



ROBO Cylinder RCP6/RCP6S Actuator Radial Cylinder Instruction Manual

═══════════════════ **Second Edition** ════════════════════

Motor Straight Type: RRA4C, RRA6C, RRA7C,
RRA8C

Motor Reversing Type: RRA4R, RRA6R, RRA7R,
RRA8R

Please Read Before Use

Thank you for purchasing our product.

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

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

The DVD that comes with the product contains instruction manuals for IAI products.

When using the product, refer to the necessary portions of the applicable instruction manual by printing them out or displaying them on a PC.

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

[Important]

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

**RC ROBO
CYLINDER**

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Safety Guide

“Safety Guide” has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it 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	<ul style="list-style-type: none"> ● This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications. <ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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	<p>(1) Installation of Robot Main Body and Controller, etc.</p> <ul style="list-style-type: none"> ● 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. <ol style="list-style-type: none"> 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	<p>(2) Cable Wiring</p> <ul style="list-style-type: none"> ● 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. <p>(3) Grounding</p> <ul style="list-style-type: none"> ● 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 0.5mm² (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	<p>(4) Safety Measures</p> <ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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. <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>

No.	Operation Description	Description
6	Trial Operation	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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. <p>Use in incomplete condition may cause damage to the product or an injury.</p> <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>
9	Modification and Dismantle	<ul style="list-style-type: none"> ● Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.
10	Disposal	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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 30mm 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. PCON-CB and MCON Controllers (Option: T) are available for switching between valid and invalid of high output setting in the parameter settings.

(It is set to valid for the high output setting at the delivery.)

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 speed and acceleration/deceleration setting differs between the high output setting being effective and ineffective. Refer to the applicable performance when the high output setting is valid or invalid in 1.2 Specifications.

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

International Standards Compliances

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

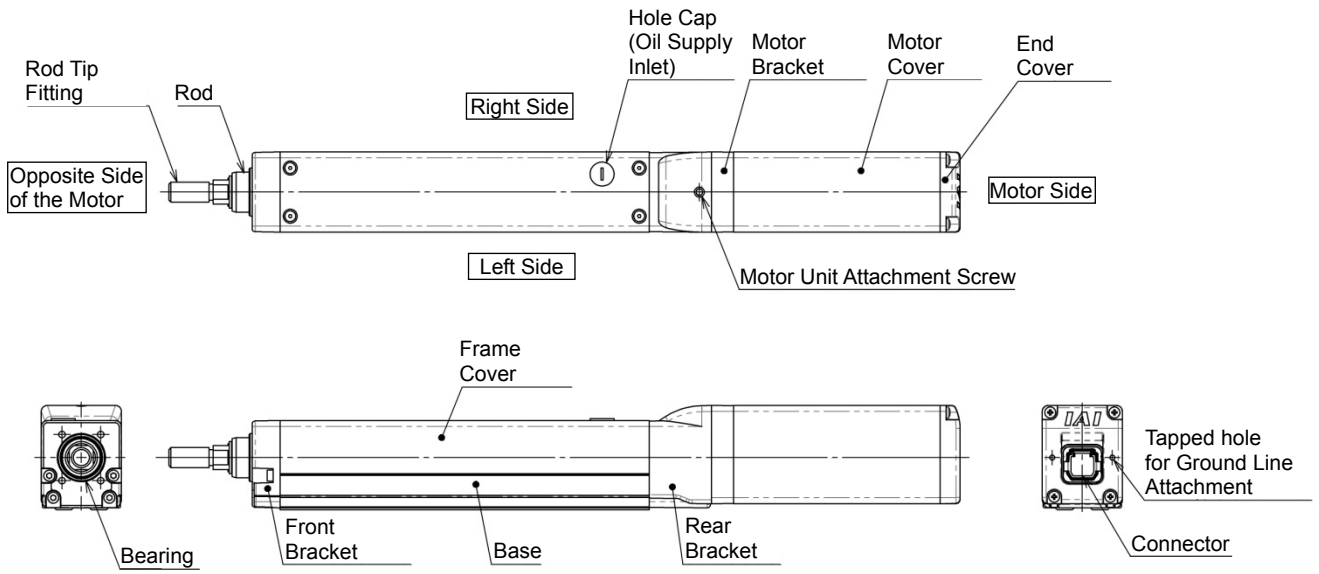
RoHS Directive	CE Marking
<input type="checkbox"/>	<input type="checkbox"/>

Names of the Parts

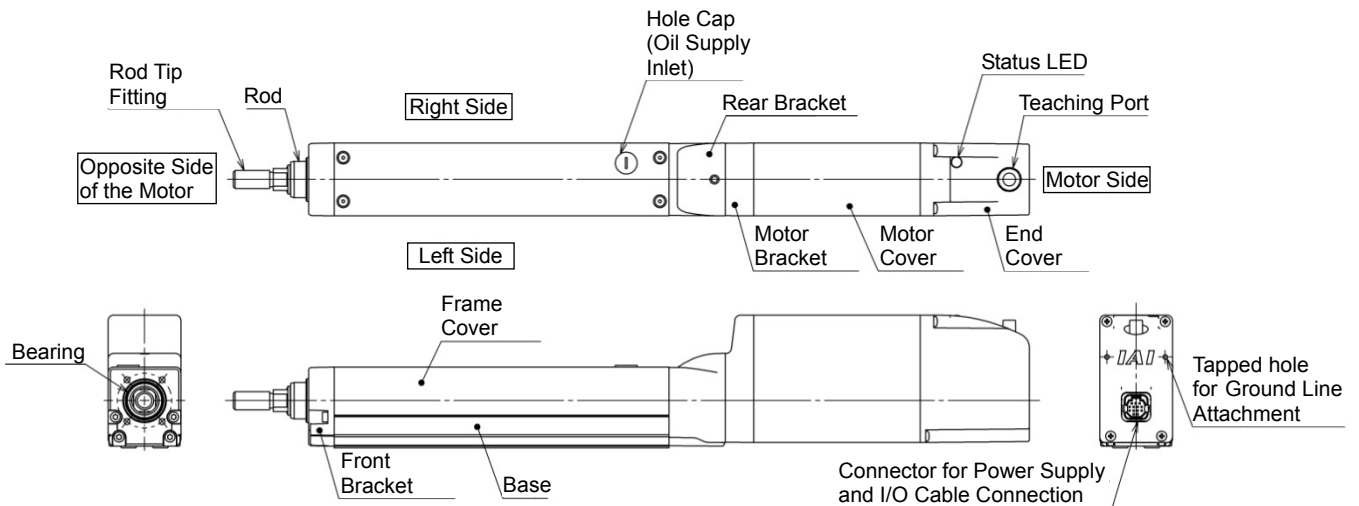
In this Instruction Manual, the left and right sides are indicated by looking at the actuator from the motor end, with the actuator placed horizontally, as shown in the figure below.

1. Motor Straight Type

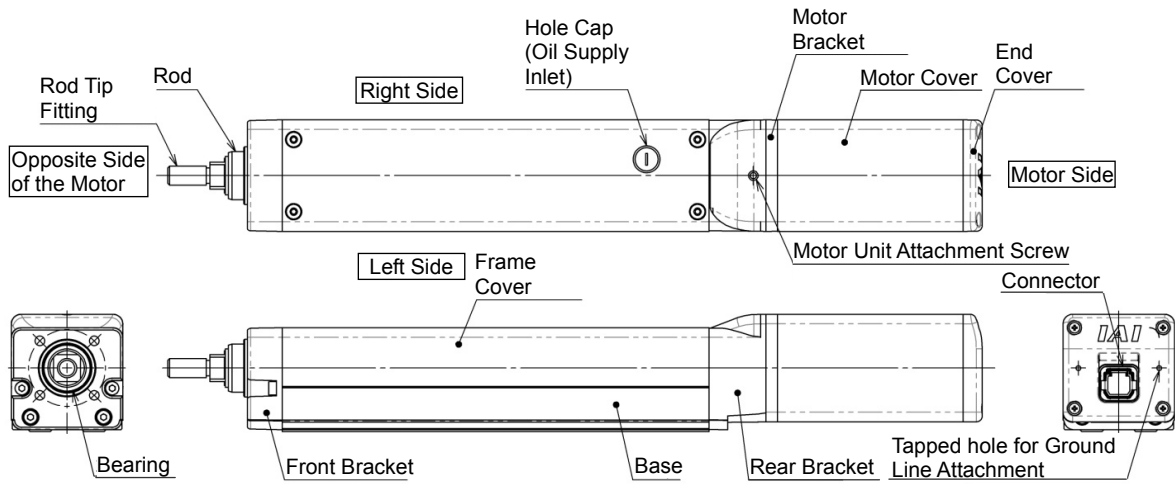
1.1 Standard Specification RCP6-RRA4C



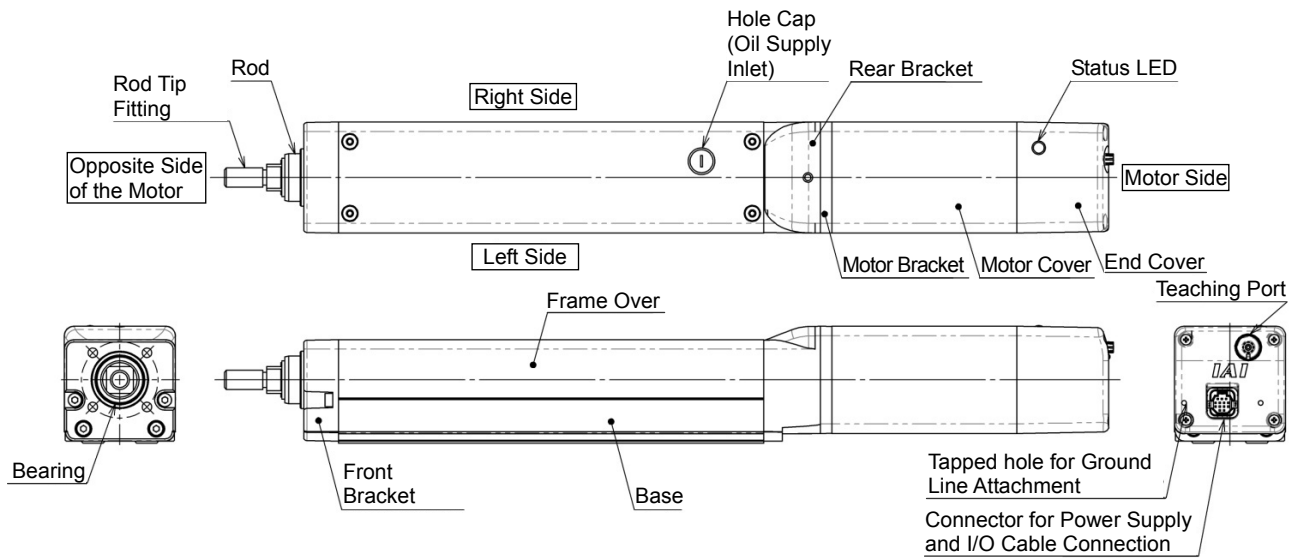
1.2 Built-in Controller Specification RCP6S-RRA4C



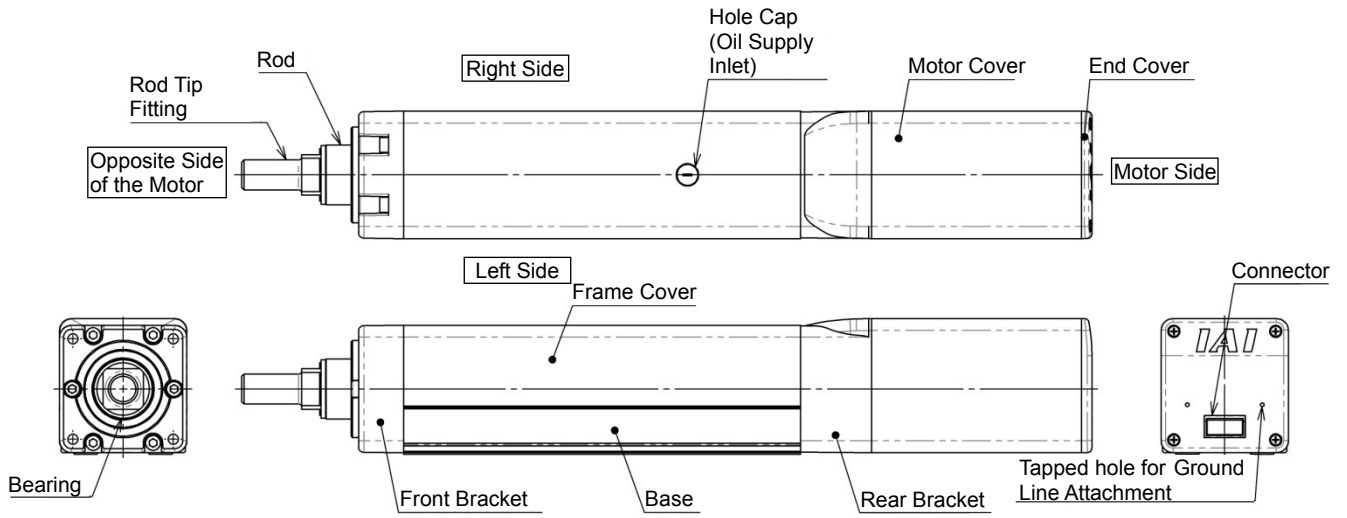
1.3 Standard Specification RCP6-RR6C, RRA7C



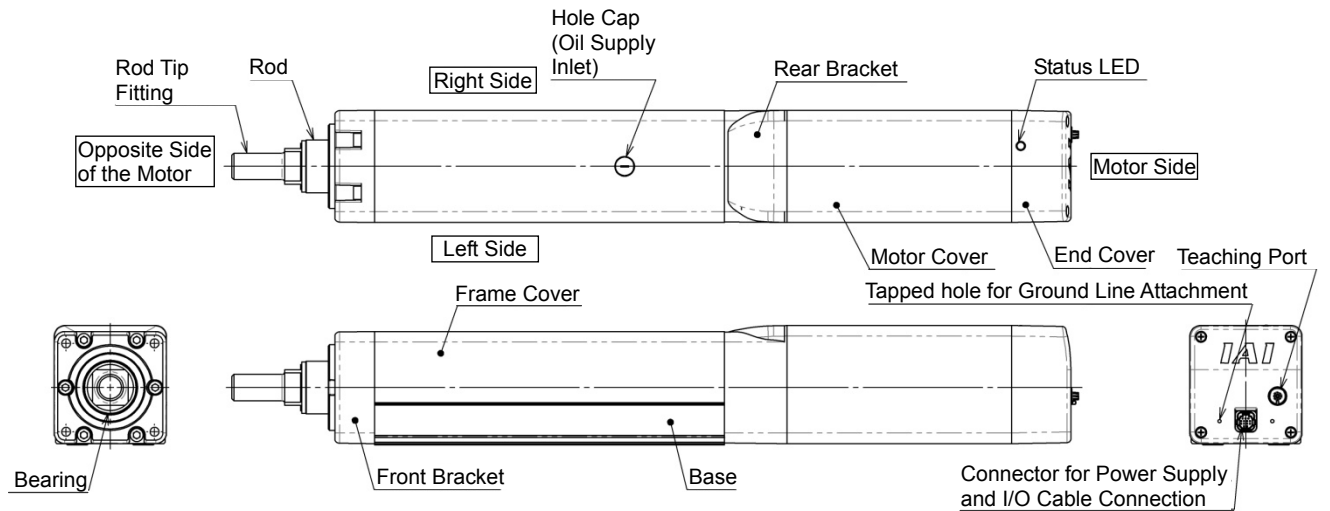
1.4 Built-in Controller Specification RCP6S-RRA6C, RRA7C



1.5 Standard Specification RCP6-RRA8C

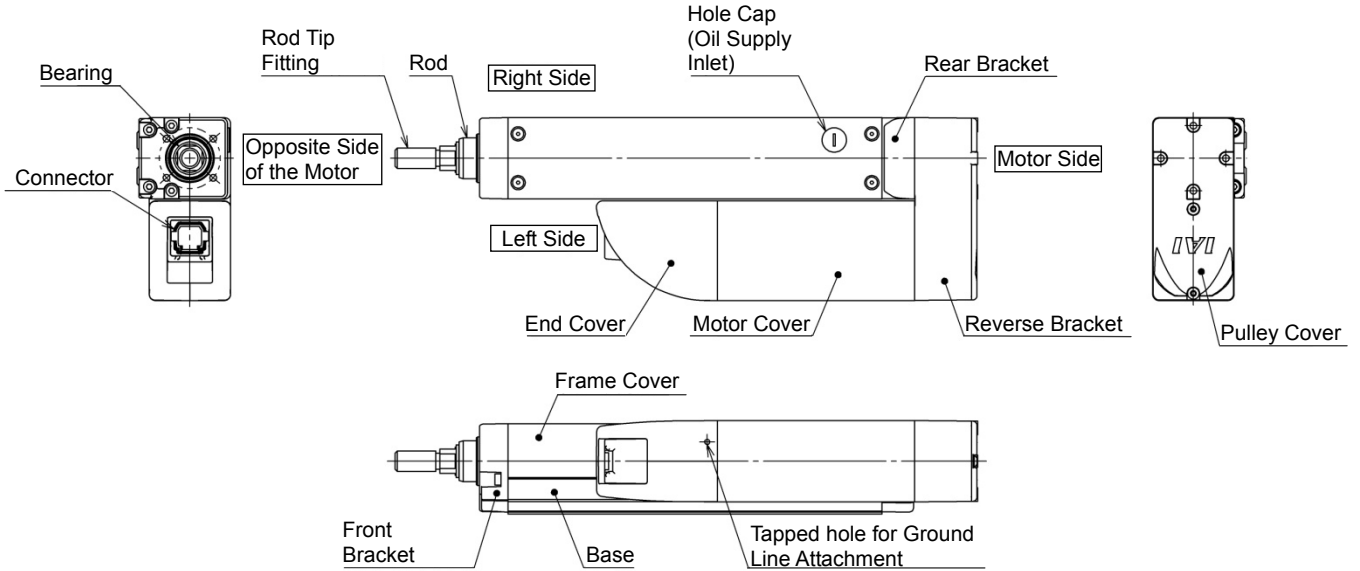


1.6 Built-in Controller Specification RCP6S-RRA8C

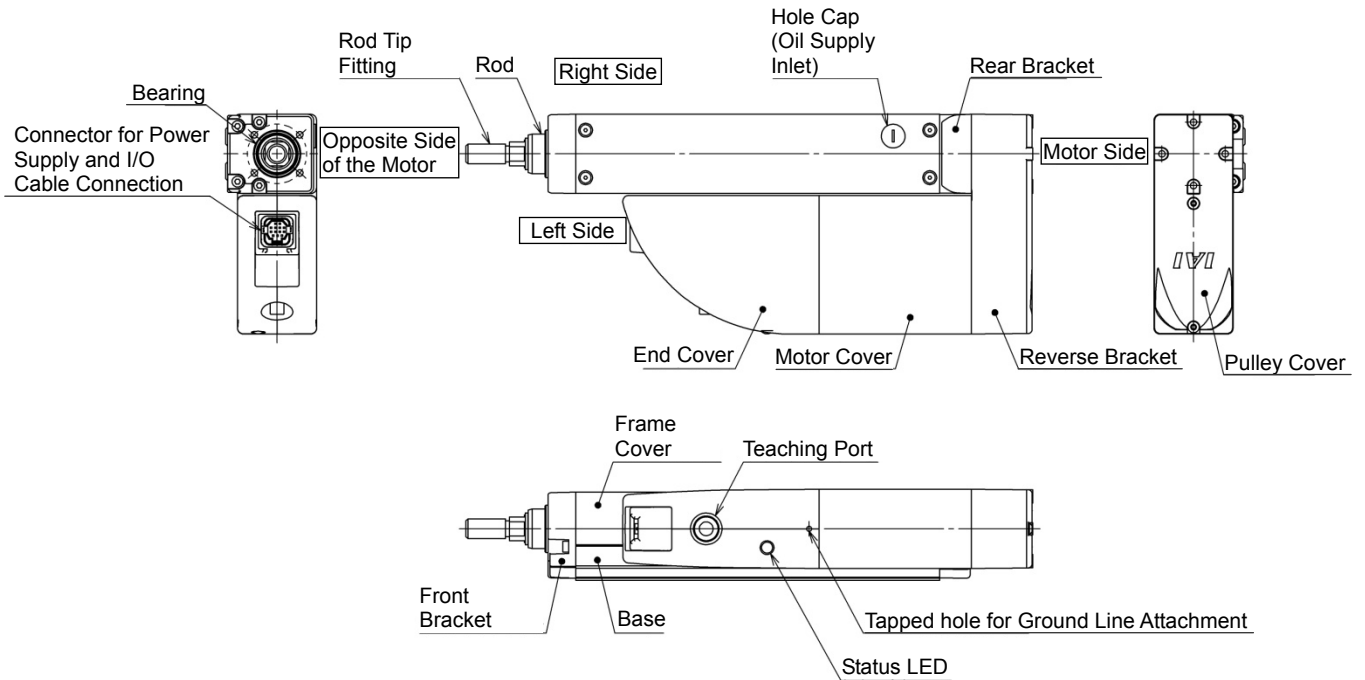


2. Motor Reversing Type

2.1 Standard Specification RCP6-RRA4R

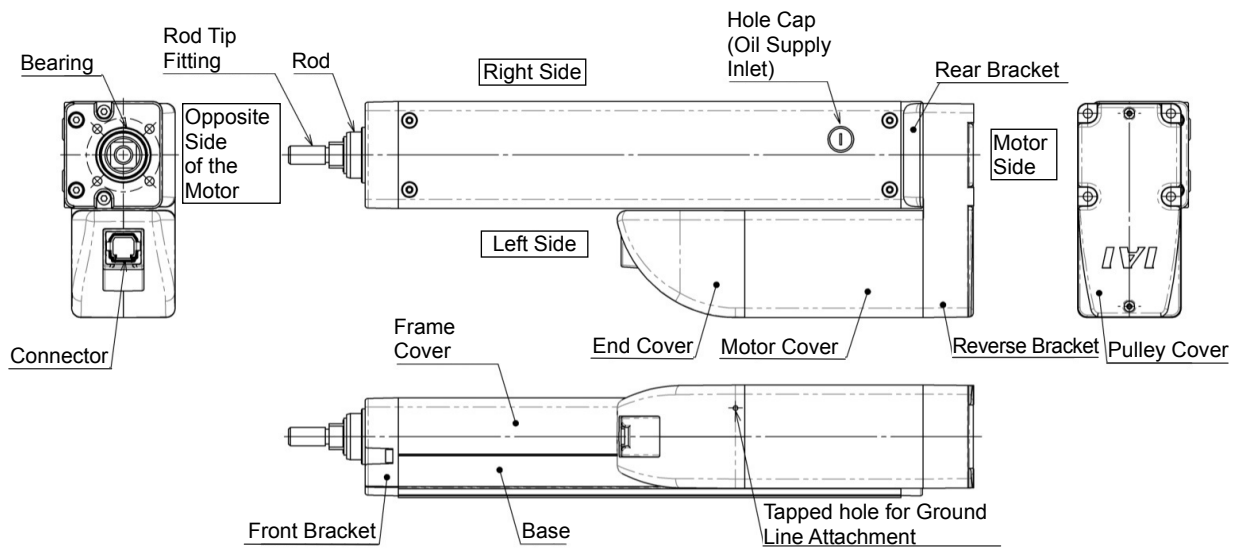


2.2 Built-in Controller Specification RCP6S-RRA4R

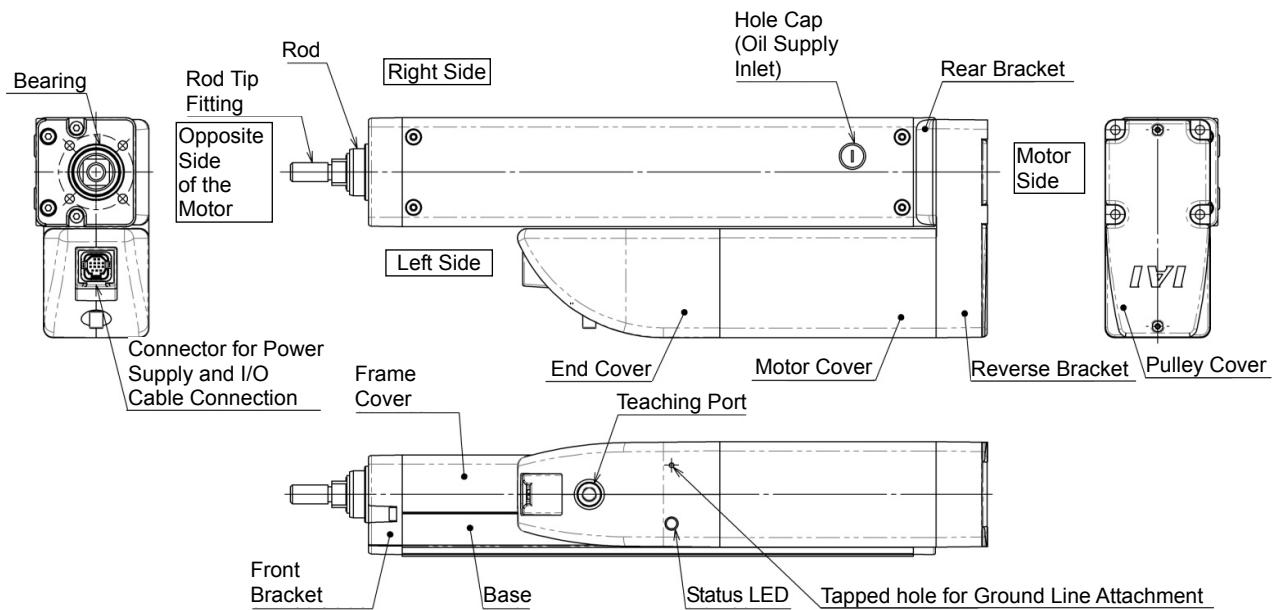


The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR.

2.3 Standard Specification RCP6-RRA6R, RRA7R

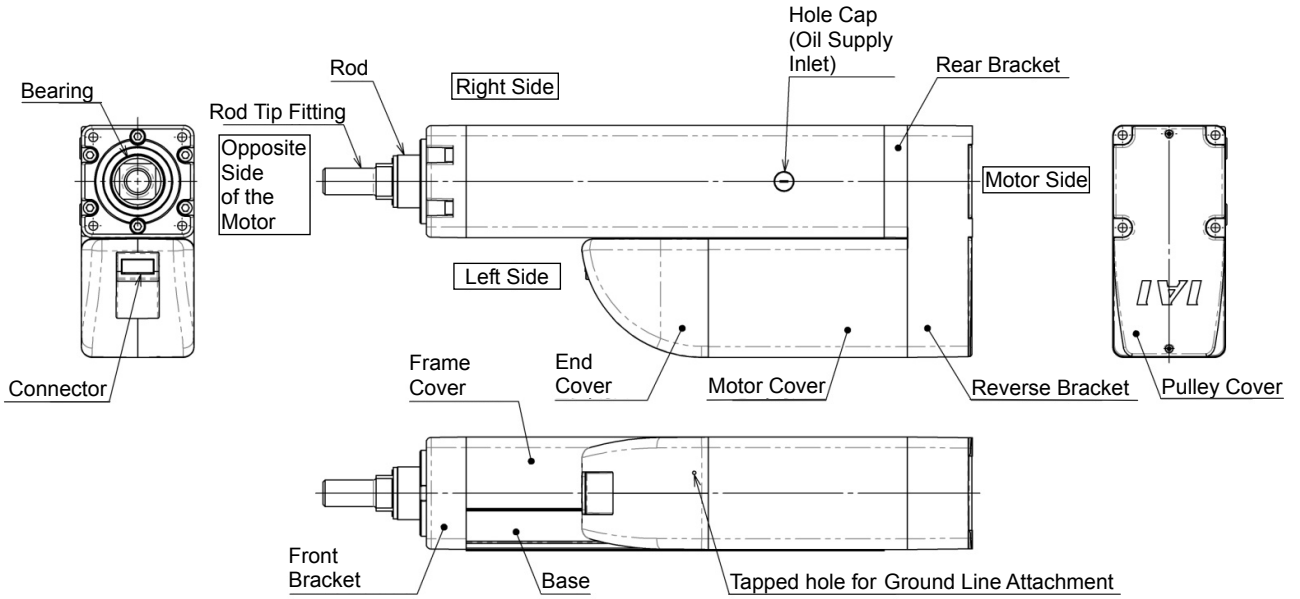


2.4 Built-in Controller Specification RCP6S-RRA6R, RRA7R

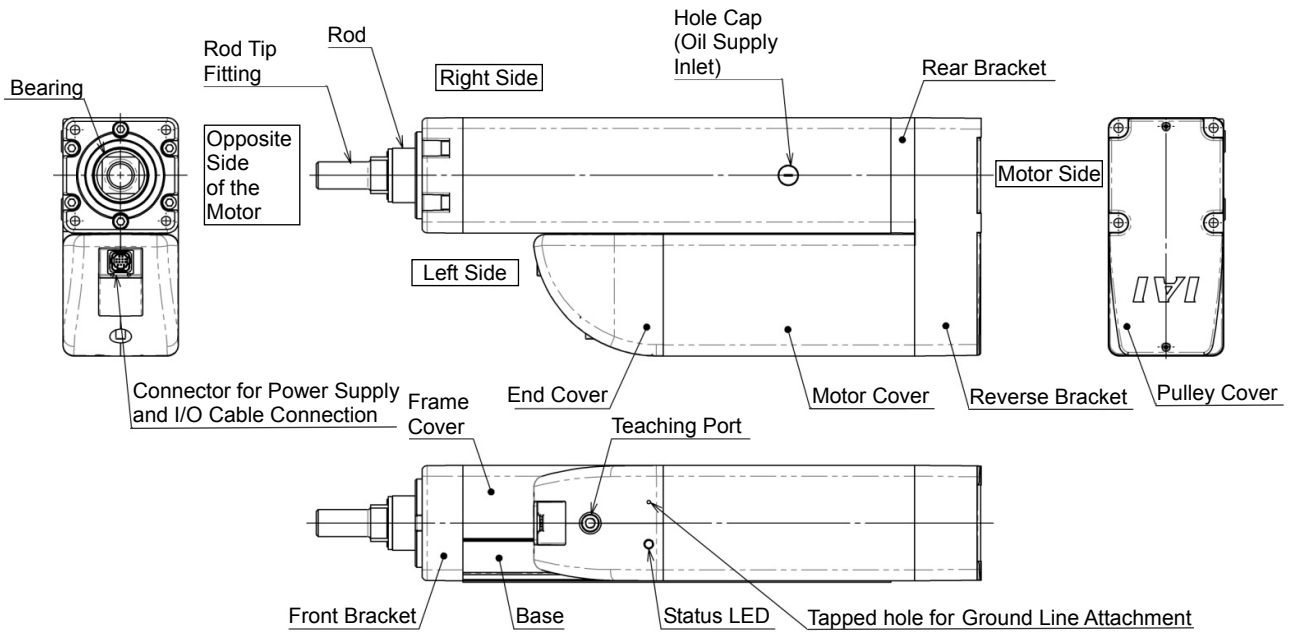


The direction of the motor is either left reversed: ML (shown in figure above) or right reversed: MR.

