splash Proof Type

The tapped holes on dustproof/splash proof type RCP5W are not through holes.
Other values are the same as standard type RCP5.

Model Name	Tapped Hole Size	Tapped Holes Depth	Tightening Torque		Reamed Hole [mm]	Oblong Hole
			In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:		
RCP5W-RA8C	M8	8.5mm	30.0N･m (3.06kgf･m)	11.4N･m (1.17kgf･m)	ϕ8H7 Depth 6.5	A:8 $^{+0.015}_{0}$ B:9 Depth 6.5mm or less
RCP5W-RA10C	M10	10mm	59.3N･m (6.06kgf･m)	23.3N･m (2.38kgf･m)	ϕ10H7 Depth 6.5	A:10 $^{+0.015}_{0}$ B:11 Depth 6.5mm or less

Tightening screws

- Use hexagonal socket head bolts for the male threads for installing the base.
- Use stainless steel screws for dustproof/splash proof type RCP5W.
- Use of high–tension bolts meeting at least ISO 10.9 is recommended.
- The length of thread engagement for screws should be 6mm max. for RA4C/RA4R, approx. 1.8 times more than the nominal diameter for RCP5-RA6C/RA6R, RCP5-RA7C/RA7R, 12mm max. for RCP5-RA8C/RA8R and 15mm max. for RCP5-RA10C/RA10R, and pay attention not to stick the screw out inside the actuator. for RCP5W-RA6C, 6.0mm max. RCP5W-RA7C, 7.5mm max. RCP5W-RA8C, 8.5mm max. for RCP5W-RA10C, 10mm max.

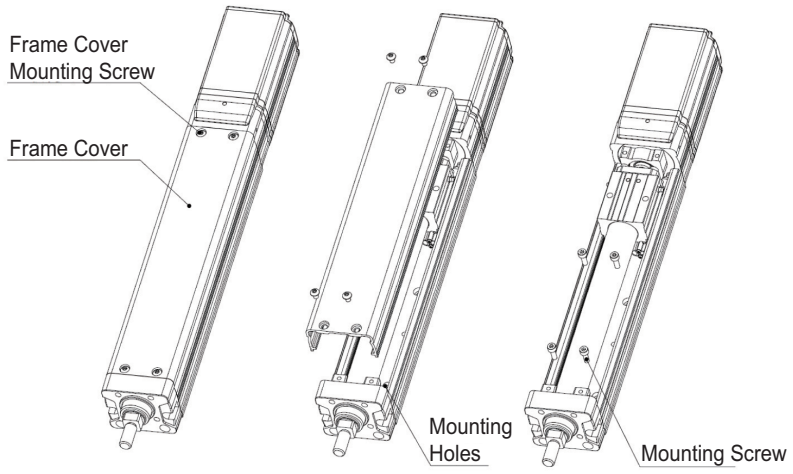
⚠ Caution: Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the tapped holes may be damaged, actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

[2] Using the Mounting Holes on the Top of the Base

For Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R, there are through holes equipped on the base so the unit can be attached from the top of the base.
To install the unit, loosen the frame cover mounting screws with a 1.5mm-sized (for RA4C, RA4R) or 2.5mm-sized (for RA6C, RA6R, RA7C and RA7R) hex wrench to detach the frame cover. (Remove 4 hex socket head cap screws.)
For the RA4C, RA4R attach the unit with the rod pulled out to avoid interference with the rod.
The rod cannot be driven only with ROBO Cylinder itself if it is equipped with a brake.
Detach the motor unit once to move the rod for installation, and put the motor unit back on. [Refer to 5.8 “Replacement Process”]
Or, connect a controller and have JOG operation to move the rod to perform installation.

- Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R

(Note) The two attachment holes on RA4C and RA4R sides cannot be used for attachment. Pay attention even though there is no problem in use.



When affixing the frame cover, tighten the screws with the tightening torque described below.

Model Name	Screw Diameter	Tightening Torgue
RA4C, RA4R	M3	0.62N•M (0.06kgf•m)
RA6C, RA6R	M4	1.76N•M (0.18kgf•m)
RA7C, RA7R	M4	1.76N•M (0.18kgf•m)

Apply the socket head cap screw indicated in the table below suitable for the platform material.

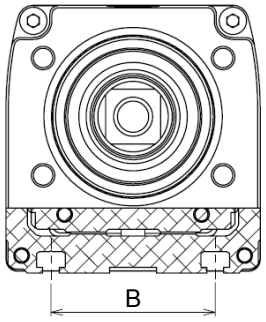
Model Name	Through Holes	Mounting Screw	Tightening Torque
RA4C, RA4R	ϕ3.4 drilled hole, ϕ6.5 counter boring depth 3.5	M3	0.83N•m (0.085kgf•m)
RA6C, RA6R	ϕ4.5 drilled hole, ϕ8 counter boring depth 4.5	M4	1.76N•m (0.18kgf•m)
RA7C, RA7R	ϕ6 drilled hole, ϕ9.5 counter boring depth 5.5	M5	3.42N•m (0.35kgf•m)

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.
- 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: Pay attention when choosing the screw length. In case that insufficient length of screws is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

[3] When using T Slots on Frame

There are T-shaped slots on the Dustproof/Splash Proof Type RCP5W-RA6C and RA7C frame for installation. By using these T-shaped slots, mount the unit directly.
Square nuts (4 pieces) for T-shaped slot are enclosed in standard.



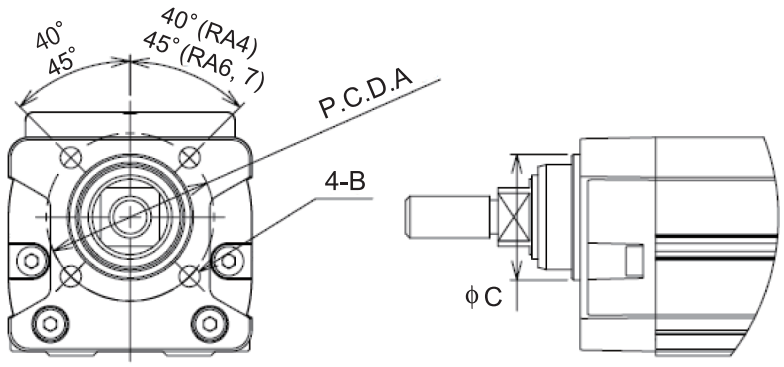
Model Name	Square nut	Screw	B	Tightening Torgue
RCP5W-RA6C	7×7 M4 t = 3.2	M4	42	2.07N·m (0.211kgf·m)
RCP5W-RA7C	8×8 M5 t = 4	M5	49	4.11N·m (0.419kgf·m)

⚠ Caution: Pay attention when choosing the screw length. In case that insufficient length of screws is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

[4] When using Tapped Holes on Front Bracket

There are tapped holes equipped on the front bracket.
Utilize these tapped holes for installation.
The effective depth for the attachment screws is as shown below;

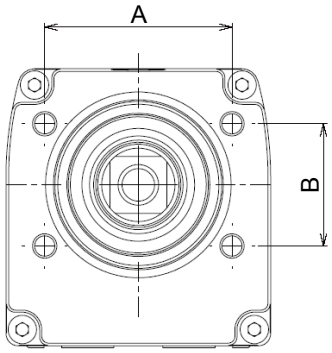
- Standard Type RCP5-RA4C, RA4R, RA6C, RA6R, RA7C and RA7R



Model Name	Tapped Hole Size B	A	Screw Effective Depth	Tightening Torque		ϕC
				In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:	
RCP5-RA4C RA4R	M4	30	8	3.59N•m (0.37kgf•m)	1.76N•m (0.18kgf•m)	ϕ24h7
RCP5-RA6C RA6R	M6	40	12	12.3N•m (1.26kgf•m)	5.4N•m (0.55kgf•m)	ϕ30h7
RCP5-RA7C RA7R	M8	46	16	30N•m (3.1kgf•m)	11.5N•m (1.2kgf•m)	ϕ35h7

- Dustproof/Splash Proof Type RCP5W-RA6C and RA7C

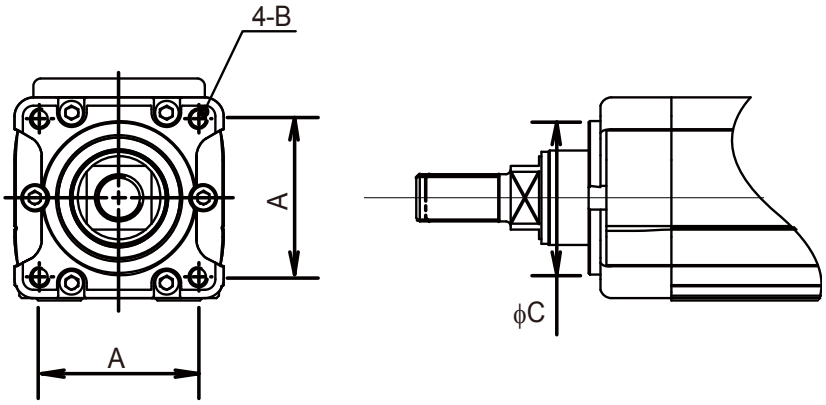
There are tapped holes equipped on the front housing.
Utilize these tapped holes for installation.
The effective depth for the attachment screws is as shown below;



Model Name	Tapped Hole Size B	B	A	Screw Effective Depth	Tightening Torque	
					In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:
RCP5W-RA6C	M6	46	30	9	7.09N·m (0.724kgf·m)	6.44N·m (0.657kgf·m)
RCP5W-RA7C	M8	55	42	12	17.22N·m (1.76kgf·m)	13.77N·m (1.41kgf·m)

- Standard Type RCP5-RA8C, RA8R, RA10C and RA10R　Dustproof/Splash Proof Type RCP5W-RA8C and RA10C

There are tapped holes equipped on the front bracket.
Utilize these tapped holes for installation.
The effective depth for the attachment screws is as shown below;



Model Name	Tapped Hole Size B	A	Screw Effective Depth	Tightening Torque		ϕC
				In the case that steel is used for the bolt seating surface:	In the case that aluminum is used for the bolt seating surface:	
RA8C RA8R	M8	67	16	30.0N•m (3.06kgf•m)	11.4N•m (1.17kgf•m)	ϕ 65h7
RA10C RA10R	M10	80	20	59.3N•m (6.06kgf•m)	23.3N•m (2.38kgf•m)	ϕ70h7

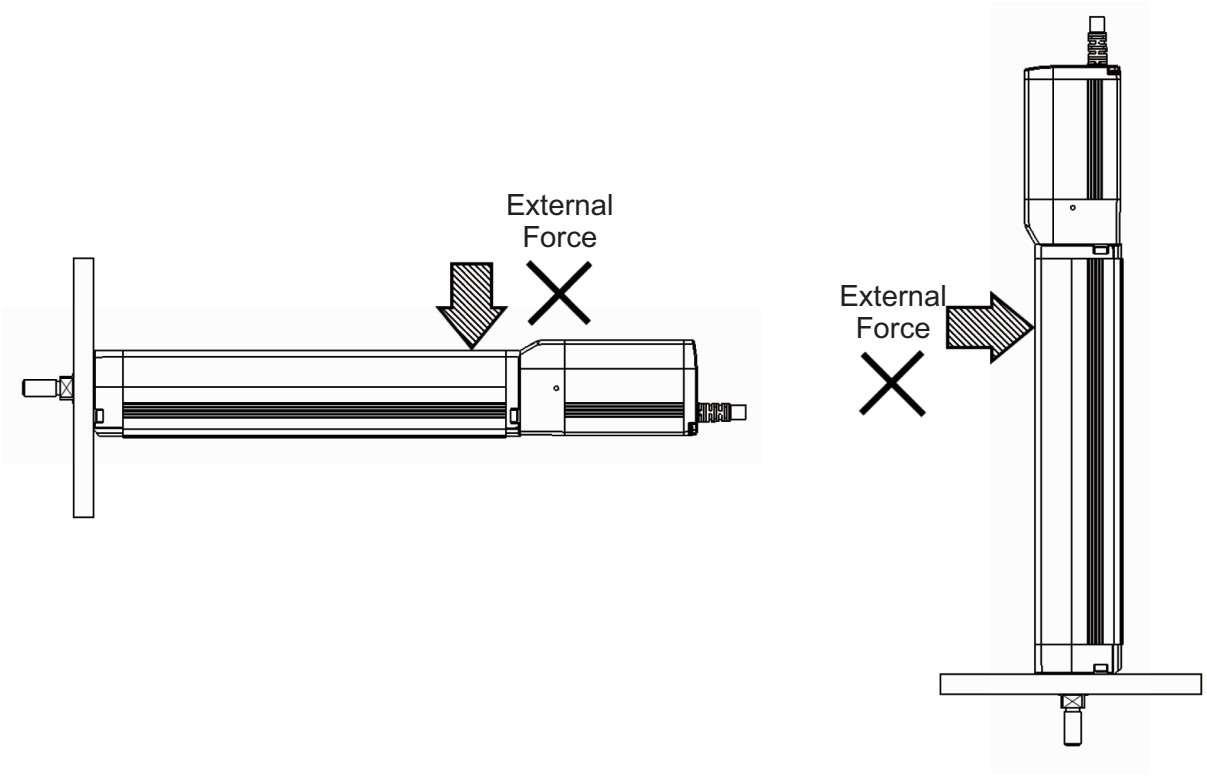
Make sure to follow "◎Caution for Installation using Front Bracket and Front Flange"

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.

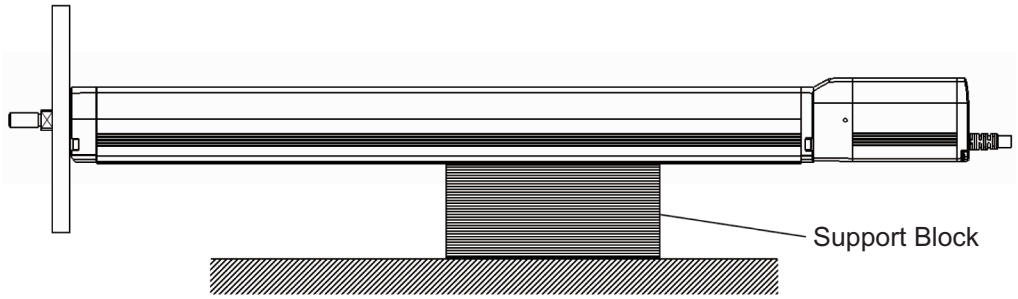
⚠ Caution: Pay attention when choosing the bolt length. In case that insufficient length of bolts is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

◎ Caution for Installation using Front Bracket

Do not attempt to apply any external force to the body when installing with front bracket. 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.



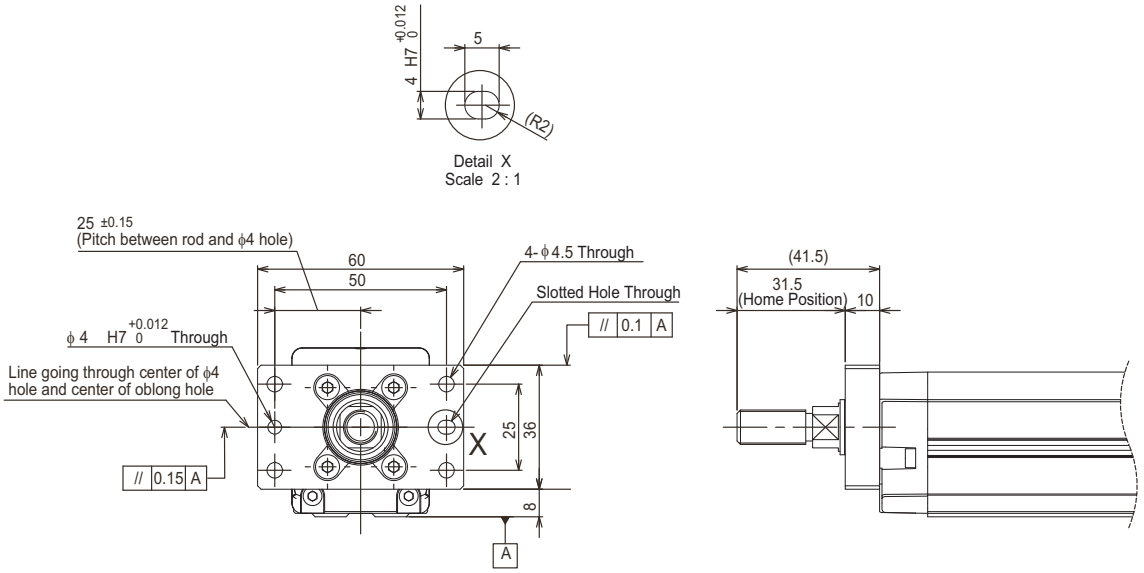
Operation of the actuator with attachment only on the front bracket applies the external force of the acceleration / deceleration multiplied by the weight of the actuator to the unit body.
Control the acceleration / deceleration at 0.05 G or less (for reference) when the actuator of RA8 or RA10 is moved with attachment only on the front bracket.

[4] When using Front Flange (Option)

There are tapped holes equipped on the front housing (Option).
Utilize these holes for the installation.
The attachment holes are located as shown below;

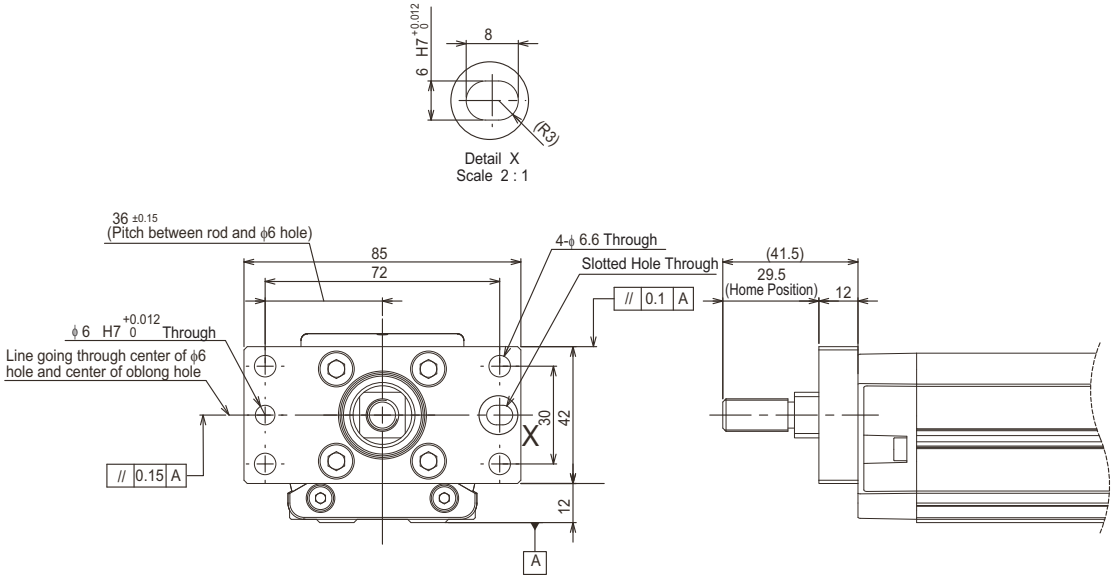
- Standard Type RCP5-RA4C and RA4R

(Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
(Note) In the delivery of IAI, the screws are glued.
(Note) Front flange cannot be used for RA4R with 60 stroke (standard) and for 60 to 110 stroke (with brake) as the motor unit interferes.



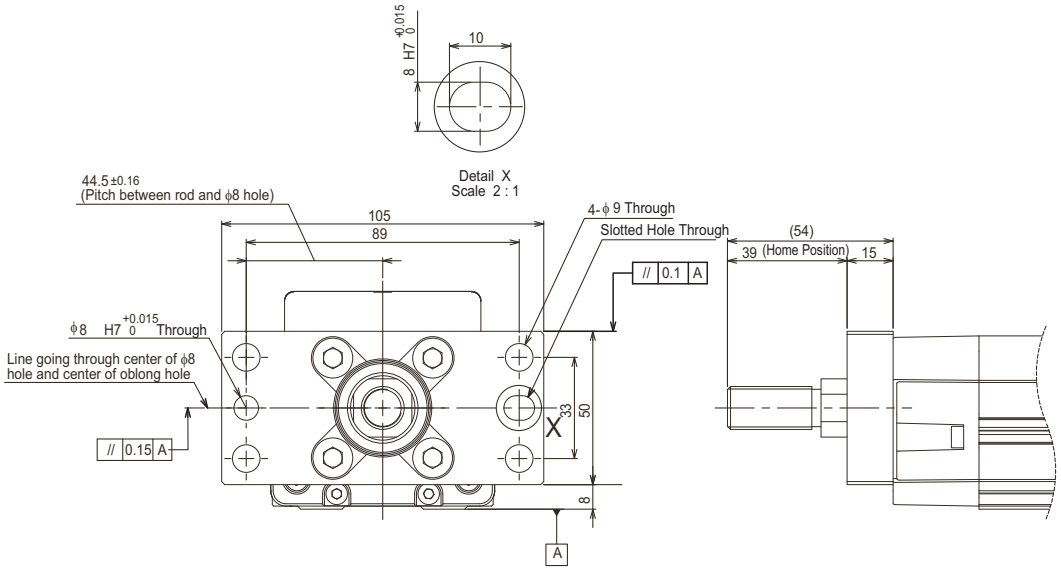
- Standard Type RCP5-RA6C and RA6R

(Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
(Note) In the delivery of IAI, the screws are glued.
(Note) Front flange cannot be used for RA6R with 65 stroke (with brake) as the motor unit interferes.

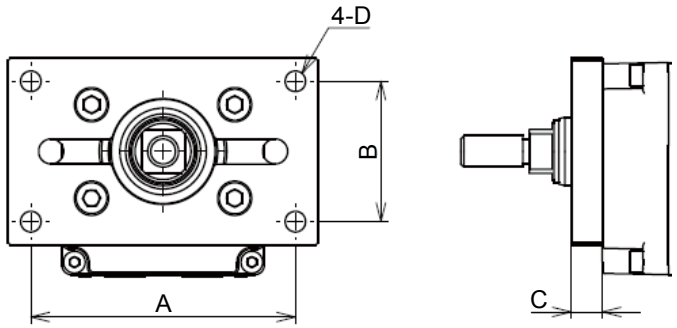


- Standard Type RCP5-RA7C and RA7R

(Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
(Note) In the delivery of IAI, the screws are glued.
(Note) Front flange cannot be used for RA7R with 70 stroke (standard) and for 70 to 120 stroke (with brake) as the motor unit interferes.



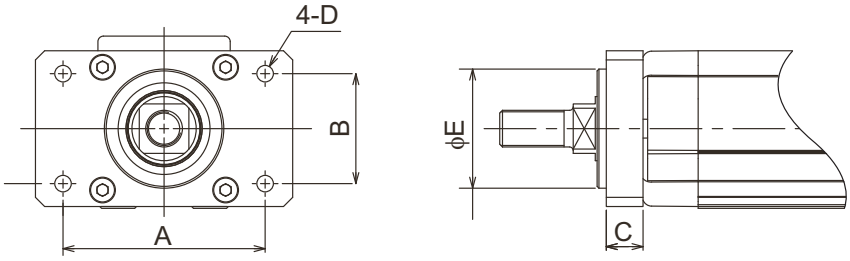
- Dustproof/Splash Proof Type RCP5W-RA6C and RA7C



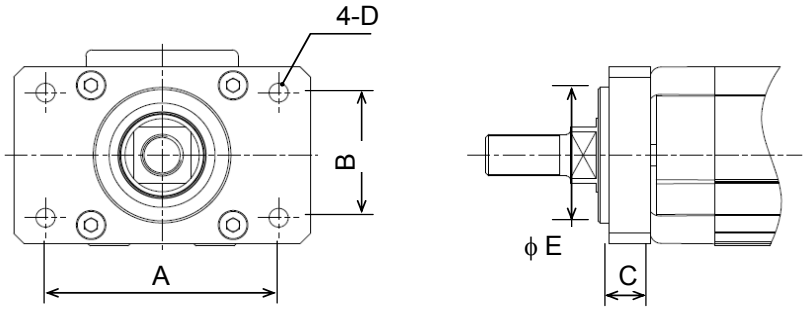
Model Name	Applicable Bolt Diameter	A	B	C	D	Tightening Torque
RA6C Front Flnage	M6	85	45	10	ϕ 6.6	6.44N・m (0.657kgf・m)
RA7C Front Flnage	M8	100	53	12	ϕ 9	13.77N・m (1.41kgf・m)

- Standard Type RCP5-RA8C, RA8R, Dustproof/Splash Proof Type RCP5W-RA8C and RA10C

◎ Standard Type



◎ Dustproof/Splash Proof Type
On the optional front flange, there are drain slots.



Model Name	Applicable Bolt Diameter	A	B	C	D	ϕE
RA8 front flange	M8	110	60	20	ϕ 9	ϕ65h7
RA10 front flange	M10	130	70	20	ϕ 11	ϕ70h7

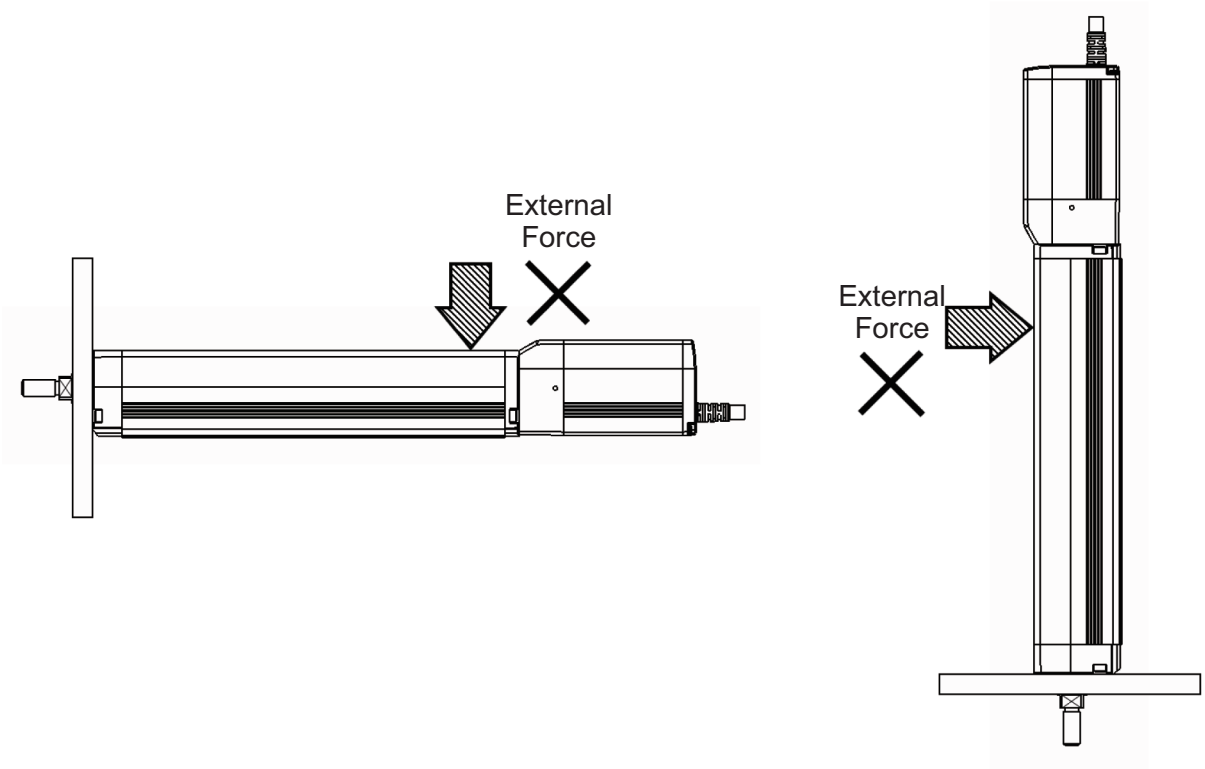
Make sure to follow "◎Caution for Installation using Front Bracket and Front Flange"

Tightening screws
- Use hexagonal socket head bolts for the male threads for installing the base.
- Use stainless steel screws for dustproof/splash proof type RCP5W.
- 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

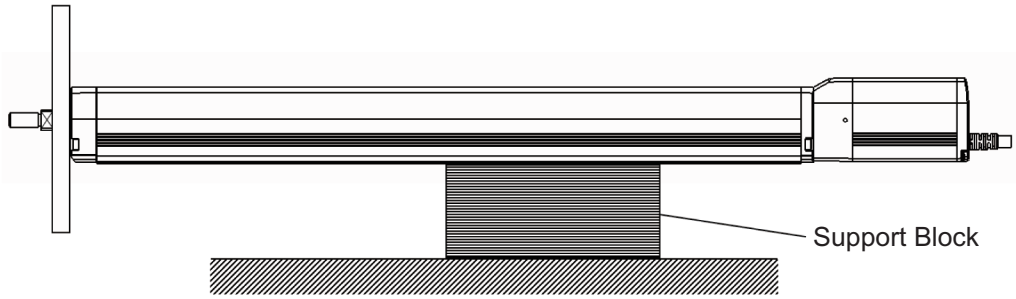
⚠ Caution: Pay attention when choosing the bolt length. In case that insufficient length of bolts is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

◎ Caution for Installation using Front Bracket and Front Flange

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



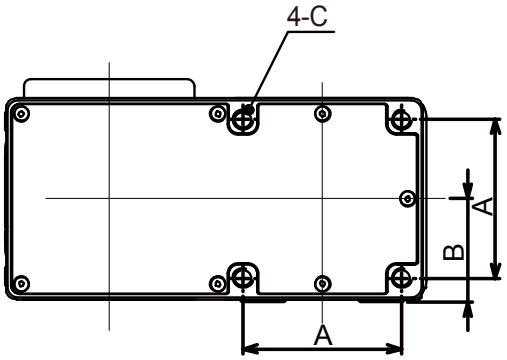
Prepare a support block as shown in the figure below for the horizontal installation of the unit with its stroke more than 150 even if there is no external force applied on the body. Even for those with the stroke less than 150, it is recommended to have a support block to avoid vibration being generated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



Operation of the actuator with attachment only on the front bracket and the front flange (option) applies the external force of the acceleration / deceleration multiplied by the weight of the actuator to the unit body.
Control the acceleration / deceleration at 0.05 G or less (for reference) when the actuator is moved with attachment only on the front bracket and the front flange (option).

[5] When Utilizing Attachment Holes on the Bracket for Motor-Reversed Type

For Standard Type RCP5-RA4R, RA6R, RA7R, RA8R and RA10R, there are tapped holes prepared on the reversing bracket. (See the table below for the detailed dimensions.)



	A	B	C
RA4R	32	10	M4 depth 9
RA6R	44	11	M6 depth 13
RA7R	52	7	M6 depth 13
RA8R	67	43.5	M8 depth 16
RA10R	80	54	M10 depth 20

Model Name	Attachment Holes	Attachment Hole Depth	Tightening Torque	
			In the case that steel is used for the bolt seating surface:	In the case that steel is used for the bolt seating surface:
RA4R	M4	9mm	3.59N•m (0.37kgf•m)	1.76N•m (0.18kgf•m)
RA6R RA7R	M6	13mm	12.3N•m (1.26kgf•m)	5.4N•m (0.55kgf•m)
RA8R	M8	16mm	30.0N•m (3.06kgf•m)	11.4N•m (1.17kgf•m)
RA10R	M10	20mm	59.3N•m (6.06kgf•m)	23.3N•m (2.38kgf•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: Pay attention when choosing the bolt length. In case that insufficient length of bolts is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

[Precautions for Attachments]

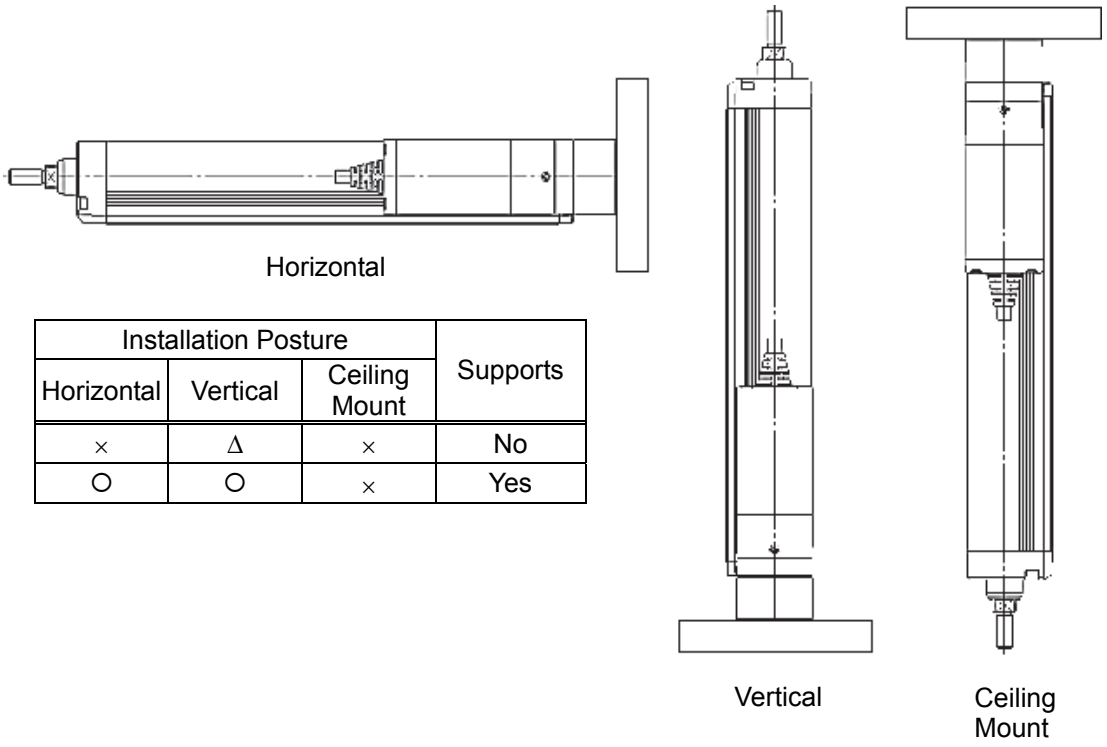
Please note the following caution notes when installing the unit with using the tapped holes on the reversing bracket.

Do not attempt to affix the unit only with the tapped holes on the reversing bracket.

Do not apply external force to the main body.

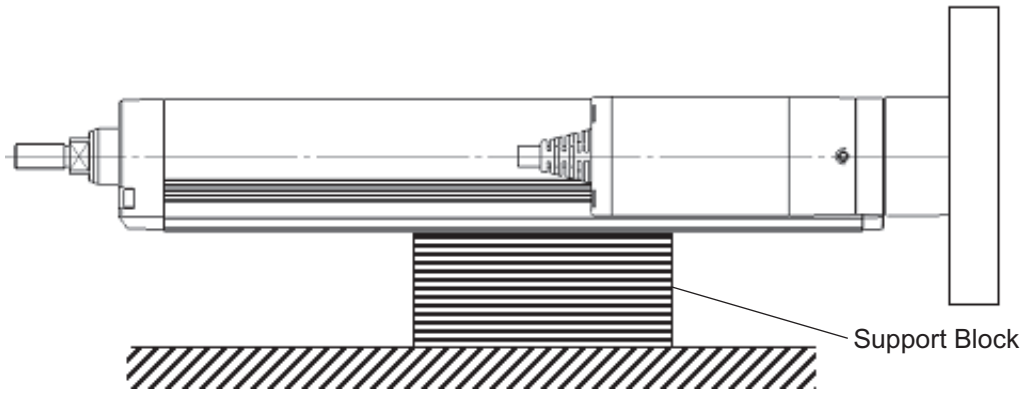
There may be caused vibration due to the operating condition or installation environment, which may result in operational failures or components malfunction.

Availability of installation for each installation posture is as shown below:
(Note) When it is perpendicular installation without support etc., external force does not act, it is not attempt to apply the radial load.



Installation Posture			Supports
Horizontal	Vertical	Ceiling Mount	
×	Δ	×	No
○	○	×	Yes

When using the unit in the horizontal or vertical orientation, have a pedestal to support the body to avoid external force being applied to the unit.

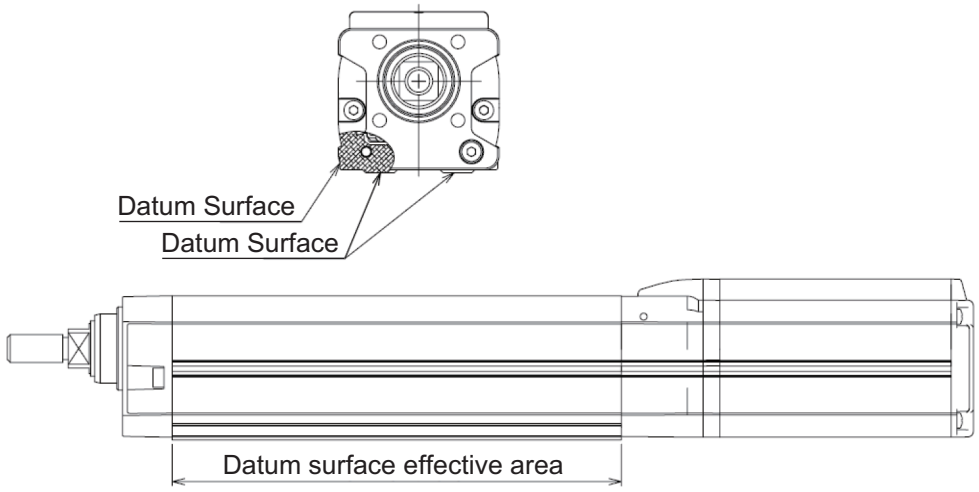


[6] Attachment of Work Part (Transported Object)

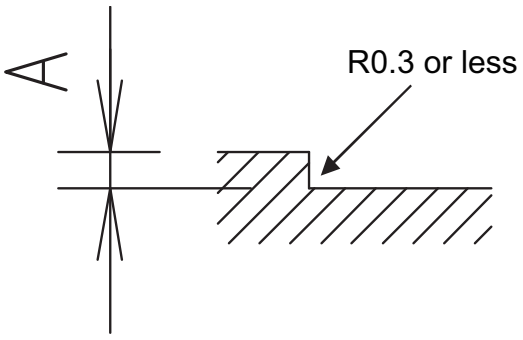
Utilize the threaded part on the rod tip to attach the work part (transported object). In the installation process, make sure to hold 2 faces on the tip with a wrench so the tightening torque would not be applied to the rod.

[7] Mounting Surface

- The platform to install the actuator should possess a structure that ensures enough stiffness, and should be free from vibration.
- The surface where the actuator will be mounted should be a machined surface or that with an accuracy equivalent to it, and the flatness should be 0.05mm/m or below.
- Ensure a room for maintenance work.
- The side and bottom surfaces of the base on the actuator work as the datum surfaces for the side of the rod.
  Use these surfaces as the datum surfaces for mounting.



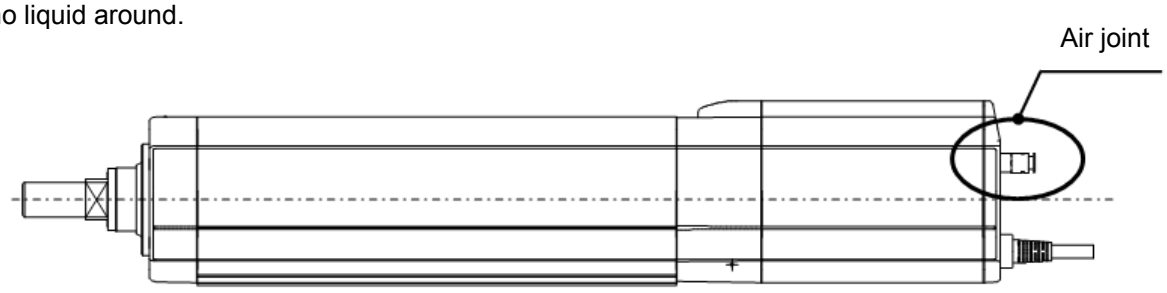
Follow the diagram below when installing the device using the reference surface.



Model Name	A Dimensions [mm]
RA4C, RA4R RA6C, RA6R RA7C, RA7R	2 to 4
RA8C, RA8R RA10C, RA10R	3 to 5

2.3.3 Connecting with Air Tube for Dustproof/Splash Proof Type RCP5W

Join a tube of ϕ6 at the air joint (air inlet/outlet port) and extend the other end of the tube to a place with no liquid around.



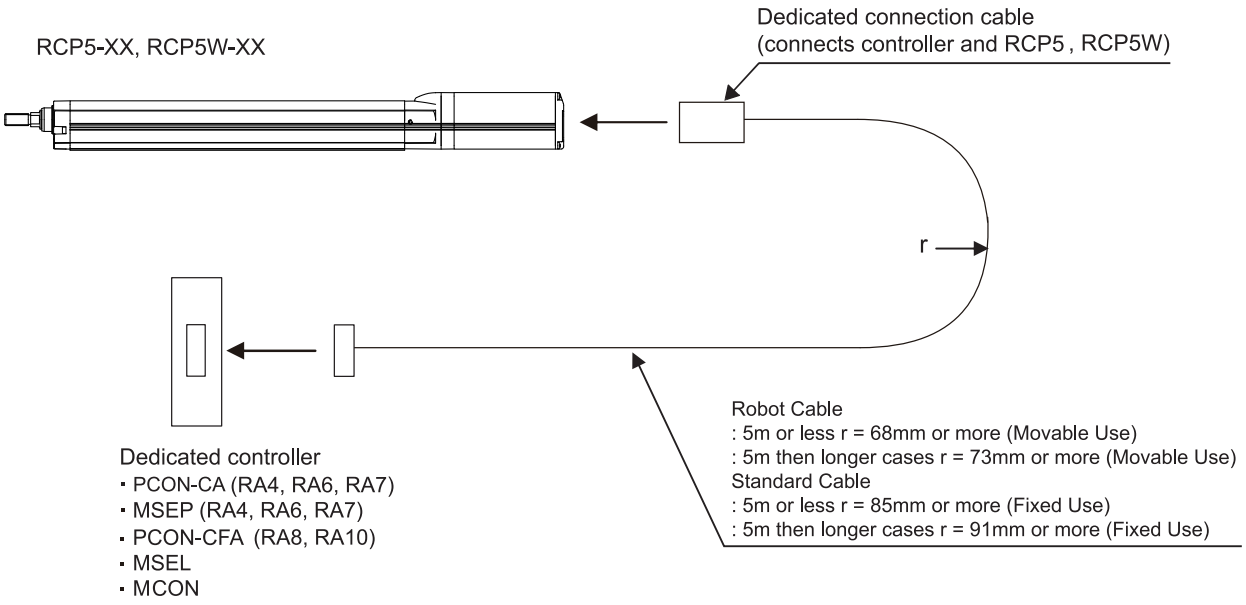
⚠ Caution: Do not attempt to suck in water through the air joint (air inlet/outlet port). Doing so may cause malfunction.

3. Connecting with the Controller

As the connection cable for the controller and RCP5 (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 connection cable
RA4, RA6 and RA7
・Motor • encoder integrated cables : CB-CAN-MPA□□□
・Motor • encoder integrated cables robot type : CB-CAN-MPA□□□-RB

RA8, RA10, RCP5W-RA7C Motor Type 56SP
・Motor • encoder integrated cables : CB-CFA3-MPA□□□
・Motor • encoder integrated cables robot type : CB-CFA3-MPA□□□-RB

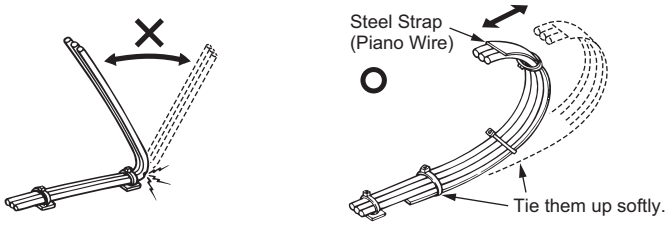
∗) □□□ indicates the cable length. Up to 20m can be specified.
Example) 080=8m

⚠ Caution: The Dustproof/Splash Proof Type RCP5W dedicated connection cable and cable joint connectors are not treated against water drops.
Do not attempt to apply water on them.

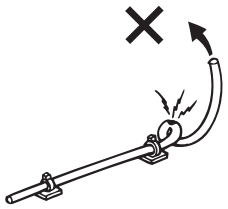
⚠ Warning: For wiring, please follow the warnings stated below. When constructing a system as the machinery equipment, pay attention to the wiring and connection of each cable so they are conducted properly. Not following them may cause not only a malfunction such as cable breakage or connection failure, 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□□□
  Motor • Encoder Integrated Cables Robot Type : CB-CAN-MPA□□□-RB, CB-CFA3-MPA□□□-RB

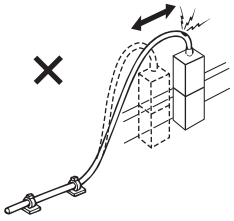
- Have a sufficient radius for bending, and avoid a bend concentrating on one point.



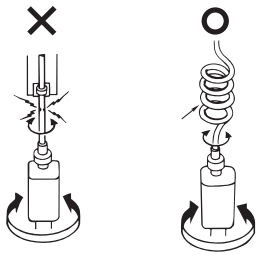
- Do not let the cable bend, kink or twist.



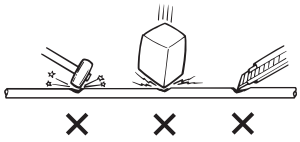
- Do not pull the cable with a strong force.



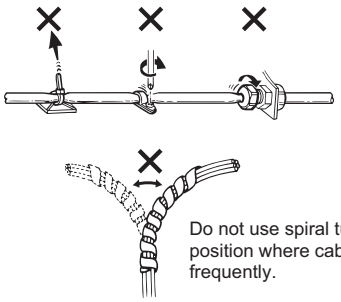
- Pay attention not to concentrate the twisting force to one point on a cable.



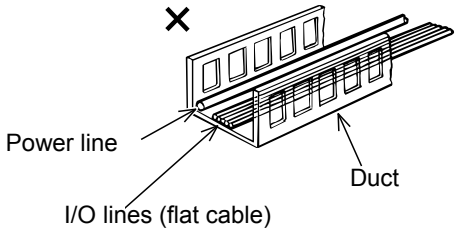
- Do not pinch, drop a heavy object onto or cut the cable.



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

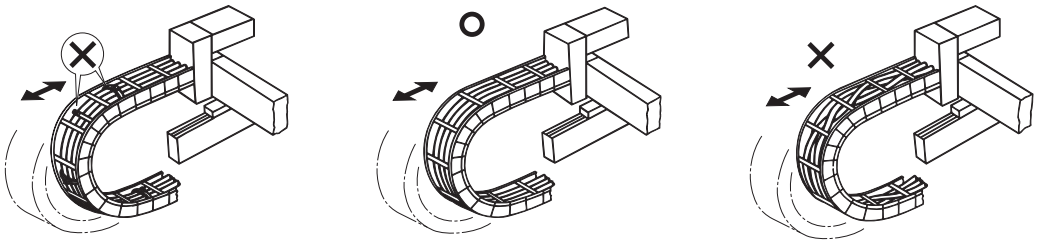


- PIO line, communication line, power and driving lines are to be put separately from each other and do not tie them together. Arrange so that such lines are independently routed in the duct.



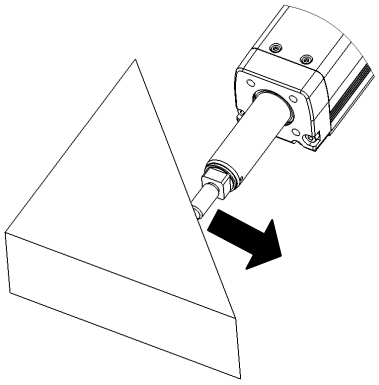
Follow the instructions below when using a cable track.

- 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.



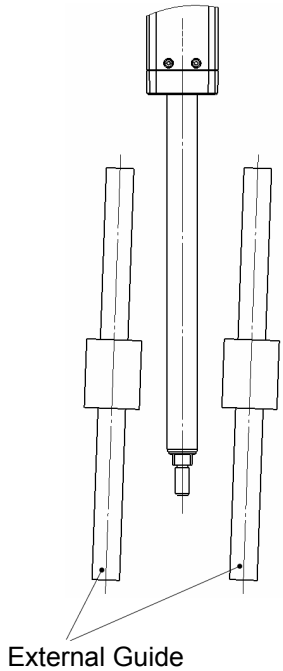
4. Caution for Operation

- When the reaction force against the pressing operation is the side-way force, make sure it would not exceed the allowable load.



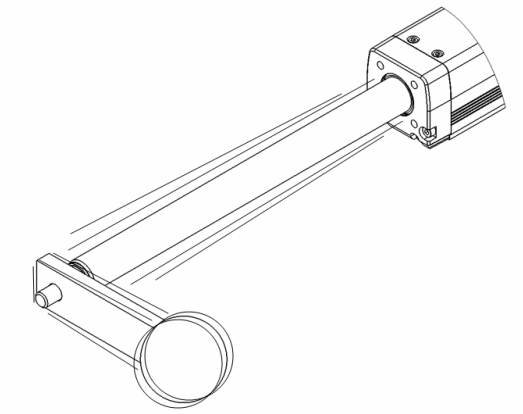
Be careful on the direction of the reaction force against the pressing

- 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. For the connection of the rod and guides, have a component such as a free joint to accept the assembly variation.



External Guide

- When using a stroke of more than 200 and the load is eccentric (offset), the rod may generate vibration in some operation conditions. Apply guides to control the vibration.



5. Maintenance and Inspection

5.1 Inspection Items and Schedule

5.1.1 Standard Type RCP5

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 inspection (Note 1)	Greasing (Note 3)
Start of work inspection	○		
1 month inspection	○		
3 month inspection	○		○ (Rod sliding surface, ball screw and guide)
Every 3 months thereafter	○		○ (Rod sliding surface)
3 months after starting operation			Depends on grease supply timing (reference) of ball screw and guide
6 month inspection	○	○ (Note 2)	
Every 6 months thereafter	○	○ (Note 2)	

Note 1 Conduct this only for RA4, RA6 and RA7.
Note 2 Check the condition of grease, and wipe off the grease before supplying new in case it is extremely dirty.
Note 3 If the actuators are moved back and forth continuously over a short distance of 30mm or less, grease film may run out. As a guide, move the actuators back and forth repeatedly for around 5 cycles over a distance of 50mm or more after every 5,000 to 10,000 cycles. A layer of the grease will recover.

*1 Supply grease to the rod sliding surface when grease is used up in the inspection at work start or every three months. First, wipe off the old grease and then supply new grease.
Sometimes grease is separated from the base oil due to the installing posture or operating conditions and the base oil leaks from the inside of actuator to the outside. Check visually whether the oil drips or not when supplying grease.

[Grease Supply Timing of Ball Screw and Guide (Reference)]
Perform grease supply when it has reached to either the operation distance or spent months described in the table below.

Maximum Speed of Use [mm/s]	Grease Supply Timing (Reference)	
	operated distance	Months
0 to 750 or less	1,250 km	12 month
750 to 840	2,500 km	

⚠ Caution:
- An actuator after 6 months of storage may have caused a degradation of the grease. Supply grease before start using. [Refer to 5.6 “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.

5.1.2 Dustproof/Splash Proof Type RCP5W

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 inspection (Note 1)	Greasing
Start of work inspection	○		
1 month inspection	○		
3 month inspection or every operation distance 1,000km	○		○ (Scraper) (Note 2)
Every 3 months since or every operation distance 1,000km	○		○ (Scraper) (Note 2)
Every 6 month since or every operation distance 5,000km	○	○	○ (Ball screw and guide) (Note 1)

Note 1 If the actuators are moved back and forth continuously over a short distance of 30mm or less, grease film may run out. As a guide, move the actuators back and forth repeatedly for around 5 cycles over a distance of 50mm or more after every 5,000 to 10,000 cycles. A layer of the grease will recover.

Note 2 To maintain the level of water protection, apply grease to the scraper regularly. Otherwise, it may cause malfunction.

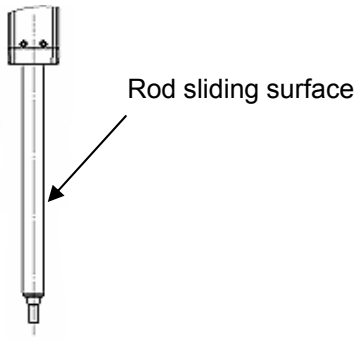
⚠Caution: • An actuator after 6 months of storage may have caused a degradation of the grease. Supply grease before start using. [Refer to 5.6 “Grease Supply”]

5.2 External Visual Inspection

5.2.1 Standard Type RCP5

An external visual inspection should check the following things.

Main unit	Loose actuator mounting bolts, other loose items
Rod sliding surface	Grease lubrication Dripping of grease base oil, etc. Dust or foreign objects on sliding surface
Cables	Scratches, proper connections
Overall	Irregular noise, vibration



5.2.2 Dustproof/Splash Proof Type RCP5W

An external visual inspection should check the following things.