2.5 Standard Specification RCP6-RRA8R



2.6 Built-in Controller Specification RCP6S-RRA8R



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

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	First Step Guide		1	
5	Instruction Manual (DVD)		1	
6	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)
RRA4C, RRA4R RRA6C, RRA6R	1		
RRA7C, RRA7R		1	
RRA8C, RRA8R			1

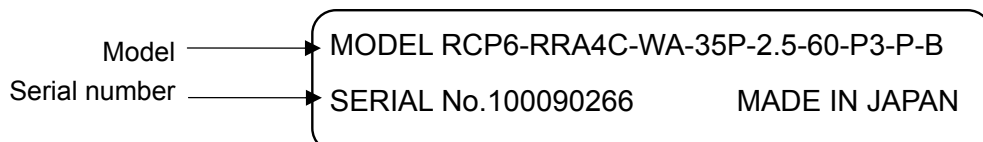
[Refer to 6. External Dimensions for the dimensions of nuts.]

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

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

No.	Name	Control No.
1	Instruction Manual for PCON-CB/CFB Controller	ME0342
2	Instruction Manual for MCON-C/CG Controller	ME0341
3	Instruction Manual for MSEL Controller	ME0336
4	Instruction Manual for RC PC Software RCM-101-MW/RCM-101-USB	ME0155
5	Instruction Manual for 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

RCP6 - RRA4C - WA - 35P - 2.5 - 60 - P3 - P - B - **

<Series name>

Standard specification
RCP6

Built-in controller specification
RCP6S

<Type>

Motor straight type

RRA4C
RRA6C
RRA7C
RRA8C

Motor reversing type

RRA4R
RRA6R
RRA7R
RRA8R

<Encoder type>

WA : Battery-less absolute

<Motor type>

35P : 35□size
42P : 42□size
56P : 56□size
60P : 60□size

<Lead>

RRA4C, RRA4R
2.5/5/10/16
RRA6C, RRA6R
3/6/12/20
RRA7C, RRA7R
4/8/16/24
RRA8C, RRA8R
5/10/20

<Stroke>

[Refer to 1.2 Specifications]

Identification for IAI use only ^(Note1)

<Options>

B : Brake
NM : Reversed-home specification
FL : Flange bracket
FFA : Tip adapter (Flange) ^(Note3)
NFA : Tip adapter (Internal Thread)
KFA : Tip adapter (Keyway) ^(Note3)
NJ : Knuckle joint ^(Note2)
QR : Clevis ^(Note2)
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 (Outside)
CJB : Cable exit direction changed (Bottom)

<Cable length>

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

Standard Specification

<Controller>

P3 : PCON-CB
MCON
MSEL
P4 : PCON-CFB

Built-in Controller Specification

<I/O type>

SE : SIO type

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

Note 2 Knuckle joint and clevis can be selected only for the motor reversed type. Also, they come in a pair. They cannot be selected separately.

Note 3 FFA: Tip Adapter (Flange) and KFA: Tip Adapter (Keyway) cannot be selected for RRA8C and RRA8R.

1.2 Specifications

1.2.1 Speed

[1] Motor Straight Type

[When high-output setting is effective]

Speed Limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]									
				60	110	160	210	260	310	360	410	-	-
RRA4C	35P	2.5	Horizontal	175							170	-	-
			Vertical	175							170	-	-
		5	Horizontal	350							340	-	-
			Vertical	350							340	-	-
		10	Horizontal	700							685	-	-
			Vertical	700							685	-	-
		16	Horizontal	1120							1080	-	-
			Vertical	1120							1080	-	-
				65	115	165	215	265	315	365	415	-	-
RRA6C	42P	3	Horizontal	225							220	-	-
			Vertical	225							220	-	-
		6	Horizontal	450							-	-	
			Vertical	450							-	-	
		12	Horizontal	700							-	-	
			Vertical	700							-	-	
		20	Horizontal	800							-	-	
			Vertical	800							-	-	
				70	120	170	220	270	320	370	420	470	520
RRA7C	56P	4	Horizontal	210									
			Vertical	210									
		8	Horizontal	420									
			Vertical	420									
		16	Horizontal	700									
			Vertical	560									
		24	Horizontal	860									
			Vertical	640									

RRA8C has no relation to the high output setting. There is no parameter setting.

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]													
				50	100	150	200	250	300	350	400	450	500	550	600	650	700
RRA8C	60P	5	Horizontal	150							130	110	90	80	70	60	55
			Vertical	150							130	110	90	80	70	60	55
		10	Horizontal	280	300					260	220	180	160	140	120	110	
			Vertical	250							220	180	160	140	120	110	
		20	Horizontal	280	405	505	585	600		520	440	360	320	280	240	220	
			Vertical	280	405	450					440	360	320	280	240	220	

[2] Motor Reversing Type


[When high-output setting is effective]

Speed Limits [Unit: mm/s]

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]										-	-
				60	110	160	210	260	310	360	410	-	-		
RRA4R	35P	2.5	Horizontal	175							170	-	-		
			Vertical	175							170	-	-		
		5	Horizontal	350							340	-	-		
			Vertical	350							340	-	-		
		10	Horizontal	610							-	-			
			Vertical	610							-	-			
		16	Horizontal	840							-	-			
			Vertical	840							-	-			
				65	115	165	215	265	315	365	415	-	-		
RRA6R	42P	3	Horizontal	225							220	-	-		
			Vertical	225							220	-	-		
		6	Horizontal	450							-	-			
			Vertical	450							-	-			
		12	Horizontal	700							-	-			
			Vertical	700							-	-			
		20	Horizontal	800							-	-			
			Vertical	800							-	-			
				70	120	170	220	270	320	370	420	470	520		
RRA7R	56P	4	Horizontal	175							-	-			
			Vertical	175							-	-			
		8	Horizontal	420							-	-			
			Vertical	350							-	-			
		16	Horizontal	560							-	-			
			Vertical	560							-	-			
		24	Horizontal	860							-	-			
			Vertical	640							-	-			

RRA8R has no relation to the high output setting. There is no parameter setting.

Size	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]												
				50	100	150	200	250	300	350	400	450	500	550	600	650
RRA8R	60P	5	Horizontal	100							90	80	70	60	55	
			Vertical	100							90	80	70	60	55	
		10	Horizontal	200							180	160	140	120	110	
			Vertical	200							180	160	140	120	110	
		20	Horizontal	280	400					360	320	280	240	220		
			Vertical	280	400					360	320	280	240	220		

 **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] / 800 / 0.001 [sec]

[3] Motor Straight Type

(Note) There is no high output setting prepared for RRA8C and RRA8R which are to be operated with PCON-CFB controller.

[When high-output setting is ineffective]

Speed Limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]										-	-
				60	110	160	210	260	310	360	410	-	-		
RRA4C	35P	2.5	Horizontal	130										-	-
			Vertical	130										-	-
		5	Horizontal	260										-	-
			Vertical	260										-	-
		10	Horizontal	525										-	-
			Vertical	525										-	-
		16	Horizontal	560										-	-
			Vertical	560										-	-
				65	115	165	215	265	315	365	415	-	-		
RRA6C	42P	3	Horizontal	125										-	-
			Vertical	125										-	-
		6	Horizontal	250										-	-
			Vertical	250										-	-
		12	Horizontal	500										-	-
			Vertical	500										-	-
		20	Horizontal	640										-	-
			Vertical	640										-	-
				70	120	170	220	270	320	370	420	470	520		
RRA7C	56P	4	Horizontal	105											
			Vertical	105											
		8	Horizontal	210											
			Vertical	210											
		16	Horizontal	420											
			Vertical	280											
		24	Horizontal	600											
			Vertical	420											


[4] Motor Reversing Type

(Note) There is no high output setting prepared for RRA8C and RRA8R which are to be operated with PCON-CFB controller.

[When high-output setting is ineffective]

Speed Limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]											
				60	110	160	210	260	310	360	410	-	-		
RRA4R	35P	2.5	Horizontal	130										-	-
			Vertical	130										-	-
		5	Horizontal	260										-	-
			Vertical	260										-	-
		10	Horizontal	525										-	-
			Vertical	525										-	-
		16	Horizontal	560										-	-
			Vertical	560										-	-
				65	115	165	215	265	315	365	415	-	-		
RRA6R	42P	3	Horizontal	125										-	-
			Vertical	125										-	-
		6	Horizontal	250										-	-
			Vertical	250										-	-
		12	Horizontal	500										-	-
			Vertical	500										-	-
		20	Horizontal	640										-	-
			Vertical	640										-	-
				70	120	170	220	270	320	370	420	470	520		
RRA7R	56P	4	Horizontal	105											
			Vertical	105											
		8	Horizontal	210											
			Vertical	210											
		16	Horizontal	420											
			Vertical	280											
		24	Horizontal	600											
			Vertical	420											

 **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] / 800 / 0.001 [sec]

1.2.2 Maximum Acceleration and Payload

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

(Note) The payloads in horizontal orientation are the values when the rod is held by external guides.

[1] Motor Straight Type

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA4C	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		8	7	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	16
				305	28	22	20	16	14
				350	28	20	14	12	11
			Vertical	0	6	6	6	-	-
				40	6	6	6	-	-
				85	6	6	6	-	-
130	6			6	6	-	-		
175	5			5	5	-	-		
215	5			5	5	-	-		
260	5	5	5	-	-				
305	5	5	5	-	-				
350	4.5	3	3	-	-				

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA4C	35P	10	Horizontal	0	18	17	15	14	13
				85	18	17	15	14	13
				175	18	17	15	14	12
				260	18	17	13	13	12
				350	18	17	13	13	10
				435	18	17	13	11	9
				525	18	15	10	8	7
				610	-	9	7	5	4
			700	-	6	5	3	2	
			Vertical	0	3	3	3	-	-
				85	3	3	3	-	-
				175	3	3	3	-	-
				260	3	3	3	-	-
				350	2.5	2.5	2.5	-	-
		435		2.5	2.5	2.5	-	-	
		525		2.5	2.5	2.5	-	-	
		610		-	2	2	-	-	
		700	-	1.5	1	-	-		
		16	Horizontal	0	7	7	6	5	3.5
				140	7	7	6	5	3.5
				280	7	7	6	5	3.5
				420	7	7	6	5	3.5
				560	-	6.5	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	-	-	1	1	0.75
			Vertical	0	1.5	1.5	1.5	-	-
				140	1.5	1.5	1.5	-	-
				280	1.5	1.5	1.5	-	-
				420	1.5	1.5	1.5	-	-
				560	1	1.5	1.5	-	-
700	-			1	1	-	-		
840	-			1	1	-	-		
980	-			1	0.75	-	-		
1120	-			-	0.5	-	-		

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA6C	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	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA6C	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	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA7C	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		8.5	4	-	-	-	
		210	1.5	-	-	-	-		
		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	2.5	1.5	-	-	
		420	1	-	-	-	-		
		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
				420	20	20	18	15	10
				640	15	14	9	7	4
				860	-	5	1	1	-
				0	3	3	3	-	-
			Vertical	200	3	3	3	-	-
				420	3	3	3	-	-
640	3			3	2	-	-		
860	-			-	-	-	-		

[Motor straight type]

RRA8C has no relation to the high output setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RRA8C	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	-
		10	Horizontal	150	-	60
				200	-	45
				240	-	40
				300	-	10
				0	-	40
				88	-	40
			Vertical	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				

[Motor straight type]

RRA8C has no relation to the high output setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.1G	0.2G
RRA8C	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				



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	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA4R	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	28	25	22	20	18
				40	28	25	22	20	18
				85	28	25	22	20	18
				130	28	25	22	20	18
				175	28	25	22	20	18
				215	28	25	22	20	18
				260	28	24	20	16	12
				305	25	20	16	12	8
			350	22	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	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA4R	35P	10	Horizontal	0	13	13	12	10	8
				85	13	13	12	10	8
				175	13	13	12	10	8
				260	13	13	12	10	6
				350	13	12	12	8	5
				435	13	10	10	6	4
				525	13	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	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA6R	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 reversing type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA6R	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 reversing type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
RRA7R	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	3	-	-	-	-
		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	-	-	-
			Vertical	420	2	-	-	-	-
				0	18	18	18	-	-
				70	18	18	18	-	-
				140	16	16	12	-	-
				210	10	10	9	-	-
				280	6	5	3	-	-
		16	Horizontal	350	3	1	-	-	-
				420	-	-	-	-	-
				0	50	50	40	35	30
				140	50	50	40	35	30
				280	50	50	35	25	20
				420	50	25	18	14	10
			Vertical	560	12	10	5	3	2
				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
				420	20	20	18	15	10
				640	15	14	9	7	4
				860	-	3	1	-	-
				Vertical	0	3	3	3	-
			200		3	3	3	-	-
			420		3	3	3	-	-
			640		3	3	2	-	-
			860		-	-	-	-	-

[Motor reversing type]

RRA8R has no relation to the high output setting. There is no parameter setting.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]			
				Speed [mm/s]	0.1G	0.2G	
RRA8R	60P	5	Horizontal	0	100	-	
				90	100	-	
				100	75	-	
			Vertical	0	70	-	
				45	70	-	
				60	45	-	
				70	35	-	
				80	25	-	
				90	16	-	
			10	Horizontal	100	10	-
					0	-	60
					160	-	60
		170			-	40	
		180			-	25	
		190			-	15	
		Vertical		200	-	12	
				0	-	40	
				80	-	40	
				90	-	34	
				100	-	28	
				110	-	23	
				120	-	18	
				130	-	15	
				140	-	12	
				150	-	10	
				160	-	8	
				170	-	6	
		20	Horizontal	180	-	4	
				190	-	3	
				200	-	2	
				0	-	30	
			Vertical	300	-	30	
				350	-	14	
				400	-	6	
				0	-	5	
				300	-	5	
330	-			3.5			
360	-			2			
400	-			0.5			



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.

[3] Motor Straight Type

(Note) There is no high output setting prepared for RRA8C and RRA8R which are to be operated with PCON-CFB controller.

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA4C	35P	2.5	Horizontal	0	35	30
				20	35	30
				40	35	30
				65	35	25
				85	30	20
				105	25	15
				130	20	10
			Vertical	0	10	-
				20	10	-
				40	10	-
				65	10	-
				85	7	-
				105	5	-
				130	4	-
		5	Horizontal	0	22	20
				40	22	20
				85	22	20
				130	22	18
				175	20	14
				215	15	10
				260	12	6
			Vertical	0	5	-
				40	5	-
				85	5	-
				130	5	-
				175	4	-
				215	3	-
				260	2	-

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA4C	35P	10	Horizontal	0	10	8
				85	10	8
				175	10	8
				260	9	7
				350	7	5
				435	6	3
			525	1	-	
			Vertical	0	2	-
				85	2	-
				175	2	-
		260		2	-	
		16	Horizontal	350	1.5	-
				435	1	-
				525	0.5	-
				0	5	3
				140	5	3
			Vertical	280	5	3
				420	4	2.5
				560	3	1.5
				0	1	-
140	1			-		
Vertical	280	1	-			
	420	0.5	-			
	560	0.5	-			

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA6C	42P	3	Horizontal	0	40	25
				25	40	25
				50	40	25
				75	40	25
				100	40	25
				125	40	25
			Vertical	0	20	-
				25	20	-
				50	20	-
				75	12	-
				100	9	-
				125	5	-
		6	Horizontal	0	40	20
				50	40	20
				100	40	20
				150	40	20
				200	35	18
				250	10	6
			Vertical	0	10	-
				50	10	-
				100	10	-
				150	8	-
				200	5	-
				250	3	-

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA6C	42P	12	Horizontal	0	25	10
				100	25	10
				200	25	10
				300	20	8
				400	10	5
			500	5	2	
			Vertical	0	4	-
				100	4	-
				200	4	-
				300	3	-
		400		2	-	
		20	Horizontal	500	1	-
				0	6	5
				160	6	5
				320	6	5
				480	4	3
			640	3	1	
			Vertical	0	1	-
				160	1	-
				320	1	-
480	1			-		
640	0.5	-				

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

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]			
				Speed [mm/s]	0.3G	0.7G	
RRA7C	56P	4	Horizontal	0	55	50	
				35	55	50	
				70	55	50	
				105	30	15	
			Vertical	0	26	-	
				35	26	-	
				70	13	-	
				105	2	-	
			8	Horizontal	0	50	30
					70	50	30
					140	50	30
					210	14	7
		Vertical		0	17.5	-	
				70	17.5	-	
				140	7	-	
				210	2	-	
		16		Horizontal	0	40	25
					140	40	25
					280	18	12
					420	1.5	1
			Vertical	0	5	-	
				140	5	-	
				280	2	-	
				420	-	-	
			24	Horizontal	0	18	9.5
					200	18	9.5
					420	10	5
					600	1	-
		Vertical		0	3	-	
				200	3	-	
				420	1.5	-	
				600	-	-	



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.

[4] Motor reversing type

(Note) There is no high output setting prepared for RRA8C and RRA8R which are to be operated with PCON-CFB controller.

[When high-output setting for motor reversing type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA4R	35P	2.5	Horizontal	0	35	30
				20	35	30
				40	35	30
				65	35	25
				85	30	20
				105	25	15
				130	20	10
			Vertical	0	10	-
				20	10	-
				40	10	-
				65	10	-
				85	7	-
				105	5	-
				130	4	-
		5	Horizontal	0	22	20
				40	22	20
				85	22	20
				130	22	18
				175	20	14
				215	15	10
				260	12	6
			Vertical	0	5	-
				40	5	-
				85	5	-
				130	5	-
				175	4	-
				215	3	-
				260	2	-

[When high-output setting for motor reversing type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA4R	35P	10	Horizontal	0	10	8
				85	10	8
				175	10	8
				260	9	7
				350	7	5
				435	6	3
			525	1	-	
			Vertical	0	2	-
				85	2	-
				175	2	-
		260		2	-	
		16	Horizontal	350	1.5	-
				435	1	-
				525	0.5	-
				0	5	3
				140	5	3
			Vertical	280	5	3
				420	4	2.5
				560	3	1.5
				0	1	-
140	1			-		
Vertical	280	1	-			
	420	0.5	-			
	560	0.5	-			
	0	1	-			
	140	1	-			

[When high-output setting for motor reversing type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA6R	42P	3	Horizontal	0	40	25
				25	40	25
				50	40	25
				75	40	25
				100	40	25
				125	40	25
			Vertical	0	20	-
				25	20	-
				50	20	-
				75	12	-
				100	9	-
				125	5	-
		6	Horizontal	0	40	20
				50	40	20
				100	40	20
				150	40	20
				200	35	18
				250	10	6
			Vertical	0	10	-
				50	10	-
				100	10	-
				150	8	-
				200	5	-
				250	3	-
		12	Horizontal	0	25	10
				100	25	10
				200	25	10
				300	20	8
				400	10	5
				500	5	2
			Vertical	0	4	-
				100	4	-
				200	4	-
				300	3	-
				400	2	-
				500	1	-
		20	Horizontal	0	6	5
				160	6	5
				320	6	5
				480	4	3
				640	3	1
				0	1	-
			垂直	160	1	-
				320	1	-
				480	1	-
				640	0.5	-

[When high-output setting for motor reversing type is ineffective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
RRA7R	56P	4	Horizontal	0	55	50
				35	55	50
				70	55	50
				105	30	15
			Vertical	0	26	-
				35	26	-
				70	13	-
				105	2	-
		8	Horizontal	0	50	30
				70	50	30
				140	50	30
				210	14	7
			Vertical	0	17.5	-
				70	17.5	-
				140	7	-
				210	2	-
		16	Horizontal	0	40	25
				140	40	25
				280	18	12
				420	1.5	1
			Vertical	0	5	-
				140	5	-
				280	2	-
				420	-	-
		24	Horizontal	0	18	9.5
				200	18	9.5
				420	10	5
				640	1	-
			Vertical	0	3	-
				200	3	-
				420	1.5	-
				640	-	-



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
RRA4C RRA4R	35P	2.5	8192	Rolled	φ8mm	C10
		5				
		10				
		16				
RRA6C RRA6R	42P	3		Rolled	φ10mm	C10
		6				
		12				
		20				
RRA7C RRA7R	56P	4		Rolled	φ12mm	C10
		8				
		16				
		24				
RRA8C RRA8R	60P	5		Rolled	φ16mm	C10
		10				
		20				

1.2.4 Positioning Precision

Type	Lead	Item	Tolerance
RRA4C RRA4R	2.5, 5, 10, 16	Positioning repeatability	±0.01mm
		Lost motion	0.1mm or less
RRA6C RRA6R	3, 6, 12, 20	Positioning repeatability	±0.01mm
		Lost motion	0.1mm or less
RRA7C RRA7R	4, 8, 16, 24	Positioning repeatability	±0.01mm
		Lost motion	0.1mm or less
RRA8C RRA8R	5, 10, 20	Positioning repeatability	±0.01mm
		Lost motion	0.1mm or less

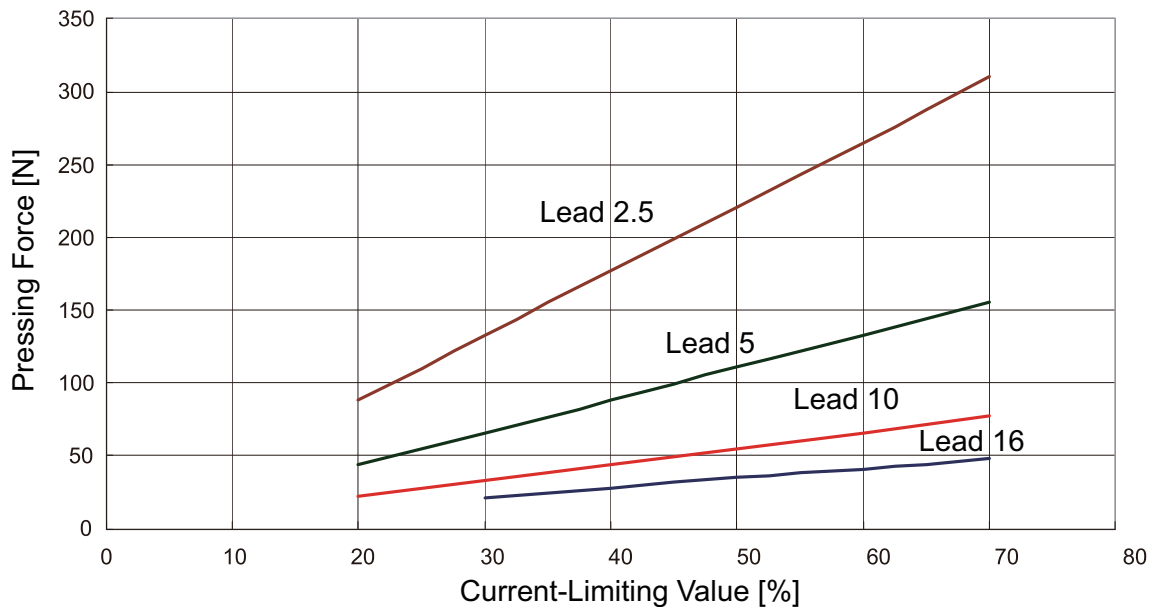
This is an option already attached when it is shipped out from the factory.
It does not include the consideration of time-dependent change as it is used.

1.2.5 Current Limit Value and Pressing Force

[1] RRA4C and RRA4R Motor Type 35P

Current Limiting Value	Lead 2.5 [N]	Lead 5 [N]	Lead 10 [N]	Lead 16 [N]
20%	89	44	22	-
30%	133	66	33	21
40%	177	88	44	27
50%	221	111	55	34
60%	266	133	66	41
70%	310	155	77	48

RRA4C/R Current Limiting Values and Pressing Force

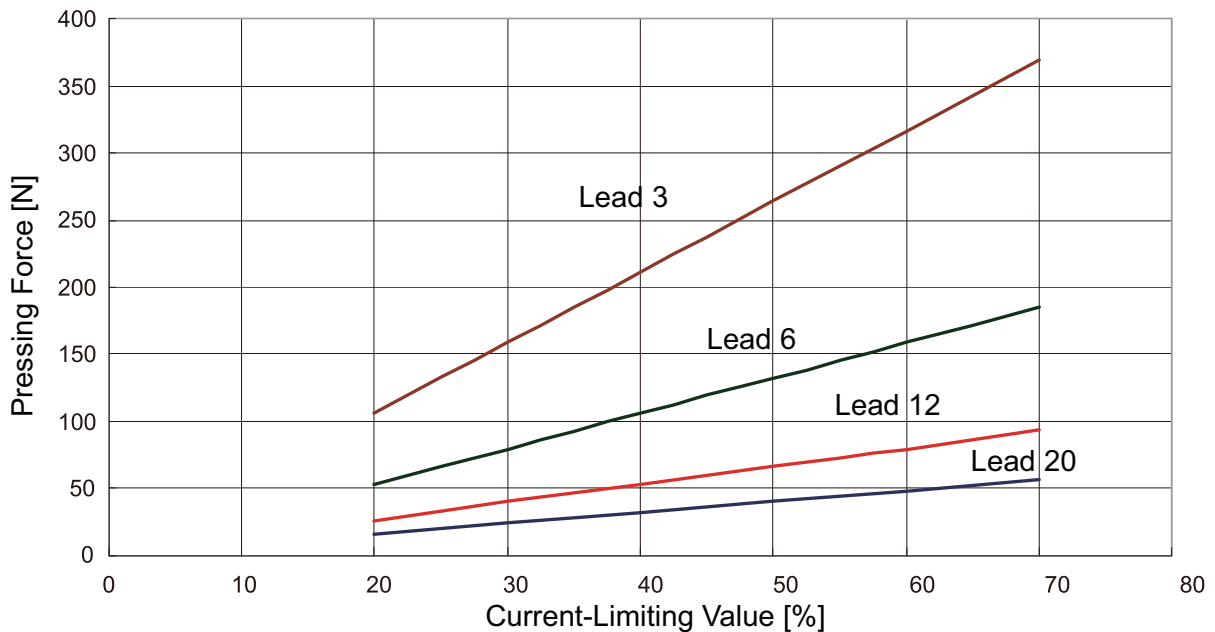


- Caution:**
- (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
 - (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
 - (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20% (below 30% for Lead 16). 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] RRA6C and RRA6R Motor Type 42P

Current Limiting Value	Lead 3 [N]	Lead 6 [N]	Lead 12 [N]	Lead 20 [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

RRA6C/R Current Limiting Values and Pressing Force



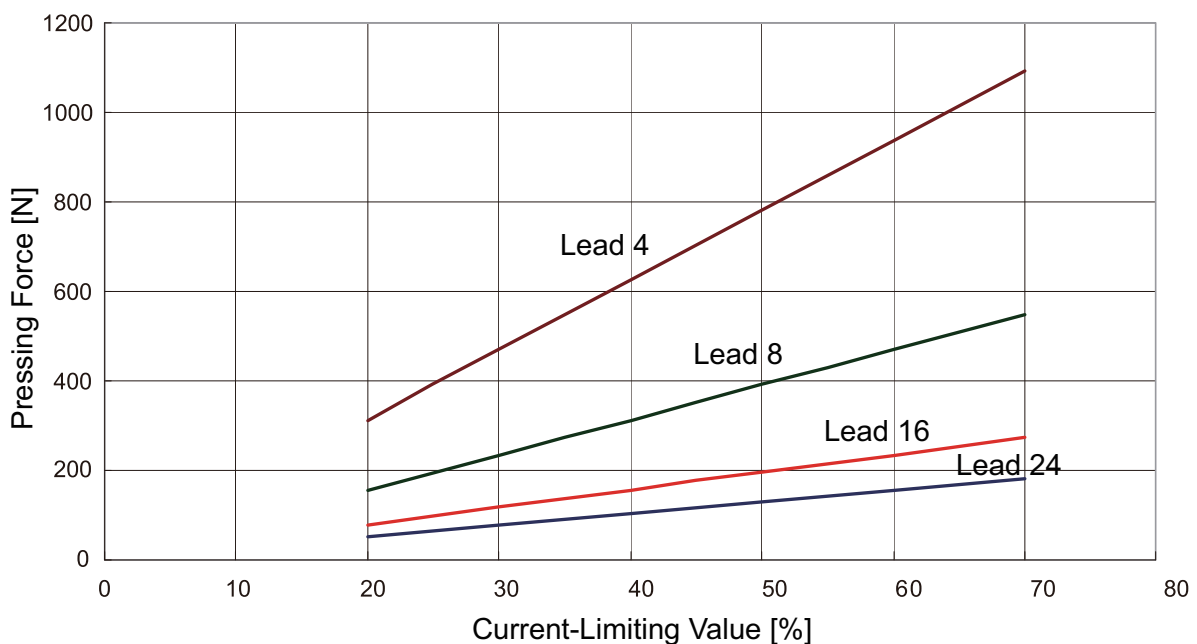
Caution:

- (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] RRA7C and RRA7R Motor Type 56P

Current Limiting Value	Lead 4 [N]	Lead 8 [N]	Lead 16 [N]	Lead 24 [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

RRA7C/R Current Limiting Values and Pressing Force

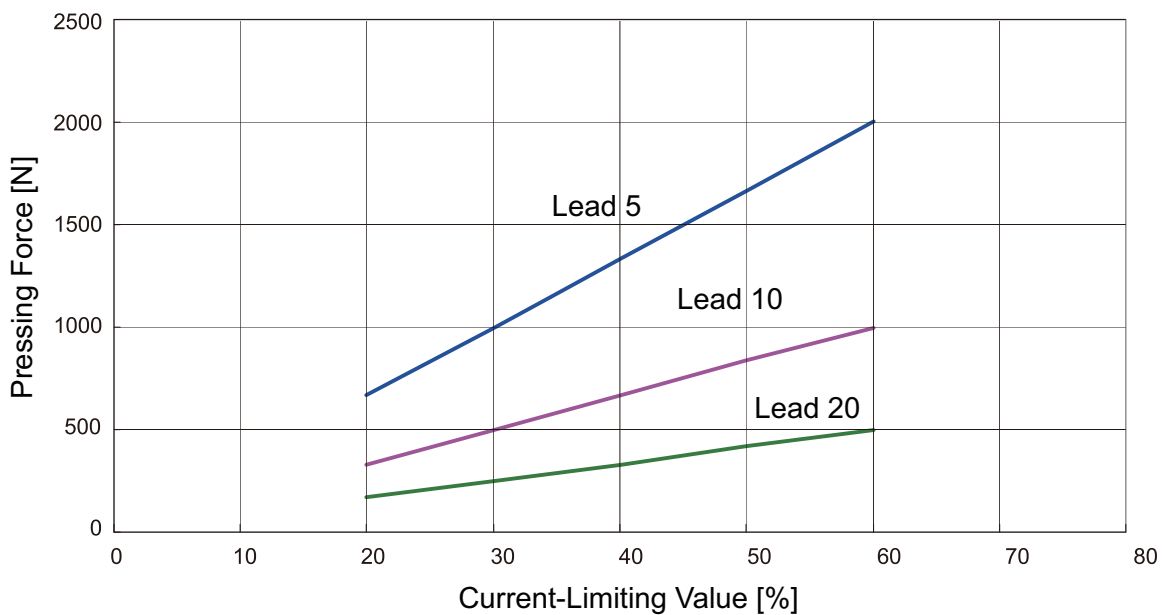


Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
 (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
 (3) Use the product within the range 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.