Main unit	Loose actuator mounting bolts, other loose items
Rod	Lubrication, dust, foreign object on sliding surfaces
Scraper	Damage, crack, scratch, wear-out
Cables	Scratches, proper connections
Overall	Irregular noise, vibration

Scraper (front bracket) is and expendable part.
As a reference for the replacement period for RCP5W-RA6C and RA7C consider every 1,000km of running distance or, when the running distance is less than 1,000km, consider every year.
As a reference for the replacement period for RCP5W-RA8C and RA10C consider every 3,000km of running distance or, when the running distance is less than 3,000km, consider every year.
Degradation and abrasion may be faster in some environment of use or operational conditions. Replace it as soon as any abnormality is found.

5.3 Cleaning

- Clean exterior surfaces as necessary.
- If the grease base oil or others drip on the rod sliding surface and its periphery, wipe it off with a soft cloth, etc.
- 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 for standard type RCP5.
- 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 Inspections

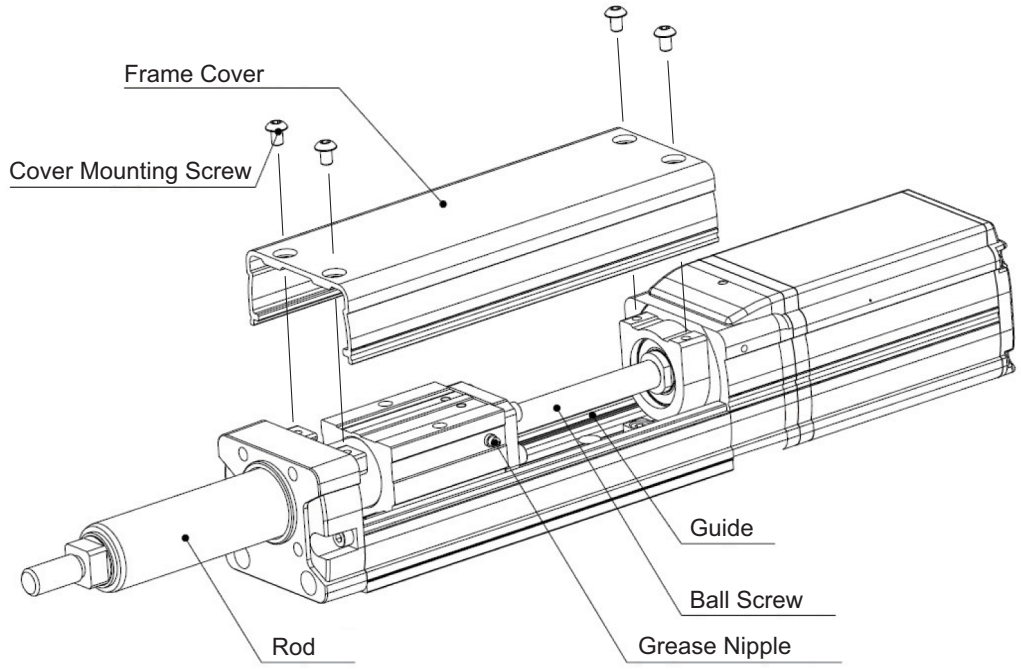
5.4.1 RCP5-RA4, RA6, RA7

For RA4, RA6 and RA7, turn off the power, remove the side cover and have a visual inspection.
When inspecting the interior, check the following items.

Main unit	Loose mounting bolts, other loose items
Guide section	Lubrication, buildup
Ball screw	Lubrication, buildup

Visually inspect the interior of the equipment. Check whether dust or other foreign matter has gotten inside and check the lubrication state.
The lubrication may have turned brown. This is not a problem as long as the travel surfaces shine as though they are wet.
If the grease is mixed with dust and does not have a shiny appearance, or if the grease has lost its efficacy due to prolonged use, then clean each section and reapply grease.
The procedure for internal inspections is outlined below.

1) With 1.5mm (RA4C, RA4R) or with 2.5mm (RA6C, RA6R, RA7C and RA7R) hex wrench, loosen the screws holding the frame cover, and detach the frame cover.
2) Check inside.
   Extend the rod when checking the ball screw. The ball screw will appear. Slide the rod manually with hand or move it with JOG operation of the controller.
3) After finishing the inspection, assemble back in the reverse order.



When affixing the frame cover, tighten the screws with the tightening torque described below.

Model Name	Screw Diameter	Tightening Torgue
RA4C, RA4R	M3	0.62N•m
RA6C, RA6R	M4	1.76N•m
RA7C, RA7R	M4	1.76N•m

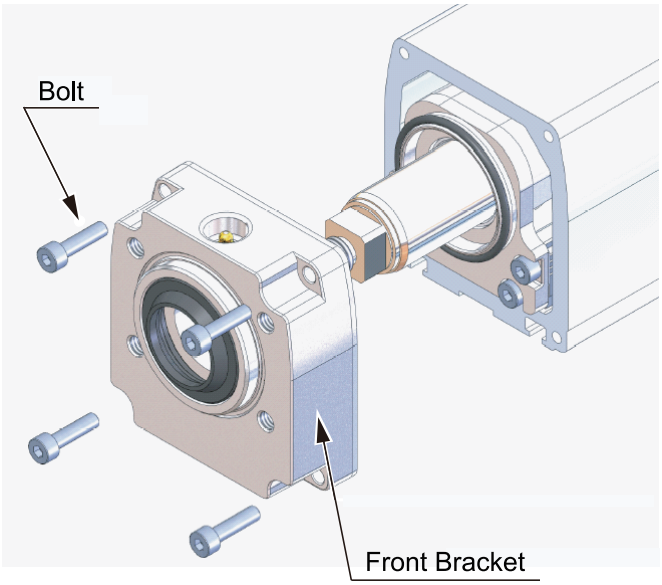
5.4.2 Dustproof/Splash Proof Type RCP5W-RA6C, RA7C

Turn OFF the power, remove the front bracket and have a visual inspection.
When inspecting the interior, check the following items.

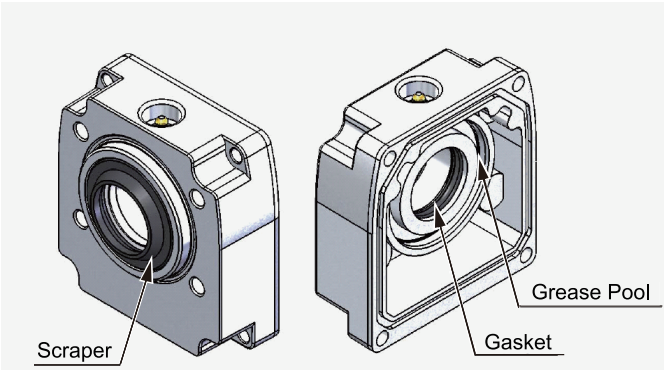
Main unit	Check for liquid or powdery dust getting in
Scraper	Wear-out, crack, damage
Gasket	Wear-out, crack, damage
Grease	Remaining volume, dirt

Visually inspect the inside condition. Check if any foreign object involved inside, sealing parts and condition of the grease.
Described below is how to check inside.

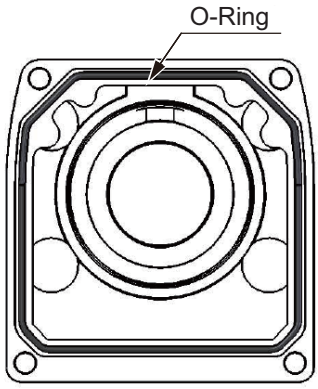
1) Loosen the attachment bolts (RA6C: M4, RA7C: M5) on the front bracket to remove the front bracket.

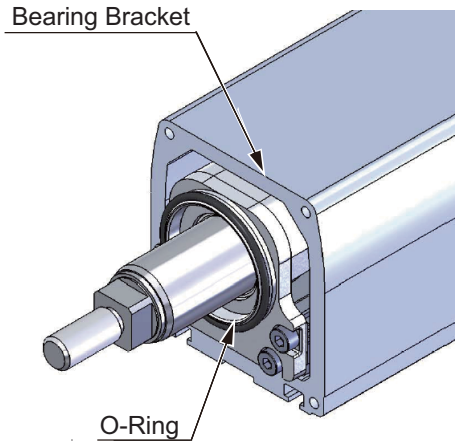


2) Have an inspection inside.



3) After the inspection is finished, put the O-rings back on in the grooves on the tip of the bearing bracket and on the front bracket.





4) Attach the front bracket and tighten with bolts.
At this time, pay attention not to pinch the O-rings in between.

Model	Screw Diameter×Length	Tightening Torgue
RA6C	M4×15	2.07N·m (0.211kgf·m)
RA7C	M5×18	4.11N·m (0.419kgf·m)

5.4.3 Dustproof/Splash Proof Type RCP5W-RA8C, RA10C

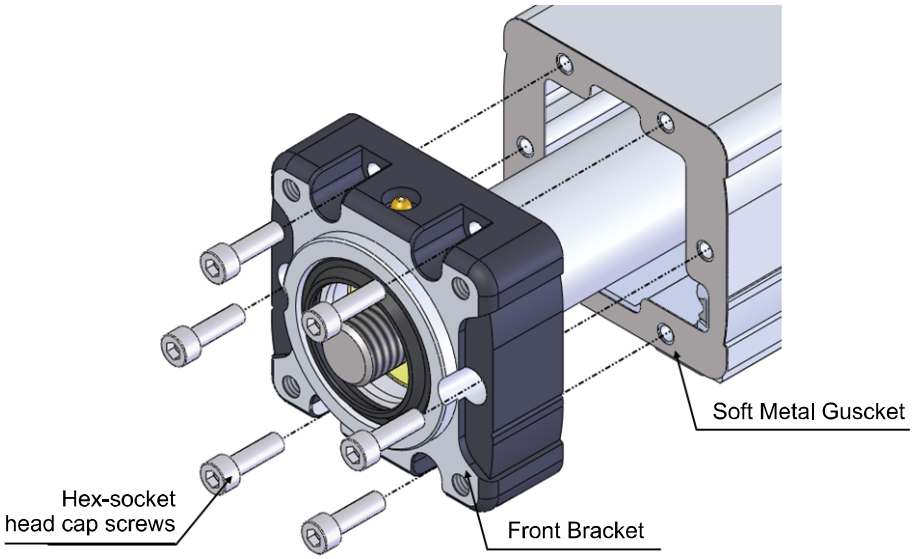
(Note) It is not necessary to have an internal inspection on Standard Type RCP5-RA8C and RA10C.

Turn OFF the power, remove the front bracket and have a visual inspection.
When inspecting the interior, check the following items.

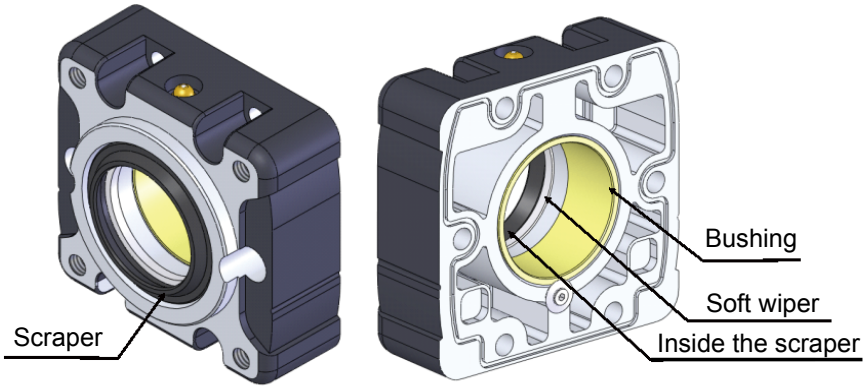
Main unit	Check for liquid or powdery dust getting in
Scraper	Wear-out, crack, damage
Soft Wiper	Wear-out, crack, damage
Grease	Remaining volume, dirt

Visually inspect the inside condition. Check if any foreign object involved inside, sealing parts and condition of the grease.
Described below is how to check inside.

1) Loosen the attachment bolts (RA8C: M6, RA10C: M8) on the front bracket to remove the front bracket.



2) Have an inspection inside.



3) Attach the front bracket and tighten with bolts (SUS).

Model	Screw Diameter×Length	Tightening Torgue
RCP5W-RA8C	M6×20	6.44N·m (0.66kgf·m)
RCP5W-RA10C	M8×25	13.77N·m (1.41kgf·m)

⚠ Caution: Do not attempt to detach the metal gasket in inspection on the front bracket. Sealing performance cannot be secured if the gasket is detached.

5.5 Internal Cleaning

Conduct it only for Standard Type RCP5-RA4C, RA6C, RA7C, RA4R, RA6R and RA7R.
- 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, neutral detergent or alcohol.

5.6 Grease Supply

5.6.1 What Grease to Use

[1] Standard Type RCP5-RA4C, RA6C, RA7C, RA4R, RA6R and RA7R

IAI uses the following grease in our plant.

Guide and Ball Screw	Kyodo Yushi	Multitemp LRL 3
Rod (sliding surface)	Kyodo Yushi	Multitemp LRL 3

Other companies also sell similar types of grease. For more detailed information, ask the supplier to find an equivalent for you by telling them the name of the grease.

> ⚠ Warning: Do not attempt to apply fluorine grease. Mixing lithium grease with other grease not only reduces the performance of the grease, it may even cause damage to the actuator.

[2] Dustproof/Splash Proof Type RCP5W-RA6C and RA7C

IAI uses the following urea based grease in our plant.

Guide and Ball Screw	Kyodo Yushi	Multitemp ET-R

Other companies also sell similar types of grease. For more detailed information, ask the supplier to find an equivalent for you by telling them the name of the grease.

> ⚠ Warning: Do not attempt to apply fluorine and lithium grease. Mixing lithium grease with other grease not only reduces the performance of the grease, it may even cause damage to the actuator.

[3] Standard Type RCP5-RA8C, RA10C, RA8R and RA10R,
Dustproof/Splash Proof Type RCP5W-RA8C and RA10C

IAI uses the following grease in our plant.
Both standard type RCP5 and dustproof/splash proof type RCP5W use the same grease.

(1) RA8

Guide, Rod (sliding surface) and Ball Screw	Idemitsu Kosan	Daphne Eponex Grease No. 2

(2) RA10

Guide and Rod (sliding surface)	Idemitsu Kosan	Daphne Eponex Grease No. 2
Ball Screw	Kyodo Yushi	Multitemp PS No.2

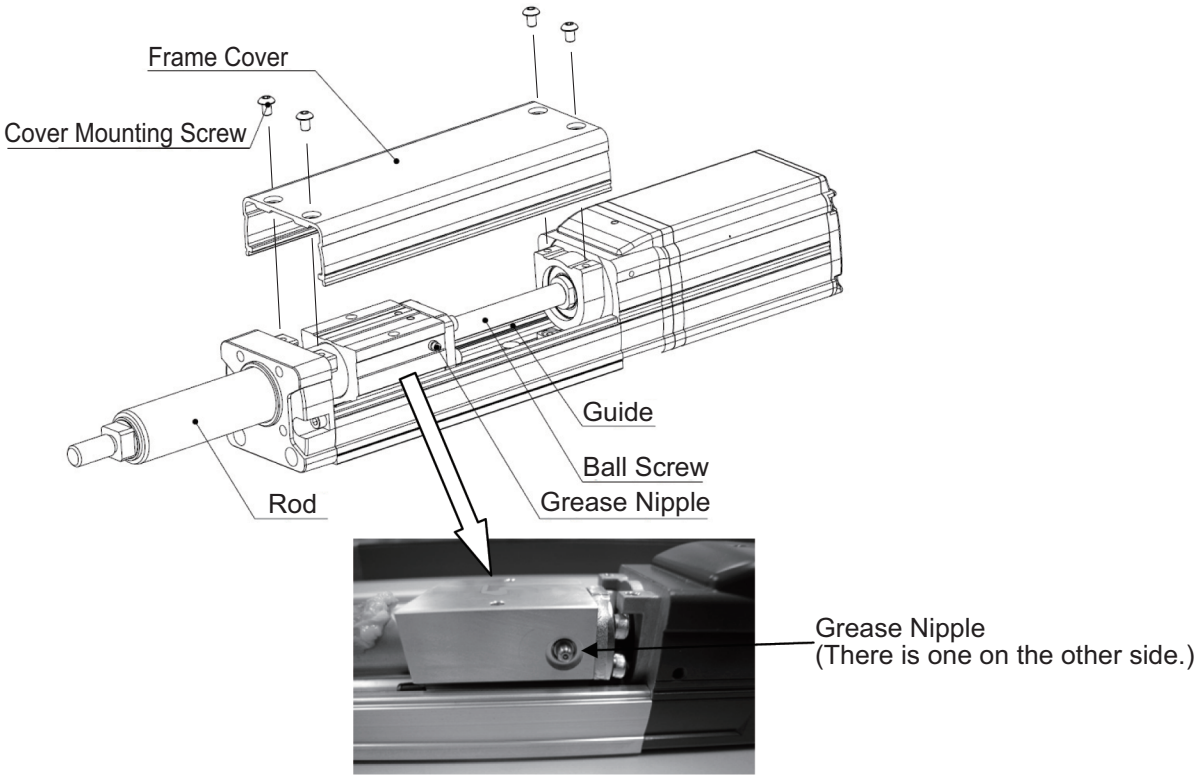
Other companies also sell similar types of grease. For more detailed information, ask the supplier to find an equivalent for you by telling them the name of the grease.

⚠ Warning: Do not attempt to apply fluorine grease. Mixing lithium grease with other grease not only reduces the performance of the grease, it may even cause damage to the actuator.

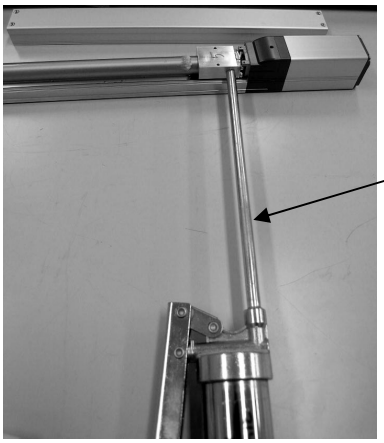
5.6.2 How to Apply Grease

[1] Standard Type RCP5-RA4C, RA6C, RA7C, RA4R, RA6R and RA7R

1) With 1.5mm-sized (RA4C, RA4R) or with 2.5mm-sized (RA6C, RA6R, RA7C and RA7R) hex wrench, loosen the screws holding the frame cover, and detach the frame cover.
Two grease nipples each on the left and right appear.



2) Supply grease from the grease nipple on either side, using the grease gun.
Wipe off the grease before supplying new in case it is extremely dirty.
(Note) Grease can also be applied from the grease nipple on the other side.
When grease is applied from the grease nipple on either side, grease is supplied to the ball screw and the guides on both sides.



(Note) Make sure to use a grease gun that is applicable for the grease nipple inlet diameter shown below.

Grease Nipple Diameter
ϕ3.5

Recommended Grease Gun	Nozzle	Supplier
HGP	NZ3	NSK

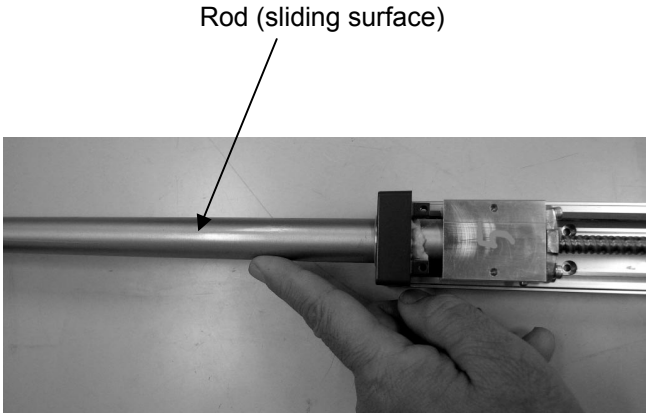
Model Name	Amount of Grease Supply (Reference)
RA4	0.5cc to 1.0cc
RA6, RA7	1.5cc to 2.0cc

Move the slider back and forth in the stroke range after supplying grease so it spreads out evenly in the area.
Low lead type actuator may not be moved manually. Use JOG operation on the controller to move the rod.

- Confirm that the ball tracks on the ball screw and guide look glossy with oil of grease. Supply grease again if it is not spread enough.
- Wipe off excess grease.

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

3) Clean up the rod (sliding surface) and apply the grease with hands. Move the rod back and forth to evenly apply the grease.
For some of the low lead actuators, the rod would not move manually with hand. Move it with JOG operation of the controller.
Wipe off the excess grease at last.



4) After supplying the grease, attach the frame cover.
When affixing the frame cover, tighten the screws with the tightening torque described below.

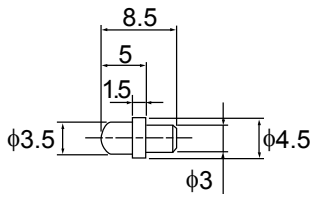
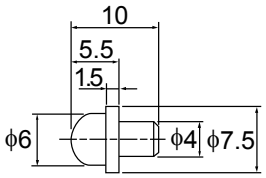
Model Name	Screw Diameter	Tightening Torgue
RA4C, RA4R	M3	0.62N•m
RA6C, RA6R	M4	1.76N•m
RA7C, RA7R	M4	1.76N•m

⚠ Caution: 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] Dustproof/Splash Proof Type RCP5W-RA6C and RA7C

(1) Ball Screw/Guide
For the grease supply to the ball screw and guide, apply on the inlets (grease nipples) on the top of the frame.

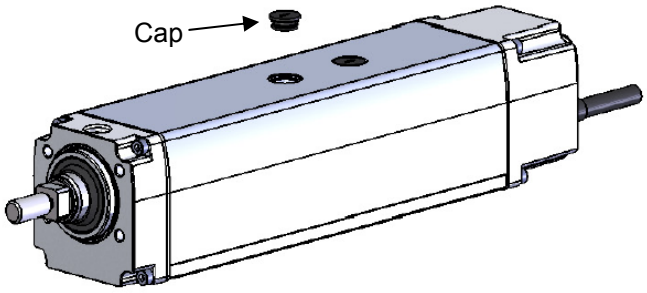
◎ Size of Grease Nipple

RA6C	RA7C
	

◎ Recommended Grease Gun

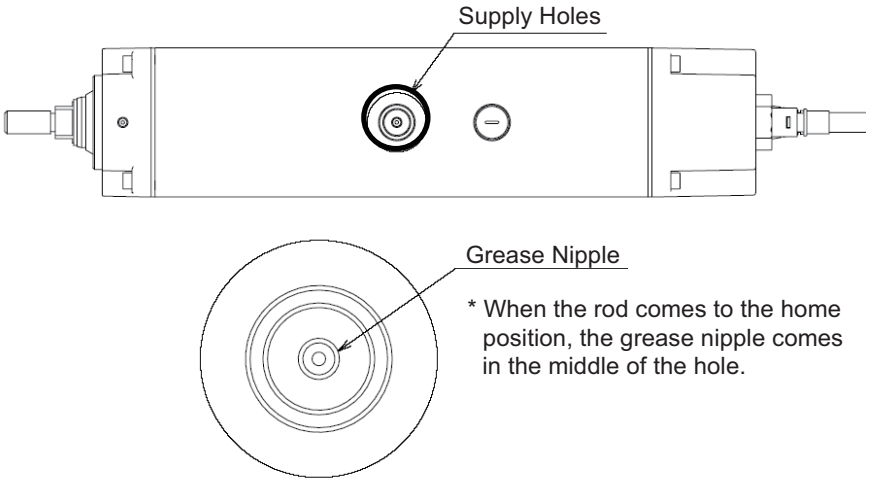
Recommended Grease Gun	Nozzle	Supplier
MG70	N type	THK

1) Take off the cap on the front side.



2) Move the rod to the end of the mechanical stopper on the home side.

3) Insert a grease gun to the supply hole (ϕ11) on the top of the frame, hold the gun on the grease nipple and supply grease.
The reference volume for grease supply are as shown table below. Supplying to much may cause a trouble.
By supplying grease only to this grease nipple, grease can be supplied to both the ball screw and guide.



Model	Amount of Grease Supply (Reference)
RA6C	1.5cc to 2cc
RA7C	2cc to 2.5cc

4) Slide the rod back and forth manually with hand or by the controller with JOG operation to spread out the grease evenly.

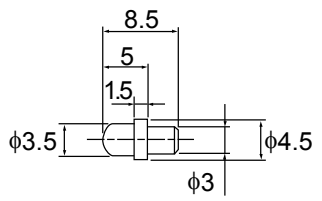
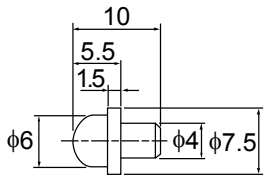
5) Attach the cap.

⚠ Caution:	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] Scraper (Rod sliding surfaces)

For the supply of grease on the scraper (rod sliding face), apply on the grease nipples on the top of the front bracket.

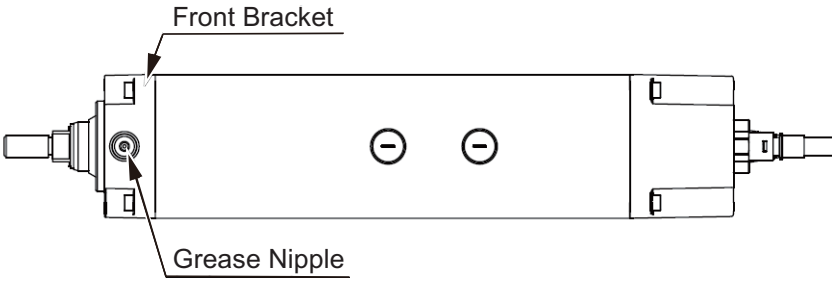
◎ Size of Grease Nipple

RA6C	RA7C
	

◎ Recommended Grease Gun

Recommended Grease Gun	Nozzle	Supplier
MG70	N type	THK

1) The hold the gun on the grease nipple and supply grease. The reference volume for grease supply are as shown table below.
Supplying to much may cause a trouble.



Model	Amount of Grease Supply (Reference)
RA6C	1cc to 1.5cc
RA7C	1.5cc to 2cc

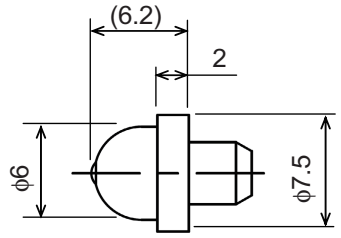
2) Slide the rod back and forth manually with hand or by the controller with JOG operation to spread out the grease evenly.

⚠ Caution:	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.

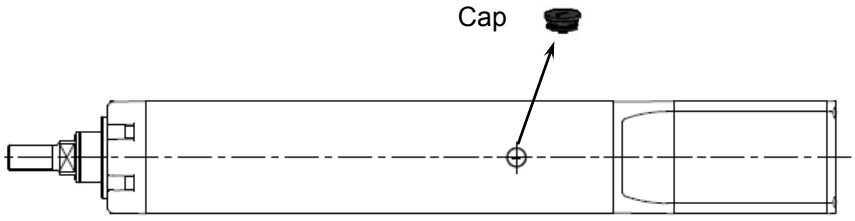
[3] Standard Type RCP5-RA8C and RA8R, Dustproof/Splash Proof Type RCP5W-RA8C

For the grease supply to the ball screw and guide, apply on the inlets (grease nipples) on the top of the frame.

◎ Size of Grease Nipple

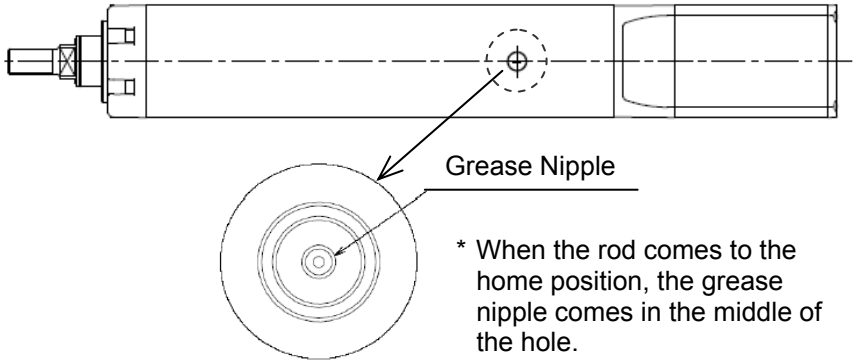


1) Take off the cap on the front side.



2) Move the rod to the home position manually or with JOG operation of the controller.

3) Insert a grease gun to the supply hole (ϕ11) on the top of the frame, hold the gun on the grease nipple and supply grease.
By supplying grease only to this grease nipple, grease can be supplied to both the ball screw and guide.



Recommended Grease Gun	Nozzle	Supplier
N type	MG70	THK

Amount of Grease Supply (Reference)
3.0cc to 3.5cc

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

4) Standard Type RCP4 clean up the rod (sliding surface) and apply the grease with hands.
Dustproof/splash proof type RCP5W supply grease to grease nipple in front bracket.
[Refer to 5.6.2 [4] Dsutproof/Splash Proof Type RCP5W-RA8C, RA10C Rod (sliding surfaces)]

5) Slide the rod back and forth manually with hand or by the controller with JOG operation to spread out the grease evenly.

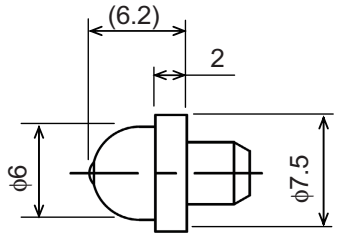
6) Attach the cap.

⚠Caution: 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.

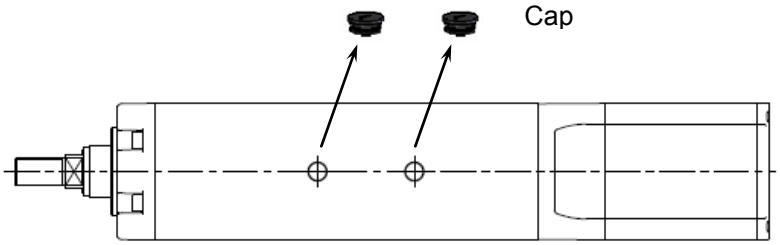
[4] Standard Type RCP5-RA10C and RA10R, Dustproof/Splash Proof Type RCP5W-RA10C

For the grease supply to the ball screw and guide, apply on the inlets (grease nipples) on the top of the frame.

◎ Size of Grease Nipple

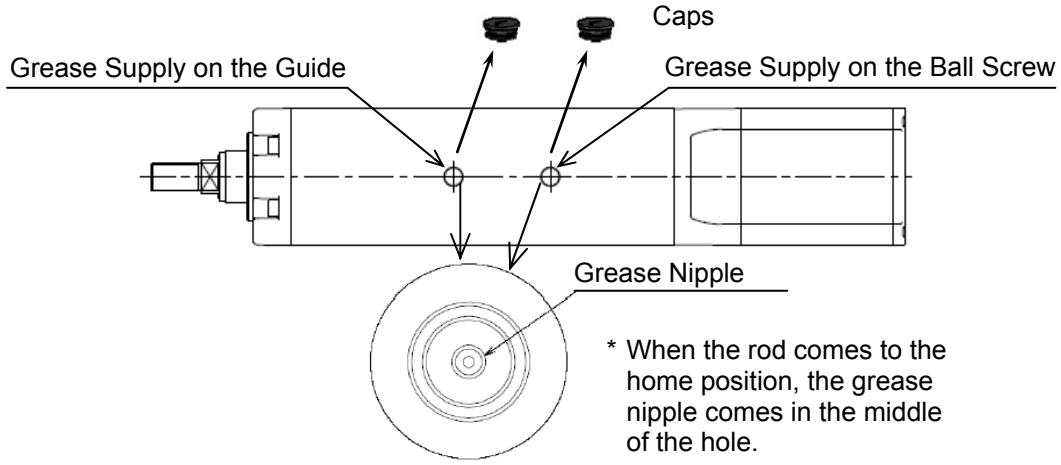


1) Take off the cap on the front side and the middle.



2) Move the rod to the end of the home position manually or with JOG operation of the controller.

3) Insert a grease gun to the supply hole (ϕ11) on the top of the frame, hold the gun on the grease nipple and supply grease.
By supplying grease on the grease nipple in the front side, the grease can be supplied to the ball screw.
By supplying grease on the grease nipple in the middle, the grease can be supplied to the guide.



Recommended Grease Gun	Nozzle	Supplier
N type	MG70	THK

Place to Supply	Amount of Grease Supply (Reference)
Guide	2.0cc to 2.5cc
Ball screw	2.0cc to 2.5cc

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

4) Standard Type RCP4 clean up the rod (sliding surface) and apply the grease with hands.
Dustproof/splash proof type RCP5W supply grease to grease nipple in front bracket.
[Refer to 5.6.2 [4] Dsutproof/Splash Proof Type RCP5W-RA8C, RA10C Rod (sliding surfaces)]

5) Slide the rod back and forth manually with hand or by the controller with JOG operation to spread out the grease evenly.

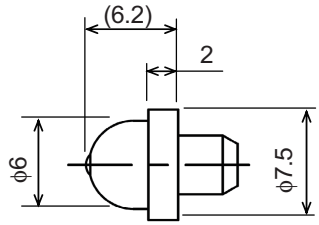
6) Attach the cap.

⚠ Caution: 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.

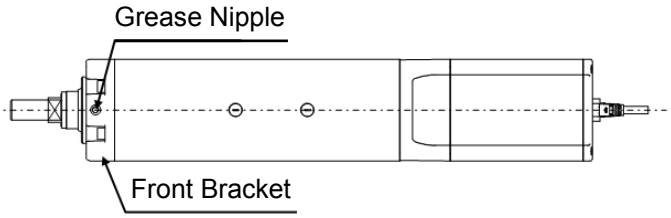
[5] Dustproof/Splash Proof Type RCP5W-RA8C, RA10C Rod (Sliding Surfaces)

For the grease supply to the scraper (rod (sliding surfaces) in dustproof/splash proof type RCP5W-RA8C, RA10C, apply on the inlets (grease nipples) on the top of the front bracket.

◎ Size of Grease Nipple



1) Insert a grease gun to the supply scraper on the top, hold the gun on the grease nipple and supply grease.



Recommended Grease Gun	Nozzle	Supplier
N type	MG70	THK

Grease supply volume (reference)
1.0cc

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

2) Slide the rod back and forth manually with hand or by the controller with JOG operation to spread out the grease evenly.

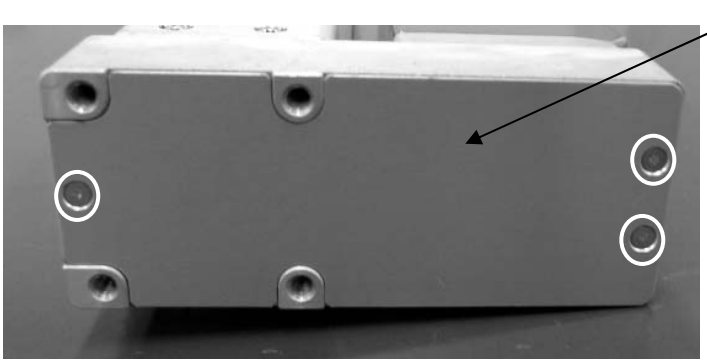
> ⚠ Caution: In case the grease got into your eye, immediately go see the doctor to get appropriate care. After finishing the grease supply work, wash your hands carefully with water and soap to rinse the grease OFF.

5.7 Procedure for Belt Replacement and Tuning

Applicable Units : RA4R, RA6R, RA7R,RA8R and RA10R

5.7.1 Inspection of the Belt

For inspection work, detach the pulley cover with a hex wrench and carry it out by visual.
Remove the three hex socket flat-head cap screws for RA4R, RA6R, RA7R, seven for RA8R and five for RA10R (where marked with a circle).



RA4R, RA6R, RA7R

RA8R, RA10R

The replacement period cannot be determined in general because the durability of the deceleration belt can be greatly influenced by the conditions of operation.
It generally has life of hundreds of times for bending movement.
The timing belt requires replacement regularly under the following conditions as a reference since degradation such as abrasion proceeds as the time passes for usage.

- When remarkable abrasion is confirmed on the teeth or edges of the belt
- When the belt is swelled for such reasons as oil being attached on
- When damage is confirmed such as crack on the tooth or back of the belt

Also, since it is difficult to confirm the degradation of the core wires to retain the strength of the teethed belt by visual or looseness caused by being elongated, it is recommended to set regular replacement periods in advance in case the product is used under such conditions that gives the core wires great fatigue due to high acceleration and deceleration speed.

5.7.2 Belts to be Used

The following belt is applied when the product is shipped out from IAI factory.

Model	IAI Maintenance Parts Model	Supplier Parts		
RA4R	TB-RCP5-RA4R	60S2M168R	Rubber	STS type (Bando Chemical Industries, Ltd.)
RA6R	TB-RCP5-RA6R	60S2M208GB	Rubber	Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
RA7R	TB-RCP5-RA7R	100S3M243R	Rubber	STS type (Bando Chemical Industries, Ltd.)
RA8R	TB-RCP5-RA8R	200S5M300	Rubber	STS type (Bando Chemical Industries, Ltd.)
RA10R	TB-RCP5-RA10R	250S5M380	Rubber	STS type (Bando Chemical Industries, Ltd.)

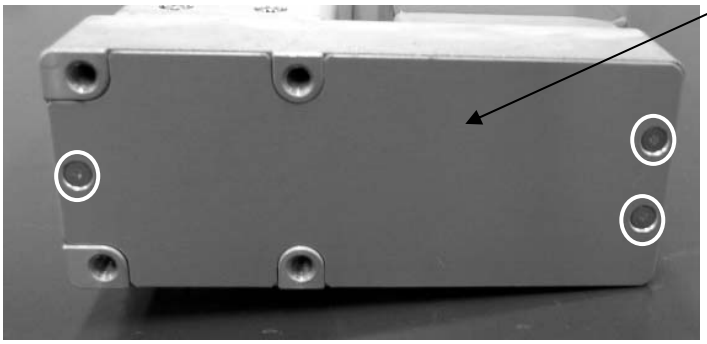
5.7.3 Replacement of the Belt

[Items Required for Replacemet Work]

- Belt for replacement
- Phillips Screwdriver (RA4R, RA6R, RA7R)
- Hex wrench 2.5mm (RA4R, RA6R), 3mm (RA7R), 5mm (RA8R), 6mm (RA10R) or 2mm (for hex socket head cap bolt) - sized
- Tension gauge (that is available for pulling with 250 ±20 N)
- Long tie-band (thin string)

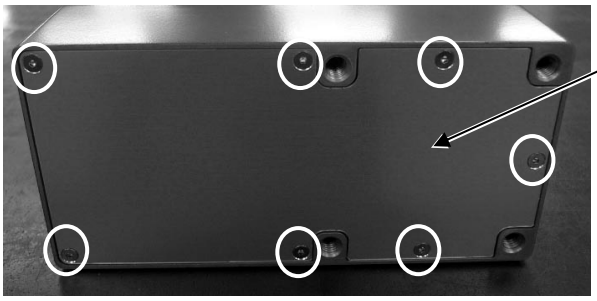
[Procedures]

1) Remove the three hex socket flat-head cap screws for RA4R, RA6R, RA7R (where marked with a circle) with a phillips screwdriver. Detach the pulley cover.



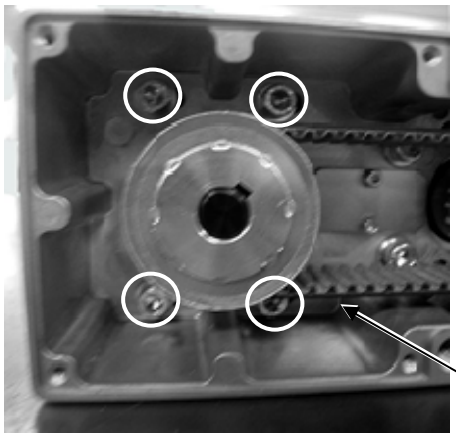
RA4R, RA6R, RA7R

Remove the seven hex socket flat-head cap screws for RA8R and five for RA10R (where marked with a circle) with a hex wrench. Detach the pulley cover.



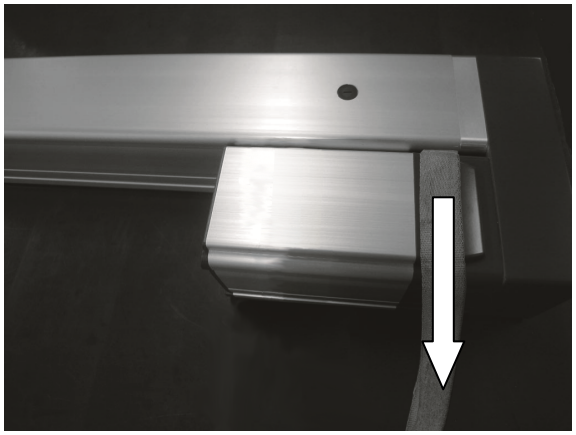
RA8R, RA10R

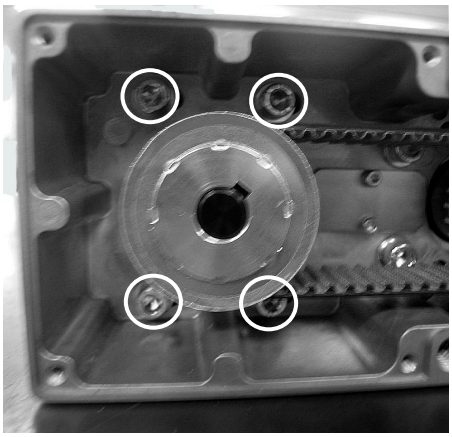
2) Loosen the four bolts (where marked with a circle) holding the pulley on the motor side with a 2.5mm-sized (RA4R, RA6R), 3mm-sized (RA7R), 5mm-sized (RA8R) or 6mm-sized (RA10R) hex wrench. If the belt is required to be replaced, replace it.



3) Adjust the belt tension.

Hand a cable band (thin string) on the edge of the motor unit and pull it on a tension gauge with the specified load (specified value of the belt tension).
When the load reached the specified, tighten the bolts with a 2.5mm-sized (RA4R, RA6R), 3mm-sized (RA7R), 5mm-sized (RA8R) or 6mm-sized (RA10R) hex wrench to hold the unit in the place.

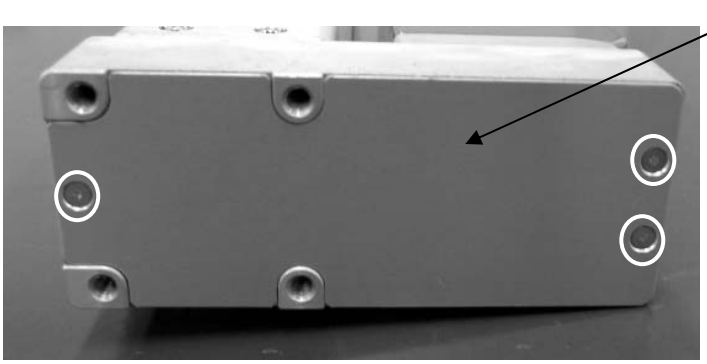




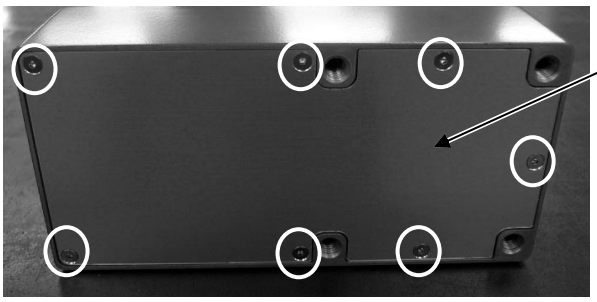
Type	Tension Force
RA4R	20 to 25N
RA6R	25 to 30N
RA7R	80 to 90N
RA8R	200N±20N
RA10R	250N±20N

Type	Tightening Torque
RA4R	162N•cm
RA6R	162N•cm
RA7R	323N•cm
RA8R	536N•cm (54.7kgf•cm)
RA10R	1148N•cm (117kgf•cm)

4) Tighten the seven hex socket head cap bolts (where marked with a circle) with a phillips screwdriver (RA4R, RA6R, RA7R) and hex wrench (RA8R, RA10R) to attach the pulley cover.



RA4R, RA6R, RA7R



RA8R, RA10R

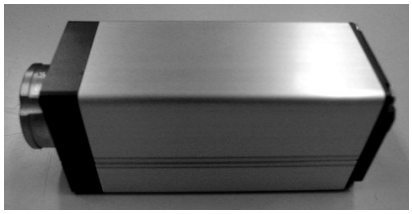
Type	Tightening Torque
RA4R, RA6R	43.1 N•cm
RA7R	76.8 N•cm
RA8R, RA10R	73.7 N•cm

5.8 Replacement Process

5.8.1 RA4C, RA6C and RA7C

[Items required for replacing the motor]

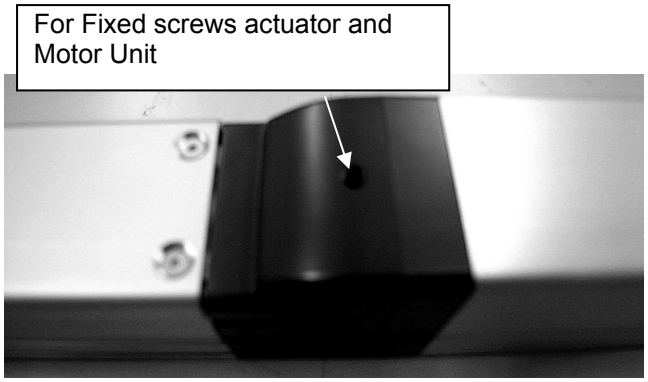
- Motor Unit for Replacement



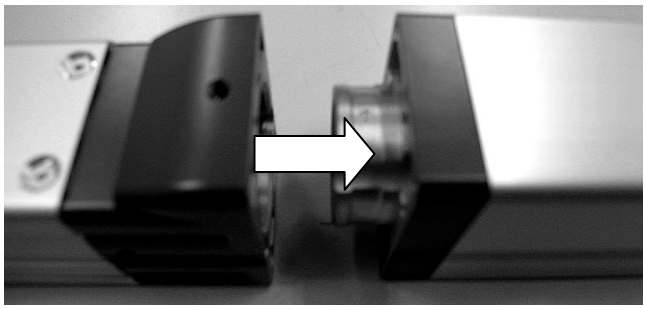
- Hex wrench set 2mm or 2.5mm-sized

[Procedure]

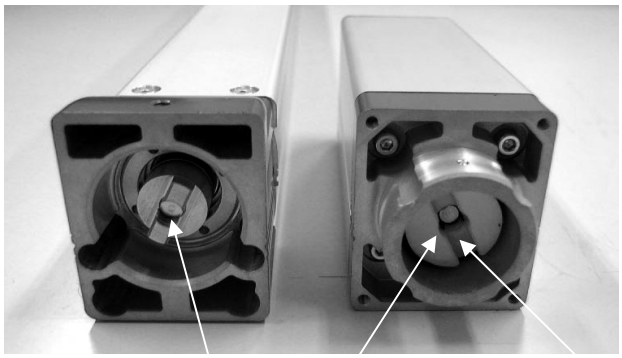
1) Remove the fixing screw affixing the actuator and the motor unit with a 2mm-sized (RA4C, RA6C) or 2.5mm-sized (RA7C) hex wrench.



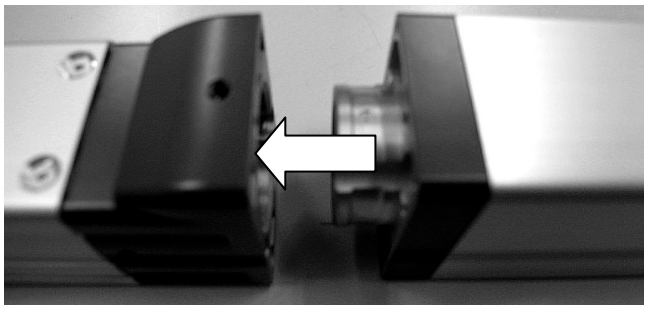
2) Detach the motor unit.



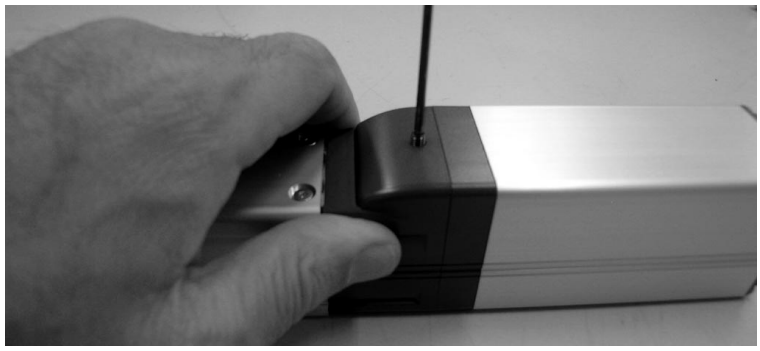
3) Make the profiles on the actuator side and motor unit side aligned so the projection matches to the slit.



4) Attach the motor unit for replacement with the projection being matched with the slit.



5) Tighten the fixing screw to affixing the motor unit to the actuator with 2mm-sized (RA4C, RA6C) or 2.5mm-sized (RA7C) hex wrench.



Model Name	Tightening Torque
RA4C, RA6C	167N·cm
RA7C	353N·cm

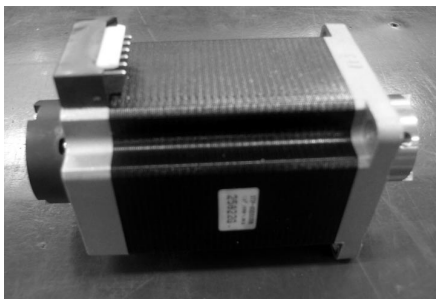
6) For Battery-less Absolute Type (Model Code WA), make sure to have a home-return operation on the PC or touch panel teaching after the motor replacement.

5.8.2 Standard Type RCP5-RA8C and RA10C

(Note) Although the replacement motor for RA10C is different from that for RA8C, the process of replacing is the same.

[Items required for replacing the motor]

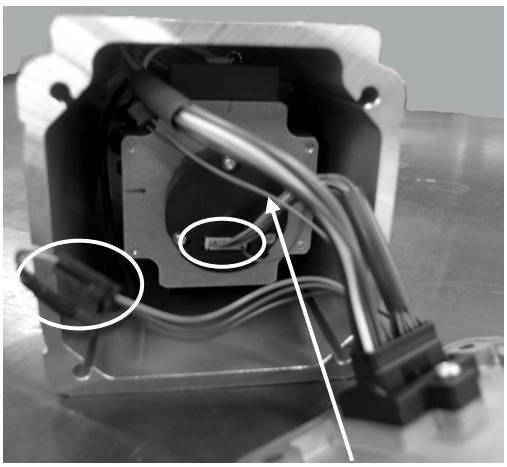
- Hex wrench set
- Phillips Screwdriver
- Motor for Replacement



Replacement Motor for RA8C

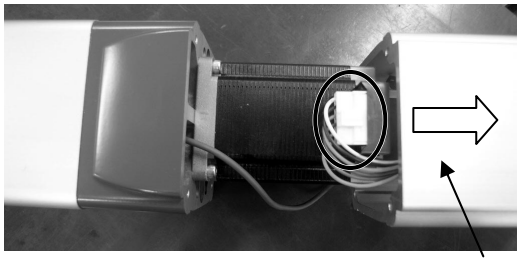
[Procedure]

1) Remove the four screws holding the motor cover with using a Phillips screwdriver. The motor cover can be detached.

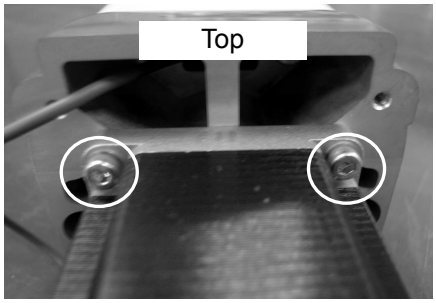


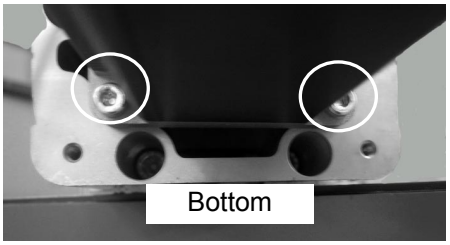
Encoder

2) Disconnect the encoder connector etc.

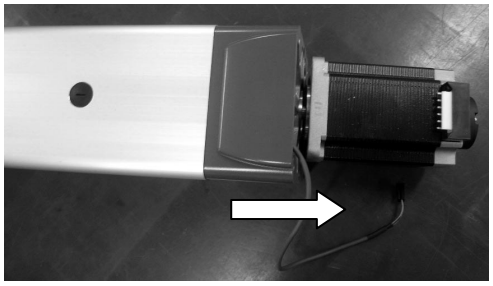


3) Slide the motor cover so the motor can be seen to take off the motor connector.
After the motor connector is taken off, detach the motor cover.