[4] RRA8C and RRA8R Motor Type 60P

Current Limiting Value	Lead 5 [N]	Lead 10 [N]	Lead 20 [N]
20%	667	333	167
30%	1000	500	250
40%	1333	667	333
50%	1667	833	417
60%	2000	1000	500

RRA8C/R Current Limiting Values and Pressing Force

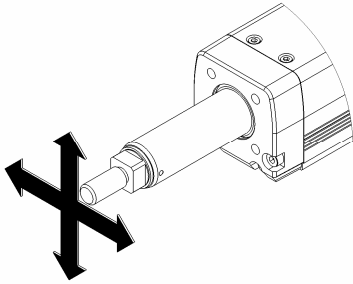


Caution:

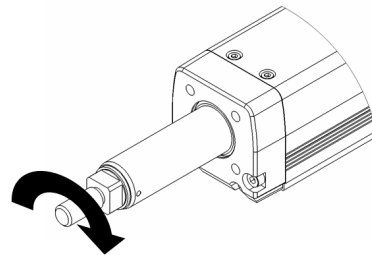
- (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 10mm/s.
- (2) There is a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
- (3) Use the product within the range 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.

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

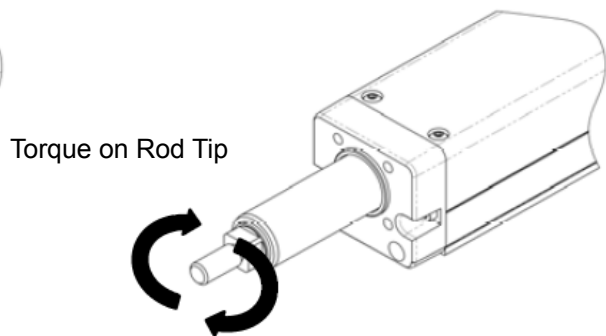
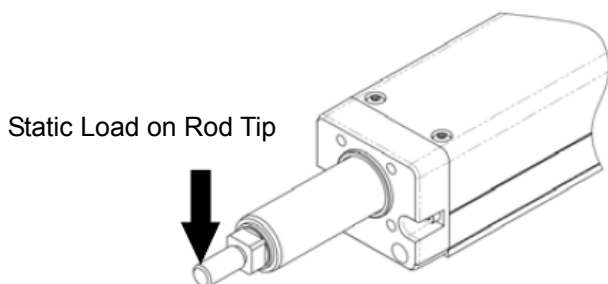


Should be below allowable torque

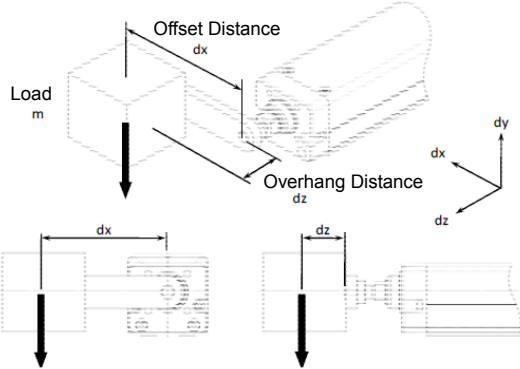
RRA4C and RRA4R

Item		Stroke	60	110	160	210	260	310	360	410
Rod Tip Static Allowable Load	[N]		63.4	50.7	42.1	36.0	31.3	27.6	24.6	22.2
Rod Tip Dynamic Allowable Load (Operating life 5,000km Remaining Probability 90%)	[N]	Load Offset Distance 0mm	28.9	22.2	17.9	14.8	12.6	10.8	9.4	8.2
	[N]	Load Offset Distance 100mm	17.9	15.5	13.4	11.6	10.2	9.0	8.0	7.1
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less							
Rod Tip Static Allowable Torque	[N·m]		6.4	5.1	4.3	3.7	3.2	2.9	2.6	2.3
Rod Tip Dynamic Allowable Torque	[N·m]		1.7	1.5	1.3	1.1	1.0	0.9	0.7	0.7
Rod Non-Rotation Accuracy ^(Note 1)	[deg]		0							

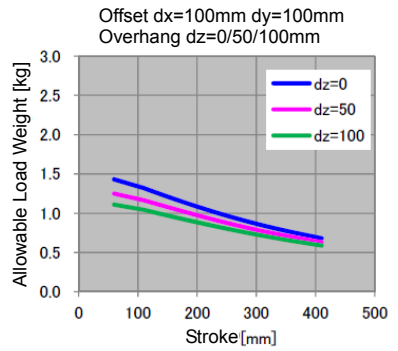
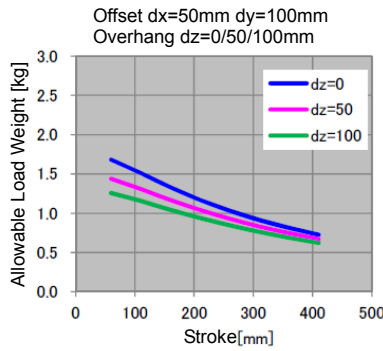
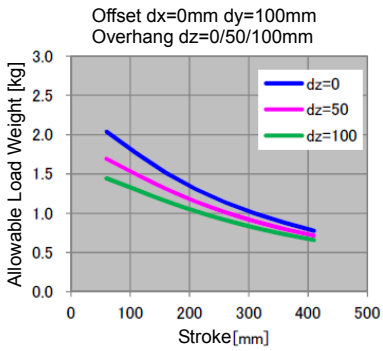
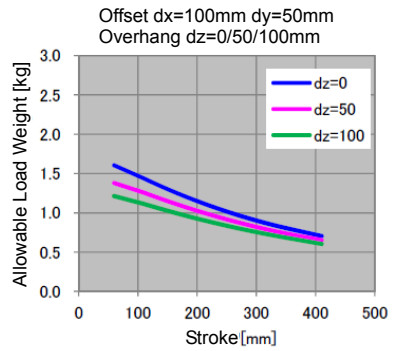
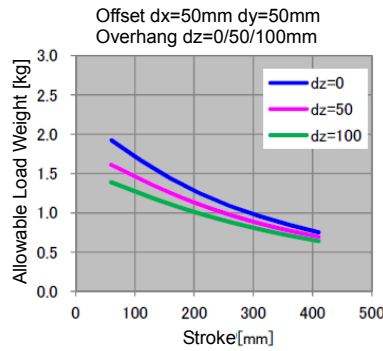
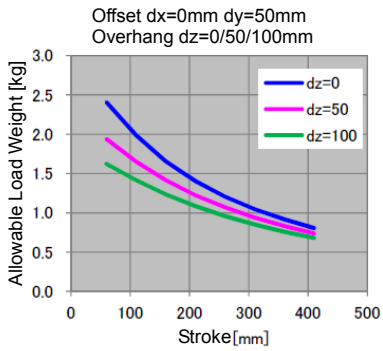
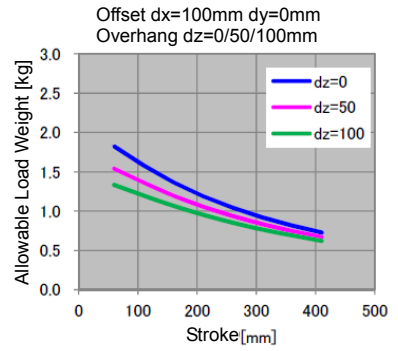
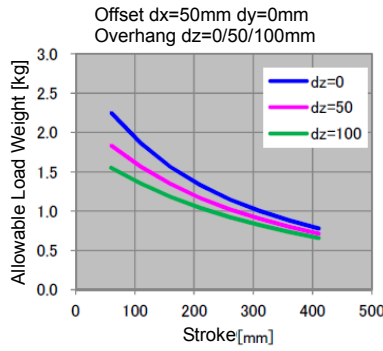
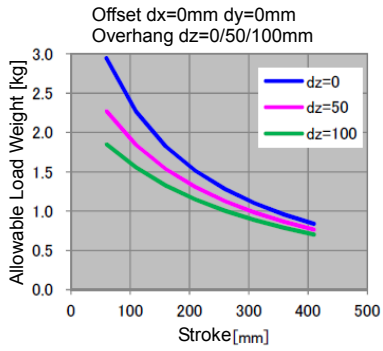
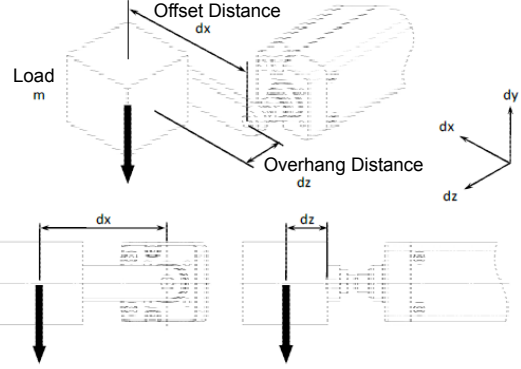
Note 1 It shows the displacement angle in the rod rotational direction at no load.



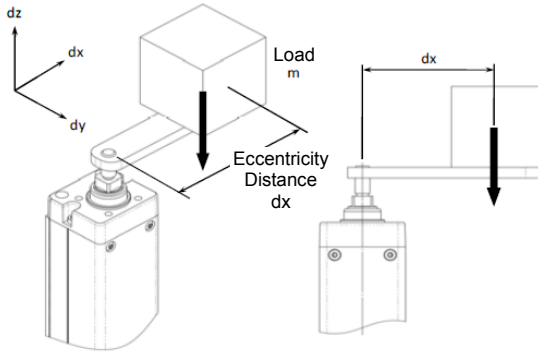
[RRA4 Horizontal Installation]



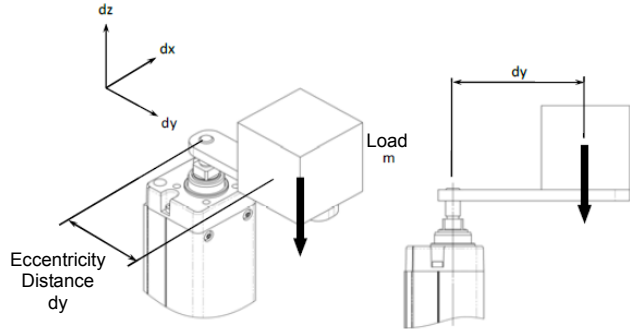
[RRA4 Sideway Installation]



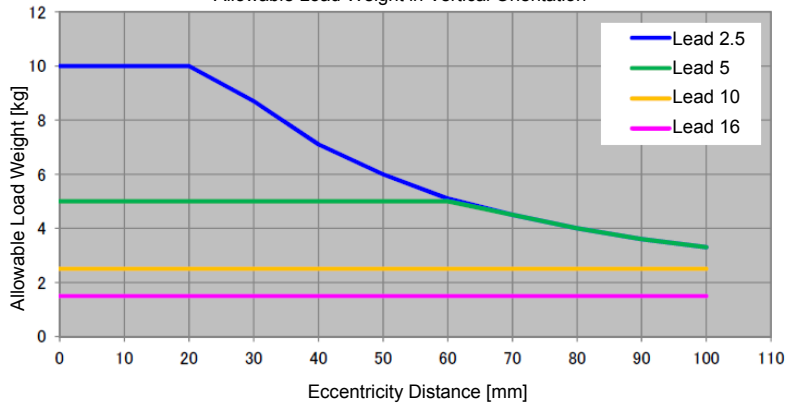
[RRA4 Vertical Orientation
Eccentricity in dx Direction]



[RRA4 Vertical Orientation
Eccentricity in dy Direction]



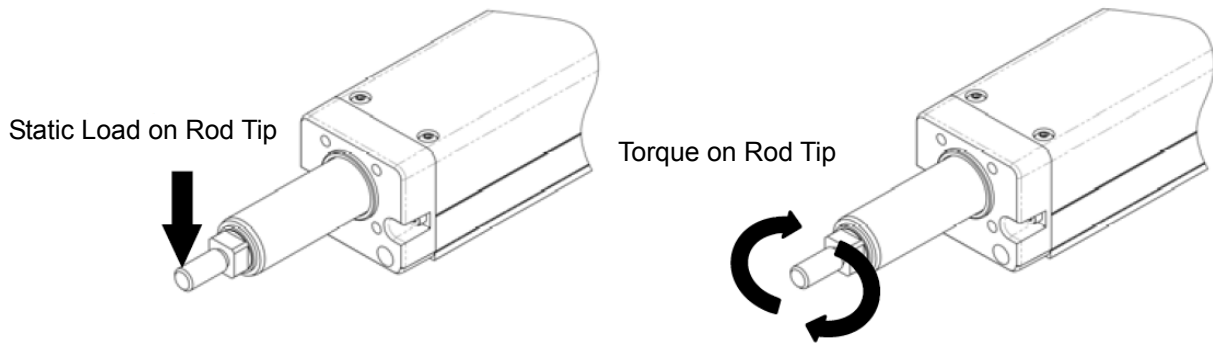
Allowable Load Weight in Vertical Orientation



RRA6C and RRA6R

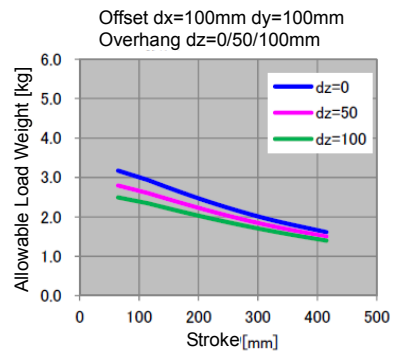
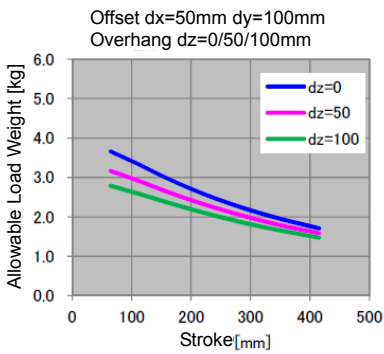
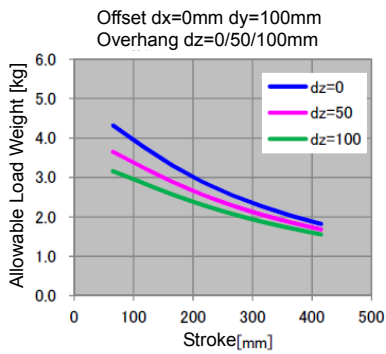
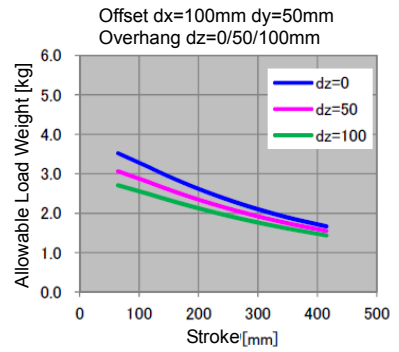
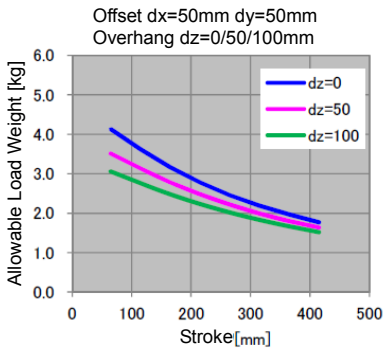
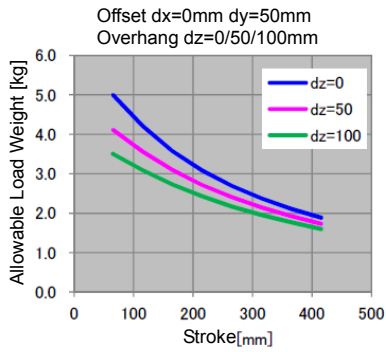
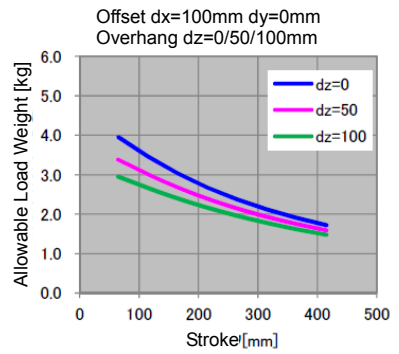
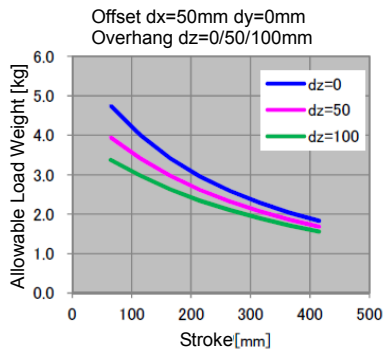
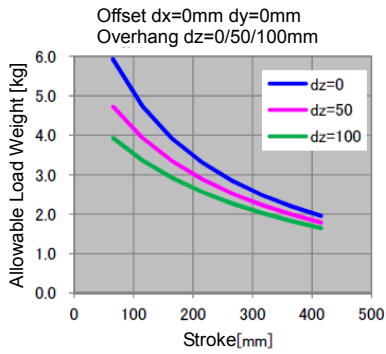
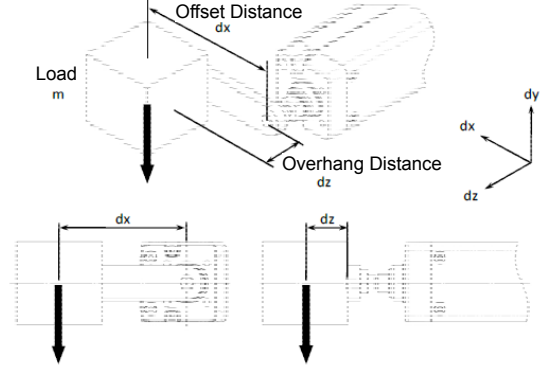
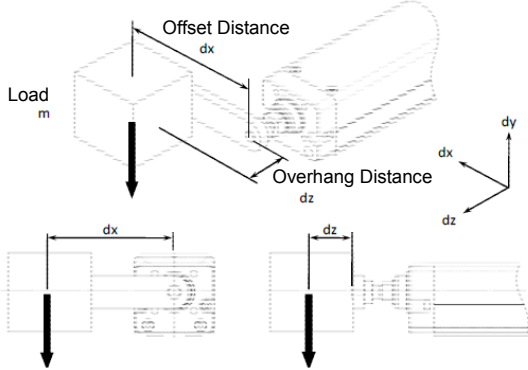
Item		Stroke	65	115	165	215	265	315	365	415
Rod Tip Static Allowable Load	[N]		144	117	99	85.4	75	66.7	59.9	54.3
Rod Tip Dynamic Allowable Load (Operating life 5,000km Remaining Probability 90%)	[N]	Load Offset Distance 0mm	58.1	46.4	38.3	32.4	27.9	24.4	21.5	19.2
	[N]	Load Offset Distance 100mm	38.8	34.0	29.7	26.2	23.2	20.8	18.7	16.8
Load Offset Distance (Center of overhang load gravity)	[mm]		100 or less							
Rod Tip Static Allowable Torque	[N•m]		14.5	11.8	10.0	8.7	7.6	6.8	6.2	5.6
Rod Tip Dynamic Allowable Torque	[N•m]		3.8	3.3	2.9	2.6	2.3	2.0	1.8	1.6
Rod Non-Rotation Accuracy ^(Note 1)	[deg]		0							

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

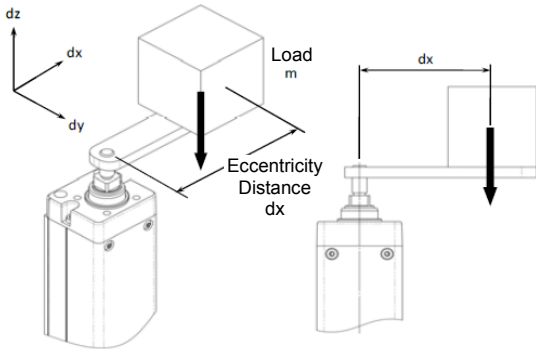


[RRA6 Horizontal Installation]

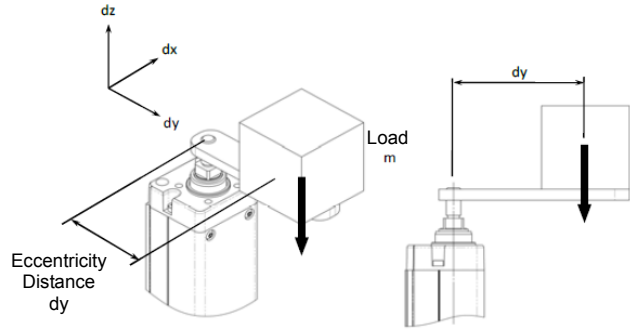
[RRA6 Sideways Installation]



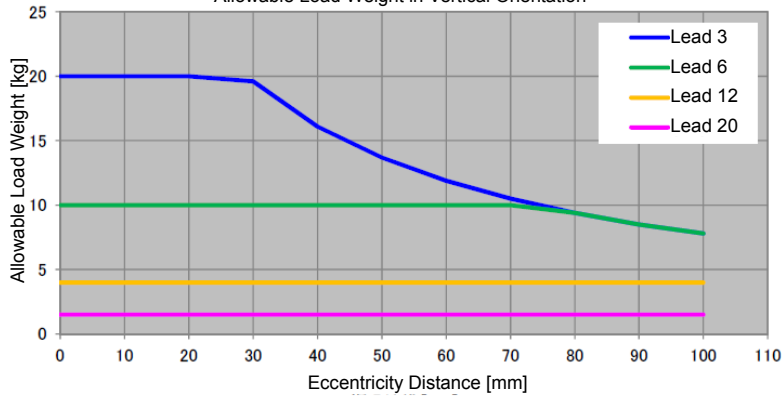
[RRA6 Vertical Orientation
Eccentricity in dx Direction]



[RRA6 Vertical Orientation
Eccentricity in dy Direction]



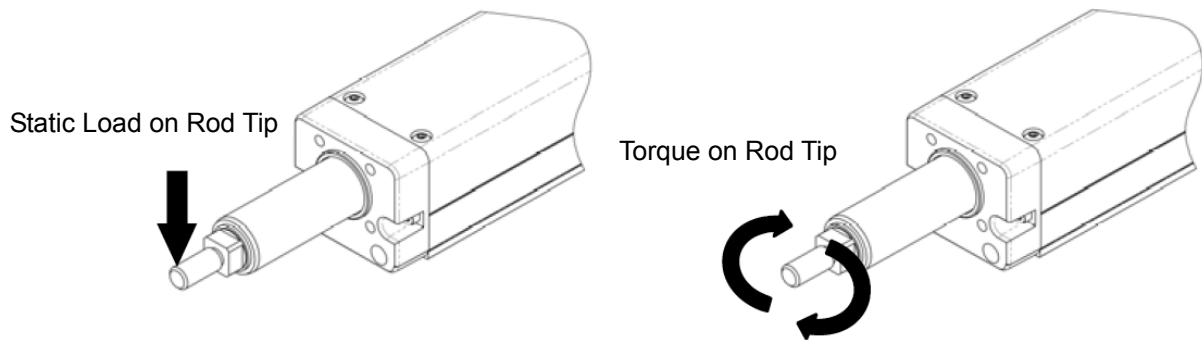
Allowable Load Weight in Vertical Orientation



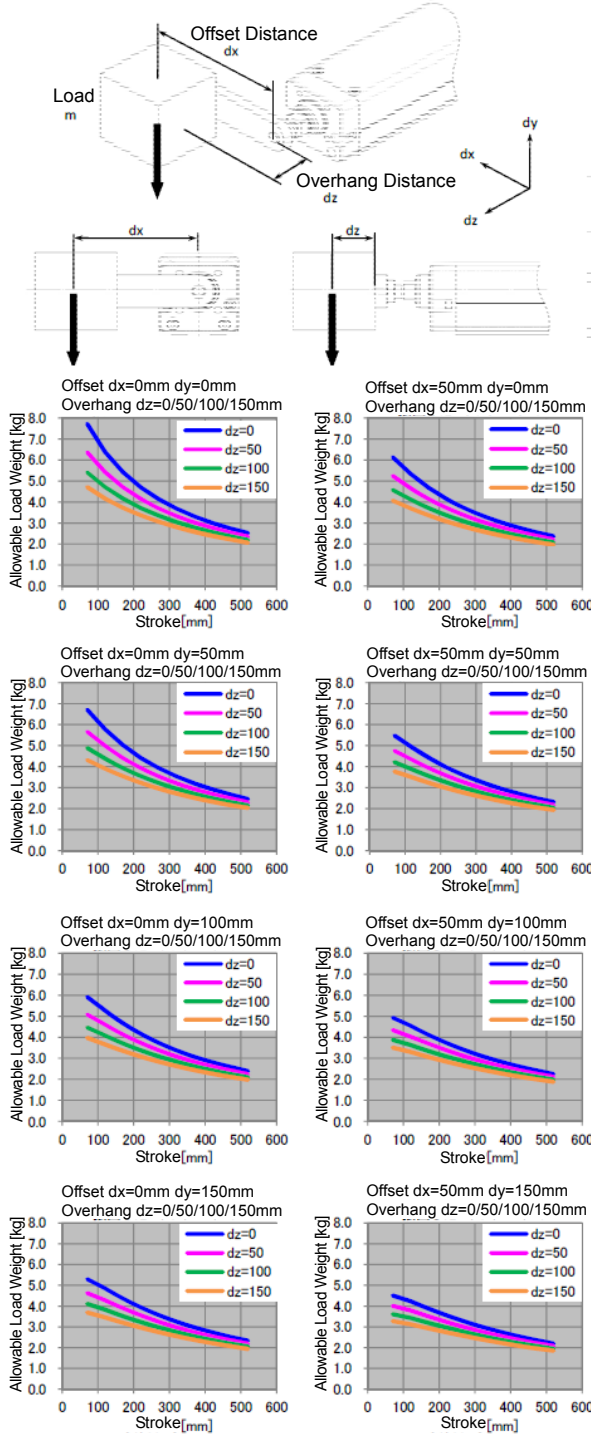
RRA7C and RRA7R

Item		Stroke	70	120	170	220	270	320	370	420	470	520
Rod Tip Static Allowable Load	[N]		175	147	126	111	98.6	88.7	80.6	73.8	68	63
Rod Tip Dynamic Allowable Load (Operating life 5,000km Remaining Probability 90%)	[N]	Load Offset Distance 0m	75.7	62.6	53.1	46.0	40.5	36.1	32.5	29.4	26.9	24.7
	[N]	Load Offset Distance 100mm	49.8	45.1	40.5	36.5	33.1	30.2	27.7	25.5	23.6	21.9
Load Offset Distance (Center of overhang load gravity)	[mm]		150 or less									
Rod Tip Static Allowable Torque	[N•m]		17.6	14.7	12.7	11.2	9.9	9.0	8.2	7.5	6.94	6.45
Rod Tip Dynamic Allowable Torque	[N•m]		5.0	4.5	4.0	3.6	3.3	3.0	2.8	2.5	2.32	2.16
Rod Non-Rotation Accuracy ^(Note 1)	[deg]		0									

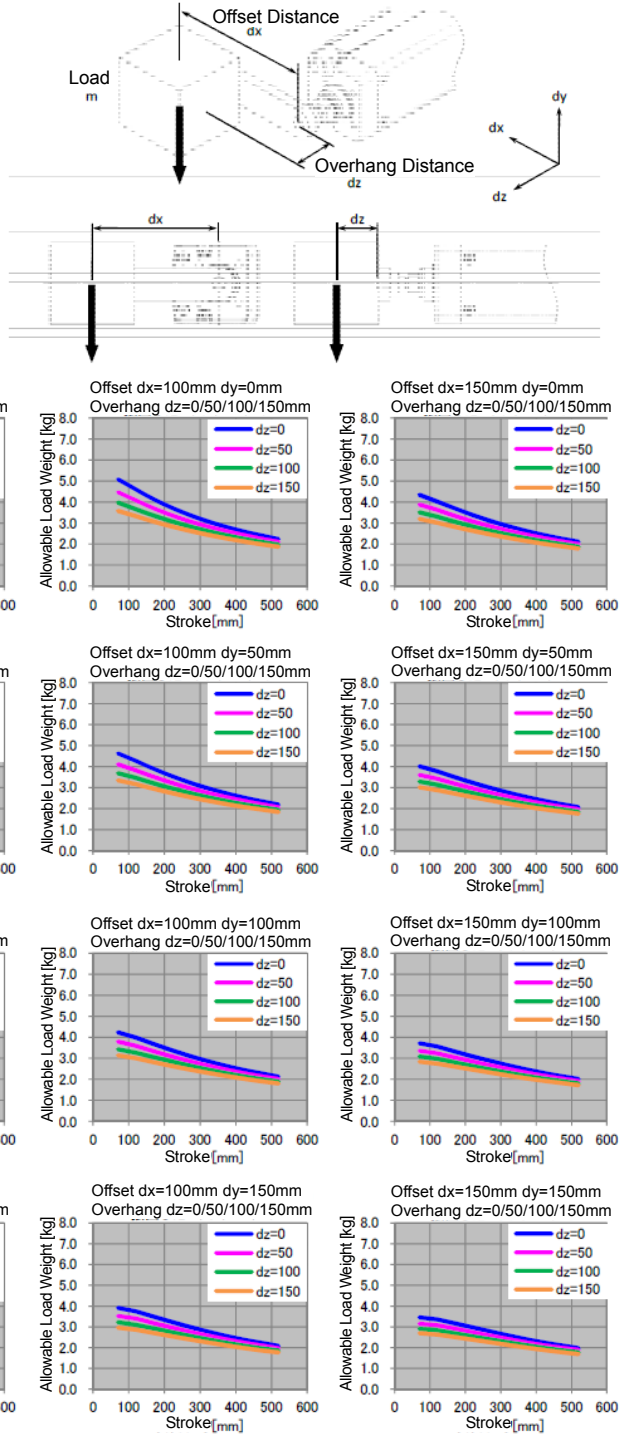
Note 1 It shows the displacement angle in the rod rotational direction at no load.