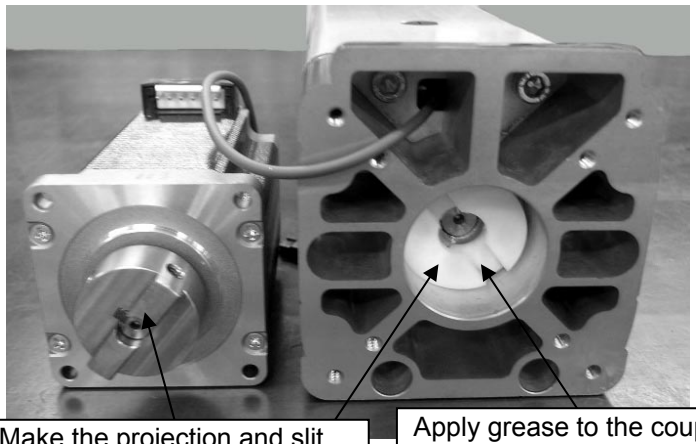


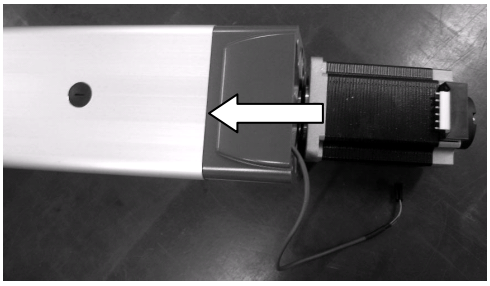
4) Remove the four hex socket head cap bolts (M4 ×15) holding the motor with using a 3mm-sized hex wrench.
(Note) It is a hex socket head bolt (M5 × 15) for RA10C.



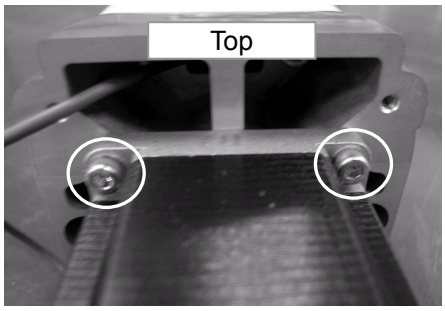
5) Pull out the motor.

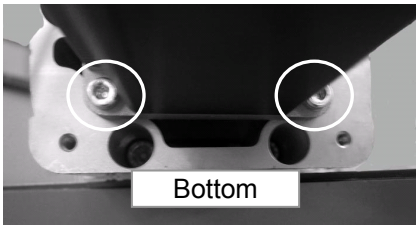
6) Make the profiles on the actuator side and motor unit side aligned so the projection matches to the slit.





7) Insert the motor to the main body while the position of the key on the motor aligned to the key groove on the main body.



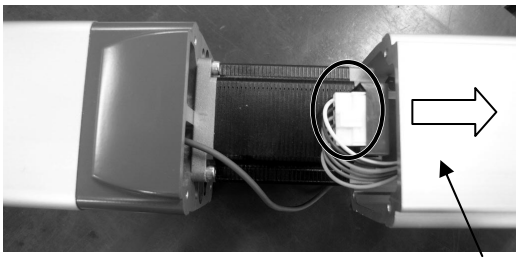


8) Affix the motor with the four bolt (M4 × 15) and tighten them with using a 3mm-sized hex wrench.

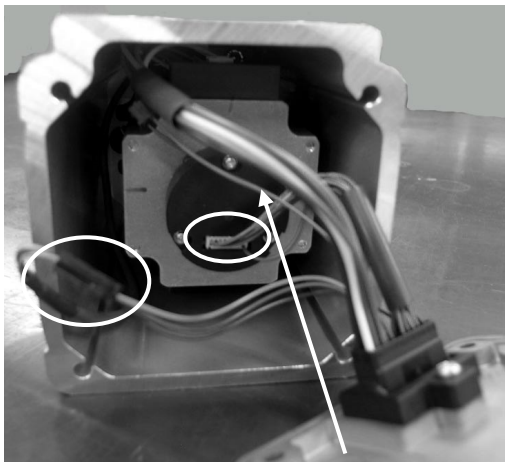
Tightening Torque : 176 N•cm (18.0kgf•cm)

(Note) It is a hex socket head screw (M5 x 15) for RA10C.

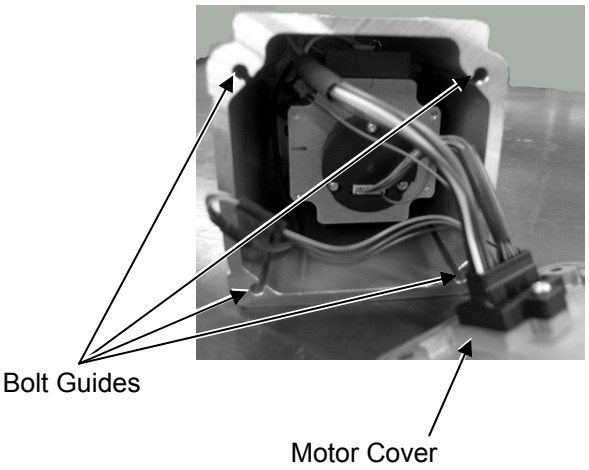
Tightening Torque : 342N•cm (34.9kgf•cm)



9) Attach the motor cover and plug in the motor connector.



10) Plug in the encoder connector etc.



11) Pay attention not to involve the wires to the bolt guilds when attaching the motor cover.
Also pay attention not to pinch the cables on the body, motor cover or end cover.

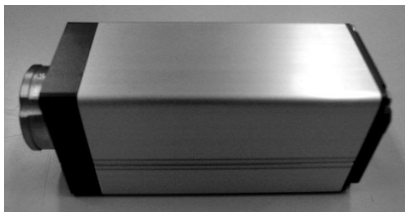
12) Affix the motor cover with the four bolts and tighten them with using a phillips screwdriver.

13) For the battery-less absolute type (model code WA), make sure to conduct a home return on a PC or a touch panel teaching after motor replacement.

5.8.3 RA4R, RA6R and RA7R

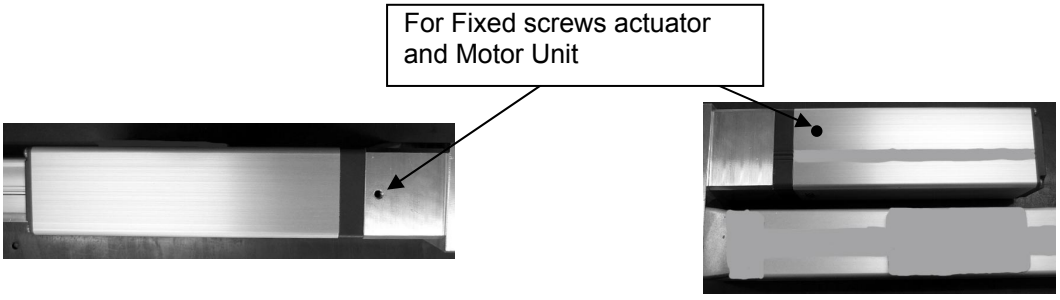
[Items required for replacing the motor]

- Motor Unit for Replacement
- Hexagon Wrench Set 2mm-sized
  2.5mm-sized



[Procedure]

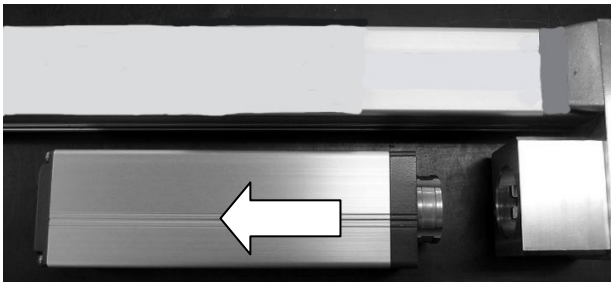
1) Remove the screw affixing the actuator and the motor unit with a 2mm-sized (RA4R, RA6R), 2.5mm-sized (RA7R) hex wrench.
   RA4R fixing screw to affixing is side, RA6R, RA7R fixing screw to affixing is top.



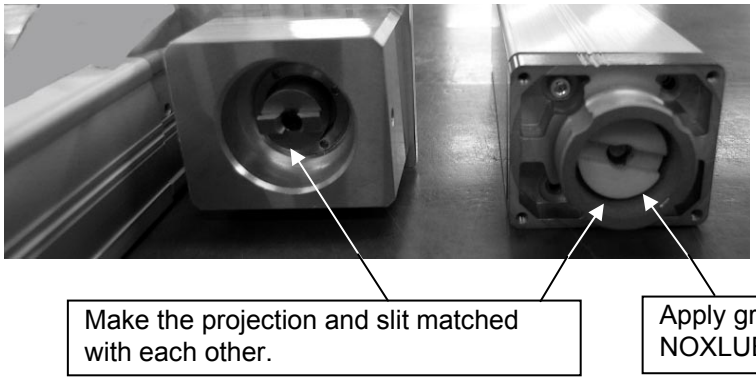
RA4R (View from side)

RA6R, RA7R (View from top)

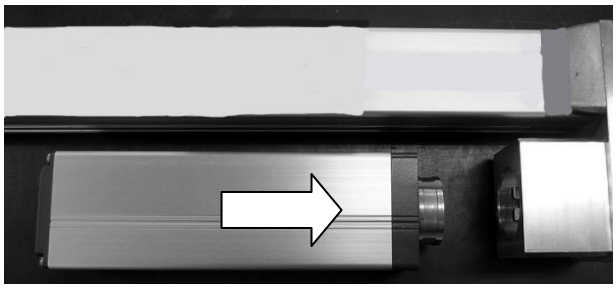
2) Detach the motor unit.



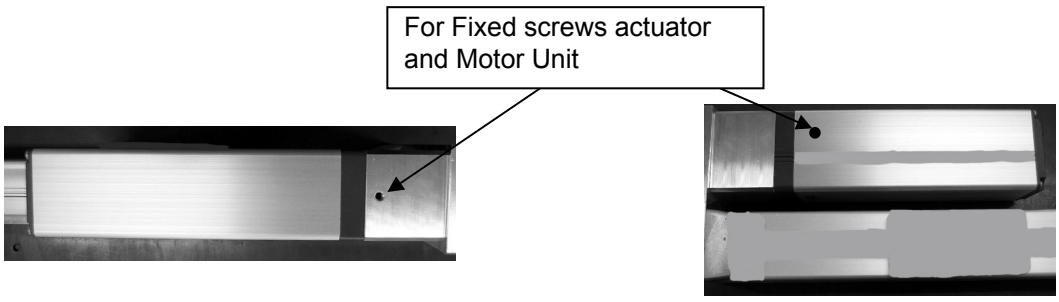
3) Make the profiles on the actuator side and motor unit side aligned so the projection matches to the slit.



4) Attach the motor unit for replacement with the projection being matched with the slit.



5) Tighten fixing screw to affixing the motor unit to the actuator with a 2mm-sized (RA4R, RA6R), 2.5mm-sized (RA7R) hex wrench.



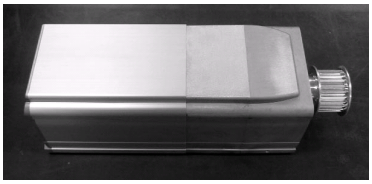
RA4R (View from side)

RA6R, SA7R (View from top)

Model Name	Tightening Torque
RA4R, RA6R	167N•cm
RA7R	353N•cm

5.8.4 RA8R and RA10R

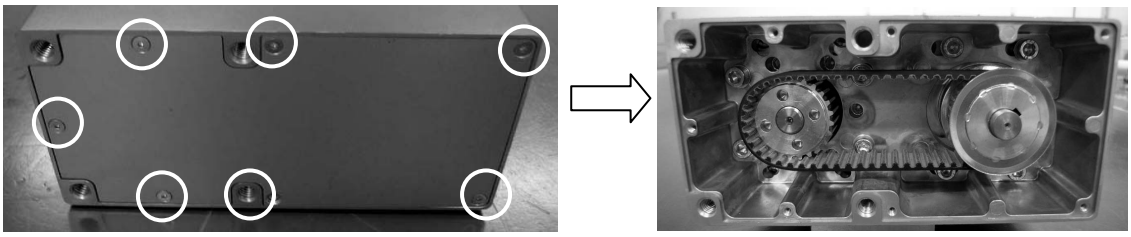
[Items Required for Replacement Work]



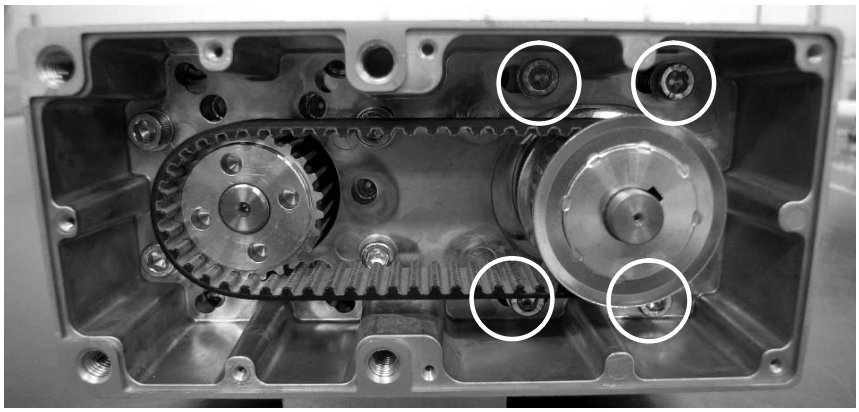
- Motor unit for replacement
- Hex wrench set
  2mm, 5mm-sized (RA8R)
  2mm, 6mm-sized (RA10R)
- Tension gauge (capable thing of tensioning to 250 N ±20 N or greater)
- Strong string or long tie-band

[Procedure]

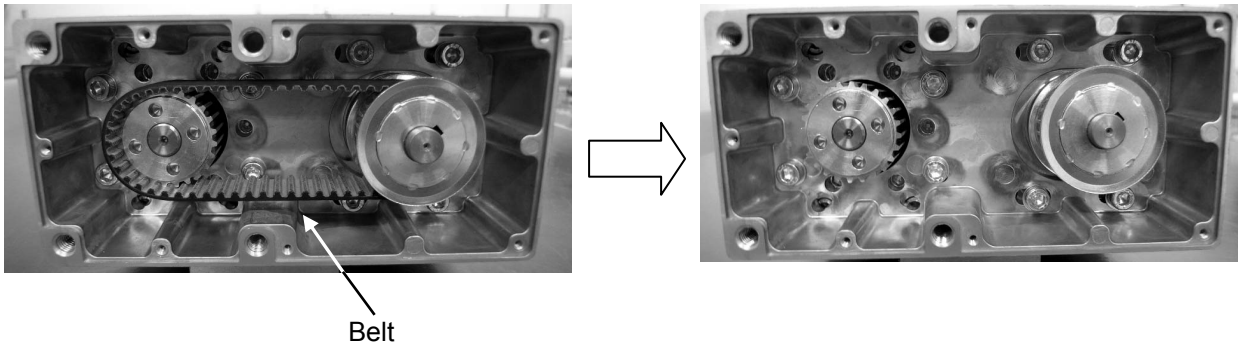
1) Detach the pulley cover.
   Remove the seven hex socket flat-head cap screws for RA8 and five for RA10 (where marked with a circle) with a hex wrench.



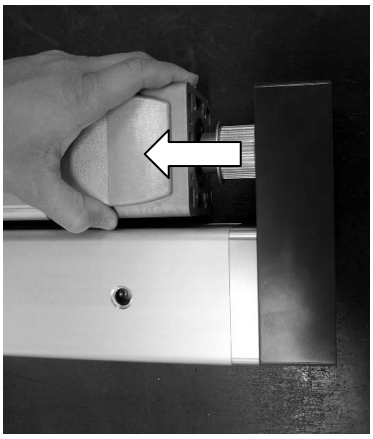
2) Loosen the four tension adjustment bolts (where marked with a circle) to loosen the belt.
   (Use a hexagon wrench with the distance to the opposite side of 5 mm (RA8R), 6 mm (RA10R))



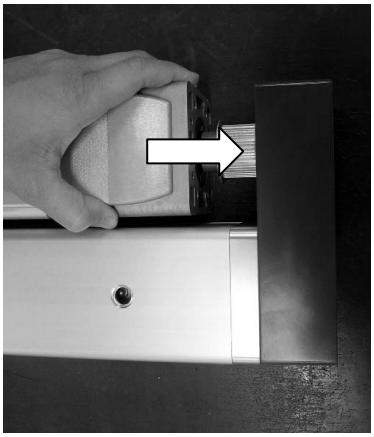
3) Detach the belt off the pulleys.

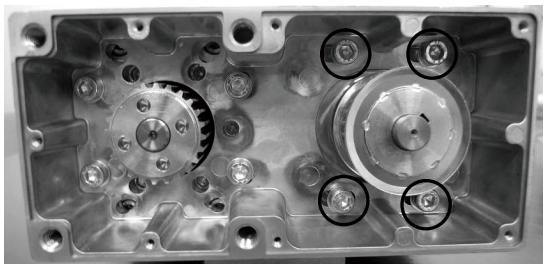


4) Pull out the four tension adjustment bolts and detach the motor unit.

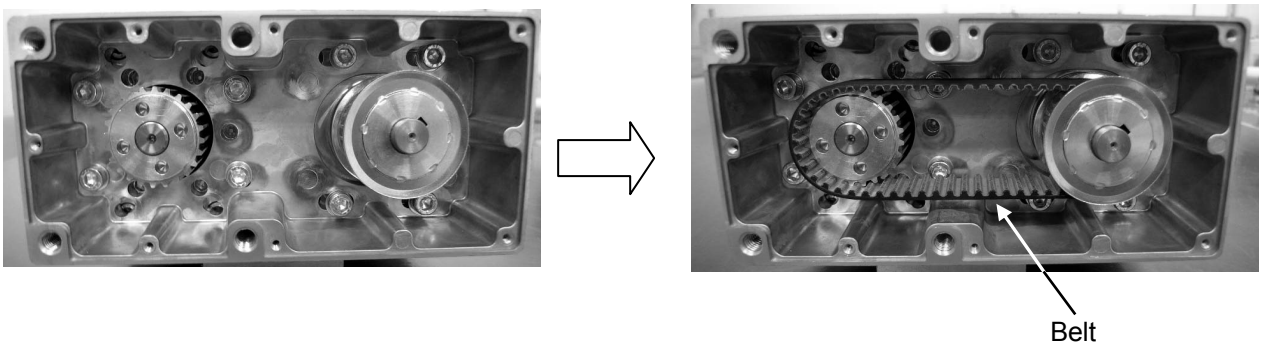


5) Attach a new motor in the tension adjustment bolts (where marked with a circle) loosely.
(Hex socket head cap bolts M6 × 20 + M6 plane washers (RA8R), Hex socket head cap bolts M8 × 22 + M8 plane washers (RA10R))

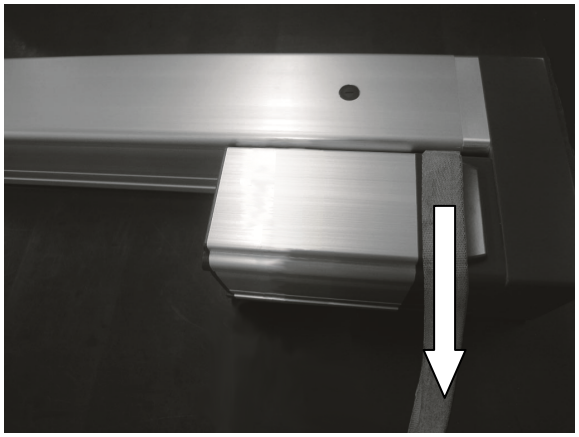


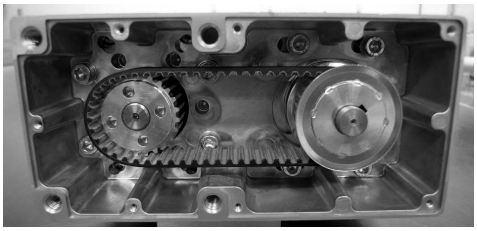


6) Hang the deceleration belt.



7) Put a strong string shaped in a loop (or a long tie-band) around the motor bracket, pull the string with a tension gauge to keep it in the specified tension force, and tighten the tension bolts (where marked with a circle) evenly.

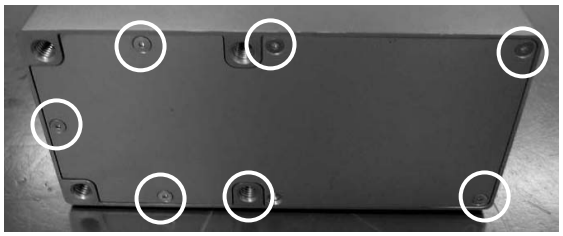




Type	Tension Force
RA8R	200N±20N
RA10R	250N±20N

Type	Tightening Torque
RA8R	536N•cm (54.7kgf•cm)
RA10R	1148N•cm (117kgf•cm)

8) Attach the pulley cover.
Tighten the seven hex socket flat-head cap screws for RA8 and five for RA10 (where marked with a circle) with a hex wrench.



RA8R, RA10R	Tightening Torque: 73.7N•cm

9) For the battery-less absolute type (model code WA), make sure to conduct a home return on a PC or a touch panel teaching after motor replacement.

5.8.5 Dustproof/Splash Proof Type RCP5W-RA6C, RA7C, RA8C and RA10C

RCP5W-RA6C and 7C: IP67, RCP5W-RA8C and 10C: To secure the performance of IP65, the motor replacement work cannot be conducted on the customer's site. Please contact us and ask for the replacement work if it is necessary.

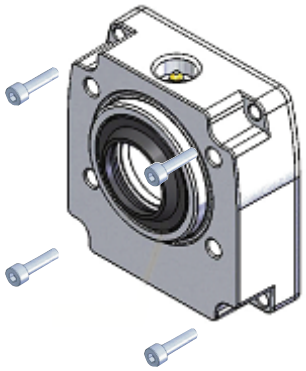
5.9 Procedures to Replace Scraper on Dustproof/Splash proof type RCP5W

5.9.1 Dustproof/Splash Proof Type RCP5W-RA6C and RA7C

[Items required for replacing the motor]

- Front Braket ASSY

(Components) Front Braket+Bolt (RA6C: M4, RA7C: M5) 4 pieces

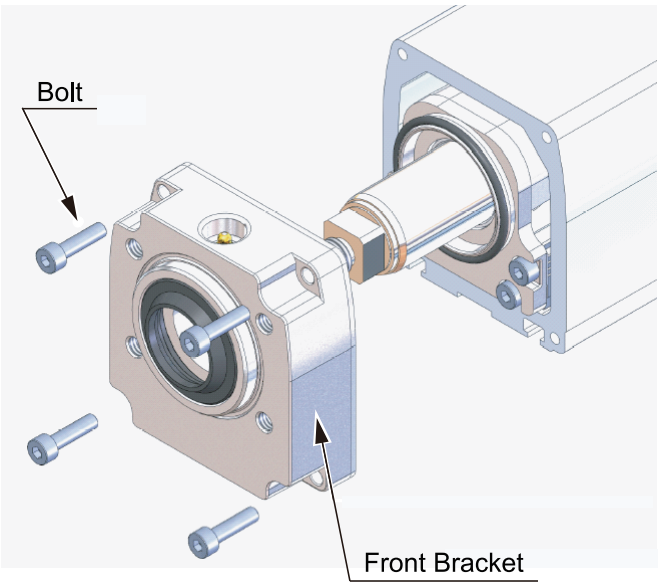


Type	Model Name
RA6C	RCP5W-FBA-RA6
RA7C	RCP5W-FBA-RA7

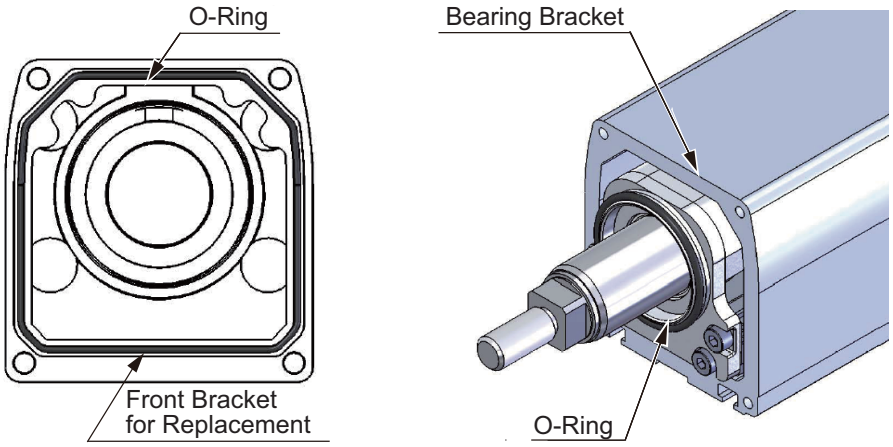
- Hex wrench

[Procedure]

1) Loosen the attachment bolts (RA6C: M4, RA7C: M5) on the front bracket to remove the front bracket.



2) Put the O-ring back on in the groove on the tip of the bearing bracket and also in the groove on the front bracket for replacement.



3) Attach the front bracket and tighten with bolts.
At this time, pay attention not to pinch the O-rings in between.

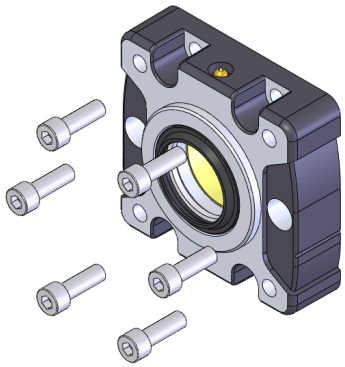
Model	Screw Diameter×Length	Tightening Torgue
RA6C	M4×15	2.07N·m (0.211kgf·m)
RA7C	M5×18	4.11N·m (0.419kgf·m)

5.9.2 Dustproof/Splash Proof Type RCP5W-RA8C and RA10C

[Items required for replacing the motor]

- Front Braket ASSY

(Components) Front Braket ASSY+Bolt (SUS) (RA8C: M6, RA10C: M8) 4 pieces

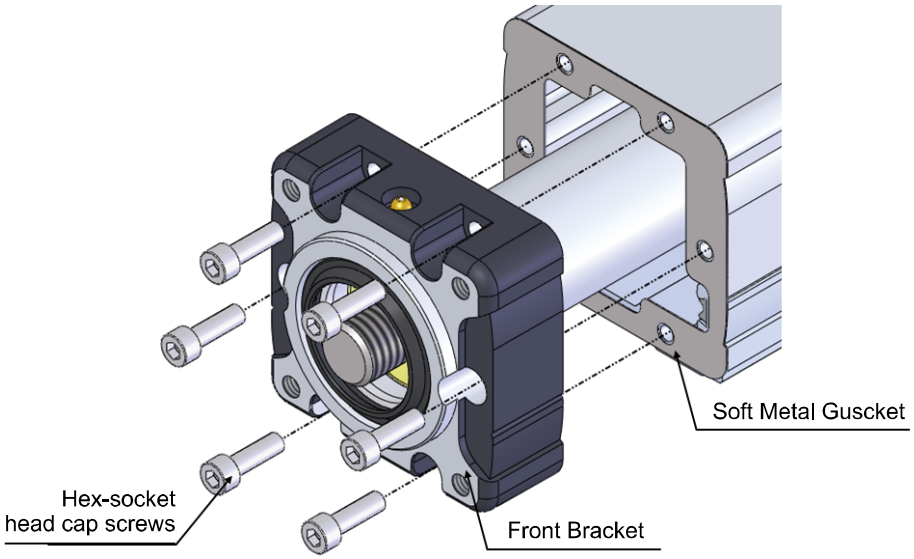


Type	Model Name
RA8C	RCP5W-FBA-RA8
RA10C	RCP5W-FBA-RA10

- Hex wrench

[Procedure]

1) Loosen the attachment bolts (RA8C: M6, RA10C: M8) on the front bracket to remove the front bracket.



2) Attach the front bracket and tighten with bolts.

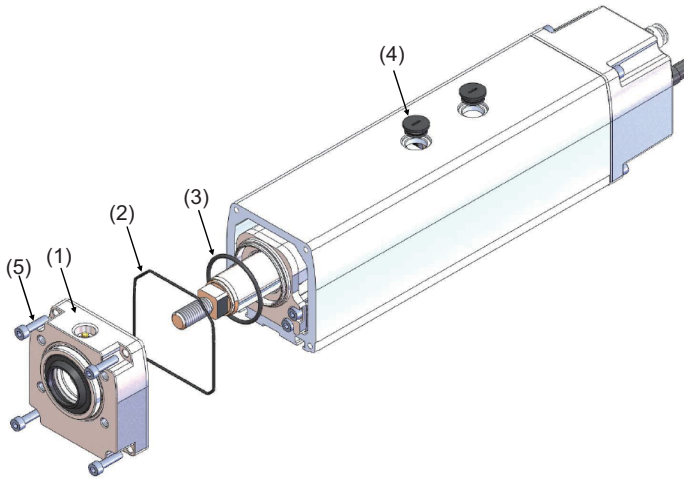
Model	Screw Diameter×Length	Tightening Torgue
RA8C	M6×20	6.44N·m (0.66kgf·m)
RA10C	M8×25	13.77N·m (1.41kgf·m)

⚠ Caution: Do not attempt to detach the metal gasket in inspection on the front bracket. Sealing performance cannot be secured if the gasket is detached.

5.10 Parts List for Maintenance to Dustproof/Splash Proof Type RCP5W

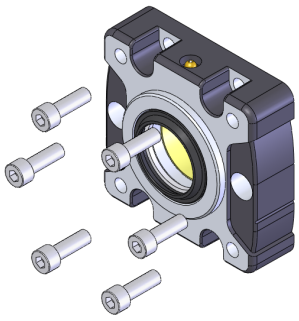
5.10.1 Dustproof/Splash Proof Type RCP5W-RA6C and RA7C

No.	Name	Model Name		Remarks
		RA6C	RA7C	
(1)	Front Bracket ASSY	RCP5W-FBA-RA6	RCP5W-FBA-RA7	
(2)	O-ring	RCP5W-OR1-RA6	RCP5W-OR1-RA7	Unit in 1 piece
(3)	O-ring	RCP5W-OR2-RA6	RCP5W-OR2-RA7	Unit in 1 piece
(4)	Cap	RCP5W-CS-RA		Unit in 1 piece
(5)	Bolt	Enclosed in this Front Bracket ASSY		

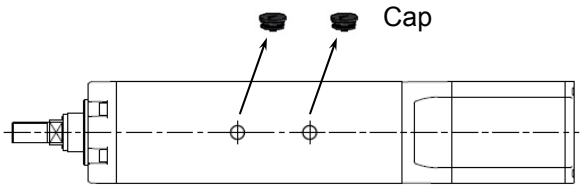


5.10.2 Dustproof/Splash Proof Type RCP5W-RA8C and RA10C

No.	Name	Model Name		Remarks
		RA8C	RA10C	
(1)	Front Bracket ASSY	RCP5W-FBA-RA8	RCP5W-FBA-RA10	
(2)	Cap	RCP4W-CS-RA		Unit in 1 piece
(3)	Bolt	Enclosed in this Front Bracket ASSY		



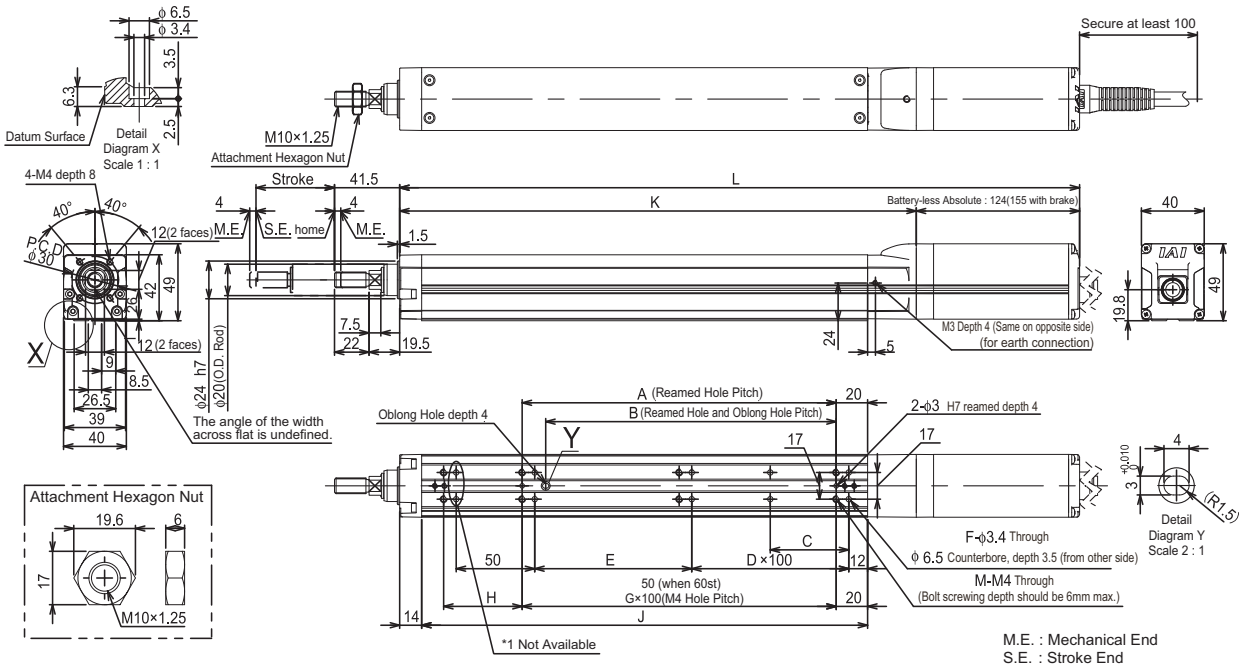
Front Braket ASSY+Bolt



Cap

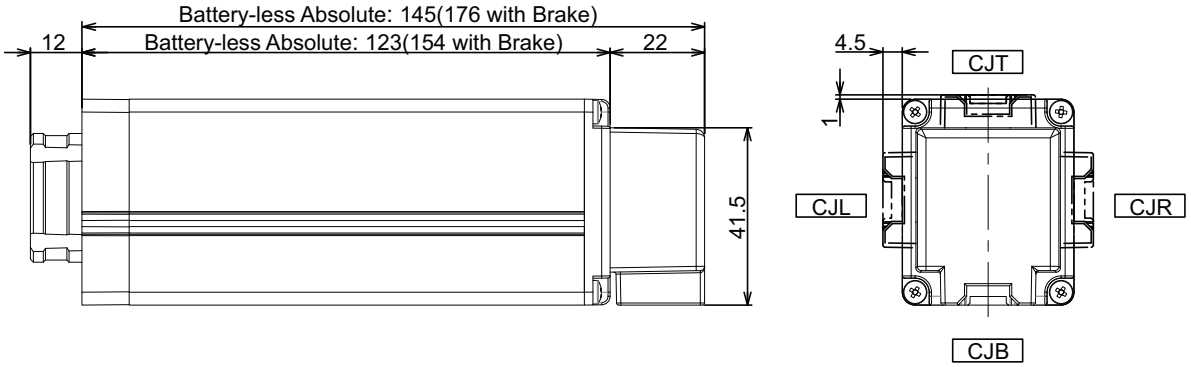
6. External Dimensions

6.1 Standard Type RCP5-RA4C



* 1 Two mounting holes on the rod side of the top of the base cannot be used.

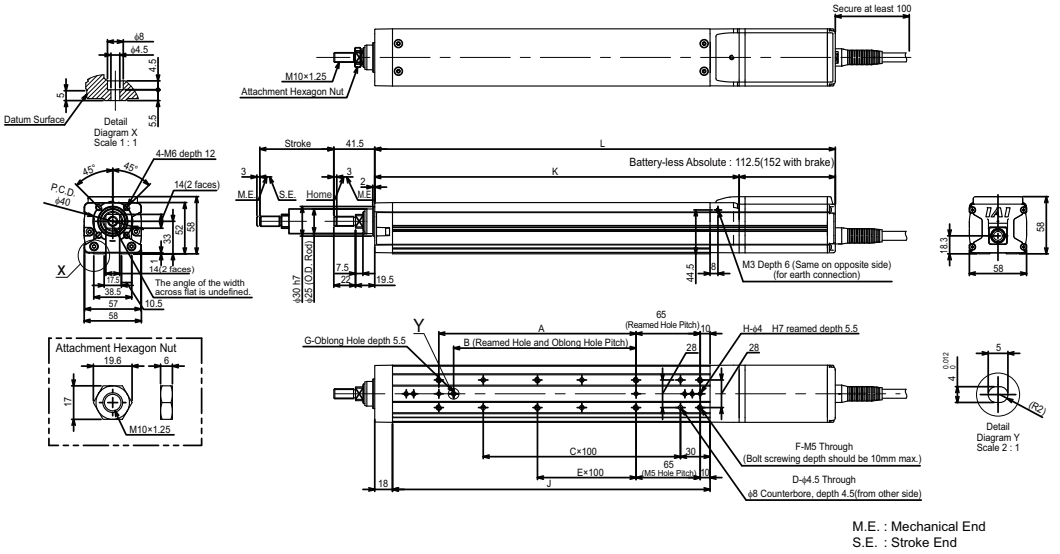
[Cable eject direction(option)]



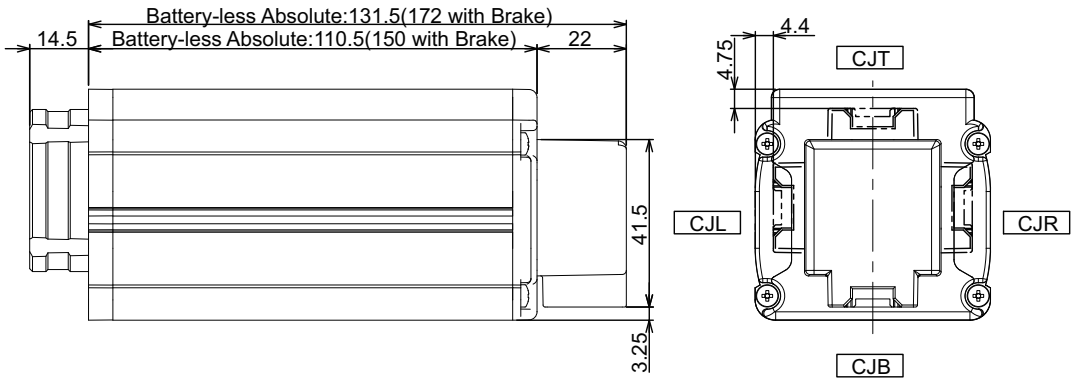
Stroke	L(Battery-less Absolute)		A	B	C	D	E	F	G	H	J	K	M	Mass [kg]	
	w/o Brake	With Brake												w/o Brake	With Brake
60	303	334	50	35	25	0	50	8	-	50	134	179	6	1.1	1.3
110	353	384	100	85	50	0	100	8	1	50	184	229	6	1.2	1.4
160	403	434	100	85	50	1	50	10	1	100	234	279	6	1.3	1.5
210	453	484	200	185	50	1	100	10	2	50	284	329	8	1.4	1.6
260	503	534	200	185	50	2	50	12	2	100	334	379	8	1.6	1.8
310	553	584	300	285	50	2	100	12	3	50	384	429	10	1.7	1.9
360	603	634	300	285	50	3	50	14	3	100	434	479	10	1.8	2.0
410	653	638	400	385	50	3	100	14	4	50	484	529	12	1.9	2.1

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 21mm.

6.2 Standard Type RCP5-RA6C



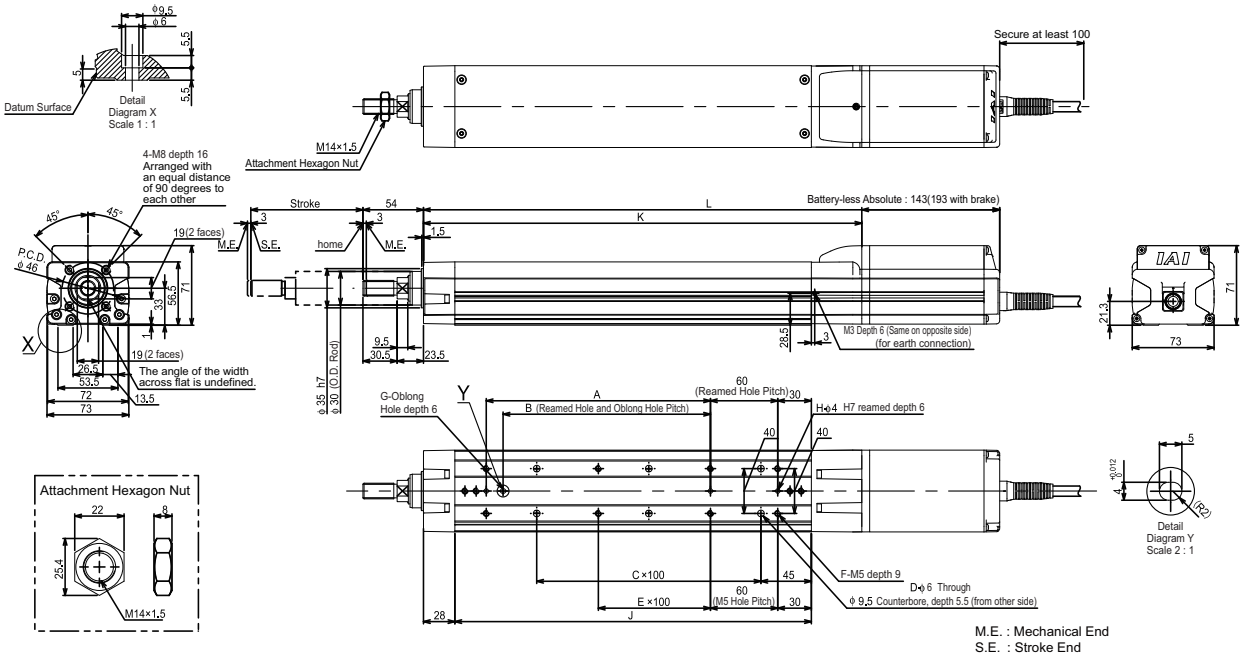
[Cable eject direction(option)]



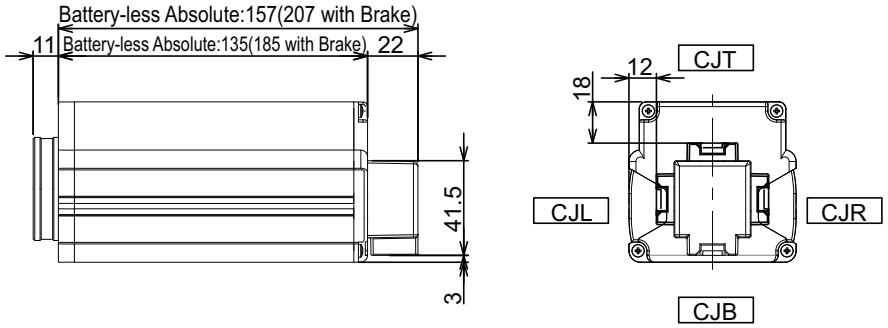
Stroke	L(Battery-less Absolute)		A	B	C	D	E	F	G	H	J	K	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
65	332	371.5	0	0	1	4	0	4	0	2	172	219.5	1.8	2.0
115	382	421.5	100	85	1	4	0	6	1	3	222	269.5	2.0	2.2
165	432	471.5	100	85	2	6	0	6	1	3	272	319.5	2.2	2.4
215	482	521.5	200	185	2	6	1	8	1	3	322	369.5	2.4	2.6
265	532	571.5	200	185	3	8	1	8	1	3	372	419.5	2.6	2.8
315	582	621.5	300	285	3	8	2	10	1	3	422	469.5	2.9	3.1
365	632	671.5	300	285	4	10	2	10	1	3	472	519.5	3.1	3.3
415	682	721.5	400	385	4	10	3	12	1	3	522	569.5	3.3	3.5

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 20mm.

6.3 Standard Type RCP5-RA7C



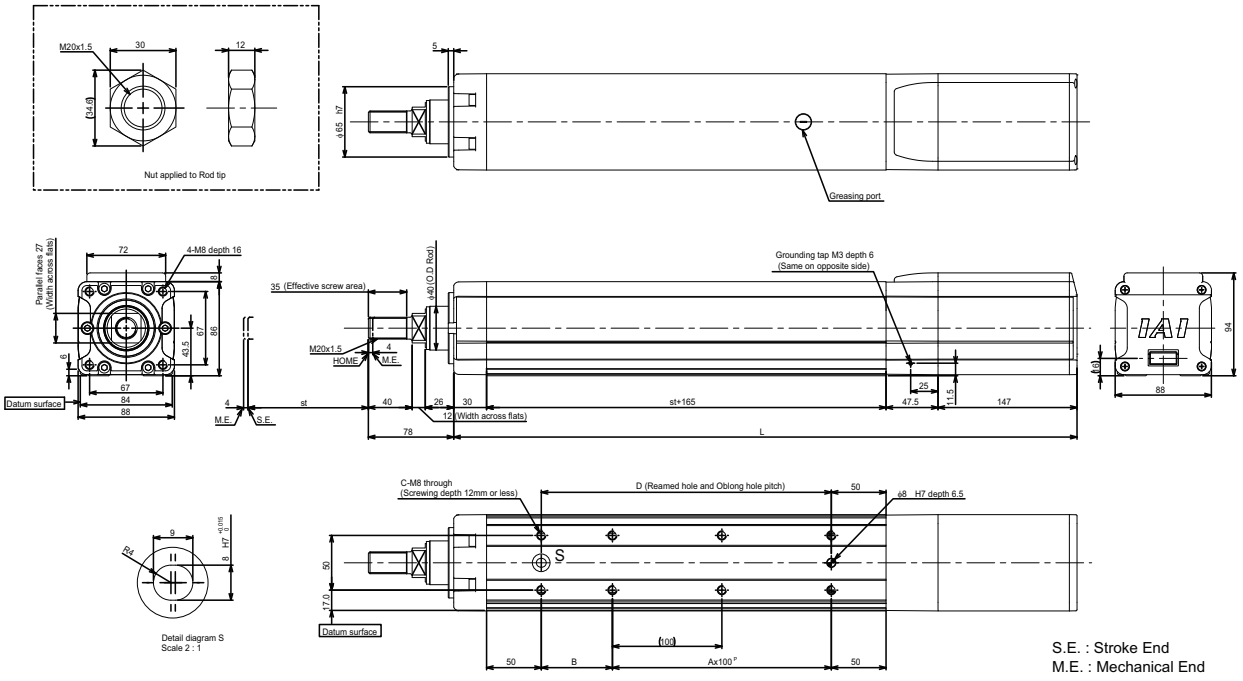
[Cable eject direction(option)]



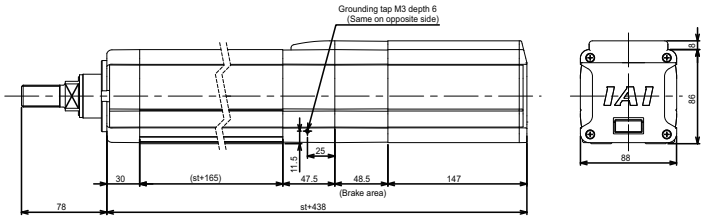
Stroke	L(Battery-less Absolute)		A	B	C	D	E	F	G	H	J	K	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
70	384	434	0	0	1	4	0	4	0	2	168	241	3.3	3.8
120	434	484	100	85	1	4	0	6	1	3	218	291	3.6	4.1
170	484	534	100	85	2	6	0	6	1	3	268	341	3.9	4.4
220	534	584	200	185	2	6	1	8	1	3	318	391	4.2	4.7
270	584	634	200	185	3	8	1	8	1	3	368	441	4.5	5.0
320	634	684	300	285	3	8	2	10	1	3	418	491	4.8	5.3
370	684	734	300	285	4	10	2	10	1	3	468	541	5.1	5.6
420	734	784	400	385	4	10	3	12	1	3	518	591	5.4	5.9
470	784	834	400	385	5	12	3	12	1	3	568	641	5.6	6.1
520	834	884	500	485	5	12	4	14	1	3	618	691	5.9	6.4

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 14mm.

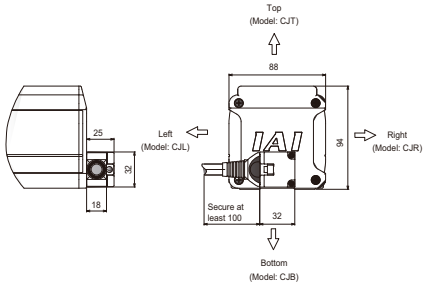
6.4 Standard Type RCP5-RA8C



[With brake (option)]

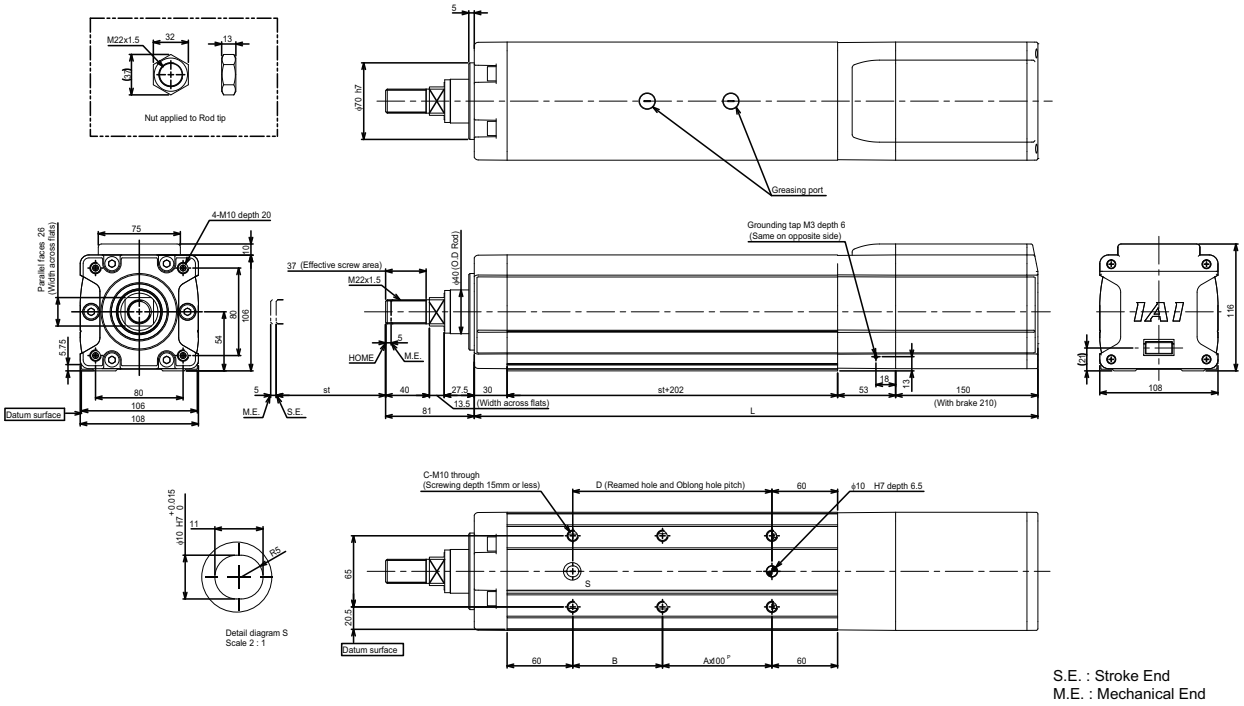


[Cable eject direction(option)]



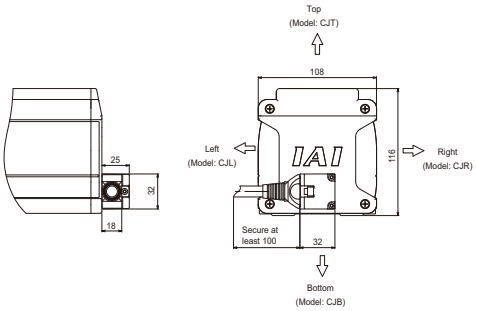
Stroke	L(Battery-less Absolute)		A	B	C	D	Mass [kg]	
	w/o Brake	With Brake					w/o Brake	With Brake
50	439.5	488	0	115	4	115	7.1	8.3
100	489.5	538	1	65	6	165	7.6	8.7
150	539.5	588	1	115	6	215	8.0	9.1
200	589.5	638	2	65	8	265	8.4	9.6
250	639.5	688	2	115	8	315	8.9	10.0
300	689.5	738	3	65	10	365	9.3	10.4
350	739.5	788	3	115	10	415	9.7	10.9
400	789.5	838	4	65	12	465	10.2	11.3
450	839.5	888	4	115	12	515	10.6	11.7
500	889.5	938	5	65	14	565	11.0	12.1
550	939.5	988	5	115	14	615	11.4	12.6
600	989.5	1038	6	65	16	665	11.9	13.0
650	1039.5	1088	6	115	16	715	12.3	13.4
700	1089.5	1138	7	65	18	765	12.7	13.9