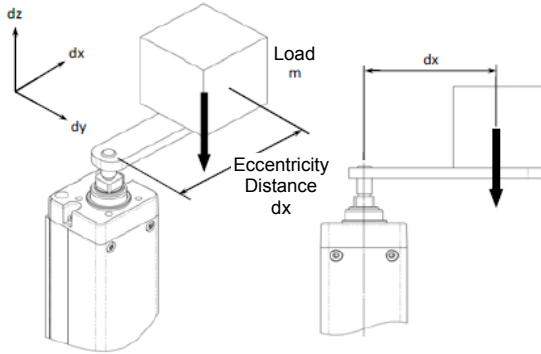
[RRA7 Horizontal Installation]



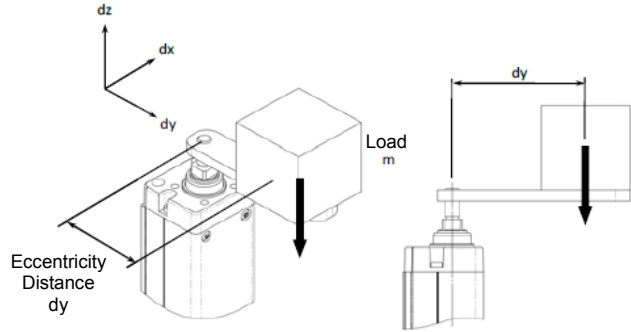
[RRA7 Sideways Installation]



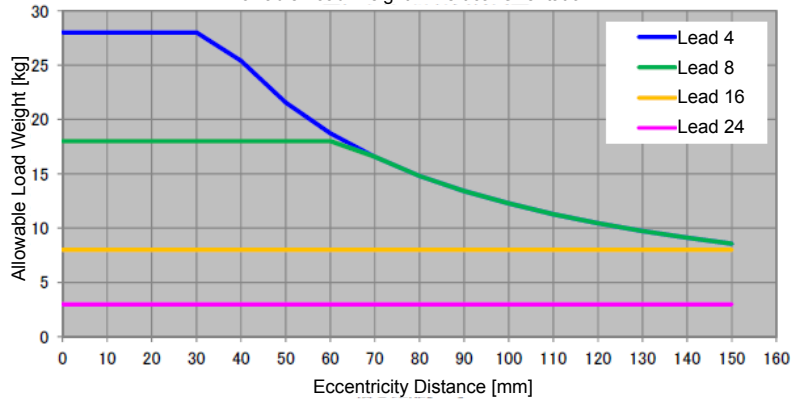
[RRA7 Vertical Orientation
Eccentricity in dx Direction]



[RRA7 Vertical Orientation
Eccentricity in dy Direction]



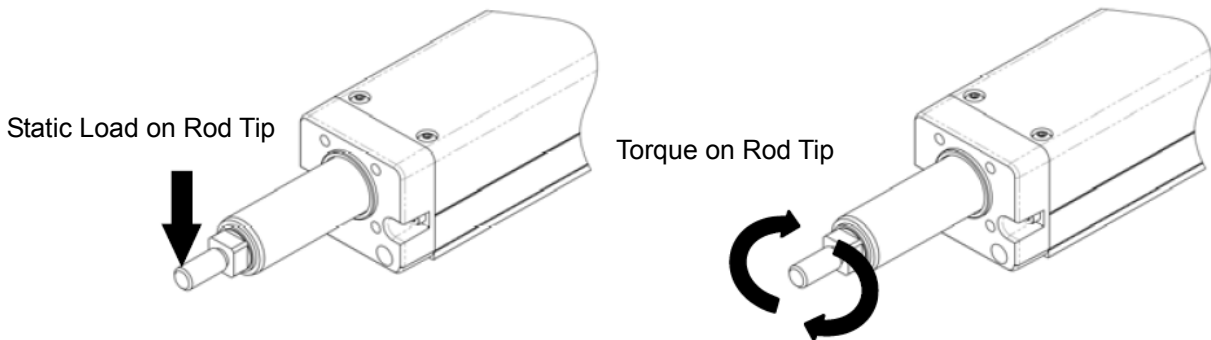
Allowable Load Weight in Vertical Orientation



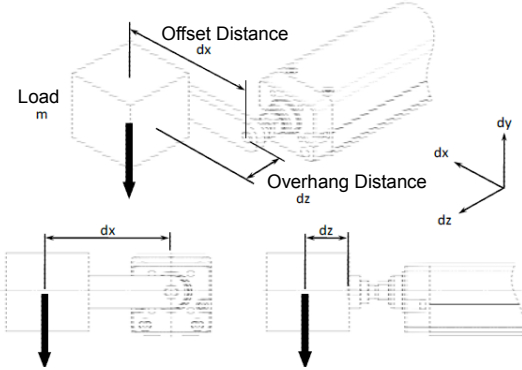
RRA8C and RRA8R

Item		Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700
Rod Tip Static Allowable Load	[N]		222	186	159	139	124	111	101	92.1	84.7	78.4	72.8	68.0	63.7	59.8
Rod Tip Dynamic Allowable Load (Operating life 5,000km Remaining Probability 90%)	[N]	Load Offset Distance 0mm	93.0	76.3	64.7	56.0	49.2	43.8	39.3	35.6	32.4	29.7	27.3	25.2	23.3	21.7
	[N]	Load Offset Distance 100mm	72.0	61.6	53.9	48.0	43.0	38.9	35.4	32.3	29.7	27.4	25.3	23.5	21.9	20.4
Load Offset Distance (Center of overhang load gravity)	[mm]		150 or less													
Rod Tip Static Allowable Torque	[N•m]		22.3	18.7	16.1	14.1	12.6	11.3	10.3	9.4	8.7	8.1	7.6	7.1	6.7	6.3
Rod Tip Dynamic Allowable Torque	[N•m]		7.2	6.2	5.4	4.8	4.3	3.9	3.5	3.2	3.0	2.7	2.5	2.4	2.2	2.0
Rod Non-Rotation Accuracy ^(Note 1)	[deg]		0													

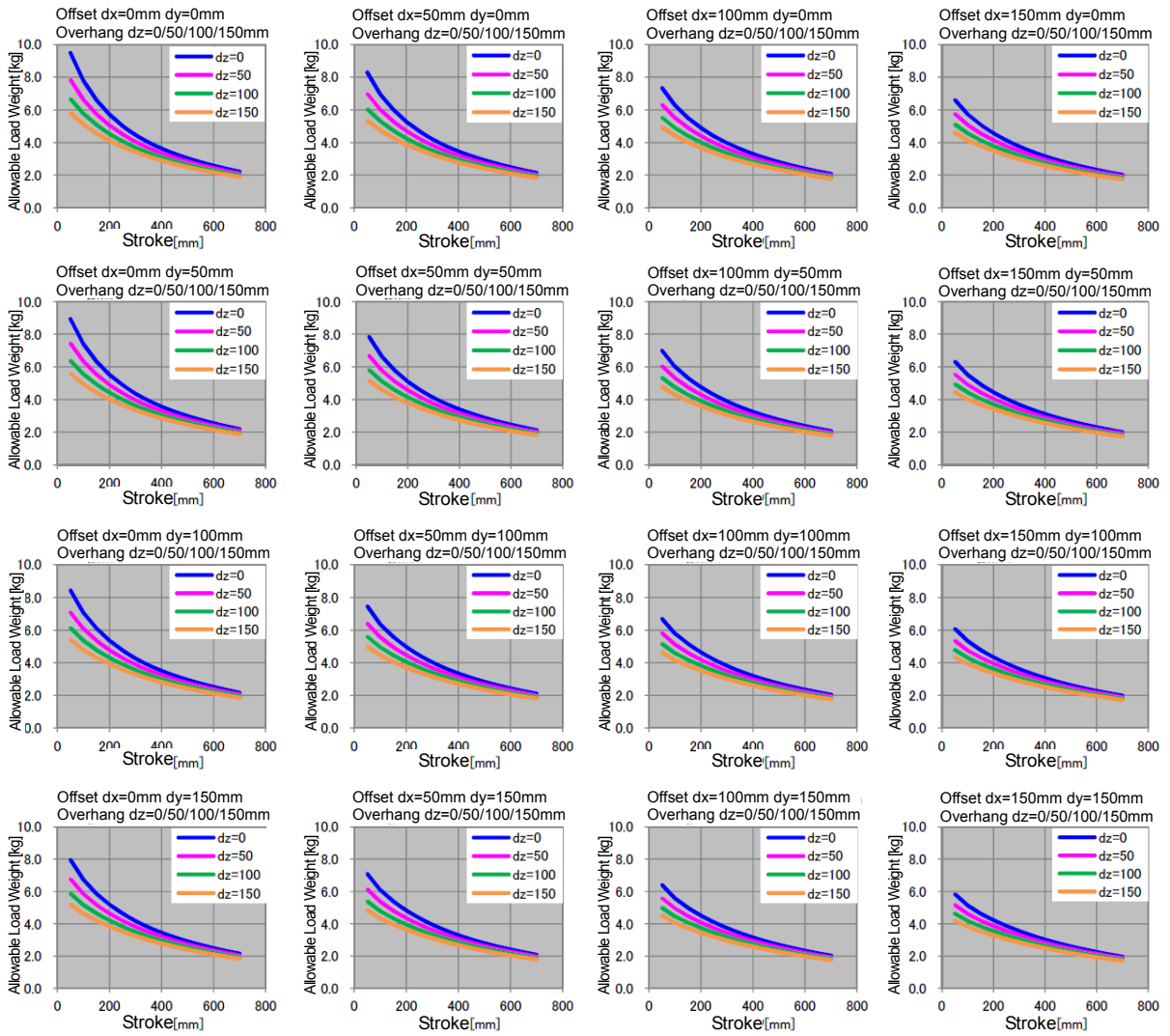
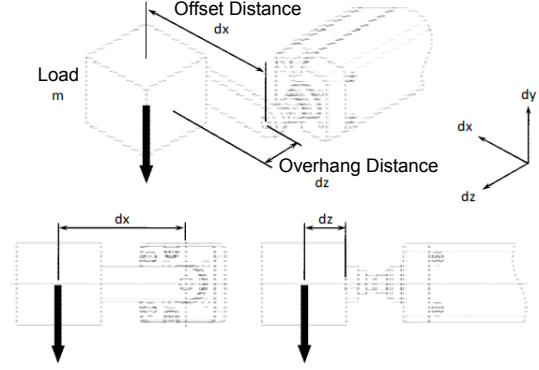
Note 1 It shows the displacement angle in the rod rotational direction at no load.



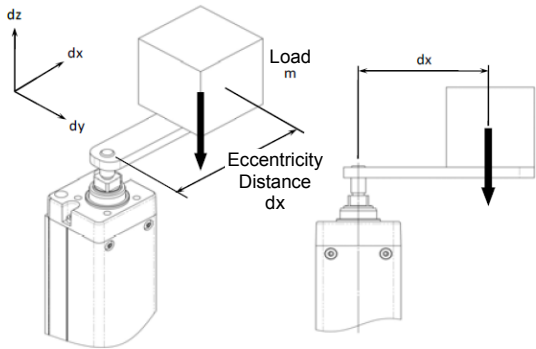
[RRA8 Horizontal Installation]



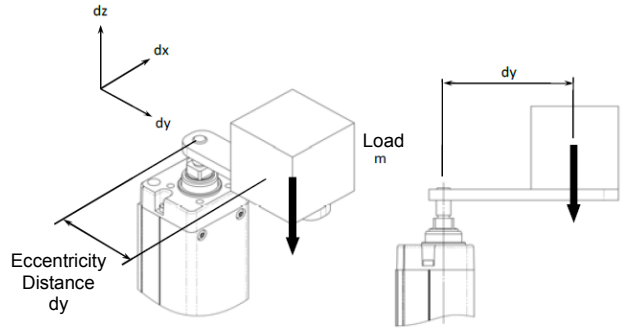
[RRA8 Sideways Installation]



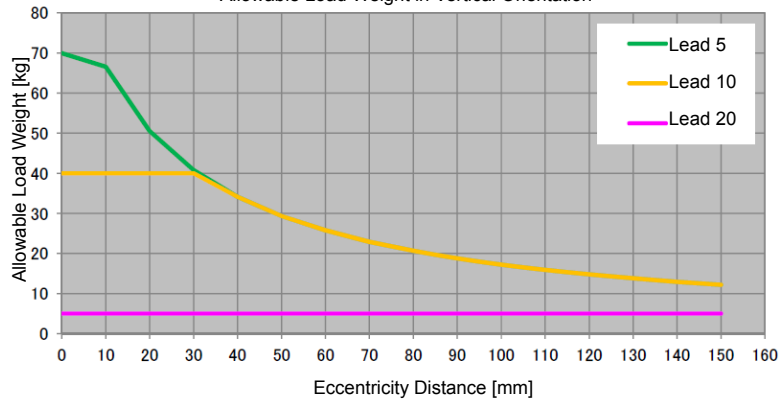
[RRA8 Vertical Orientation
Eccentricity in dx Direction]



[RRA8 Vertical Orientation
Eccentricity in dy Direction]



Allowable Load Weight in Vertical Orientation

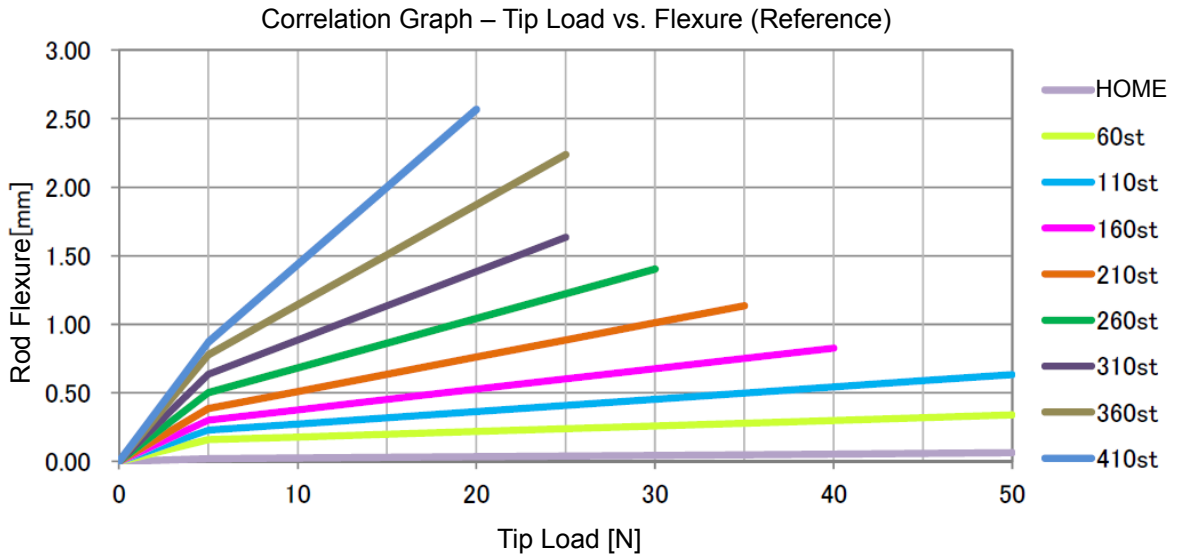


1.2.7 Rod Flexure (Reference)

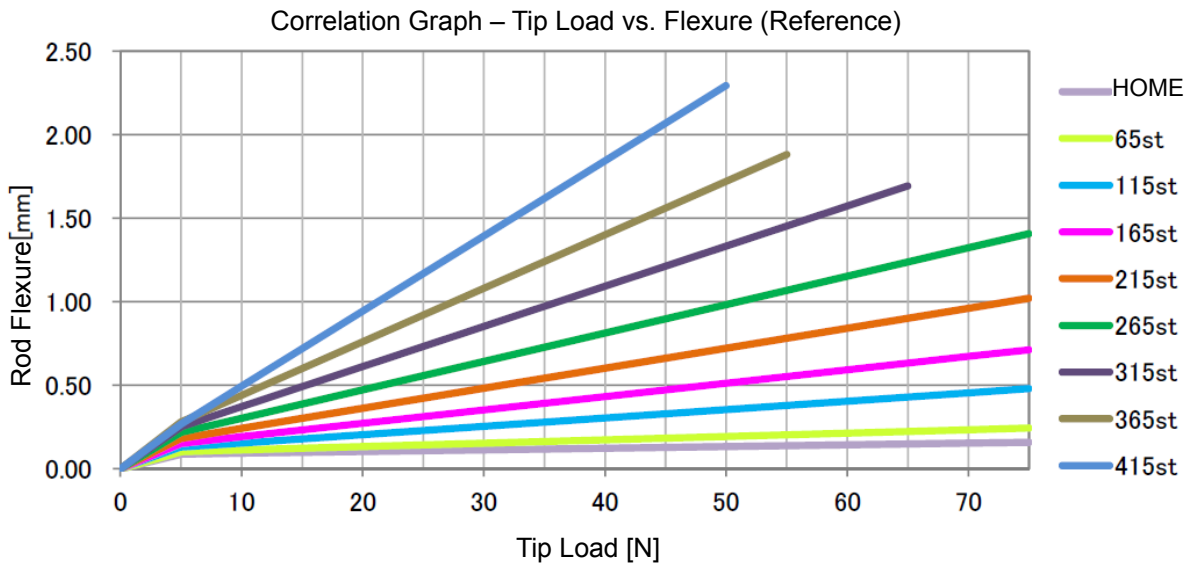
(Note) This is the flexure of the rod when the actuator is installed horizontally. It does not include the flexure caused by the weight of itself.

1. Specifications Check

RRA4C and RRA4R Rod Flexure (Reference)

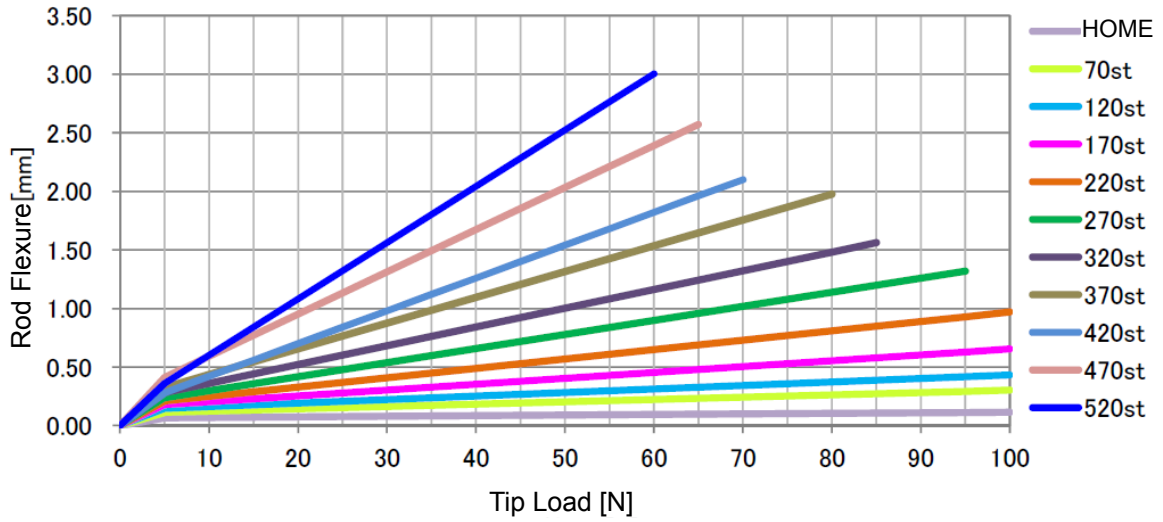


RRA6C and RRA6R Rod Flexure (Reference)



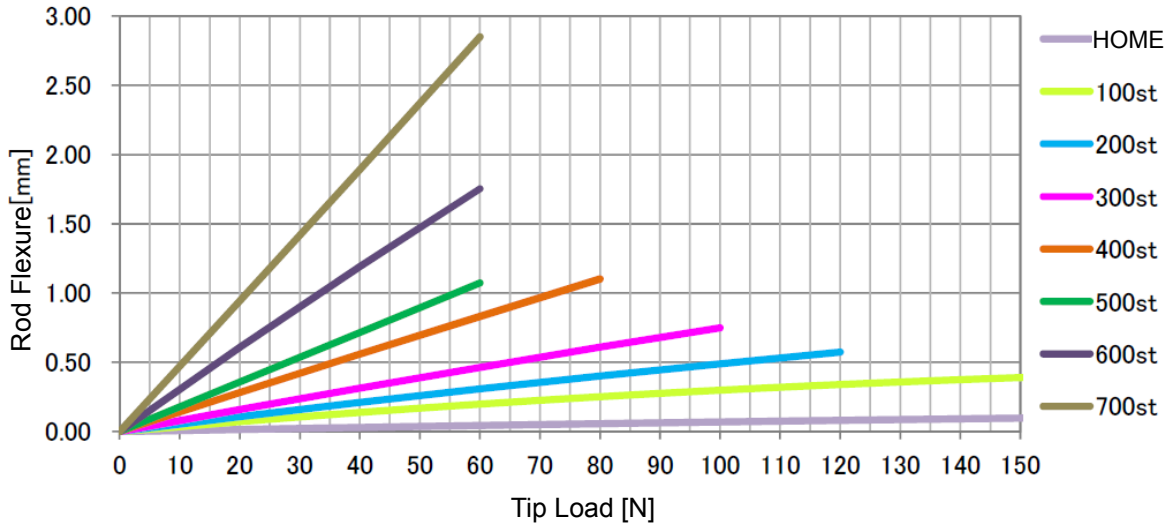
RRA7C and RRA7R Rod Flexure (Reference)

Correlation Graph – Tip Load vs. Flexure (Reference)



RRA8C and RRA8R Rod Flexure (Reference)

Correlation Graph – Tip Load vs. Flexure (Reference)



1.2.8 Duty Ratio of Continuous Operation

[Standard Specification]

Continuous operation is available with the duty ratio 100%.

[Built-in Controller Specification]

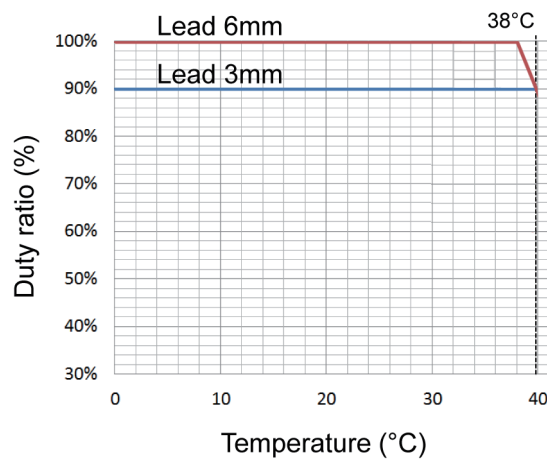
©RCP6S-RRA4C and 4R

Continuous operation is available with the duty ratio 100%.

©RCP6S-RRA6C and 6R

Lead 12mm and 20mm are available for continuous operation at 100% of the duty ratio.

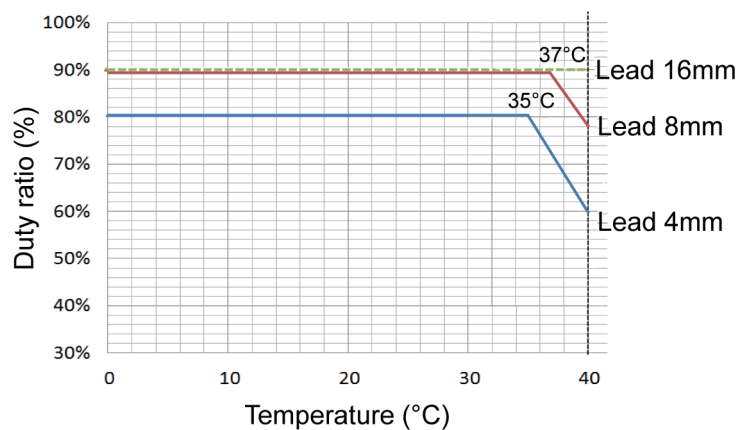
Follow the graph below for the duty ratio when operating Lead 3mm and 6mm.



©RCP6S-RRA7C and 7R

Lead 24mm are available for continuous operation at 100% of the duty ratio.

Follow the graph below for the duty ratio when operating Lead 4mm, 8mm and 16mm.



©RCP6S-RRA8C and 8R

Perform operation at 70% of duty ratio or less.

Duty ratio is the rate of operation expressed in % that presents the time of the actuator being operated in 1 cycle of operation.

1.3 Options

1.3.1 Brake Type (Model Code: 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 Code: NM)

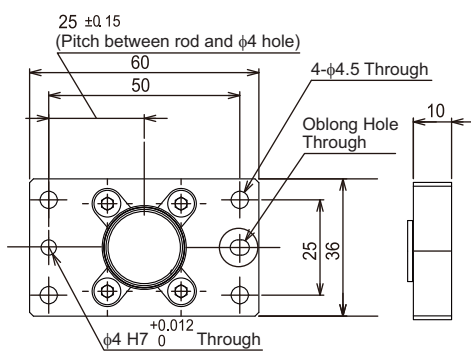
The standard home position is on the motor side. However, the motor position will be reversed if it is desirable in view of the layout of the system, etc.

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

1.3.3 Flange (Front) (Model Code: FL)

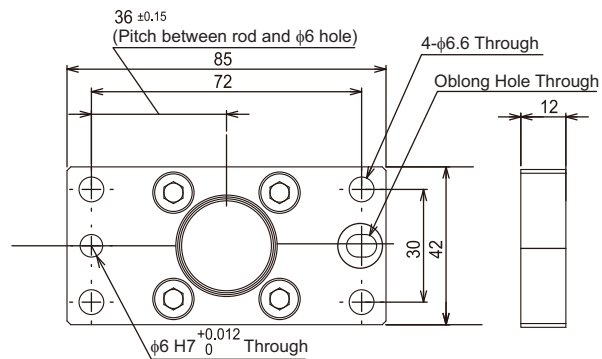
This is the flange to attach on the front of the main unit.

[Model code of single product: RCP6-FL-RRA4]



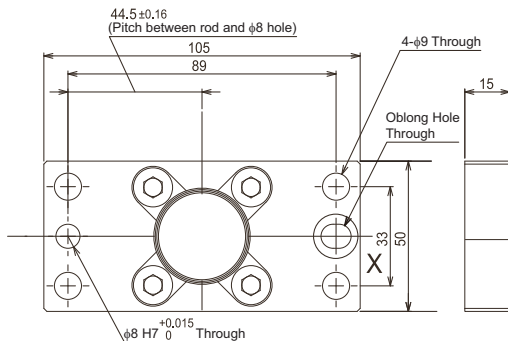
RRA4C and RRA4R

[Model code of single product: RCP6-FL-RRA6]



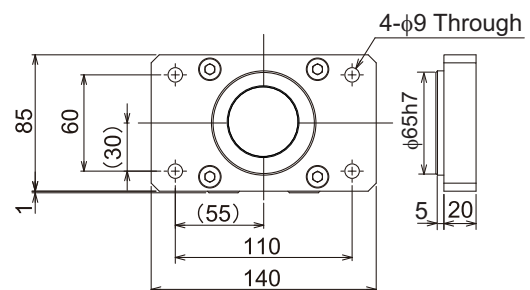
RRA6C and RRA6R

[Model code of single product: RCP6-FL-RRA7]



RRA7C and RRA7R

[Model code of single product: RCP6-FL-RRA8]



RRA8C and RRA8R

1.3.4 Tip Adapter (Flange) (Model Code: FFA)

Applicable Units: RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R

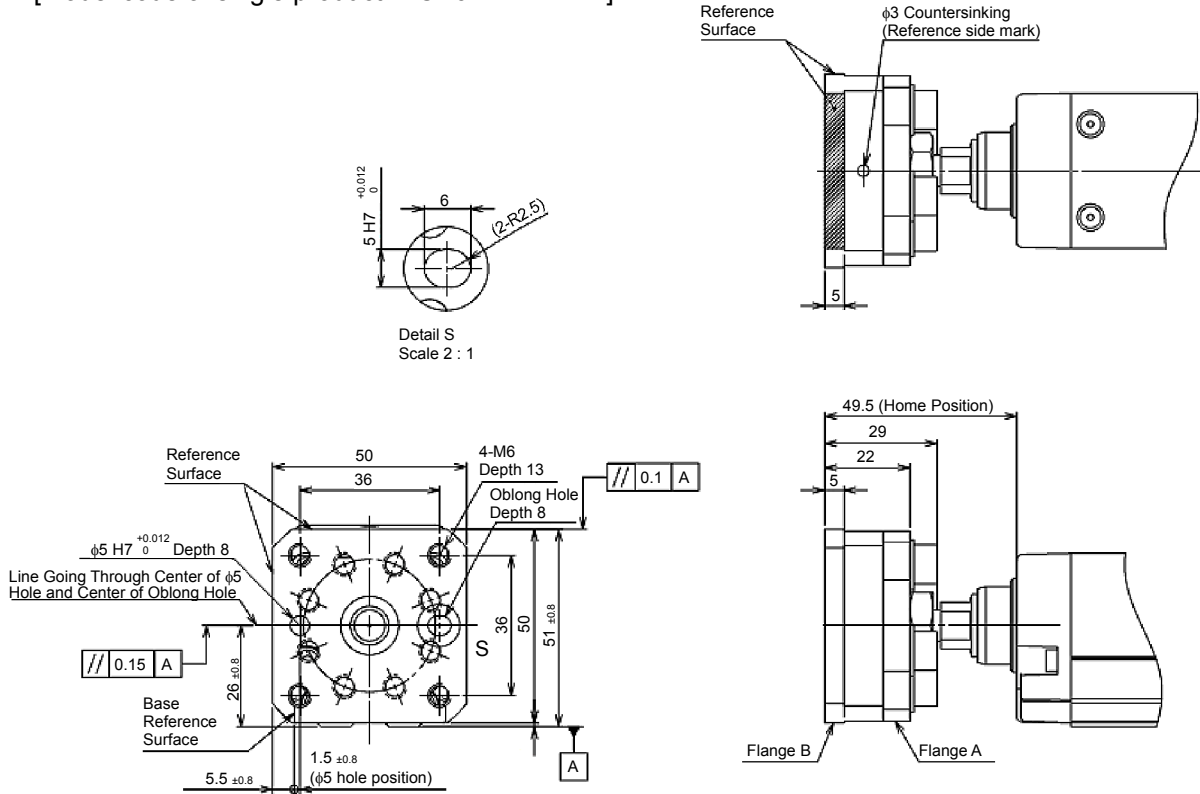
This is an adapter to attach on the rod tip an object such as a fixture with four screws.

(Note) In the delivery of IAI, the flatness is secured in the way described in the figure.

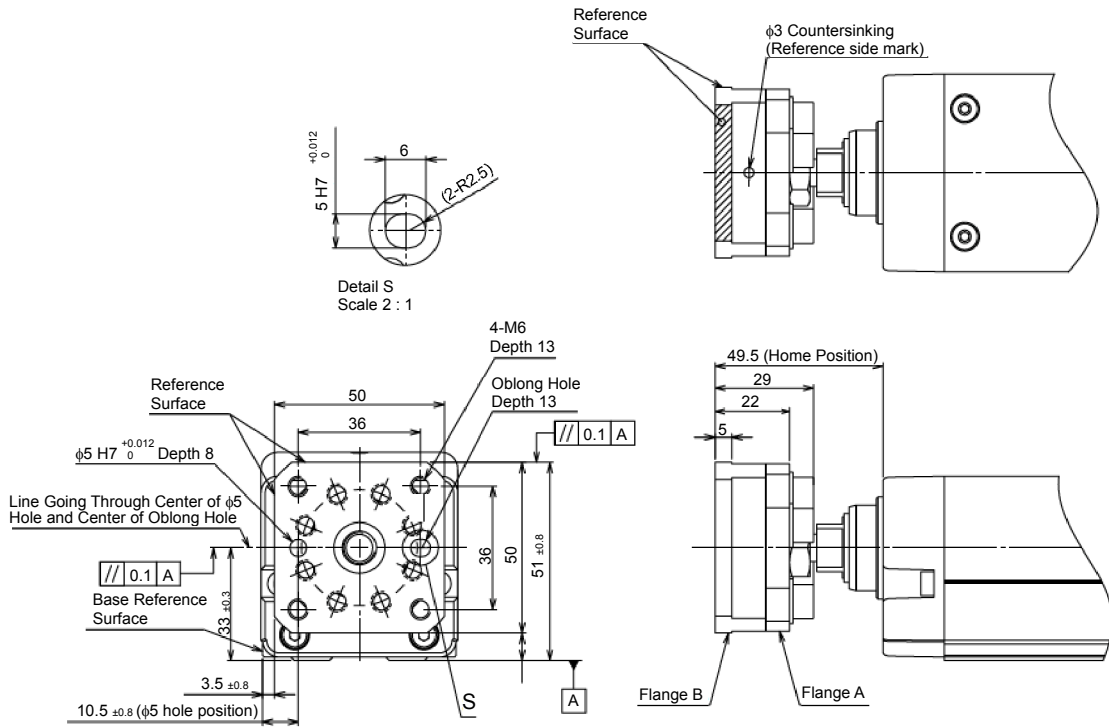
(Note) In the delivery of IAI, the screws are glued.

©RRA4C and RRA4R

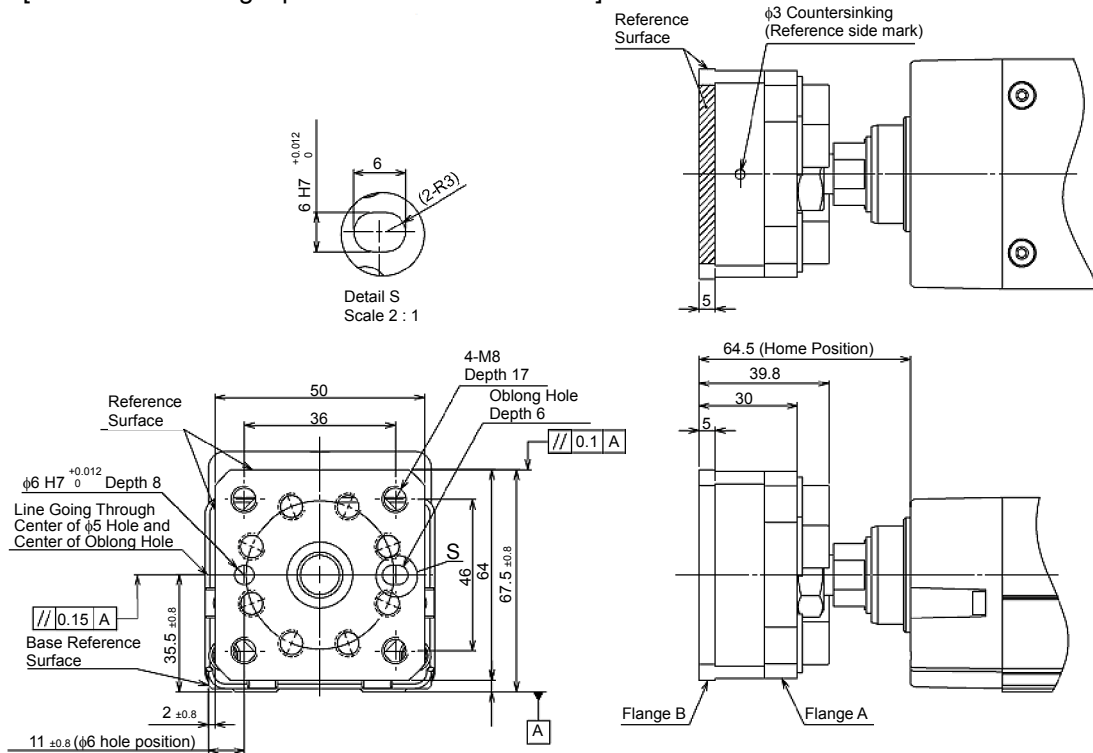
[Model code of single product: RCP6-FFA-RRA4]



©RRA6C and RRA6R
 [Model code of single product: RCP6-FFA-RRA6]



©RRA7C and RRA7R
 [Model code of single product: RCP6-FFA-RRA7]



1.3.5 Tip Adapter (Internal Thread) (Model Code: NFA)

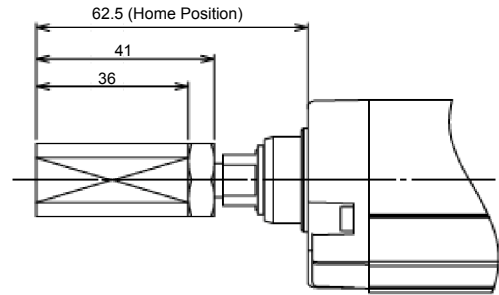
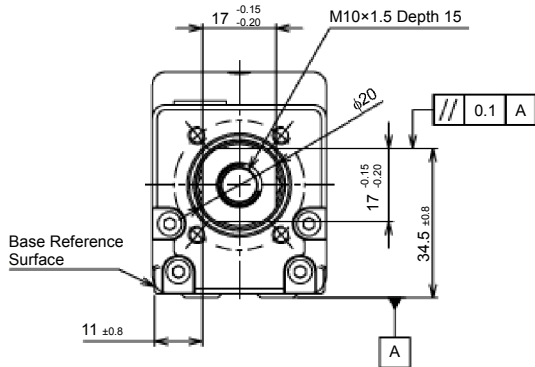
This is an adapter to attach on the rod end an object such as a fixture with one screw.

(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.

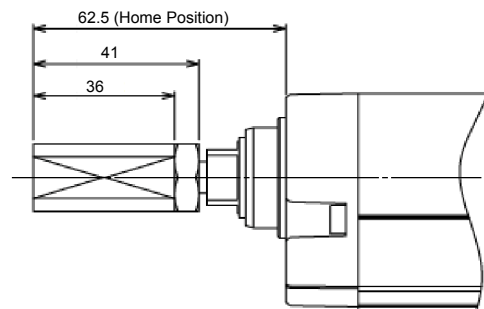
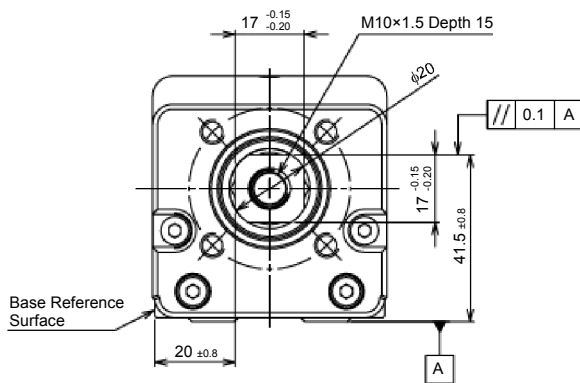
©RRA4C and RRA4R

[Model code of single product: RCP6-NFA-RRA4]

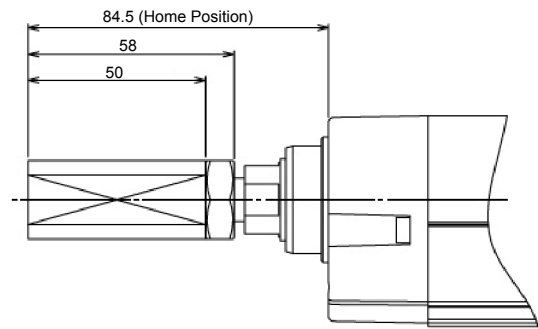
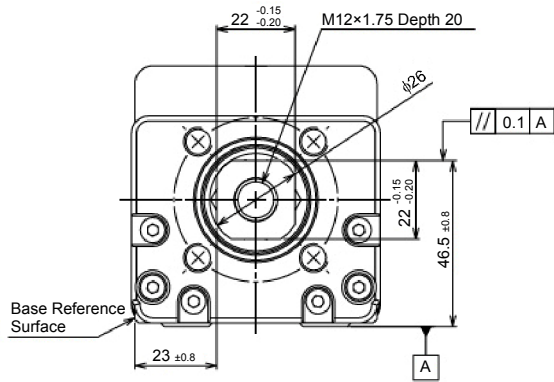


©RRA6C and RRA6R

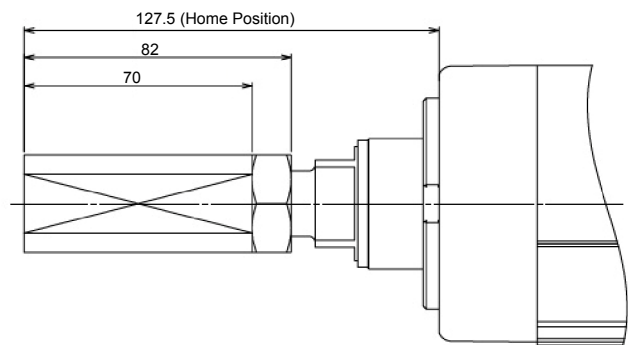
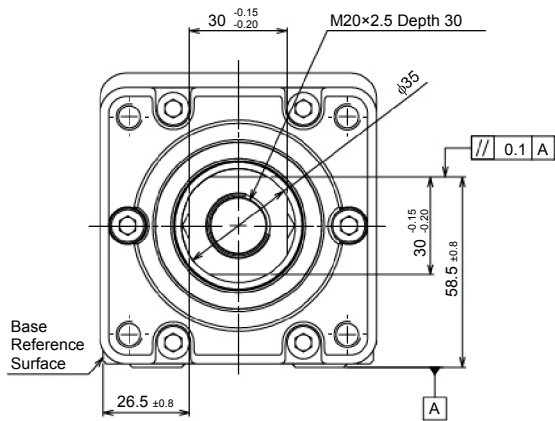
[Model code of single product: RCP6-NFA-RRA6]



©RRA7C and RRA7R
 [Model code of single product: RCP6-NFA-RRA7]



©RRA8C and RRA8R
 [Model code of single product: RCP6-NFA-RRA8]



1.3.6 Tip Adapter (Keyway) (Model Code: KFA)

Applicable Units: RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R

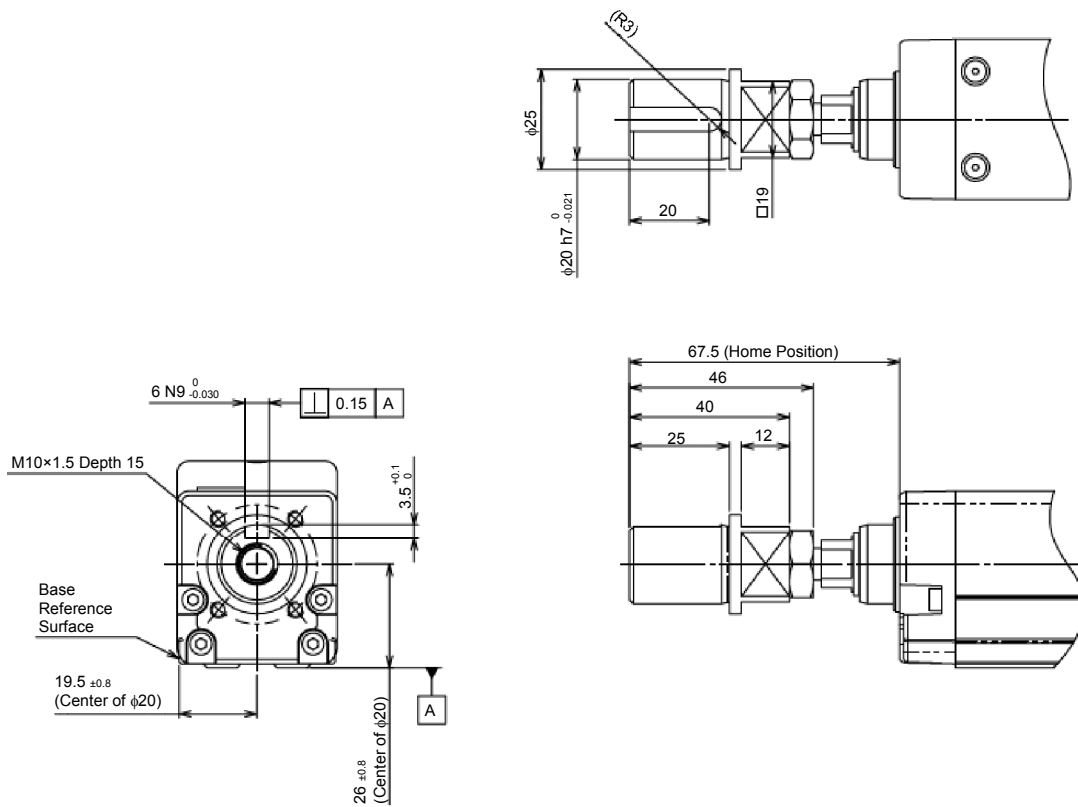
This is an adapter to attach on the rod end an object such as a fixture with one screw and a parallel key.

(Note) In the delivery of IAI, the perpendicularity is secured in the way described in the figure.

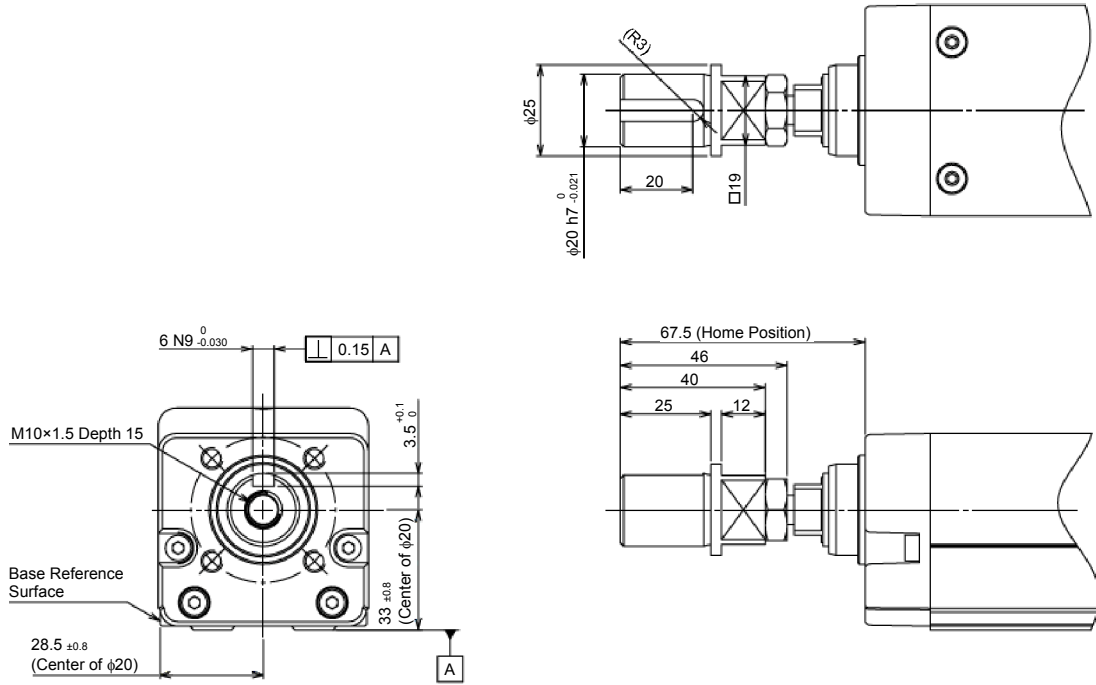
(Note) In the delivery of IAI, the screws are glued.

©RRA4C and RRA4R

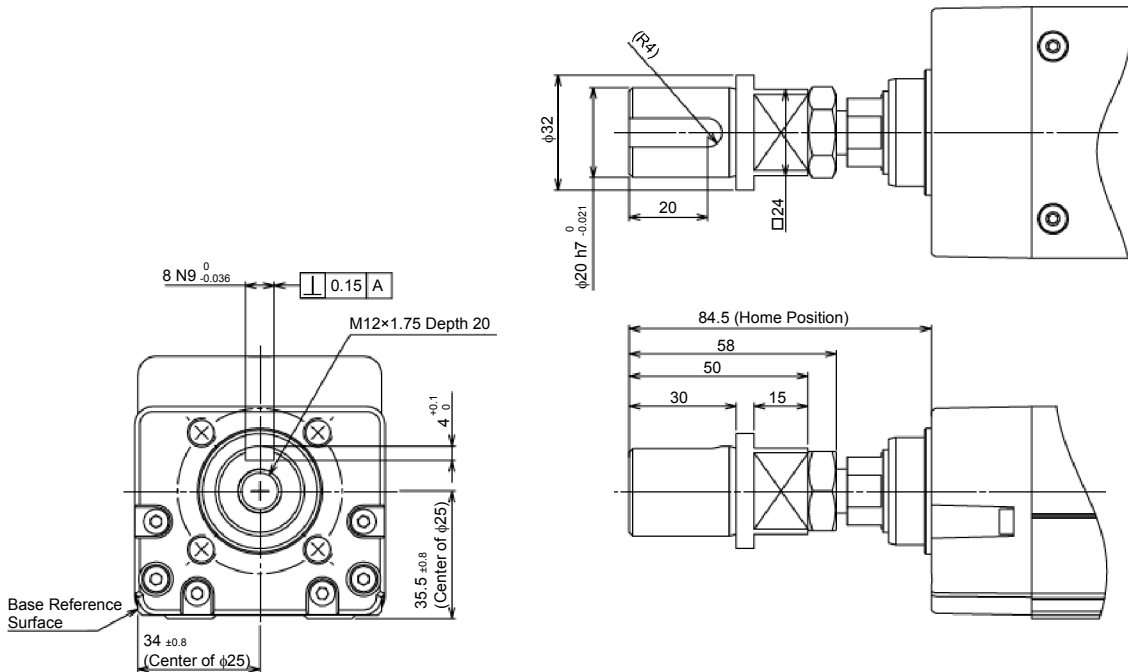
[Model code of single product: RCP6-KFA-RRA4]



©RRA6C and RRA6R
 [Model code of single product: RCP6-KFA-RAA6]



©RRA7C and RRA7R
 [Model code of single product: RCP6-KFA-RAA7]



1.3.7 Knuckle Joint (Model No.: NJ) Clevis (Model Code: QR)

Applicable Units: RRA4R, RRA6R, RRA7R and RRA8R

The knuckle joint is a component that gives the rod tip on the actuator flexibility in movement (rotation) when using a clevis.

The clevis is a component that makes the cylinder to follow when the movement of an object attached on the rod tip is different from the movement direction of the rod.

Knuckle joint and clevis can be selected only for the motor reversed type. Also, they come in a pair. They cannot be selected separately.

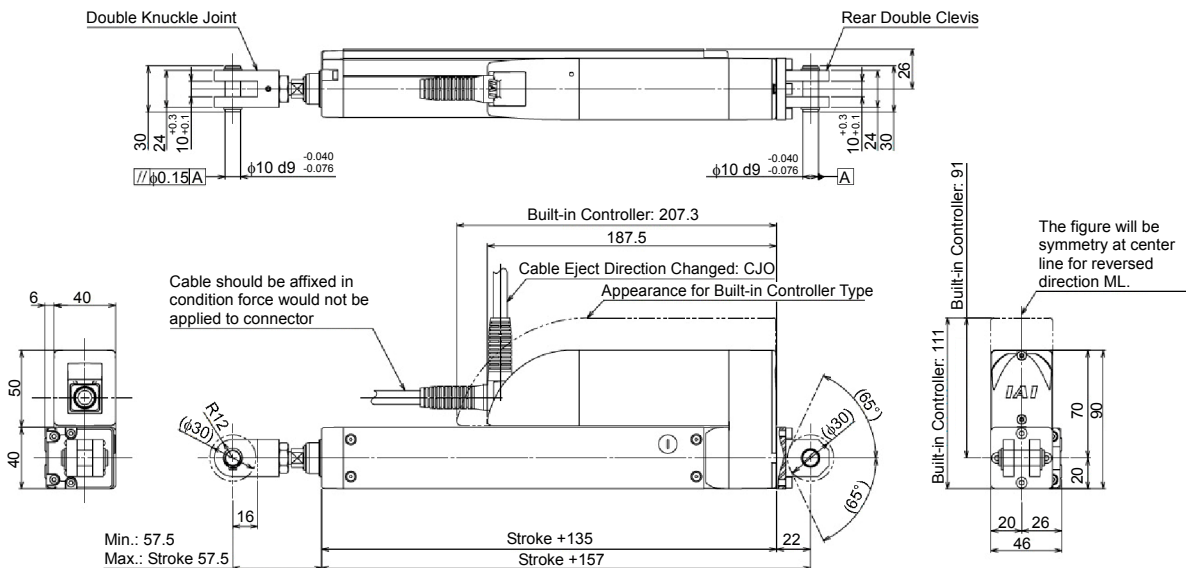
(Note) The knuckle joint and clevis are not mounted on the main unit at the delivery. The components are enclosed separately from the product. Attach them by referring to the drawing.

It is recommended that the datum for adjustment is within the parallelism stated in the drawing.

◎RRA4R

[Knuckle Joint: Model code of single product; RCP6-NJ-RRA4]

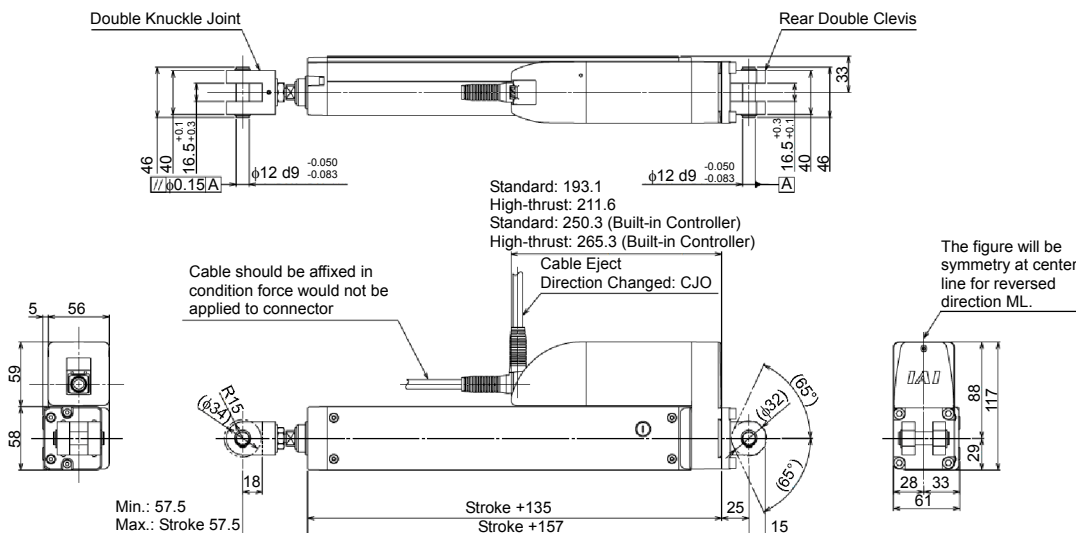
[Clevis: Model code of single product; RCP6-QR-RRA4]



◎RRA6R

[Knuckle Joint: Model code of single product; RCP6-NJ-RRA6]

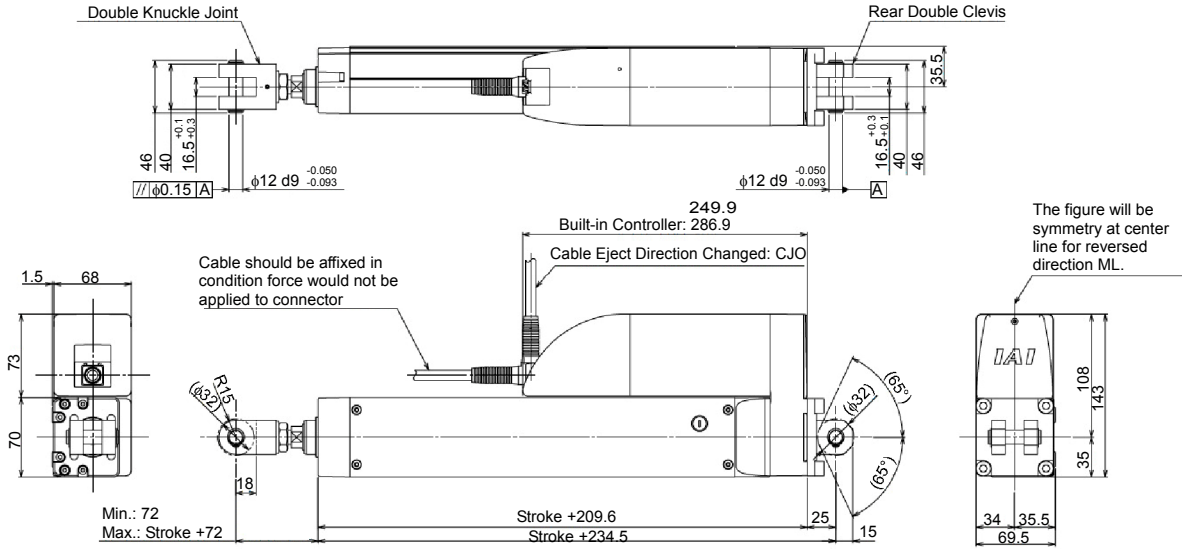
[Clevis: Model code of single product; RCP6-QR-RRA6]



◎RRA7R

[Knuckle Joint: Model code of single product; RCP6-NJ-RRA7]

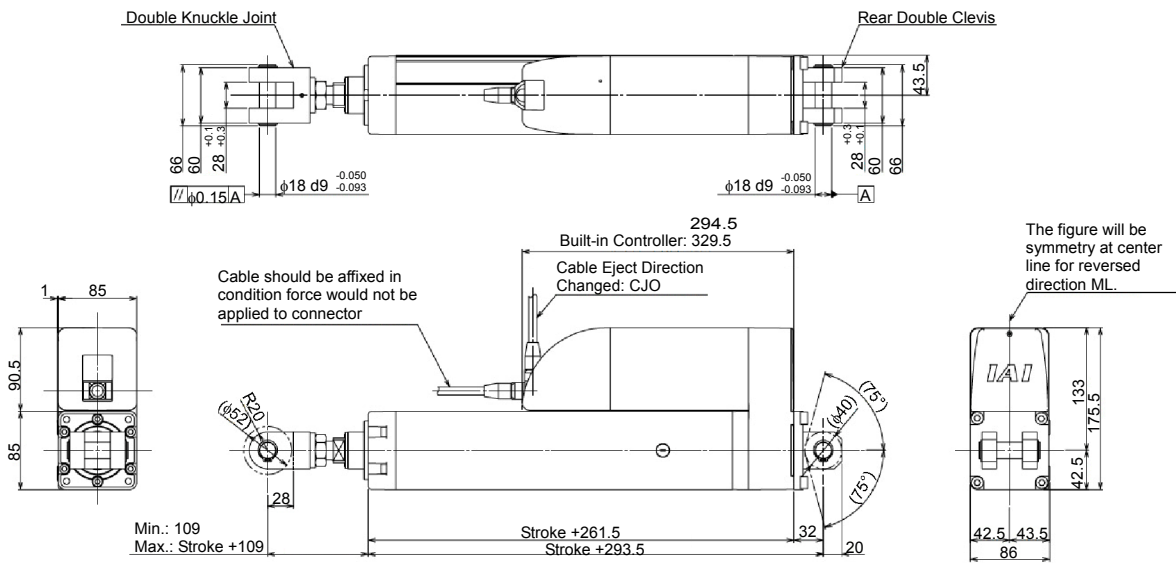
[Clevis: Model code of single product; RCP6-QR-RRA7]



◎RRA8R

[Knuckle Joint: Model code of single product; RCP6-NJ-RRA8]

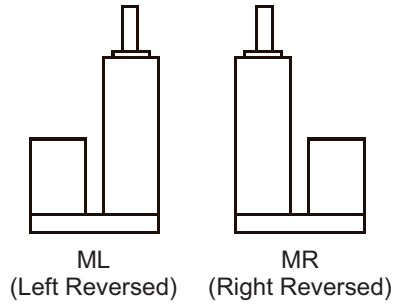
[Clevis: Model code of single product; RCP6-QR-RRA8]



1.3.8 Motor Left Reversed, Motor Right Reversed (Model Code: ML and MR)

Applicable Units: RRA4R, RRA6R, RRA7R and RRA8R

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.

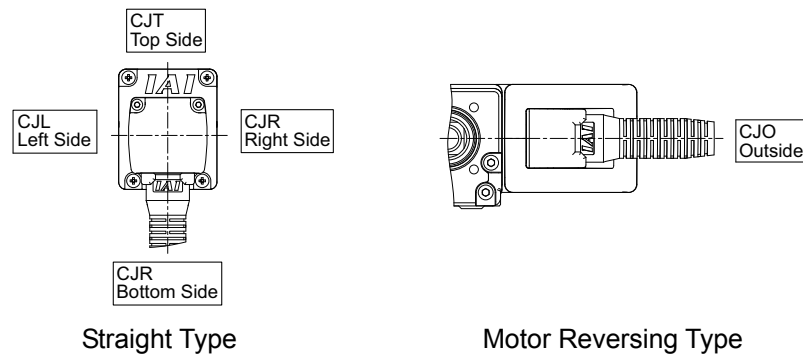


1.3.9 Cable Eject Direction Changed (Model Code: CJT, CJR, CJL, CJB and CJO)

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 outside (model code: CJO).

CJO cannot be selected for the straight type RRA4C, RRA6C, RRA7C and RRA8C.

Only CJO can be selected for the reversed type RRA4R, RRA6R, RRA7R and RRA8R.