6.5 Standard Type RCP5-RA10C



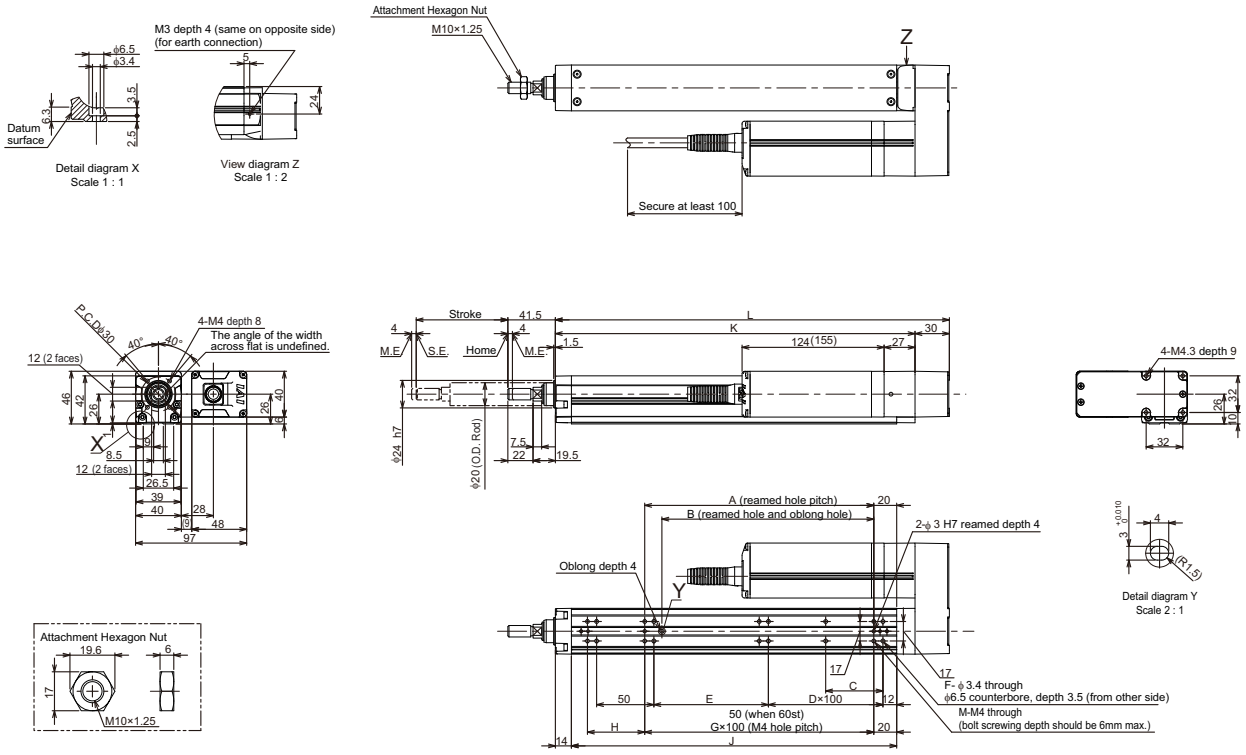
S.E. : Stroke End
M.E. : Mechanical End

[Cable eject direction(option)]



Stroke	L(Battery-less Absolute)		A	B	C	D	Mass [kg]	
	w/o Brake	With Brake					w/o Brake	With Brake
50	485	545	0	132	4	132	11.5	13.1
100	535	595	1	82	6	182	12.2	13.8
150	585	645	1	132	6	232	12.9	14.5
200	635	695	2	82	8	282	13.6	15.2
250	685	745	2	132	8	332	14.3	15.9
300	735	795	3	82	10	382	15	16.6
350	785	845	3	132	10	432	15.7	17.3
400	835	895	4	82	12	482	16.4	18
450	885	945	4	132	12	532	17.1	18.7
500	935	995	5	82	14	582	17.8	19.4
550	985	1045	5	132	14	632	18.5	20.1
600	1035	1095	6	82	16	682	19.2	20.8
650	1085	1145	6	132	16	732	19.9	21.5
700	1135	1195	7	82	18	782	20.6	22.2
750	1185	1245	7	132	18	832	21.3	22.9
800	1235	1295	8	82	20	882	22	23.6

6.6 Standard Type RCP5-RA4R

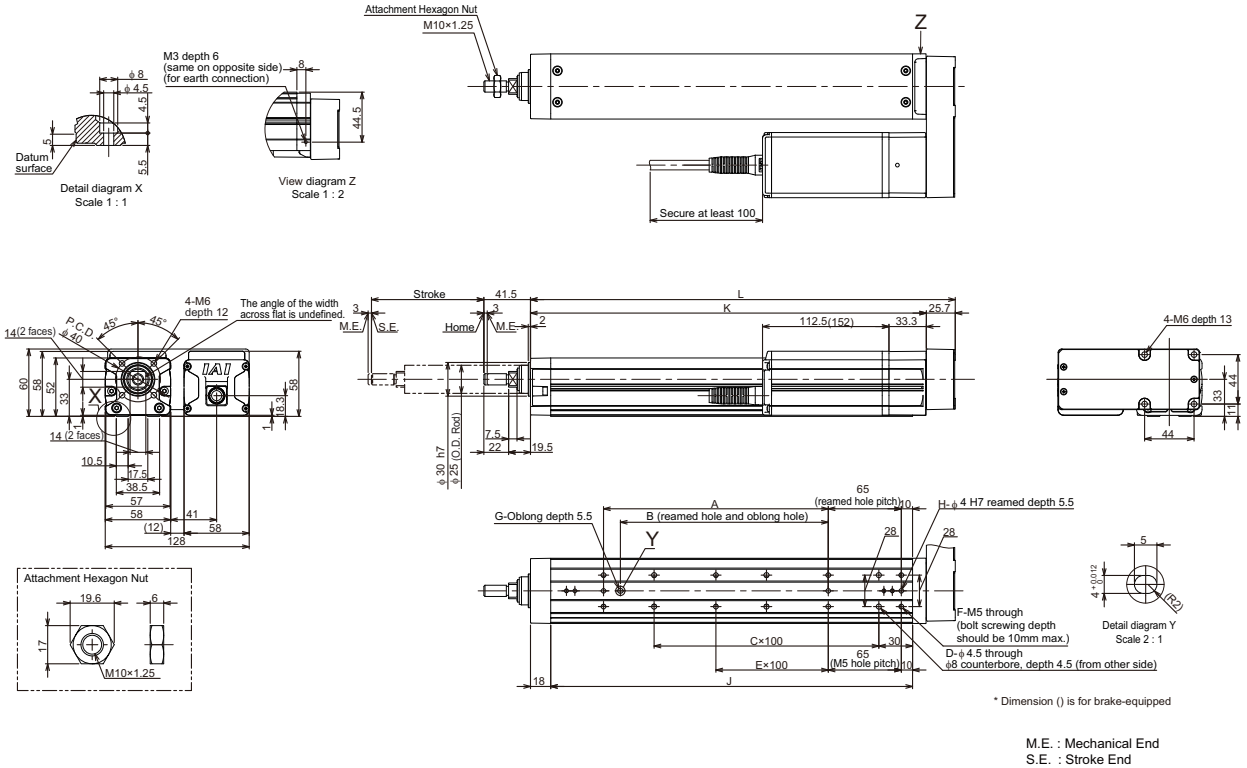


* Dimension () is for brake-equipped

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

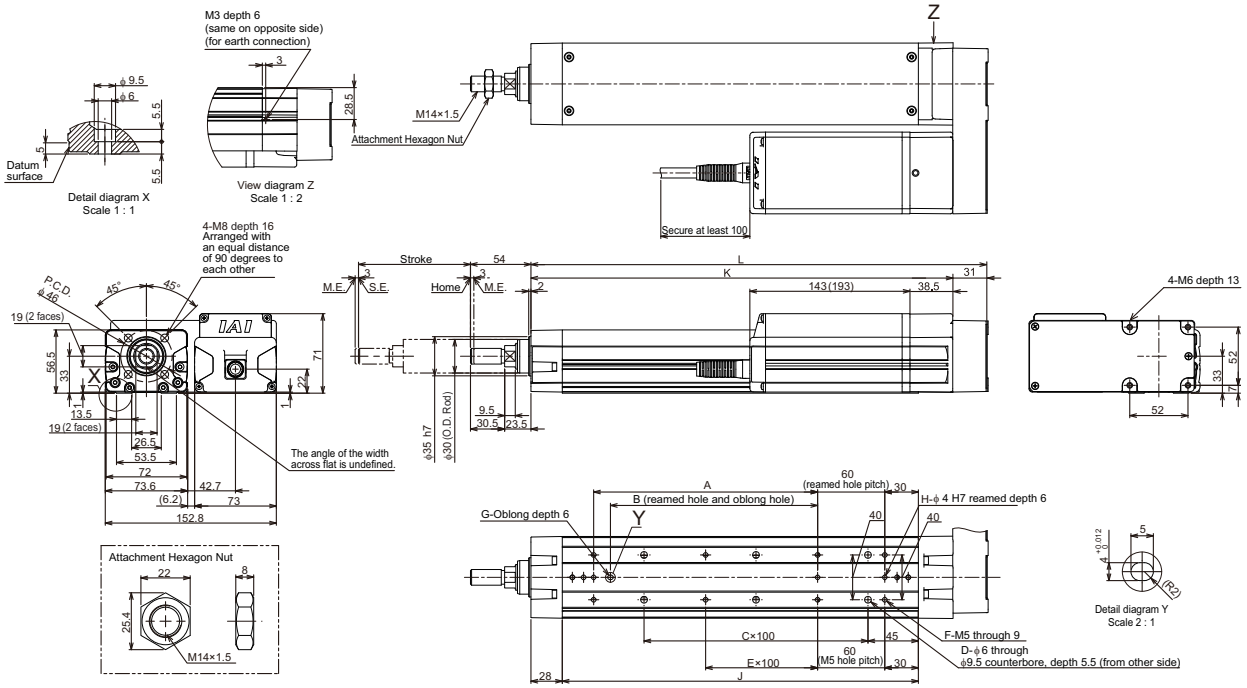
Stroke	L	A	B	C	D	E	F	G	H	J	K	M	Mass [kg]	
													w/o Brake	With Brake
60	194	50	35	25	0	50	8	-	50	134	164	6	1.4	1.6
110	244	100	85	50	0	100	8	1	50	184	214	6	1.5	1.7
160	294	100	85	50	1	50	10	1	100	234	264	6	1.6	1.8
210	344	200	185	50	1	100	10	2	50	284	314	8	1.7	1.9
260	394	200	185	50	2	50	12	2	100	334	364	8	1.9	2.1
310	444	300	285	50	2	100	12	3	50	384	414	10	2.0	2.2
360	494	300	285	50	3	50	14	3	100	434	464	10	2.1	2.3
410	544	400	385	50	3	100	14	4	50	484	514	12	2.2	2.4

6.7 Standard Type RCP5-RA6R



Stroke	L	A	B	C	D	E	F	G	H	J	K	Mass [kg]	
												w/o Brake	With Brake
65	228	0	0	1	4	0	4	0	2	172	202.3	2.2	2.4
115	278	100	85	1	4	0	6	1	3	222	252.3	2.4	2.6
165	328	100	85	2	6	0	6	1	3	272	302.3	2.6	2.8
215	378	200	185	2	6	1	8	1	3	322	352.3	2.8	3.0
265	428	200	185	3	8	1	8	1	3	372	402.3	3.0	3.2
315	478	300	285	3	8	2	10	1	3	422	452.3	3.3	3.5
365	528	300	285	4	10	2	10	1	3	472	502.3	3.5	3.7
415	578	400	385	4	10	3	12	1	3	522	552.3	3.7	3.9

6.8 Standard Type RCP5-RA7R

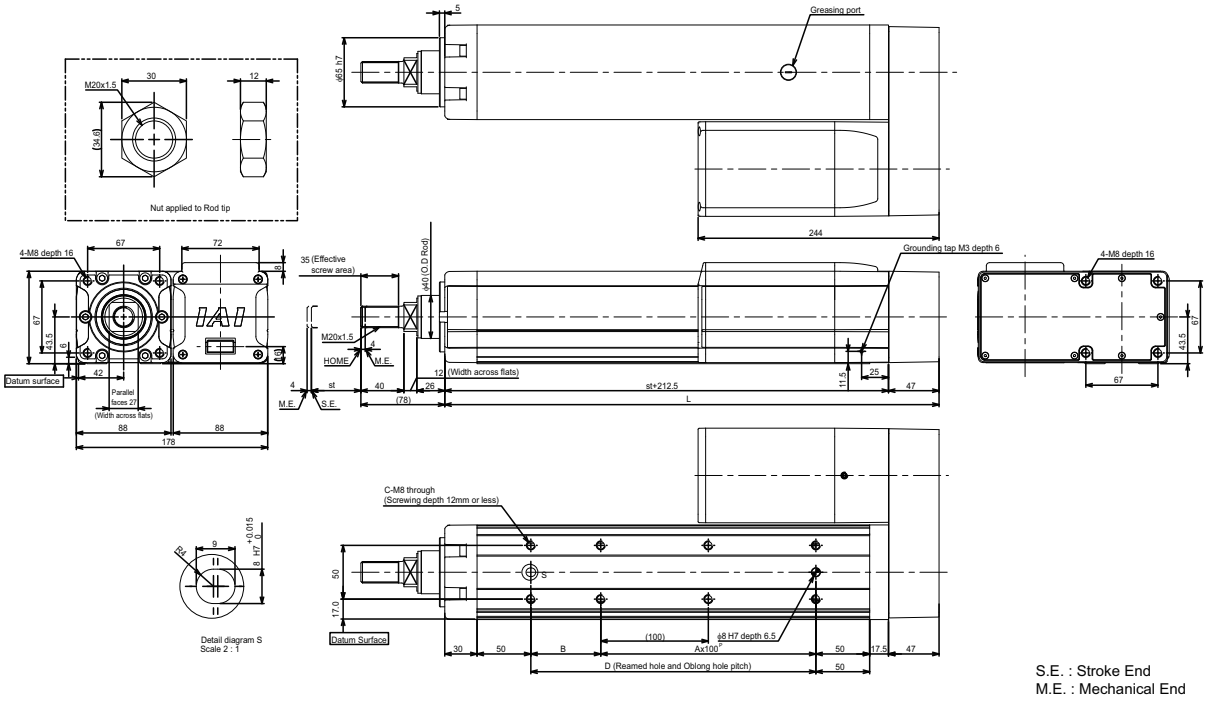


* Dimension () is for brake-equipped

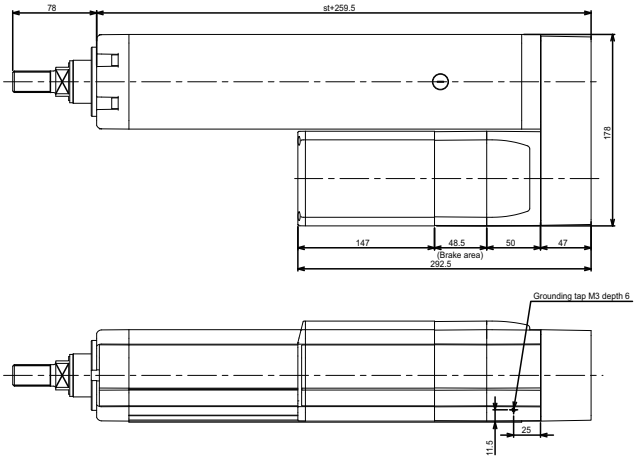
M.E. : Mechanical End
S.E. : Stroke End

Stroke	L	A	B	C	D	E	F	G	H	J	K	Mass [kg]	
												w/o Brake	With Brake
70	258	0	0	1	4	0	4	0	2	168	227	4.0	4.5
120	308	100	85	1	4	0	6	1	3	218	277	4.3	4.8
170	358	100	85	2	6	0	6	1	3	268	327	4.6	5.1
220	408	200	185	2	6	1	8	1	3	318	377	4.9	5.4
270	458	200	185	3	8	1	8	1	3	368	427	5.2	5.7
320	508	300	285	3	8	2	10	1	3	418	477	5.5	6.0
370	558	300	285	4	10	2	10	1	3	468	527	5.8	6.3
420	608	400	385	4	10	3	12	1	3	518	577	6.1	6.6
470	658	400	385	5	12	3	12	1	3	568	627	6.3	6.8
520	708	500	485	5	12	4	14	1	3	618	677	6.6	7.1

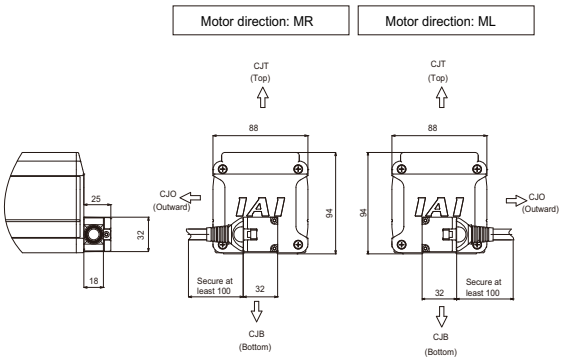
6.9 Standard Type RCP5-RA8R



[With brake (option)]

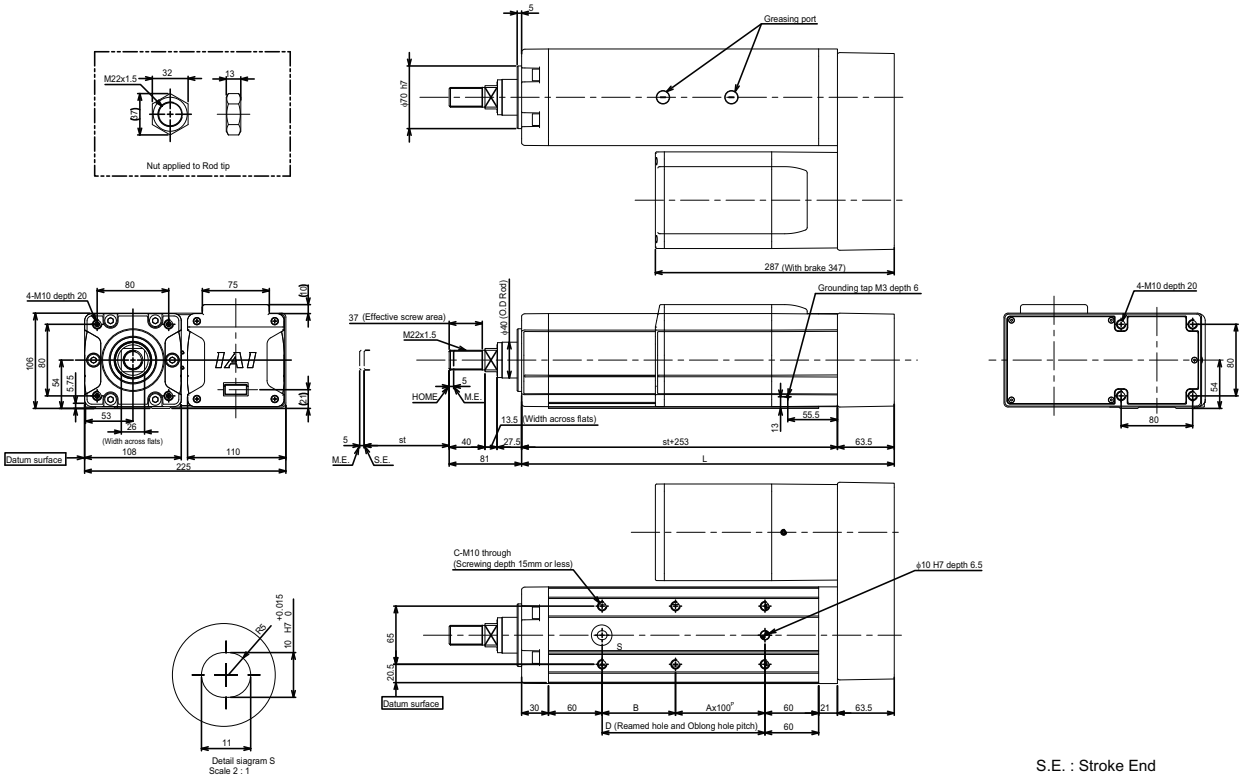


[Cable eject direction(option)]



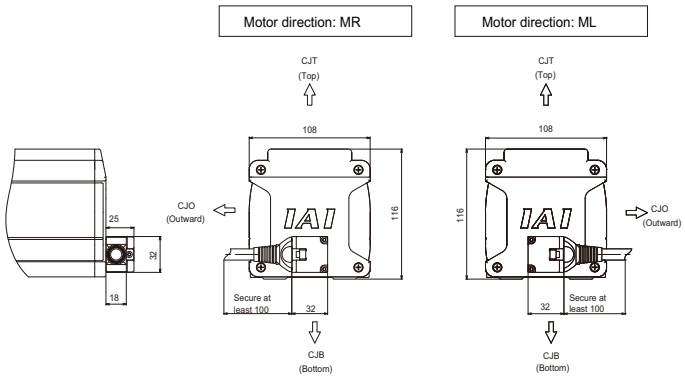
Stroke	L	A	B	C	D	Mass [kg]	
						w/o Brake	With Brake
50	309.5	0	115	4	115	8.6	9.6
100	359.5	1	65	6	165	9.0	10.0
150	409.5	1	115	6	215	9.4	10.4
200	459.5	2	65	8	265	9.8	10.9
250	509.5	2	115	8	315	10.3	11.3
300	559.5	3	65	10	365	10.7	11.7
350	609.5	3	115	10	415	11.1	12.2
400	659.5	4	65	12	465	11.6	12.6
450	709.5	4	115	12	515	12.0	13.0
500	759.5	5	65	14	565	12.4	13.4
550	809.5	5	115	14	615	12.9	13.9
600	859.5	6	65	16	665	13.3	14.3
650	909.5	6	115	16	715	13.7	14.7
700	959.5	7	65	18	765	14.1	15.2

6.10 Standard Type RCP5-RA10R



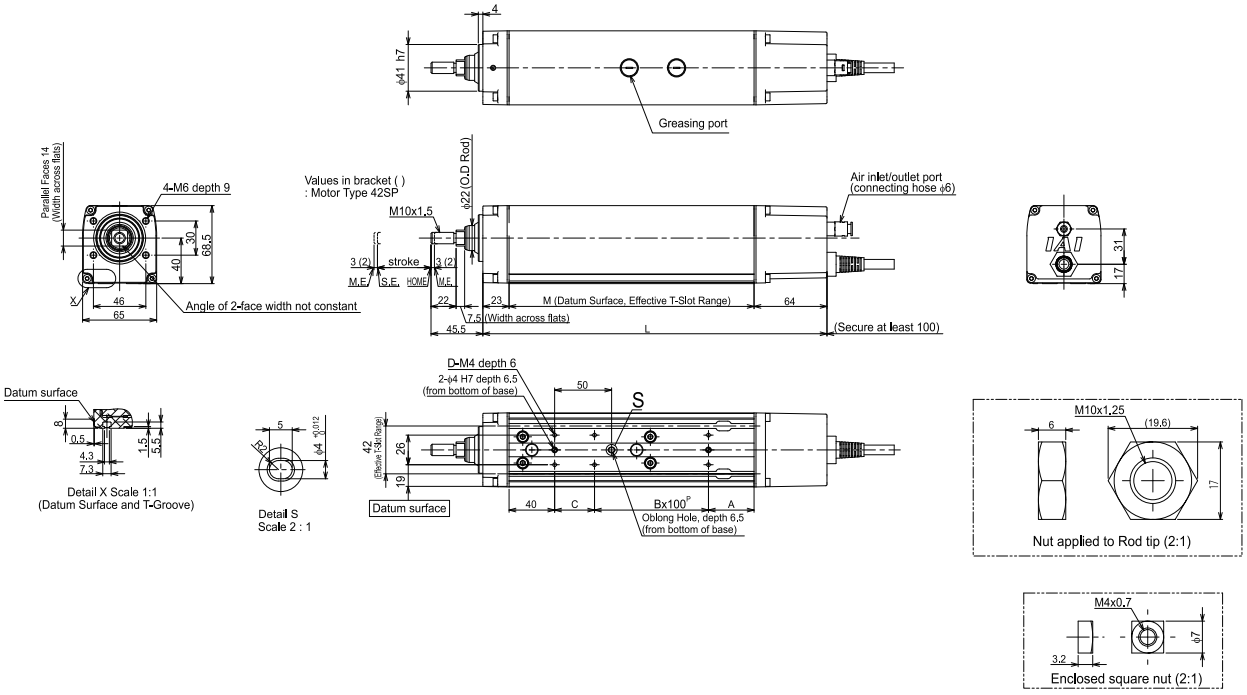
S.E. : Stroke End
M.E. : Mechanical End

[Cable eject direction(Option)]



Stroke	L	A	B	C	D	Mass [kg]	
						w/o Brake	With Brake
50	366.5	0	132	4	132	14.6	16.2
100	416.5	1	82	6	182	15.3	16.9
150	466.5	1	132	6	232	16.0	17.6
200	516.5	2	82	8	282	16.7	18.3
250	566.5	2	132	8	332	17.4	19.0
300	616.5	3	82	10	382	18.1	19.7
350	666.5	3	132	10	432	18.8	20.4
400	716.5	4	82	12	482	19.5	21.1
450	766.5	4	132	12	532	20.2	21.8
500	816.5	5	82	14	582	20.9	22.5
550	866.5	5	132	14	632	21.6	23.2
600	916.5	6	82	16	682	22.3	23.9
650	966.5	6	132	16	732	23.0	24.6
700	1016.5	7	82	18	782	23.7	25.3
750	1066.5	7	132	18	832	24.4	26.0
800	1116.5	8	82	20	882	25.1	26.7