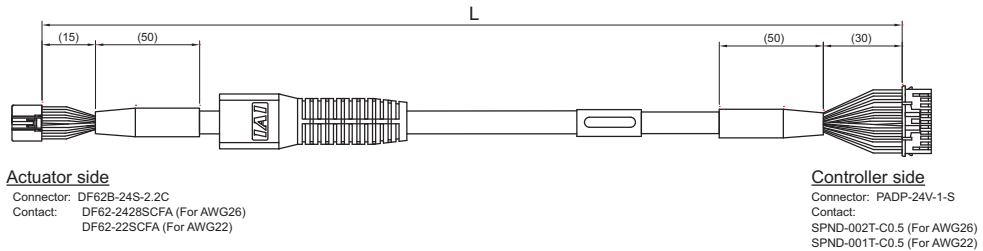


1.4 Motor • Encoder Cables

1.4.1 Motor • Encoder Integrated Cables (RRA4, RRA6 and RRA7)

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	ϕ A	3
AWG22/19	Orange	VMM	5
AWG22/19	Brown	ϕ B	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	ϕ A	Blue	AWG22/19
2	VMM	Orange	AWG22/19
3	ϕ B	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

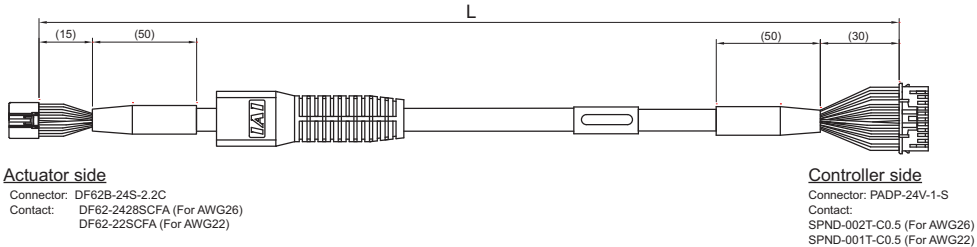
(Note) About thickness AWG22/19

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 (RRA4, RRA6 and RRA7)

CB-CAN-MPA□□□-RB

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



Connection diagram

Actuator side

Controller side

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

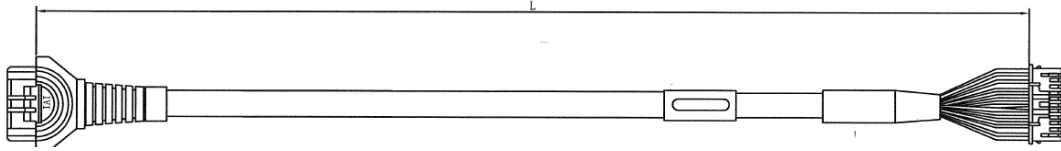
(Note) About thickness AWG22/19

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

1.4.3 Motor • Encoder Integrated Cables (RRA8)

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	ϕ A	A1
AWG22/19	Orange	VMM	B1
AWG22/19	Green	ϕ _A	A2
AWG22/19	Brown	ϕ B	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	ϕ A	Blue	AWG22/19
2	VMM	Orange	AWG22/19
5	ϕ _A	Green	AWG22/19
3	ϕ B	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

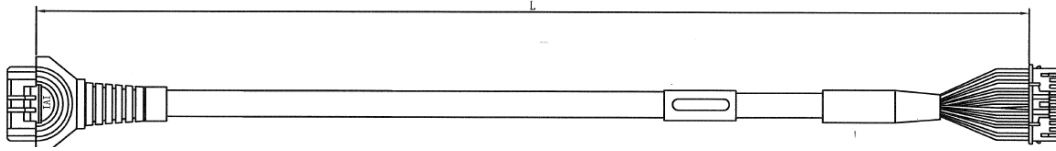
(Note) About thickness AWG22/19

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 (RRA8)

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	ϕ A	A1
AWG22/19	Orange	VMM	B1
AWG22/19	Green	ϕ _A	A2
AWG22/19	Brown	ϕ B	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	ϕ A	Blue	AWG22/19
2	VMM	Orange	AWG22/19
5	ϕ _A	Green	AWG22/19
3	ϕ B	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. In particular, 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 accidentally 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
- Where the actuator receives direct sunlight
- Where the actuator is exposed to corrosive or combustible gases
- Where the ambient air contains a large amount of powder dust, salt or iron (at level exceeding what is normally expected in an assembly plant)
- Where the actuator is subject to splashed water, oil (including oil mist or cutting fluid) or chemical solutions
- Where the actuator receives impact or vibration
- Where the altitude is more than 2,000m

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.

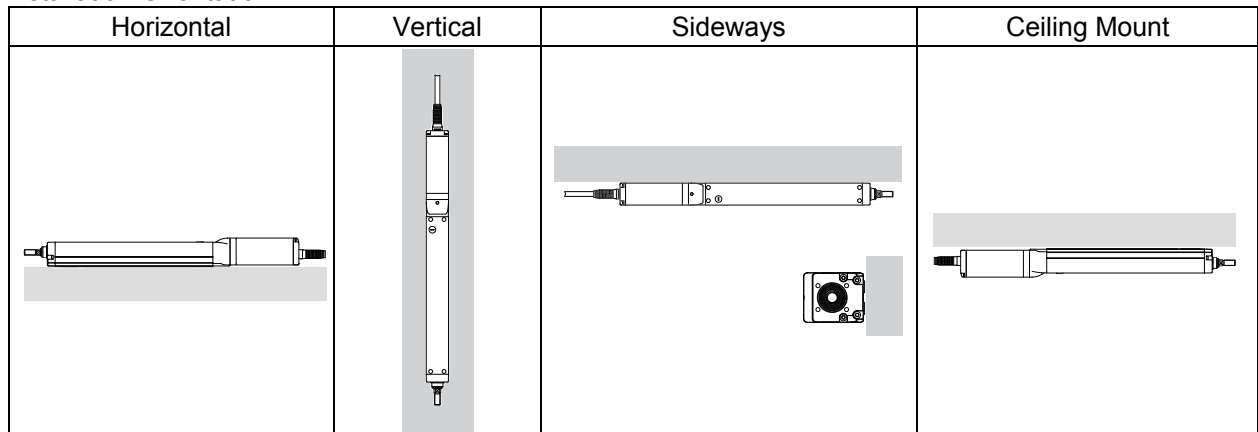
2.3.1 Installation

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 Name	Horizontal Installation	Vertical Installation	Sideway Installation	Ceiling mount Installation
RRA4C, RRA4R RRA6C, RRA6R RRA7C, RRA7R RRA8C, RRA8R	○	○	○	○

Installation Orientation



⚠ 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 (There is no through hole on RRA8C and 8R), 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.

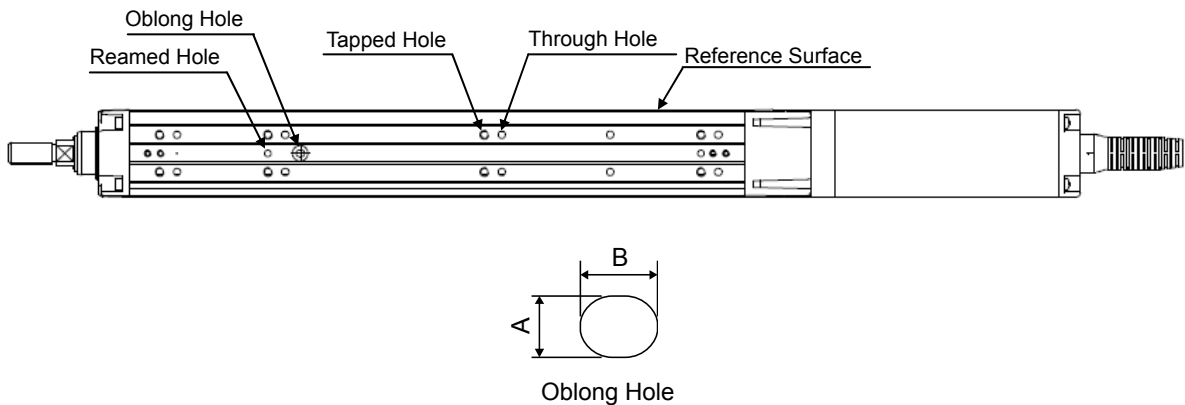
[1] Using the Tapped Holes on the Bottom of the Base

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")

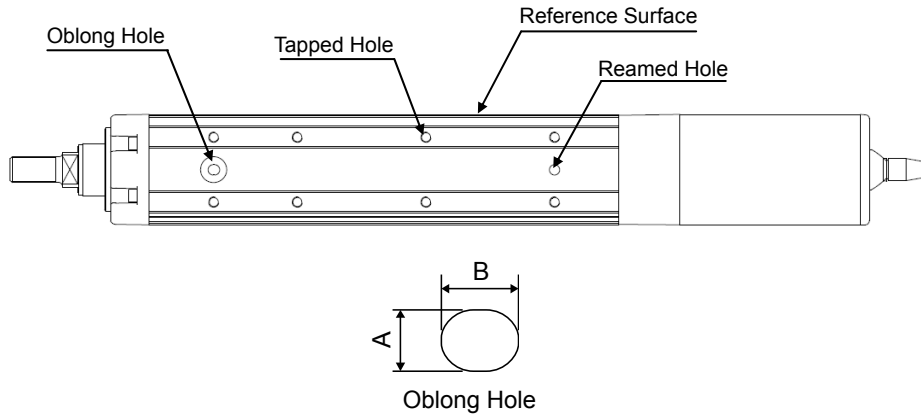
Also, there are reamed holes and a oblong hole for positioning pins.

- RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R



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:		
RRA4C RRA4R	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
RRA6C RRA6R	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 ^{+0.010} ₀ B:5 depth 5.5mm or less
RRA7C RRA7R	M5	Through (screwed depth should be 10mm max.)	7.27N·m (0.74kgf·m)	3.42N·m (0.35kgf·m)	φ4H7 depth 6	A:4 ^{+0.010} ₀ B:5 depth 6mm or less

● RRA8C and RRA8R



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:		
RRA8C RRA8R	M8	Through (screwed depth should be 12mm max.)	30.0N•m (3.06kgf•m)	11.4N•m (1.17kgf•m)	φ 8H7 Depth 6.5	A: $8^{+0.010}_0$ B: 9 Depth 6.5mm or less

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.
- The length of thread engagement for screws should be 6mm max. for RRA4C/RRA4R, approx. 1.8 times more than the nominal diameter for RRA6C/RRA6R/RRA7C/RRA7R and 12mm max. for RRA8C/RRA8R.



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 RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R, 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 RRA4C and RRA4R) or 2.5mm-sized (for RRA6C, RRA6R, RRA7C and RRA7R) hex wrench to detach the frame cover. (Remove 4 hex socket head cap screws.)

For the RRA4C and RRA4R 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.

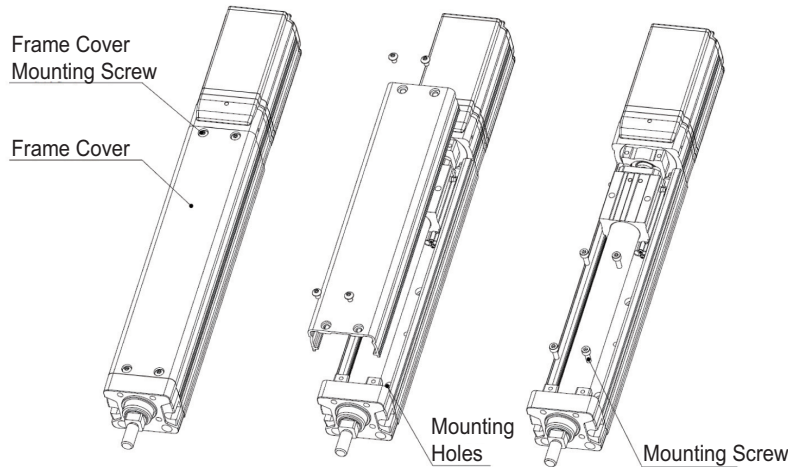
Detach the motor unit once to move the rod for installation, and put the motor unit back on. [Refer to 5.8 "Replacement Process"]

Or, connect a controller and have JOG operation to move the rod to perform installation.

- RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R

(Note) The two attachment holes on RRA4C side 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 Torque
RRA4C, RRA4R	M3	0.62N•m (0.06kgf•m)
RRA6C, RRA6R	M4	1.76N•m (0.18kgf•m)
RRA7C, RRA7R	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
RRA4C, RRA4R	φ3.4 drilled hole, φ6.5 counter boring depth 3.5	M3	0.83N•m (0.085kgf•m)
RRA6C, RRA6R	φ4.5 drilled hole, φ8 counter boring depth 4.5	M4	1.76N•m (0.18kgf•m)
RRA7C, RRA7R	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

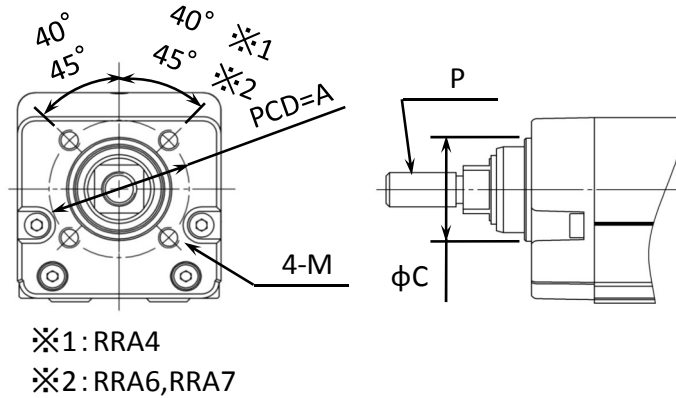


Caution: Pay attention when choosing the screw length. In case that insufficient length of screws is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

[3] When using 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;

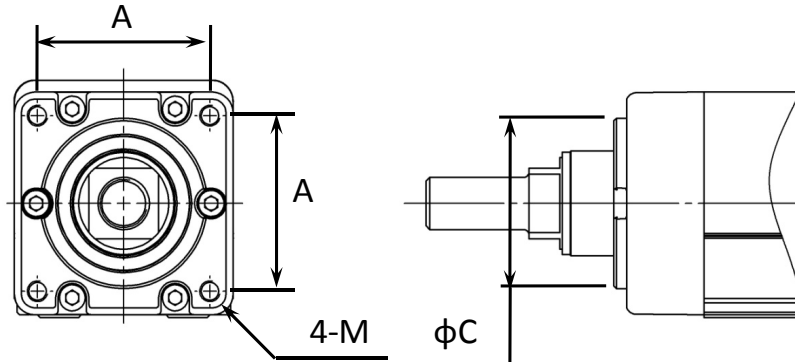
- RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R



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:	
RRA4C RRA4R	M4	30	8	3.59N•m (0.37kgf•m)	1.76N•m (0.18kgf•m)	φ24h7
RRA6C RRA6R	M6	40	12	12.3N•m (1.26kgf•m)	5.4N•m (0.55kgf•m)	φ30h7
RRA7C RRA7R	M8	46	16	30N•m (3.1kgf•m)	11.5N•m (1.2kgf•m)	φ35h7

● RRA8C and RRA8R

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:	
RRA8C RRA8R	M8	67	16	30.0N•m (3.06kgf•m)	11.4N•m (1.17kgf•m)	φ 65h7

Make sure to follow “ⓈCaution for Installation using Front Bracket and Front Flange”

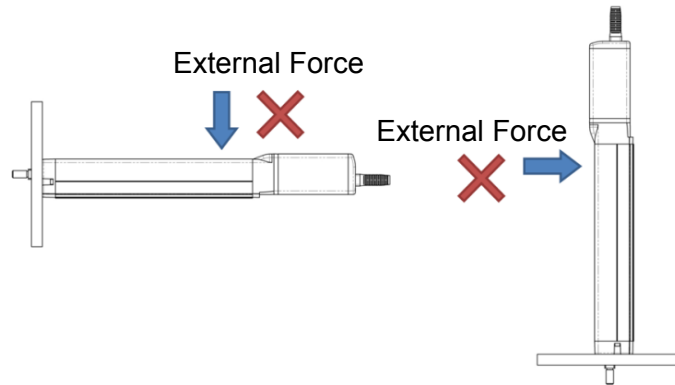
Tightening screws

- 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.

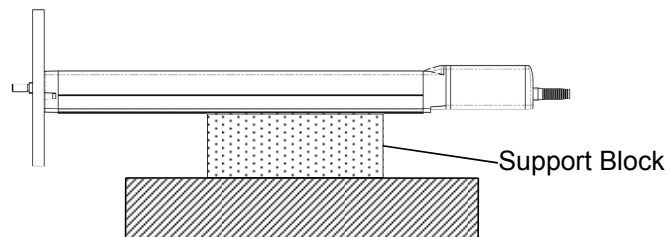
⚠ Caution: Pay attention when choosing the bolt length. In case that insufficient length of bolts is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

◎ 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.

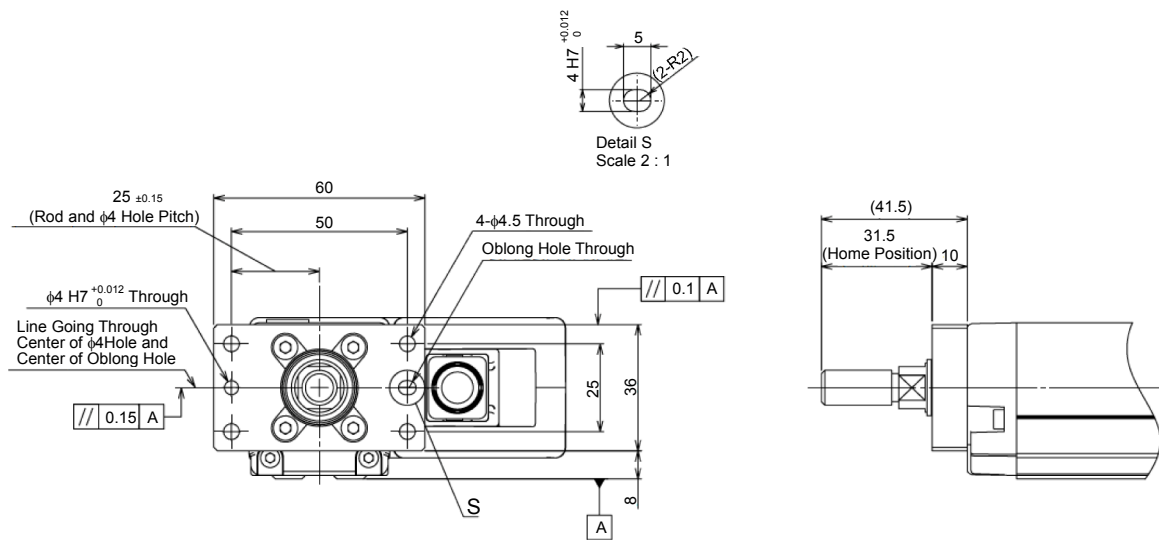


Operation of the actuator with attachment only on the front bracket applies the external force of the acceleration/deceleration multiplied by the weight of the actuator to the unit body. Control the acceleration/deceleration at 0.05G or less (for reference) when the actuator is moved with attachment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

[4] When using Front Flange (Option)

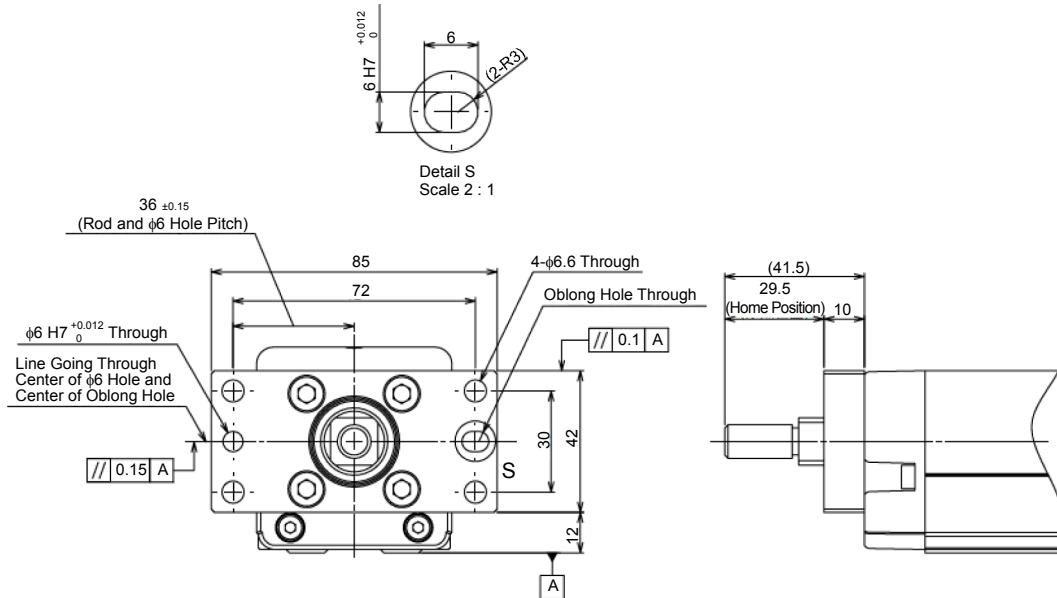
There are tapped holes equipped on the front housing (Option).
Utilize these holes for the installation.
The attachment holes are located as shown below;

- RRA4C and RRA4R
 - (Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
 - (Note) The front flange cannot be used for Stroke 60/110 of RCP6-RRA4R and Stroke 60/110/160 of RCP6S-RRA4R as the motor unit interferes to it.
 - (Note) In some stroke variations, the mounting surface can interfere to the cable. Pay attention to interference to peripherals when a short stroke is selected.



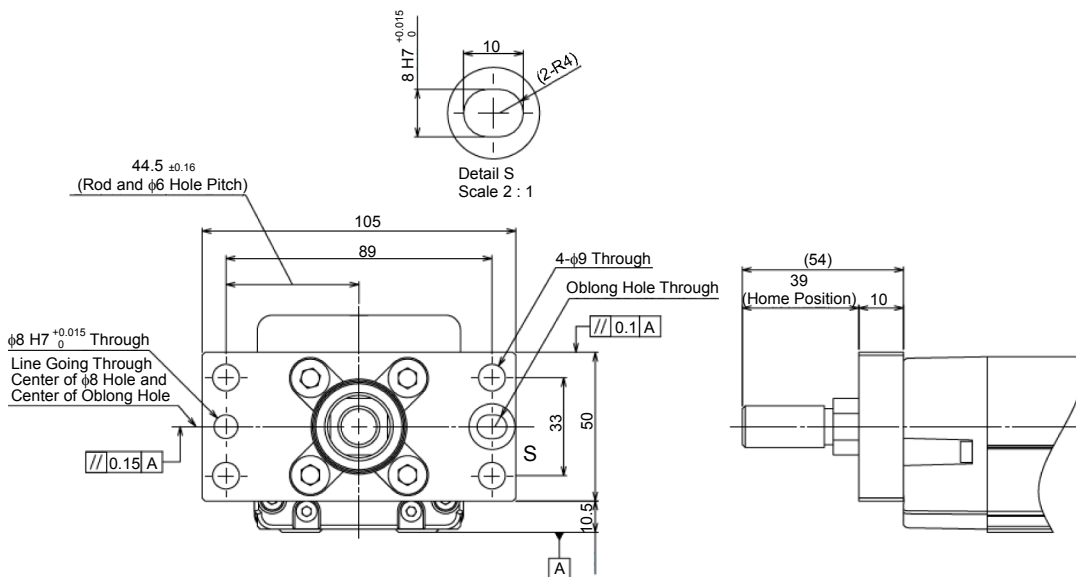
● RRA6C and RRA6R

- (Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
- (Note) The front flange cannot be used for Stroke 65/115 of RCP6-RRA6R and Stroke 65/115/165 of RCP6S-RRA6R as the motor unit interferes to it.
- (Note) In some stroke variations, the mounting surface can interfere to the cable. Pay attention to interference to peripherals when a short stroke is selected.



● RRA7C and RRA7R

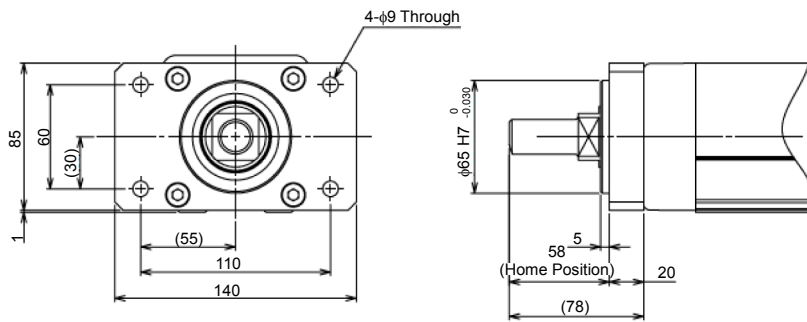
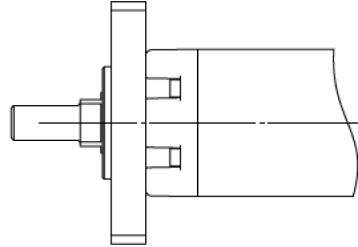
- (Note) In the delivery of IAI, the flatness is secured in the way described in the figure.
- (Note) The front flange cannot be used for Stroke 70/120 of RCP6-RRA7R and Stroke 70/120/170 of RCP6S-RRA7R as the motor unit interferes to it.
- (Note) In some stroke variations, the mounting surface can interfere to the cable. Pay attention to interference to peripherals when a short stroke is selected.



- RRA8C and RRA8R

(Note) The front flange cannot be used for Stroke 50/100 of RCP6-RRA8R and Stroke 50/100/150 of RCP6S-RRA8R as the motor unit interferes to it.

(Note) Pay attention to interference to peripherals for short strokes.



Make sure to follow “ⓈCaution for Installation using Front Bracket and Front Flange”

Tightening screws

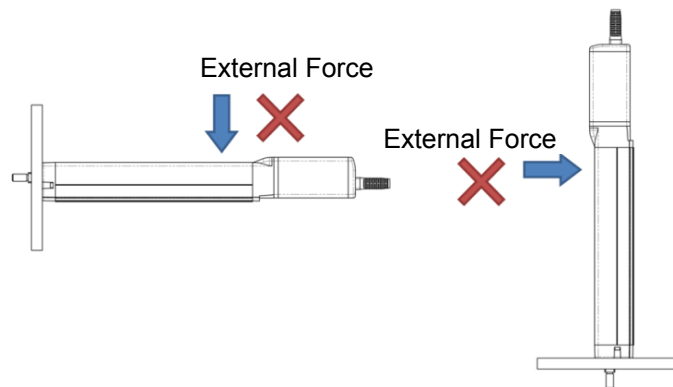
- Use hexagonal socket head bolts for the male threads for installing the base.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- For the effective engagement length between the bolt and female thread, provide at least the applicable value specified below:
 Female thread is made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



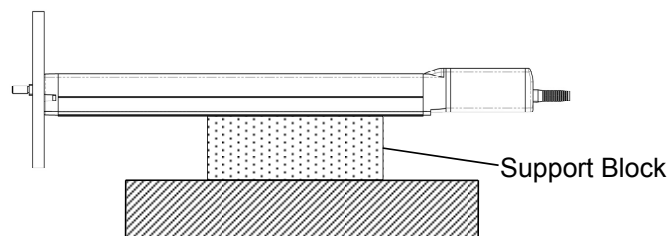
Caution: Pay attention when choosing the bolt length. In case that insufficient length of bolts is chosen, it may cause such problems as the strength not being enough on the actuator attachment, interference with driving part, drop in accuracy performance and unexpected accidents.

Ⓢ 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.

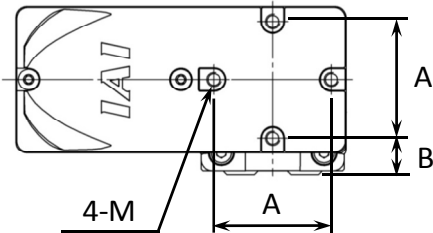


Operation of the actuator with attachment only on the front bracket and the front flange (option) applies the external force of the acceleration/deceleration multiplied by the weight of the actuator to the unit body. Control the acceleration/deceleration at 0.05G or less (for reference) when the actuator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

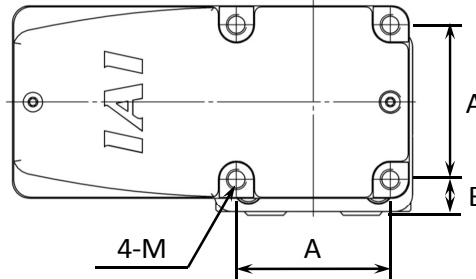
[5] When Utilizing Attachment Holes on the Bracket for Motor-Reversed Type

For RRA4R, RRA6R, RRA7R and RRA8R, there are tapped holes prepared on the reversing bracket. (See the table below for the detailed dimensions.)

● RRA4C and RRA4R



● RRA6C, RRA6R, RRA7C and RRA7R




	A	B	C
RRA4R	32	10	M4 depth 8
RRA6R	45	10.5	M6 depth 12
RRA7R	55	8	M6 depth 16
RRA8R	70	8.5	M8 depth 16

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:
RRA4R	M4	8mm	3.59N•m (0.37kgf•m)	1.76N•m (0.18kgf•m)
RRA6R	M6	12mm	12.3N•m (1.26kgf•m)	5.4N•m (0.55kgf•m)
RRA7R RRA8R	M8	16mm	30.0N•m (3.06kg•m)	11.4N•m (1.17kgf•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.

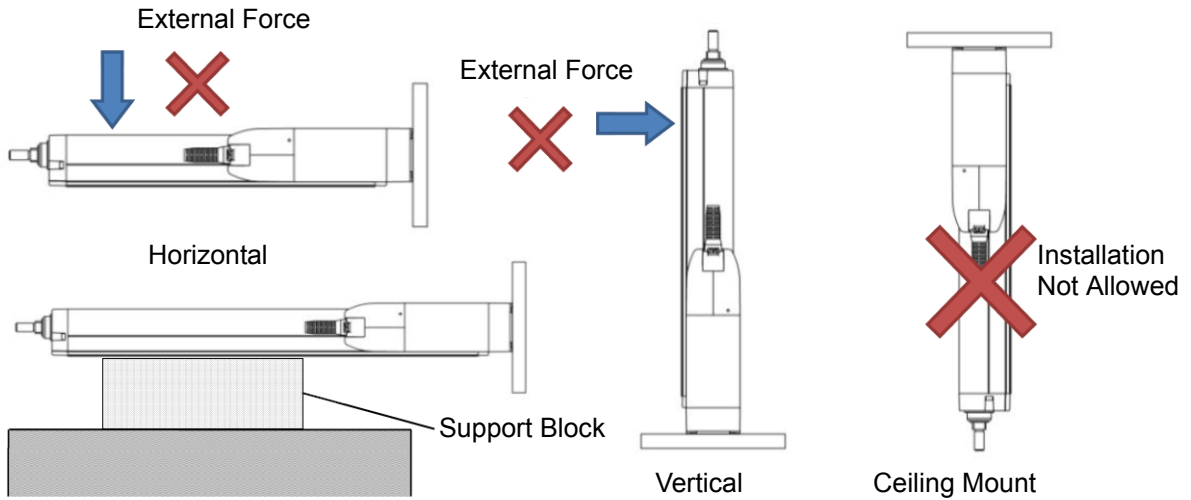
Do not attempt to affix the unit only with the tapped holes on the reversing bracket.

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:

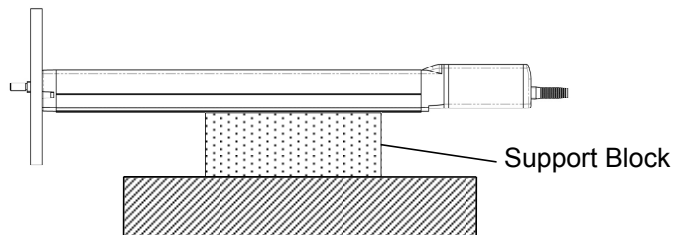
(Note) When it is perpendicular installation without support etc., external force does not act, it is not attempt to apply the radial load.



○: Possible ×: Not possible

Installation Posture			Supports
Horizontal	Vertical	Ceiling Mount	
×	×	×	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.



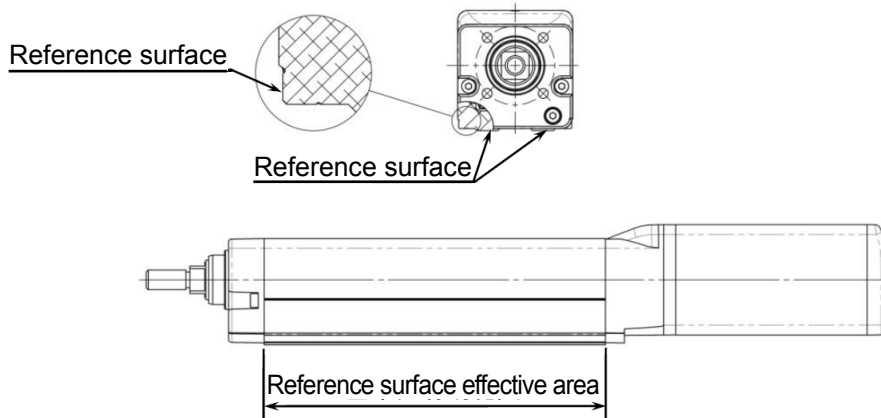
[6] Attachment of Work Part (Transported Object)

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.

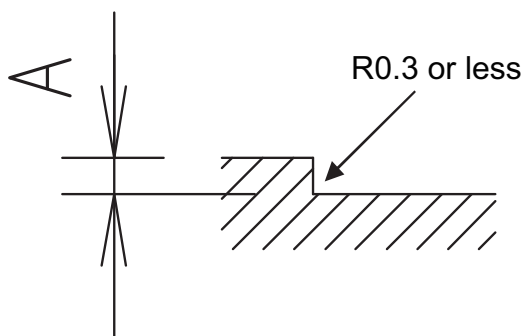
[7] Mounting Surface

- 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 reference surfaces for mounting.



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



Model Name	A Dimensions [mm]
RRA4C, RRA4R	2 to 4
RRA6C, RRA6R	
RRA7C, RRA7R	
RRA8C, RRA8R	3 to 5

⚠ Caution: As there could be a case that the width dimension of the front bracket or rear bracket is wider than the datum surface dimension on the side, have them pushed towards the datum surface within the datum surface effective range. Having machining work to press the brackets towards the datum surface outside the datum surface effective range may cause interference to brackets and motors.

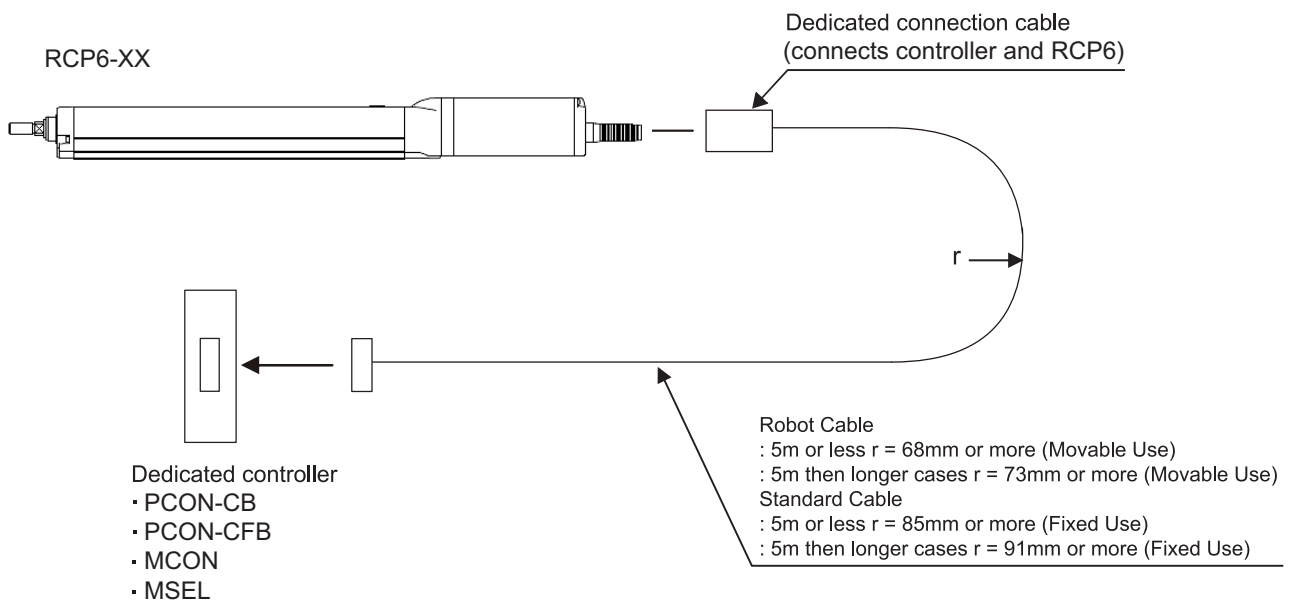
3. Connecting with the Controller

As the connection cable for the controller and RCP6 (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

RRA4, RRA6 and RRA7

• Motor • encoder integrated cables : CB-CAN-MPA□□□

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

RRA8

• 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

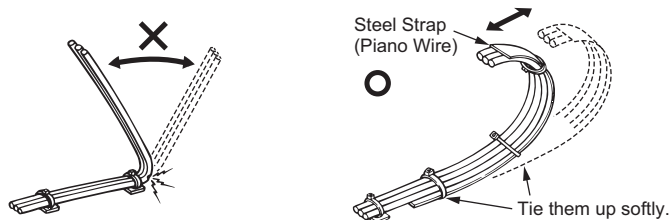


Warning: For wiring, please follow the warnings stated below. When constructing a system as the machinery equipment, pay attention to the wiring and connection of each cable so they are conducted properly. Not following them may cause not only a malfunction such as cable breakage or connection failure,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

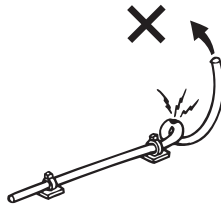
- Use dedicated cables of IAI indicated in this instruction manual. Contact us if you wish to have a change to the specifications of the dedicated cables.
- Make sure to turn the power off in the process of power line or cable connection or disconnection.
- Do not attempt to cut a dedicated cable with 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



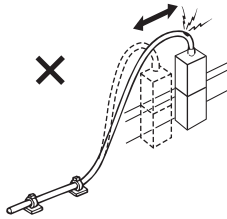
- Have a sufficient radius for bending, and avoid a bend concentrating on one point.



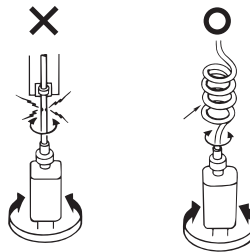
- Do not let the cable bend, kink or twist.



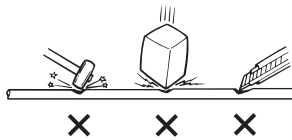
- Do not pull the cable with a strong force.



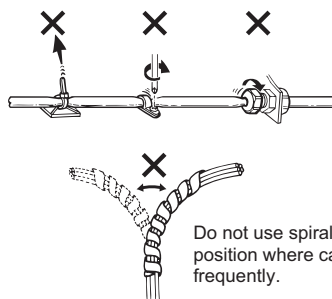
- Pay attention not to concentrate the twisting force to one point on a cable.



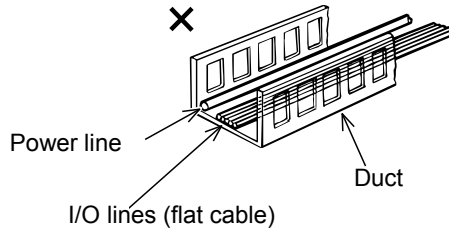
- Do not pinch, drop a heavy object onto or cut the cable.



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

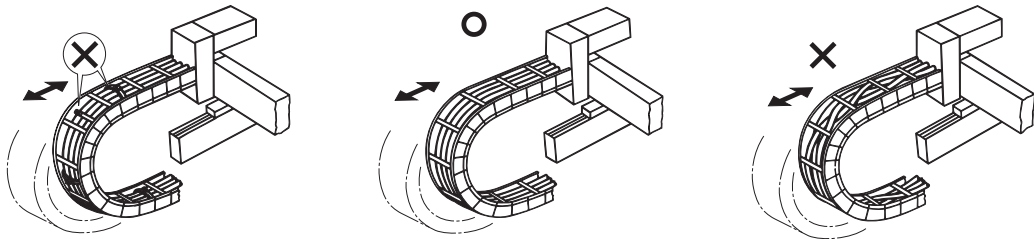


- PIO line, communication line, power and driving lines are to be put separately from each other and do not tie them together. Arrange so that such lines are independently routed in the duct.



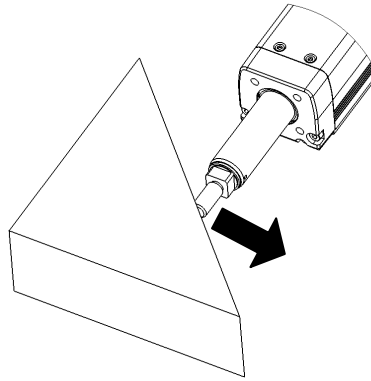
Follow the instructions below when using a cable track.

- 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.



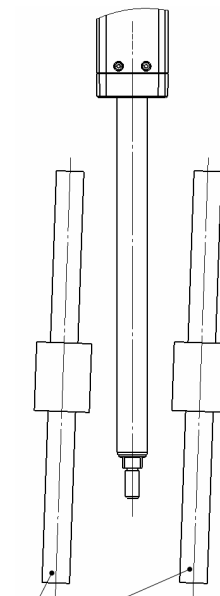
4. Caution for Operation

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



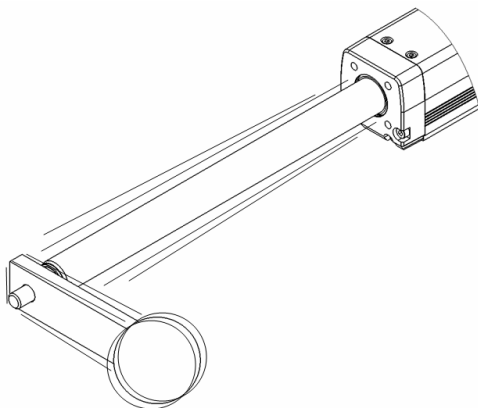
Be careful on the direction of the reaction force against the pressing.

- 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

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 RRA4, RRA6 and RRA7.

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.

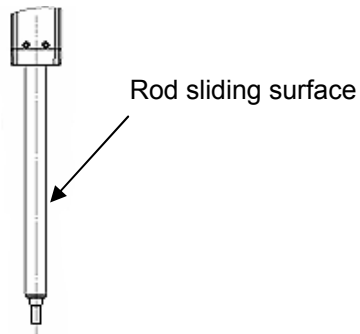
Maximum Speed of Use [mm/s]	Grease Supply Timing (Reference)	
	Operated distance	Months
0 to 750 or less	1,250km	12 month
750 to 1120	2,500km	

- ⚠ 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.

5.2 External Visual Inspection

An external visual inspection should check the following things.

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



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.
- 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

For RRA4, RRA6 and RRA7, 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

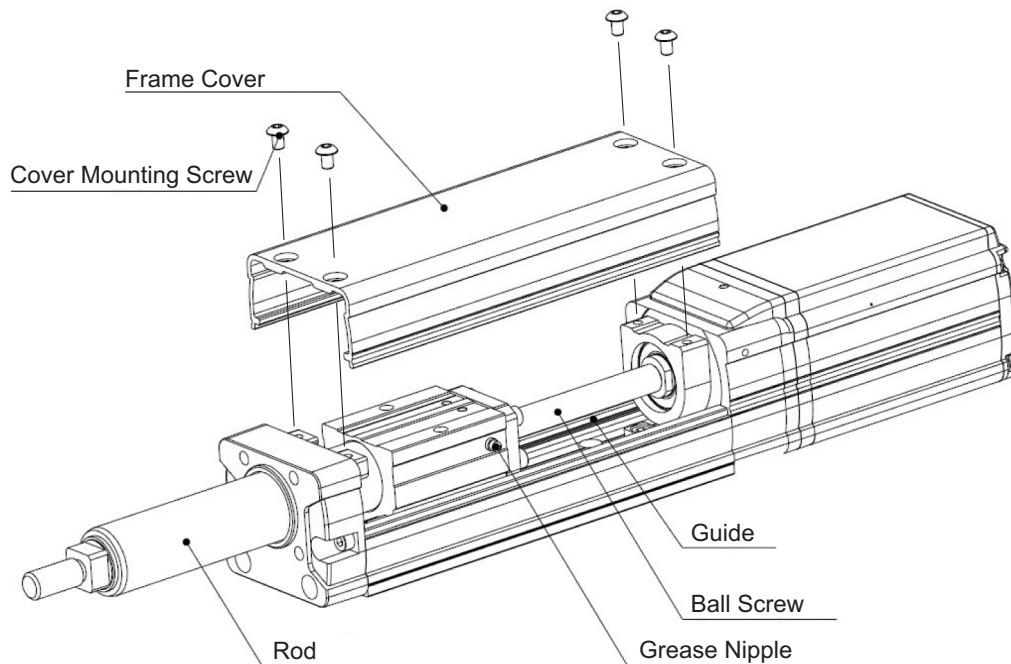
Visually inspect the interior of the equipment. Check whether dust or other foreign matter has gotten inside and check the lubrication state.

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 (RRA4C, RRA4R) or with 2.5mm (RRA6C, RRA6R, RRA7C and RRA7R) 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 Torque
RRA4C, RRA4R	M3	0.62N•m
RRA6C, RRA6R	M4	1.76N•m
RRA7C, RRA7R	M4	1.76N•m

5.5 Internal Cleaning

Conduct it only for Standard Type RRA4, RRA6 and RRA7.

- 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] RRA4, RRA6 and RRA7

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] RRA8

IAI uses the following grease in our plant.

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

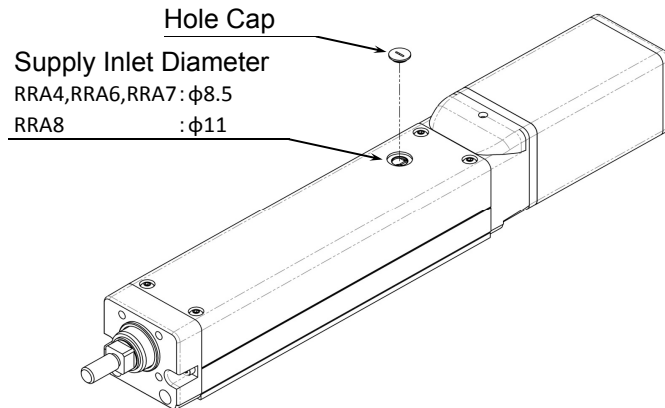
Other companies also sell similar types of grease. For more detailed information, ask the supplier to find an equivalent for you by telling them the name of the grease.

 **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

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

- 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 (RRA4, RRA6 and RRA7: $\phi 8.5$, RRA8: $\phi 11$) 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.

(Note) Follow the grease nipple diameter shown in the list below when preparing a grease gun.

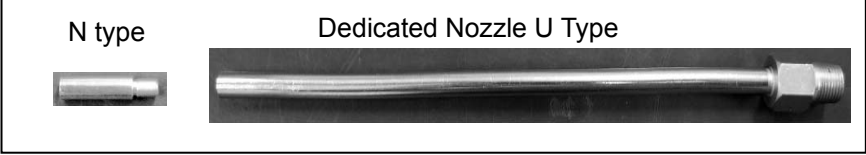

Model	Nipple Diameter
RRA4, RRA6, RRA7	$\phi 3.5$
RRA8	$\phi 6$

◎ RRA4, RRA6, RRA7

Grease Gun	Nozzle	Supplier of nozzle
Grease gun of mounting screw R1/8 (Example) GC-57K (Yamada Corporation)	NZ3	NSK

© RRA8

Grease Gun Attachment Screw R1/8	Supplier
(Example) GC-57K	Yamada Corporation

Nozzle	Supplier
<p>N type + Dedicated Nozzle U Type</p>  <p>N type Dedicated Nozzle U Type</p>	THK
<p>© Connect N type to the tip of the dedicated nozzle U type and attach a grease gun to use.</p>  <p>N type Dedicated Nozzle U Type</p> <p style="text-align: center;">Attachment Screw R1/8 on Grease Gun Attachment Side</p>	

Model	Amount of Grease Supply (Reference)
RRA4	0.5cc to 1.0cc
RRA6	1.5cc to 2.0cc
RRA7	2.0cc to 2.5cc
RRA8	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) Cleanup the rod (sliding surface) and apply the grease with hands.
- 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.

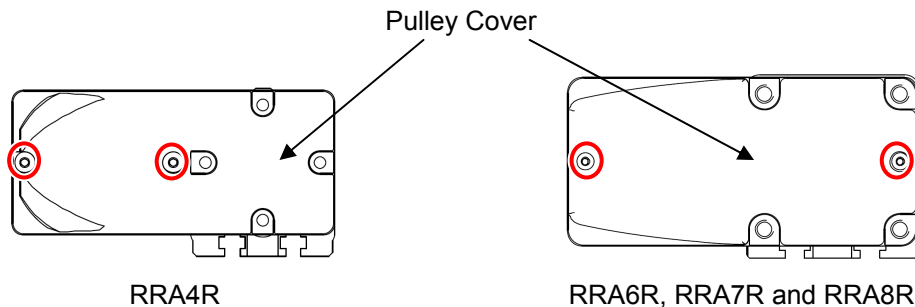
⚠ Caution: In case the grease got into your eye, immediately go see the doctor to get appropriate care. After finishing the grease supply work, wash your hands carefully with water and soap to rinse the grease OFF.

5.7 Procedure for Belt Replacement and Tuning

Applicable Units: RRA4R, RRA6R, RRA7R and RRA8R

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 two hex socket flat-head cap screws (where marked with a circle) for RRA4R, RRA6R, RRA7R and RRA8R.



The replacement period cannot be determined in general because the durability of the 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 toothed 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		
RRA4R	TB-RCP6-STRA4R	60S2M148GB	Rubber	Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
RRA6R	TB-RCP6-STRA6R	60S2M182GB	Rubber	Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
RRA7R	TB-RCP6-STRA7R	100S3M225GB	Rubber	Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
RRA8R	TB-RCP6-RA8R	275-EV5GT-15	Rubber	EV belt (Gates Unitta Asia)

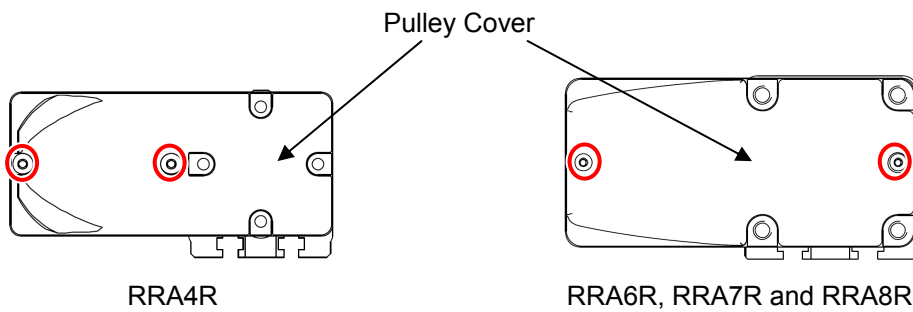
5.7.3 Replacement of the Belt

[Items Required for Replacemet Work]

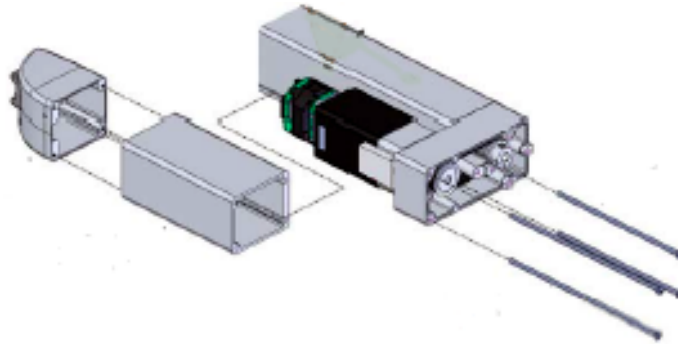
- Belt for Replacement
- Hex Wrench 2.5mm (RRA4R), 3mm (RRA6R/RRA7R), 4mm (RRA8R) and 2mm (for hex socket head cap bolt) - sized
- Phillips Screwdriver
- Tension Gauge (that is available for pulling with 200N)
- Long Tie-band (thin string)

[Procedures]

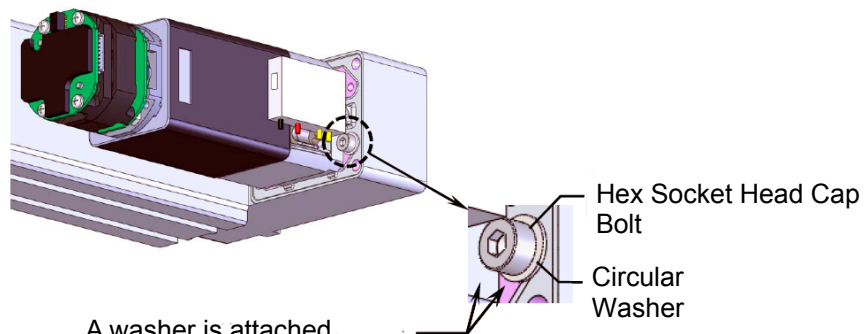
- 1) Remove the two hex socket flat-head cap screws for RRA4R, RRA6R, RRA7R and RRA8R (where marked with a circle) with a phillips screwdriver. Detach the pulley cover.



- 2) Remove the four cross recessed screws holding the motor cover with using a Phillips screwdriver, and detach the motor cover.

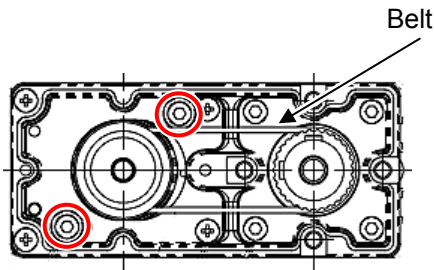


- 3) After adjusting the belt tension, remove the bolt and circular washer shown below which are attached in purpose of motor position reproducibility with using a 2.5mm-sized hex wrench.

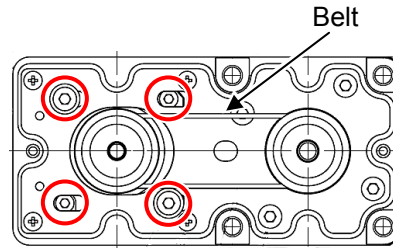


A washer is attached contacting closely to the motor bracket.

- 4) Loosen the bolts holding the motor (areas marked with circles, 2 places for RRA4R, four places for RRA6R, RRA7R and RRA8R) with using a 2.5mm-sized (for RRA4R), 3mm-sized (for RRA6R and RRA7R) or 4mm-sized (for RRA8R) hex wrench. Replace the belt if it is necessary.

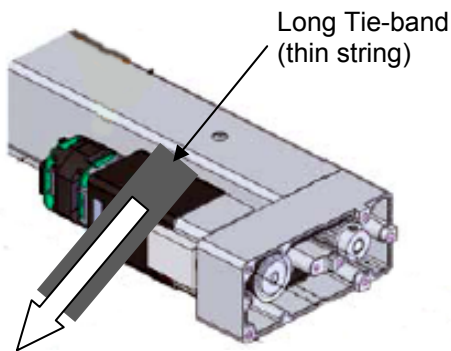


RRA4R

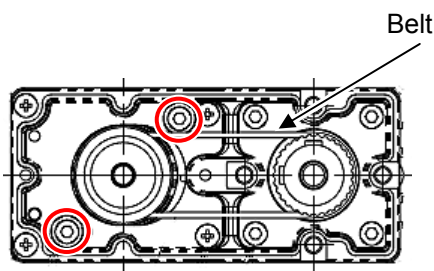


RRA6R, RRA7R and RRA8R

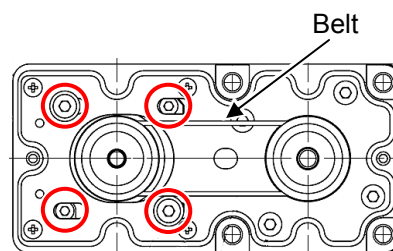
- 5) Adjust the belt tension. Hang a tie-band (thin string) on the end of the motor unit and pull it in specified load (specified tensile strength) with a tension gauge. Once the load reached the specified, tighten the bolts with a 2.5 mm-sized (for RRA4R), 3mm-sized (for RRA6R/RRA7R) or 4mm-sized (for RRA8R) hex wrench to affix.



Type	Tension Force
RRA4R	20 to 25N
RRA6R	25 to 30N
RRA7R	80 to 90N
RRA8R	180 to 200N



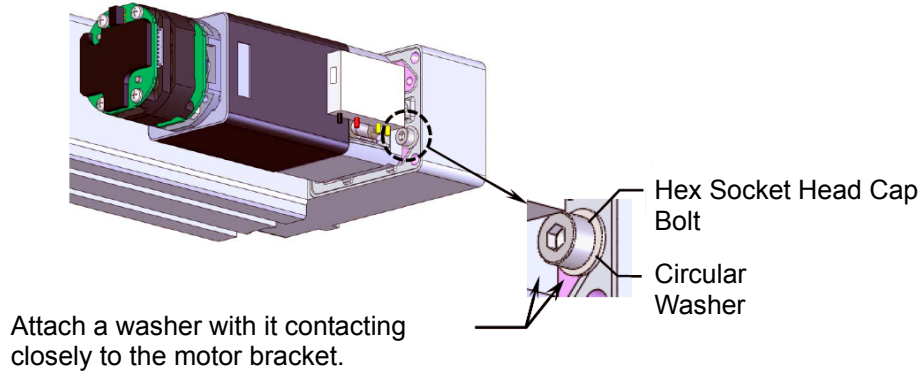
RRA4R



RRA6R, RRA7R and RRA8R

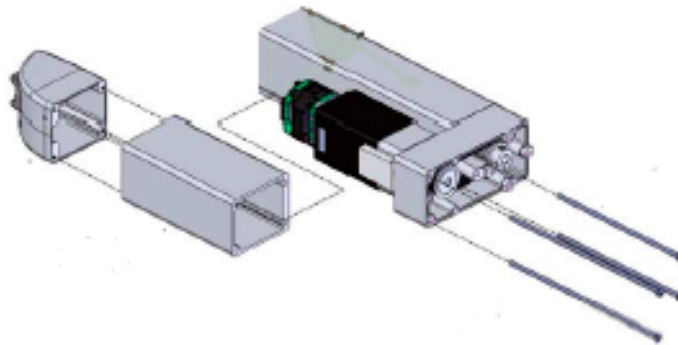
Type	Tightening Torque
RRA4R	162N•cm
RRA6R	323N•cm
RRA7R	323N•cm
RRA8R	631N•cm

- 6) After adjusting the belt tension, have the screws and circular washers shown below which are to be attached in purpose of motor position reproducibility set close to the motor bracket, and tighten them with using a 2.5mm-sized hex wrench.



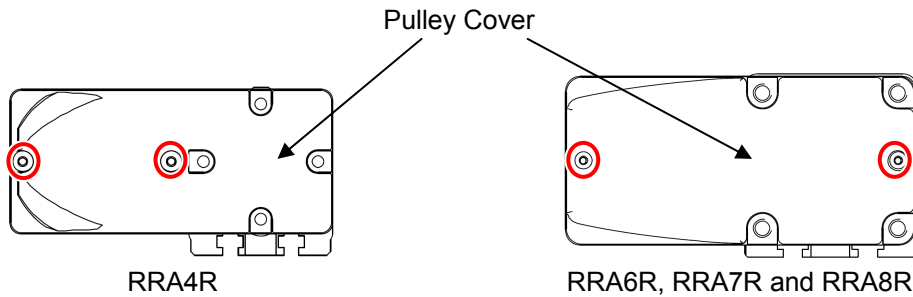
Tightening Torque
88.7 N•cm

- 7) Attach the motor cover with the four cross recessed screws, and tighten them with using a Phillips screwdriver.



Type	Tightening Torque
RRA4R, RRA6R, RRA7R	41.4 N•cm
RRA8R	96.4 N•cm

- 8) Attach the pulley cover with the hex socket flat head cap screws (areas marked with circles, two places for RRA4R, RRA6R, RRA7R and RRA8R), and tighten them with using a hex wrench.



Tightening Torque
47.9 N•cm

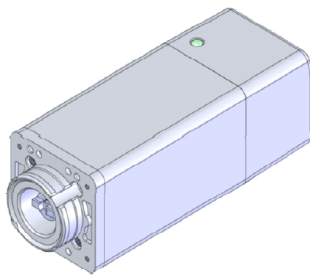
5.8 Replacement Process

- ⚠ Caution : The encoder area in the motor for replacement and the control PC boards in RCP6S may get damaged by static electricity. Follow the caution notes below when having a work.
- Do not attempt to touch the encoder area in the motor for replacement directly with hand.
 - Do not attempt to touch the control PC boards in RCP6S directly with hand except for replacement work.
 - Touch a metal before starting the work in order to release static electricity from the body.
 - Do not attempt to conduct the replacement work in a circumstance that is easy to generate static electricity (such as on a carpet).

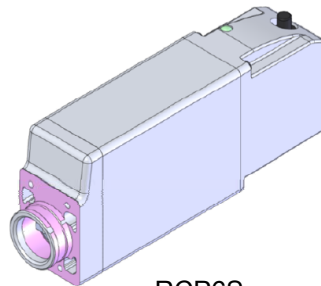
5.8.1 RRA4C, RRA6C and RRA7C

[Items required for replacing the motor]

- Motor Unit for Replacement



RCP6

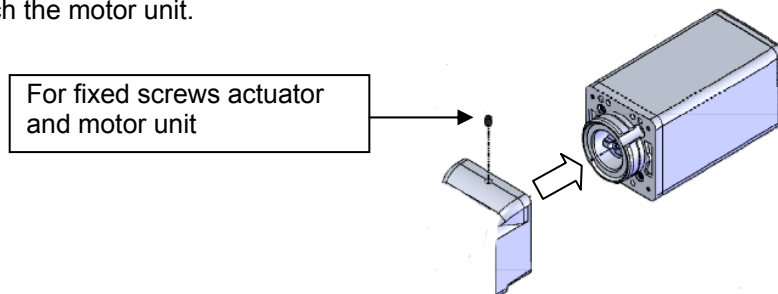


RCP6S

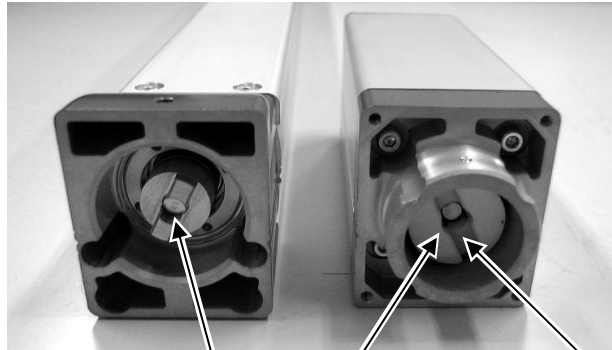
- Hex Wrench Set 2mm or 2.5mm-sized

[Procedure]

- 1) Remove the fixing screw affixing the actuator and the motor unit with a 2mm-sized (RRA4C and RRA6C) or 2.5mm-sized (RRA7C) hex wrench.
- 2) Detach the motor unit.



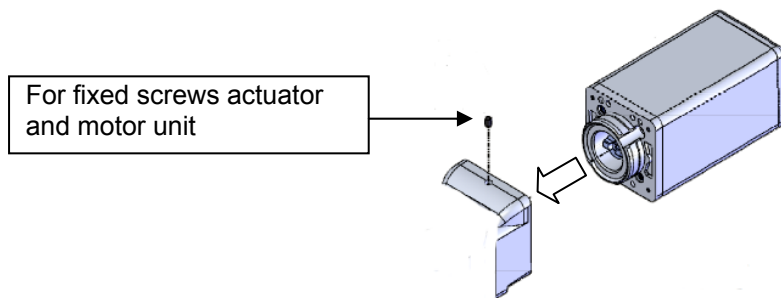
- 3) Make the profiles on the actuator side and motor unit side aligned so the projection matches to the slit.