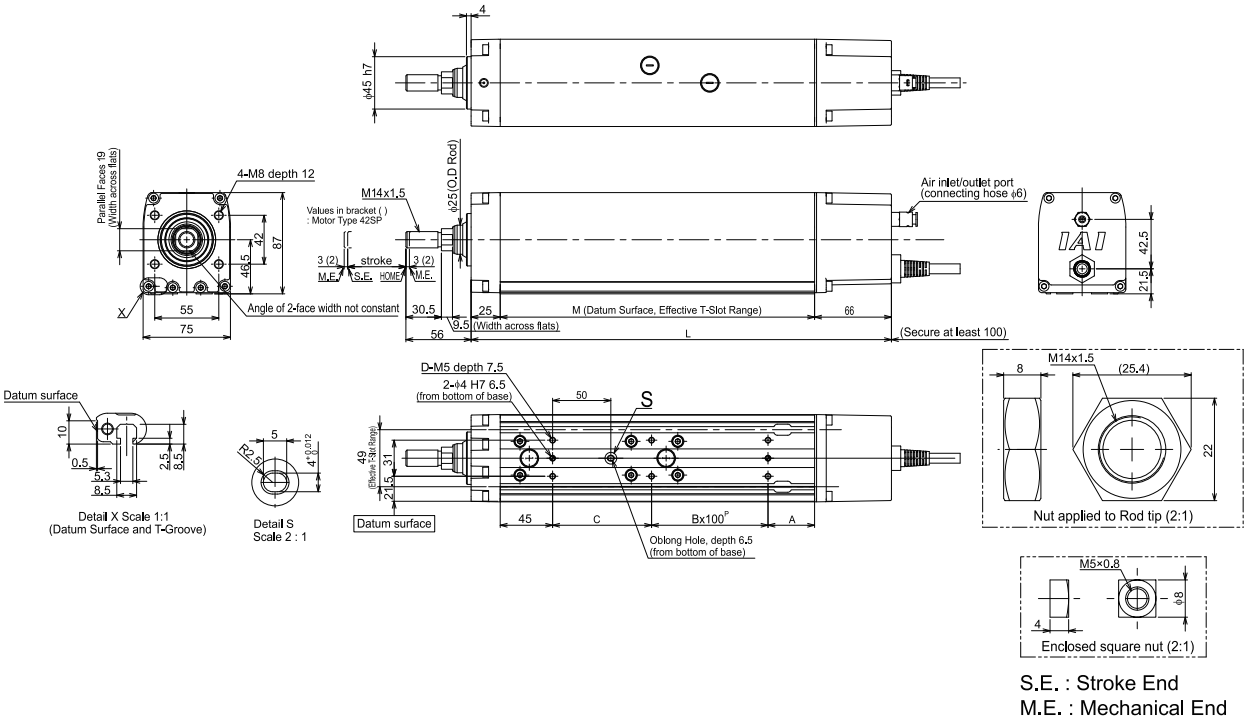
6.11 Dustproof/Splash Proof Type RCP5W-RA6C



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

Stroke	L		A		B	C	D	M		Mass [kg]		
	w/o Brake	With Brake	w/o Brake	With Brake				w/o Brake	With Brake	w/o Brake	With Brake	With Brake (42SP Motor)
50	302	363	40	101	1	35	6	215	276	3.2	3.6	3.7
100	352	413	40	101	1	85	6	265	326	3.6	4.0	4.1
150	402	463	40	101	2	35	8	315	376	3.9	4.4	4.5
200	452	513	40	101	2	85	8	365	426	4.3	4.8	4.9
250	502	563	40	101	3	35	10	415	476	4.7	5.2	5.3
300	552	613	40	101	3	85	10	465	526	5.1	5.6	5.7
350	602	663	40	101	4	35	12	515	576	5.5	6.0	6.1
400	652	713	40	101	4	85	12	565	626	5.9	6.4	6.5

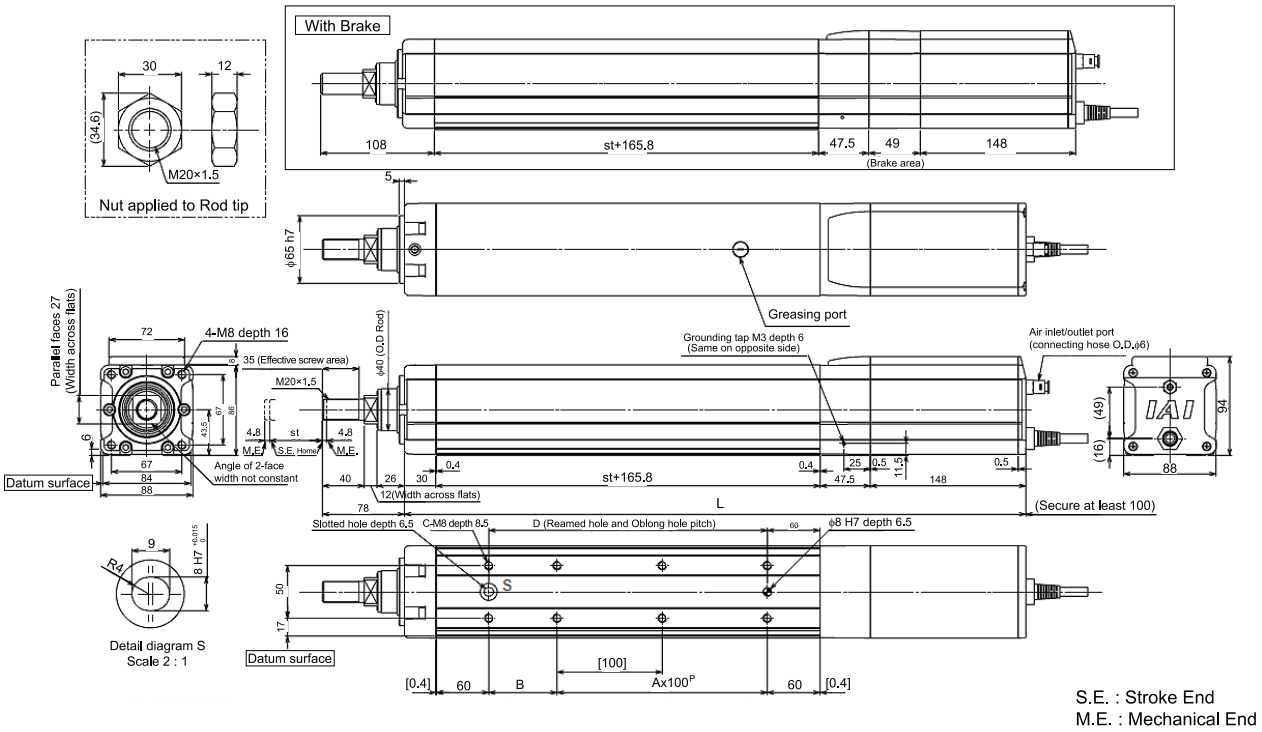
6.12 Dustproof/Splash Proof Type RCP5W-RA7C



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

Stroke	L		A		B	C	D	M		Mass [kg]	
	w/o Brake	With Brake	w/o Brake	With Brake				w/o Brake	With Brake	w/o Brake	With Brake
50	361	416	40	95	1	85	6	270	325	5.7	6.5
100	411	466	40	95	1	135	6	320	375	6.2	7.0
150	461	516	40	95	2	85	8	370	425	6.7	7.5
200	511	566	40	95	2	135	8	420	475	7.3	8.0
250	561	616	40	95	3	85	10	470	525	7.8	8.5
300	611	666	40	95	3	135	10	520	575	8.3	9.1
350	661	716	40	95	4	85	12	570	625	8.8	9.6
400	711	766	40	95	4	135	12	620	675	9.3	10.1
450	761	816	40	95	5	85	14	670	725	9.8	10.6
500	811	866	40	95	5	135	14	720	775	10.3	11.1

6.13 Dustproof/Splash Proof Type RCP5W-RA8C

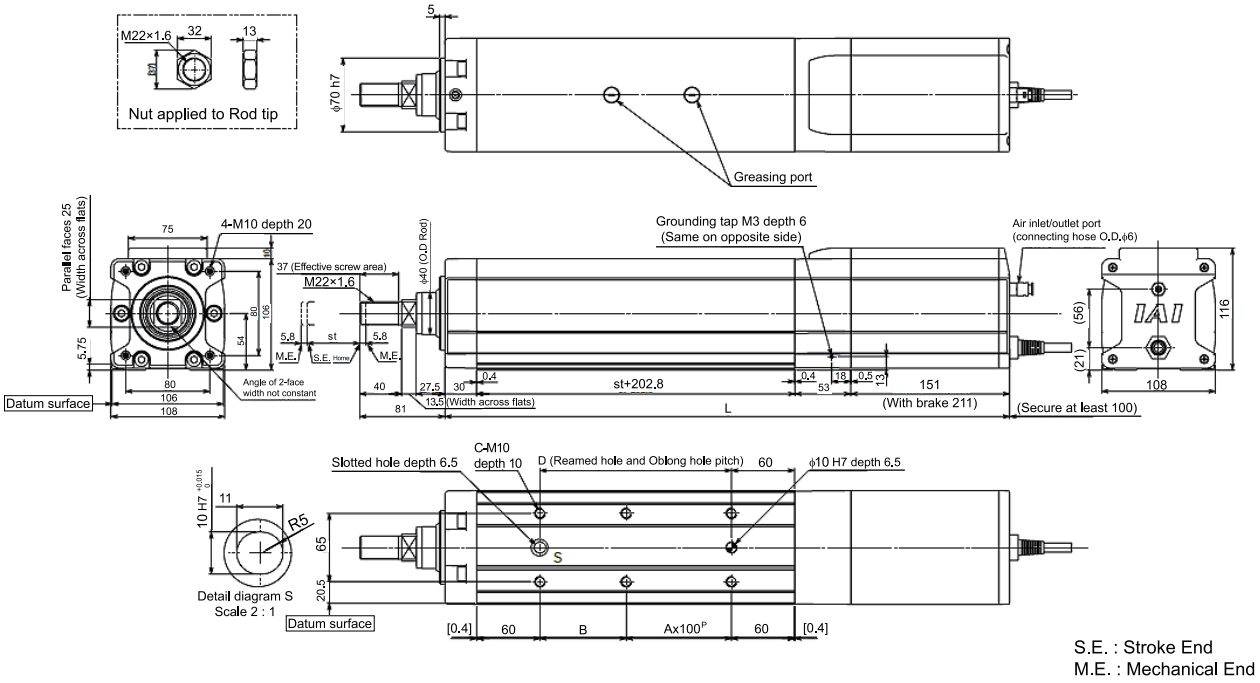


S.E. : Stroke End
M.E. : Mechanical End

(Note) The length of the actuator cable is 2m.

Stroke	L (Battery-less Absolute)		A	B	C	D	Mass [kg]	
	w/o Brake	With Brake					w/o Brake	With Brake
50	441.3	490.3	0	115	4	115	7.6	8.8
100	491.3	540.3	1	65	6	165	8.1	9.2
150	541.3	590.3	1	115	6	215	8.5	9.6
200	591.3	640.3	2	65	8	265	8.9	10.1
250	641.3	690.3	2	115	8	315	9.4	10.5
300	691.3	740.3	3	65	10	365	9.8	10.9
350	741.3	790.3	3	115	10	415	10.2	11.4
400	791.3	840.3	4	65	12	465	10.7	11.8
450	841.3	890.3	4	115	12	515	11.1	12.2
500	891.3	940.3	5	65	14	565	11.5	12.6
550	941.3	990.3	5	115	14	615	11.9	13.1
600	991.3	1040.3	6	65	16	665	12.4	13.5
650	1041.3	1090.3	6	115	16	715	12.8	13.9
700	1091.3	1140.3	7	65	18	765	13.2	14.4

6.14 Dustproof/Splash Proof Type RCP5W-RA10C



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

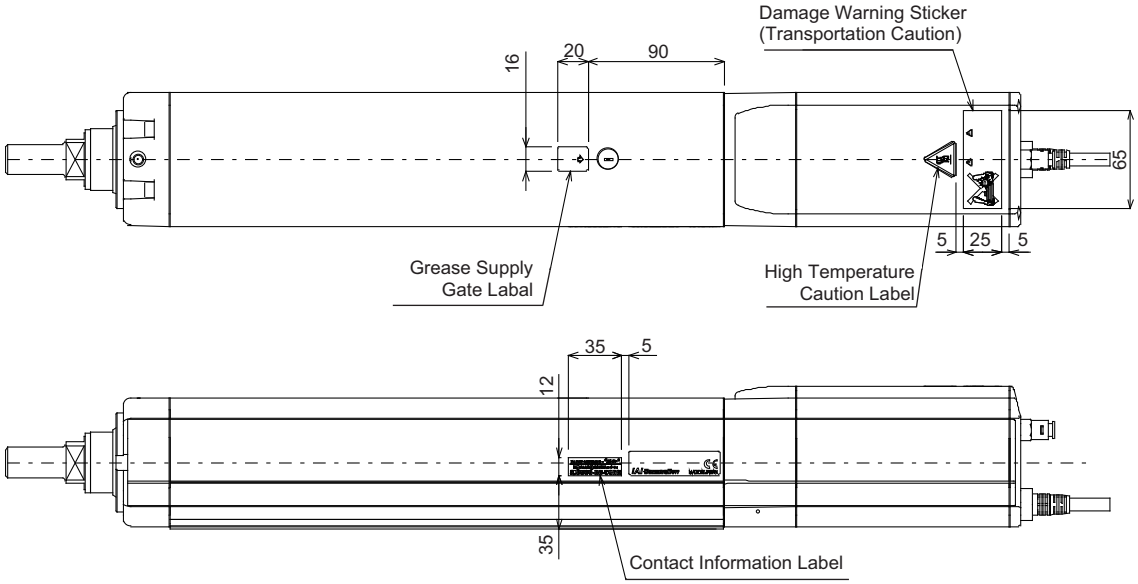
(Note) The length of the actuator cable is 2m.

Stroke	L (Battery-less Absolute)		A	B	C	D	Mass [kg]	
	w/o Brake	With Brake					w/o Brake	With Brake
50	486.8	546.8	0	132	4	132	12.5	14.1
100	536.8	596.8	1	82	6	182	13.2	14.8
150	586.8	646.8	1	132	6	232	13.9	15.5
200	636.8	696.8	2	82	8	282	14.6	16.2
250	686.8	746.8	2	132	8	332	15.3	16.9
300	736.8	796.8	3	82	10	382	16	17.6
350	786.8	846.8	3	132	10	432	16.7	18.3
400	836.8	896.8	4	82	12	482	17.4	19
450	886.8	946.8	4	132	12	532	18.1	19.7
500	936.8	996.8	5	82	14	582	18.8	20.4
550	986.8	1046.8	5	132	14	632	19.5	21.1
600	1036.8	1096.8	6	82	16	682	20.2	21.8
650	1086.8	1146.8	6	132	16	732	20.9	22.5
700	1136.8	1196.8	7	82	18	782	21.6	23.2
750	1186.8	1246.8	7	132	18	832	22.3	23.9
800	1236.8	1296.8	8	82	20	882	23	24.6

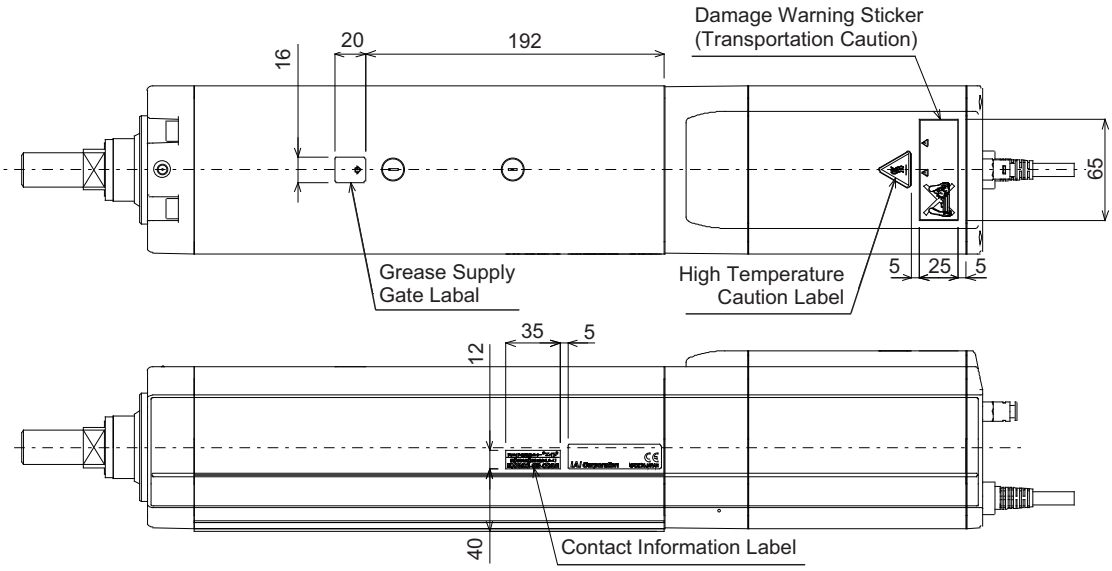
7. Caution and Warning Label to Dustproof/Splash Proof Type RCP5W

The caution and warning labels for dustproof/splash proof type RCP5W-RA8/10C are attached on the product body.
It may get peeled off depending on the environment of use. Put it back on if necessary.
Refer to the figures below for the positions to attach labels.

RCP5W-RA8C



RCP5W-RA10C



(Note) It is not necessary to attach the contact information label if the product is to be used besides japan.
The contact information label shows the information of 24-hour contact in japan.
The free-call number described on the label is only for japanese domestic use.

8. Life

8.1 RA4C, RA4R, RA6C, RA6R, RA7C and RA7C

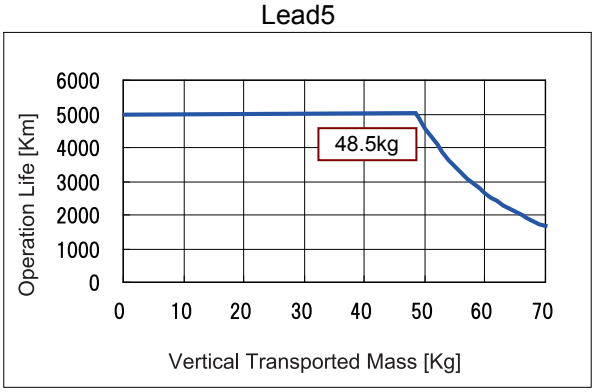
The life is assumed under condition of operation with maximum transported mass and maximum acceleration/deceleration, and it is 5,000km (reference).

(Note) Scraper for Dustproof/Splash Proof Type RCP5W-RA6C and RA7C is not considered in the product life as it is an expendable part.

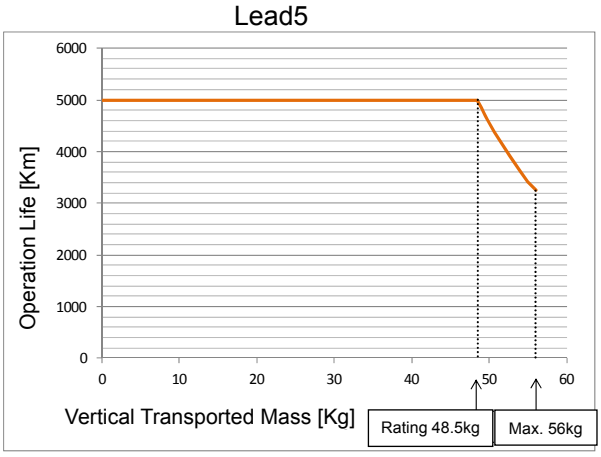
8.2 RA8C and RA8R

The life of Lead 10 and 20 is assumed 5,000km (reference) under the condition of maximum transported mass, maximum acceleration and deceleration.
The life of Lead 5 in the standard horizontal orientation is assumed to be 5,000km (reference).
The life of Lead 5 in the vertical orientation may change depending on the transported mass.
The graph below shows the relation of transported mass and life.

[Standard Type RCP5]



[Dustproof/Splash Proof Type RCP5W]

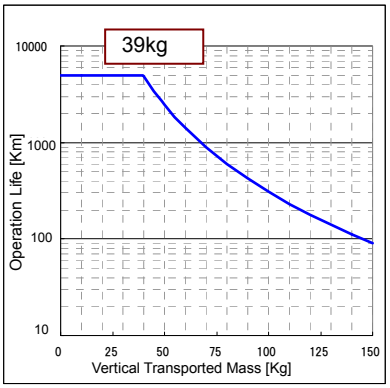


8.3 RA10C and RA10R

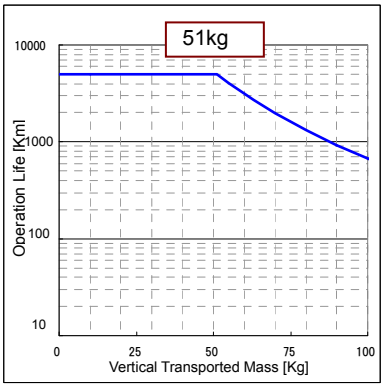
The life in the standard horizontal orientation is assumed to be 5,000km (reference) under the condition that the product is positioning operation operated with maximum transported mass and in maximum acceleration and deceleration.
The life in the vertical orientation may largely change depending on the transported mass since the maximum thrust is comparatively larger than other models. The graphs below show the relation of transported mass and life.

[Standard Type RCP5]

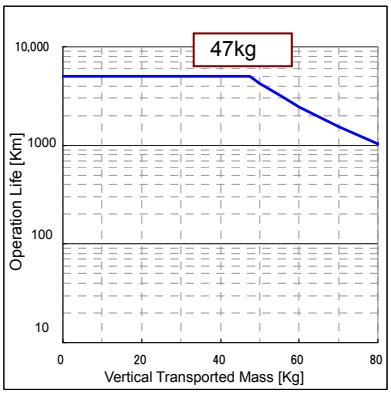
Lead 2.5



Lead 5

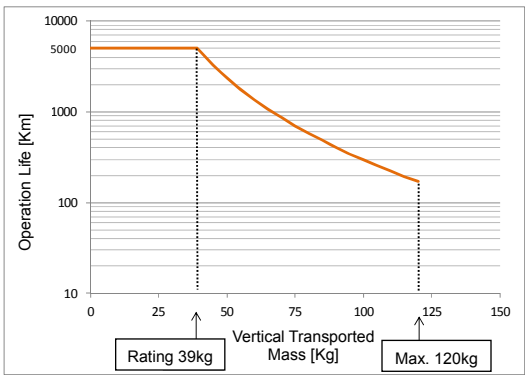


Lead 10

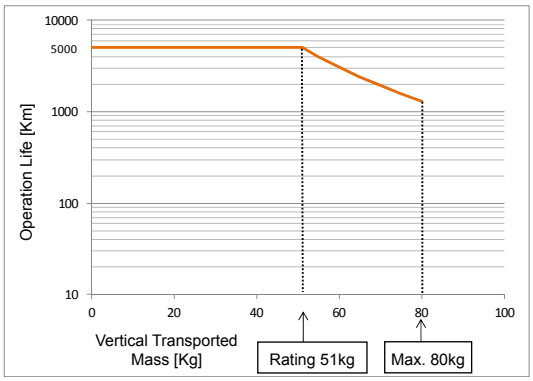


[Dustproof/Splash Proof Type RCP5W]

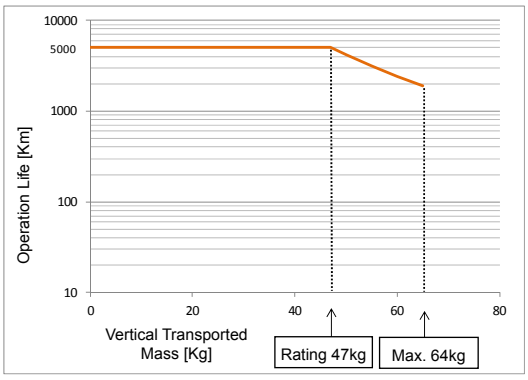
Lead 2.5



Lead 5



Lead 10



When having maximum pressing force (70% of current boundary) with pressing distance at 1mm to operate the pressing movement, take the values for the times of pressing stated in the table below as a reference for the upper limit.

(Note) The values for times of pressing stated in the table are those under assumption that there is no impact or vibration applied. The upper limit of times of pressing may differ depending on the operational conditions such as impact and vibration.

Lead	2.5	5	10
Times of pressing	1,400,000 times	25,000,000 times	157,600,000 times

9. Warranty

9.1 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

9.2 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.

9.3 Honoring the Warranty

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

9.4 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.

9.5 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 pertaining to maintenance or management of human life or health
   [2] A mechanism or mechanical equipment intended to move or transport people (such as a vehicle, railway facility or aviation facility)
   [3] Important safety parts of mechanical equipment (such as safety devices)
   [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.

9.6 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
March 2014	First edition
March 2014	Second edition • Value at high-output setting invalid added to 1.2.1 Speed and 1.2.2 Maximum Acceleration and Transportable Mass. • Procedure 6) added to 5.7 Motor Replacement Process
May 2014	Third edition • RA8C, RA8R, RA10C and RA10R added
June 2014	Edition 3B • Pg. 96 to 99 Correction of external dimensions of the RA8C, RA8R, RA10C and RA10R
August 2014	Fourth edition • Pg. 56 to 93 Note added telling two mounting holes in rod side on base top of RA4C cannot be used • Pg. 101 Note added for reference of upper limit for times of pressing
September 2014	Fifth edition • Pg. 10 CE Marking Preparing for compliance → ○ • Pg. 14 FFA, NFA and KFA added in How to Read Model Code • Pg. 44 Figures for RA4C, 6C and 7C added • Pg. 45 to 49 Following sections added; 1.3.4 Tip Adapter (Flange) (Model No.: FFA) 1.3.5 Tip Adapter (Internal Thread) (Model No.: NFA) 1.3.6 Tip Adapter (Keyway) (Model No.: KFA) • Pg. 66 to 67 Figures for RA4C, RA6C and RA7C added • Pg. 100 Correction of the drawing (when 50st) → (when 60st)
October 2014	Sixth edition • Change made in grease supply period • Note added for grease supply amount and recommended grease gun • Cable eject direction options added in appearance drawing • Pg. 61 Caution note added for installation of brake-equipped type
November 2014	Edition 6B • Pg. 8 Caution note added to warn position slightly move in first servo-ON after power getting supplied
February 2015	Edition 6C • Pg. 83 Note corrected Supplier NSG → NSK
April 2015	Seventh edition • Contents added for motor reversing types SA4R, SA6R and SA7R • Pg. 74 40deg, position of tapped hole on RA4, added
May 2015	Edition 7B • Pg. 53 Note corrected Vertical Installation → Holizontal Installation • Pg. 124 L and K added to appearance drawing of RA7R

Revision Date	Description of Revision
July 2015	Edition 7C • Contents added in caution for handling for effective/ineffective of high output setting. • Pg. 23 Caution note added for minimum speed • Pg. 116 Belts to be used IAI maintenance parts model added.
June 2015	Eighth edition • Contents added for motor Dustproof/Splash Proof Type RCP5W-RA8C, RA10C.
December 2015	Ninth edition • Contents added for motor Dustproof/Splash Proof Type RCP5W-RA6C, RA7C.
January 2016	Edition 9B • Pg. 145 Correction made RA4R, RA5R Tightening Torque 152N·cm→162N·cm
April 2016	Edition 9C • Pg. 121 and 123 The contents about grease supply on rod sliding surface and cleaning are added

Manual No.: ME3738-9C (April 2016)

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