Make the projection and slit matched with each other.

Apply grease to the coupling part.
NOXLUB TL1010 grease made by NOK

- 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 (RRA4C and RRA6C) or 2.5mm-sized (RRA7C) hex wrench.



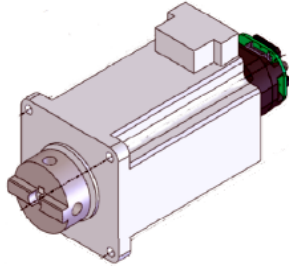
Model Name	Tightening Torque
RRA4C, RRA6C	167N•cm
RRA7C	353N•cm

- 6) Do not fail to conduct home-return operation on the PC or touch panel teaching after replacing the motor.

5.8.2 RRA8C

[Items required for replacing the motor]

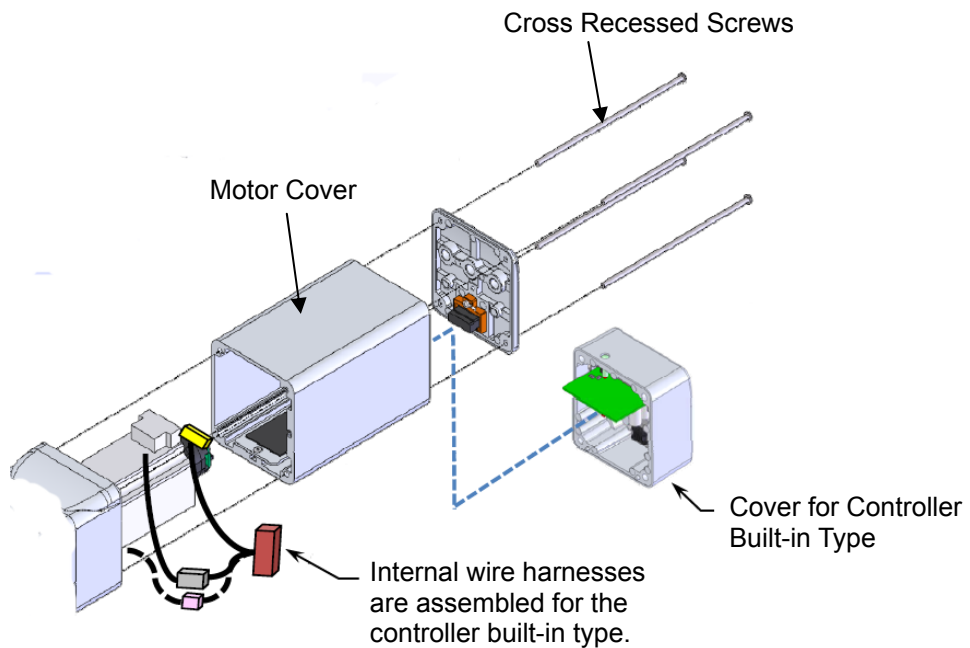
- Hex Wrench Set
- Phillips Screwdriver
- Motor for Replacement



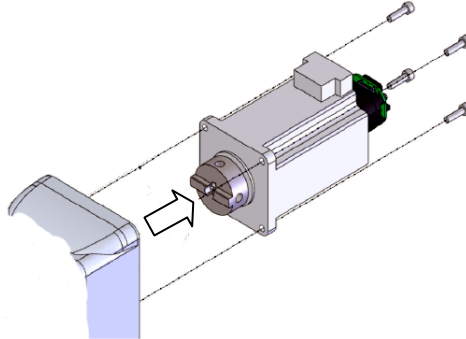
Replacement Motor

[Procedure]

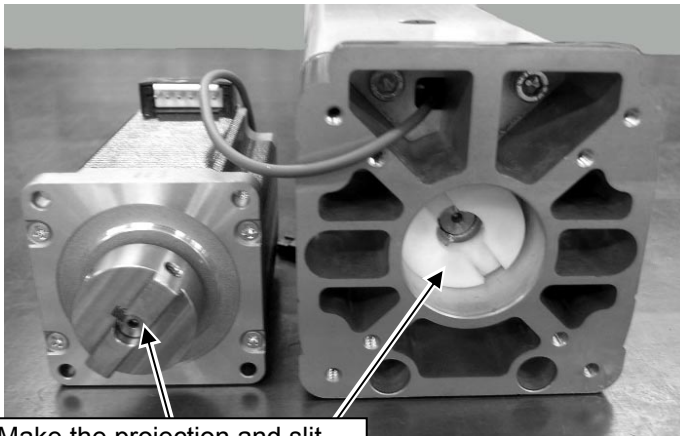
- 1) Remove the four cross recessed screws holding the motor cover with using a Phillips screwdriver. The motor cover can be detached.
- 2) Disconnect the motor and encoder connector.
- 3) Detach the motor cover.



- 4) Remove the four hex socket head cap bolts (Without brake: M4×15, With brake: M4×12) holding the motor with using a 3mm-sized hex wrench.
- 5) Pull out the motor.

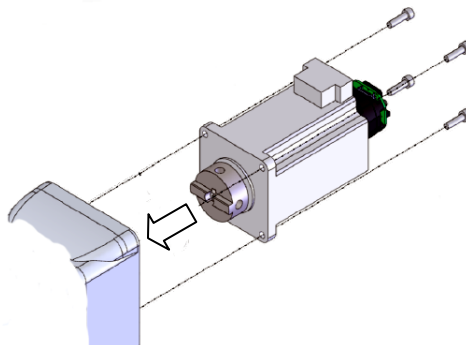


- 6) Make the profiles on the actuator side and motor unit side aligned so the projection matches to the slit.



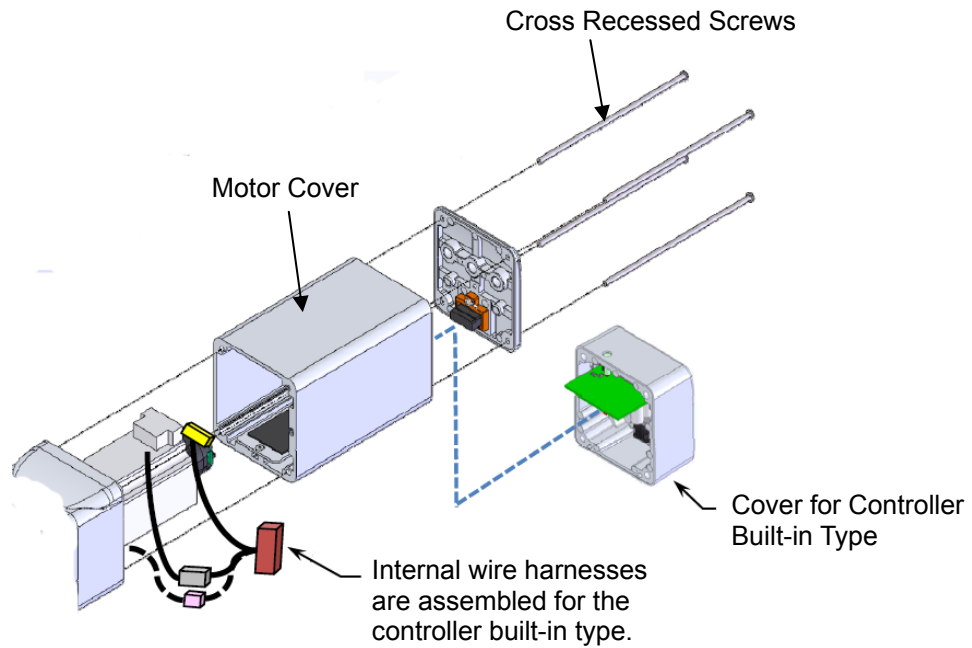
Make the projection and slit matched with each other.

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



Tightening Torque
176N•cm

- 9) Attach the motor cover and then the motor connectors.
When attaching the motor cover, pay attention not to pinch the cables at the screw guiding parts.
- 10) Plug in the motor connector and encoder connector.
- 11) Affix the motor cover with the four cross recessed screws, and tighten them with using a Phillips screwdriver.



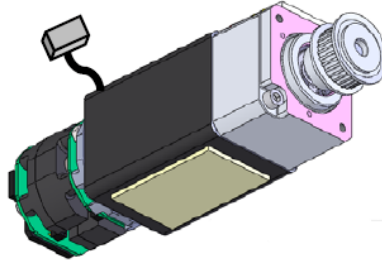
Tightening Torque
96.4N·cm

- 12) Do not fail to conduct home-return operation on the PC or touch panel teaching after replacing the motor.

5.8.3 RRA4R, RRA6R, RRA7R and RRA8R

[Items Required for Replacement Work]

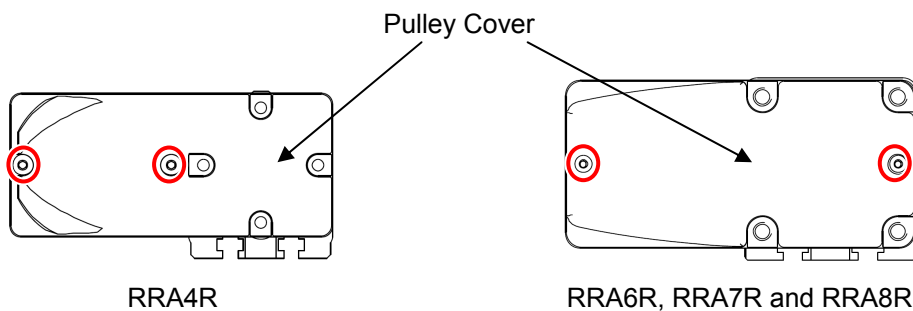
- Motor Unit for Replacement



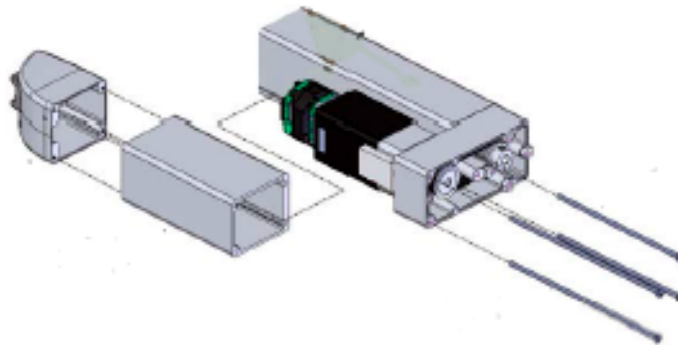
- Hex Wrench Set: 2.5mm (RRA4R, RRA6R), 3mm (RRA7R), 4mm (RRA8R) or 2mm (for hex socket head cap bolt) - sized
- Phillips Screwdriver
- Tension Gauge (Capable thing of tensioning to 200N or greater)
- Strong String or Long Tie-band

[Procedure]

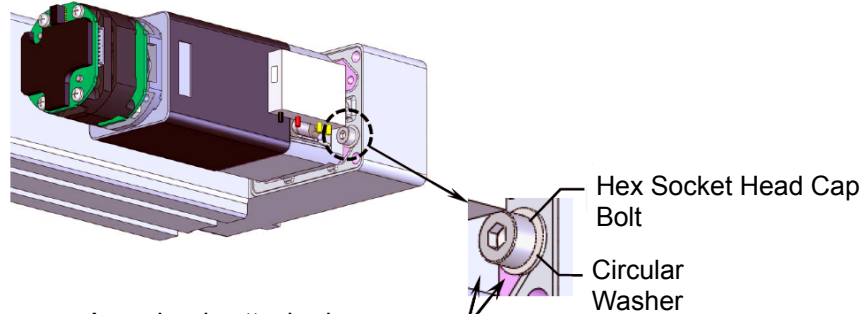
- 1) Remove the two hex socket flat-head cap screws for RRA4R, RRA6R, RRA7R and RRA8R (where marked with a circle) with a phillips screwdriver. Detach the pulley cover. Detach the pulley cover.



- 2) Remove the four cross recessed screws holding the motor cover with using a Phillips screwdriver, and detach the motor cover.

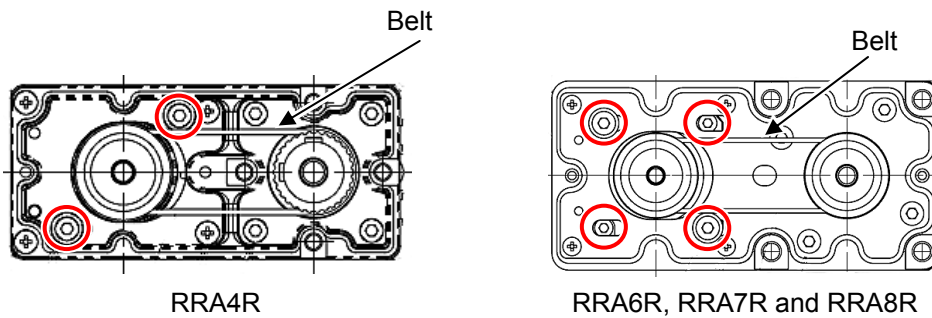


- 3) When it is necessary to replace the belt together at the same time, remove the screws and circular washers shown below which are attached in purpose of motor position reproducibility with using a 2.5mm-sized hex wrench after adjusting the belt tension.

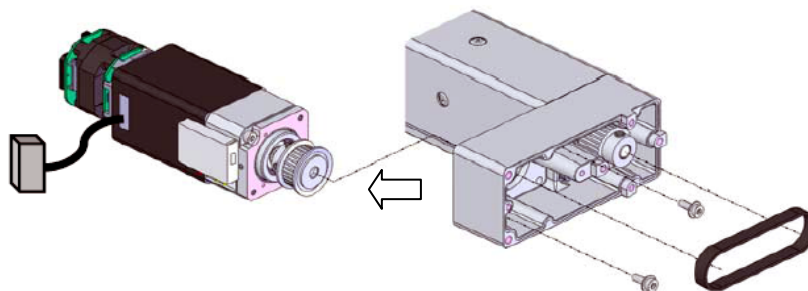


A washer is attached contacting closely to the motor bracket.

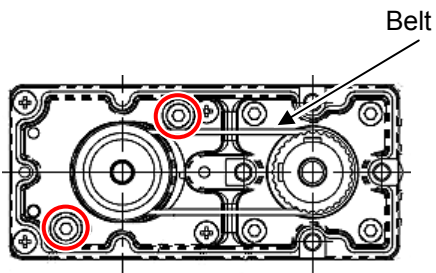
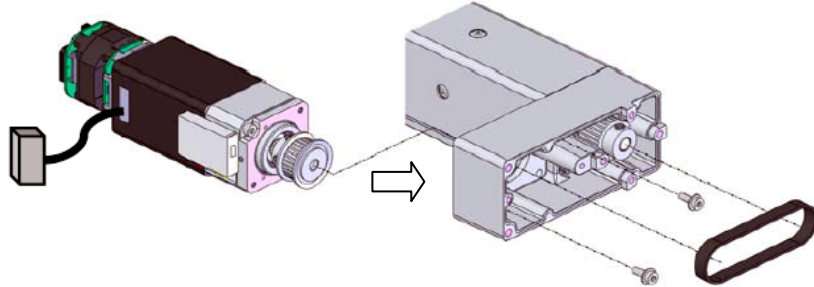
- 4) Loosen the screws holding the motor (areas marked with circles, 2 places for RRA4R, four places for RRA6R, RRA7R and RRA8R) with using a 2.5mm-sized (for RRA4R), 3mm-sized (for RRA6R and RRA7R) or 4mm-sized (for RRA8R) hex wrench. Replace the belt if it is necessary.



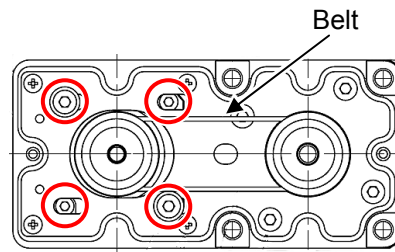
- 5) Detach the belt off the pulleys.
- 6) Pull out the four screws to take off the motor unit.



- 7) Attach a new motor in the tension adjustment bolts (where marked with a circle) loosely. Hang the timing belt.



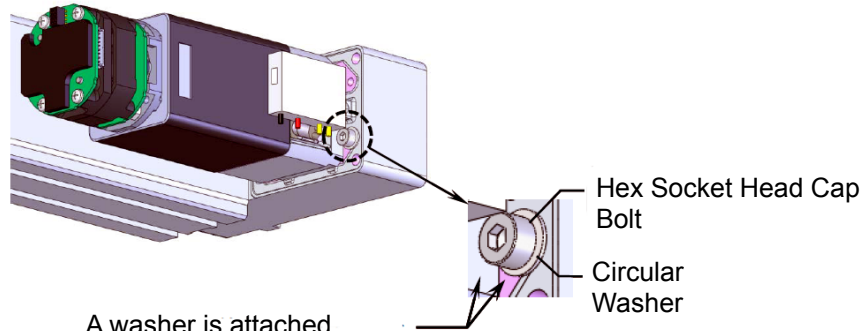
RRA4R



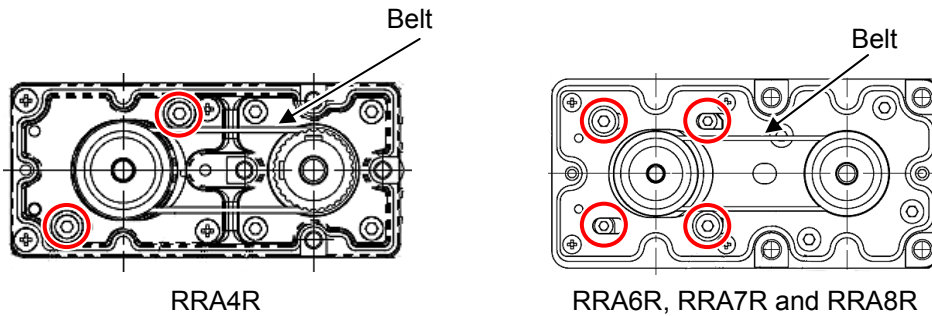
RRA6R, RRA7R and RRA8R

(Note) It is not necessary to adjust the belt tension stated in Step 8) when the cross recessed screws and circular washers shown below were not removed because the belt was not replaced at the same time.

While hanging a cable band (thin string) on the edge of the motor unit in order to pull it against the hex socket screw, tighten the screws (areas marked with circles) with using a 2.5mm-sized (for RRA4R), 3mm-sized (for RRA6R and RRA7R) or 4mm-sized (for RRA8R) hex wrench to affix the motor unit.



A washer is attached contacting closely to the motor bracket.

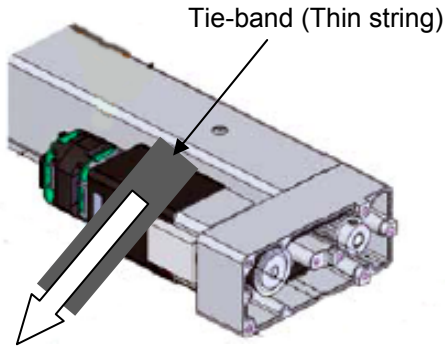


RRA4R

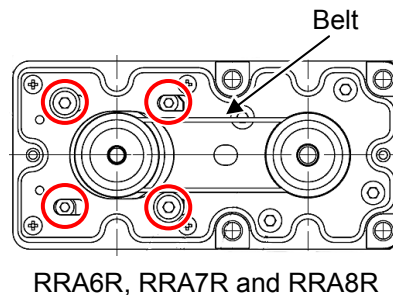
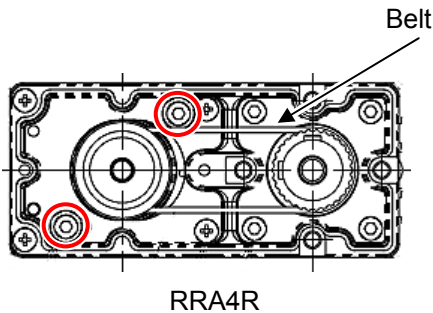
RRA6R, RRA7R and RRA8R

Model Name	Tightening Torque
RRA4R	162N·cm
RRA6R	323N·cm
RRA7R	323N·cm
RRA8R	631N·cm

- 8) Adjust the belt tension in case the belt was replaced at the same time.
 Hang a cable band (thin string) on the edge of the motor unit and pull it while applying the specific load (specified value for the belt tension) with a tension gauge.
 Once the load has reached the specified load, tighten the screws (areas marked with circles) with using a 2.5mm-sized (for RRA4R), 3mm-sized (for RRA6R and RRA7R) or 4mm-sized (for RRA8R) hex wrench to affix the motor unit.

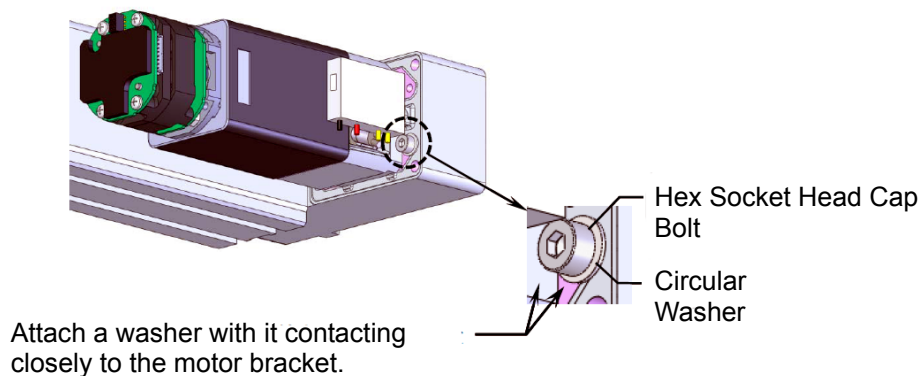


Model Name	Tension Force
RRA4R	20 to 25N
RRA6R	25 to 30N
RRA7R	80 to 90N
RRA8R	180 to 200N



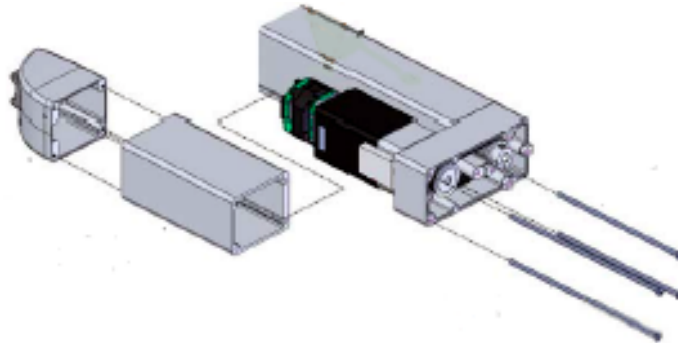
Model Name	Tightening Torque
RRA4R	162N·cm
RRA6R	323N·cm
RRA7R	323N·cm
RRA8R	631N·cm

- 9) After adjusting the belt tension, have the screws and circular washers shown below which are to be attached in purpose of motor position reproducibility set close to the motor bracket, and tighten them with using a 2.5mm-sized hex wrench in case the belt was replaced at the same time.



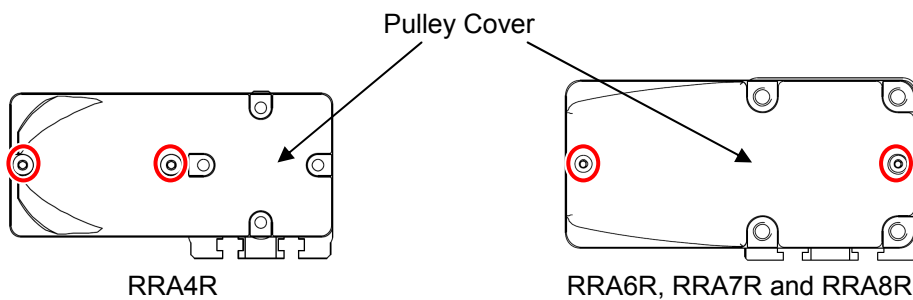
Tightening Torque
88.7N·cm

- 10) Attach the motor cover with the four cross recessed screws, and tighten them with using a Phillips screwdriver.



Model Name	Tightening Torque
RRA4R, RRA6R, RRA7R	41.4N·cm
RRA8R	96.4N·cm

- 11) Attach the pulley cover with the hex socket flat head cap screws (areas marked with circles, two places for RRA4R, RRA6R, RRA7R and RRA8R), and tighten them with using a hex wrench.

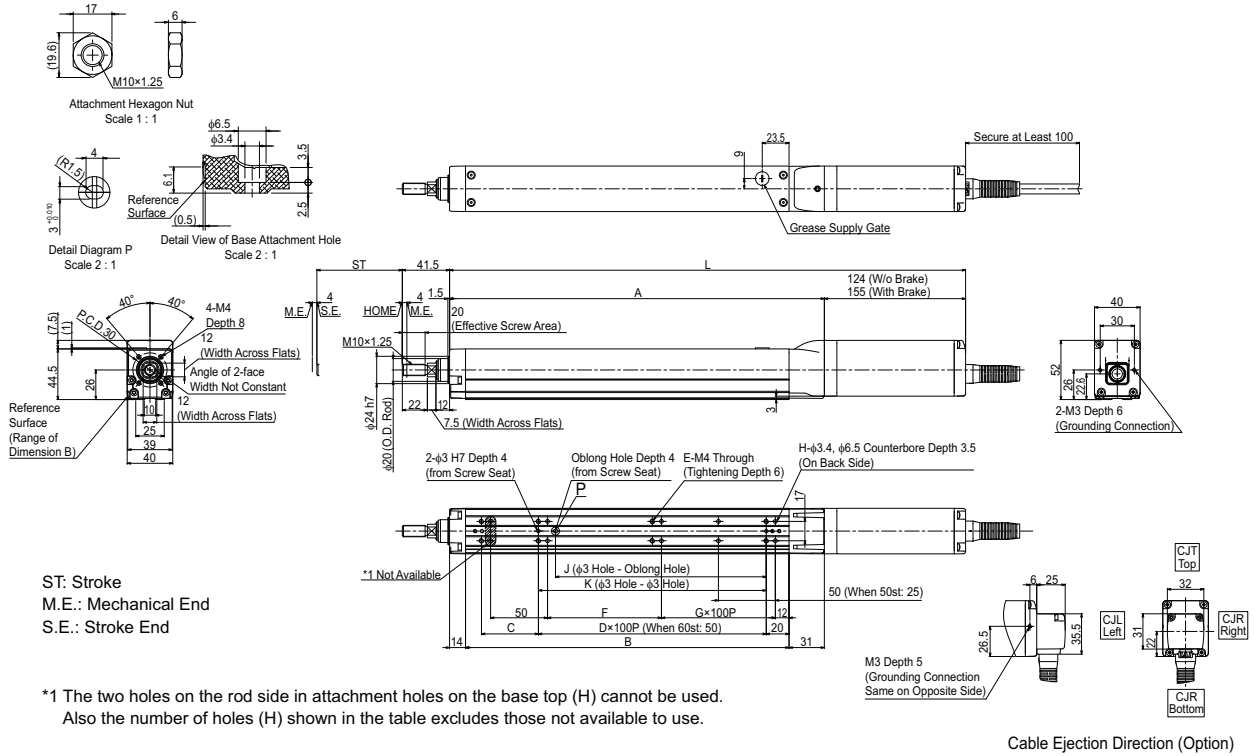


Tightening Torque
47.9N·cm

- 12) Do not fail to conduct home-return operation on the PC or touch panel teaching after replacing the motor.

6. External Dimensions

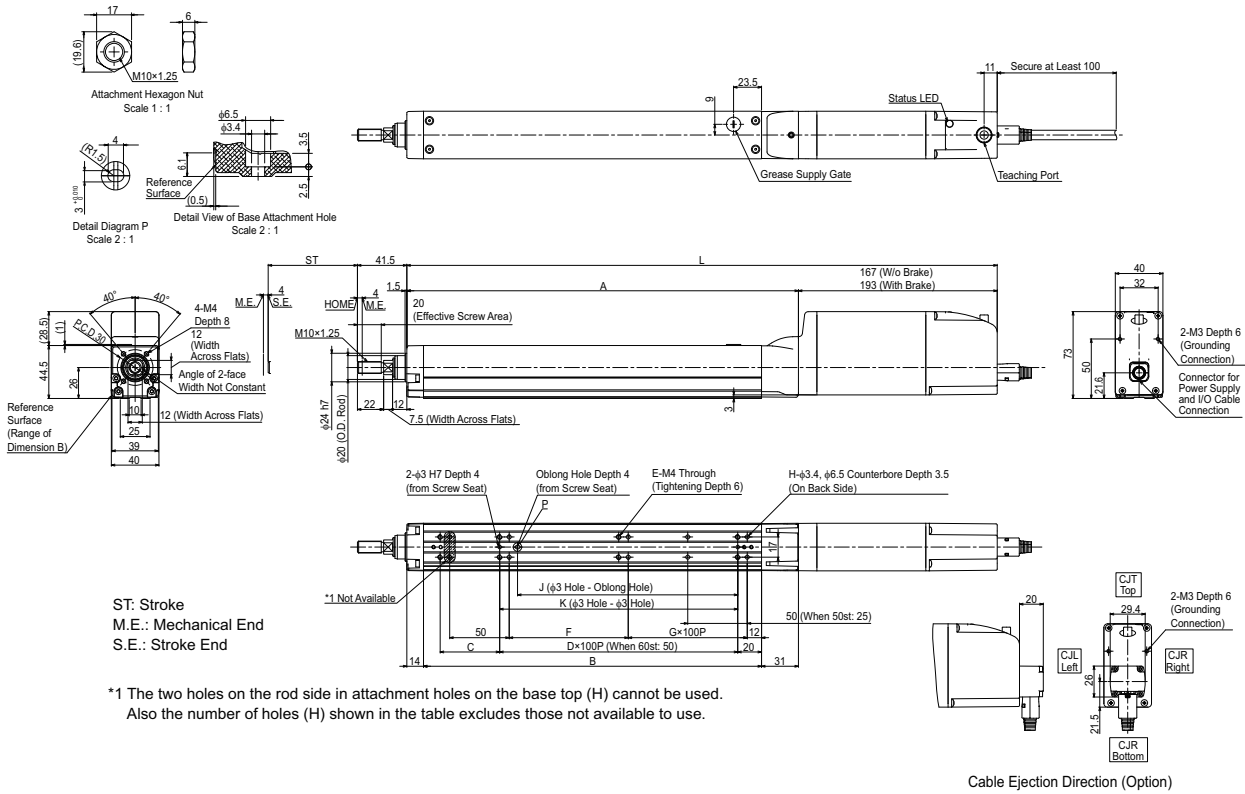
6.1 Standard specification RCP6-RRA4C



Stroke	L (Battery-less Absolute)		A	B	C	D	E	F	G	H *1	J	K	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
60	303	334	179	134	50	0	6	50	0	6	35	50	1.2	1.4
110	353	384	229	184	50	1	6	100	0	6	85	100	1.4	1.5
160	403	434	279	234	100	1	6	50	1	8	85	100	1.5	1.7
210	453	484	329	284	50	2	8	100	1	8	185	200	1.6	1.8
260	503	534	379	334	100	2	8	50	2	10	185	200	1.7	1.9
310	553	584	429	384	50	3	10	100	2	10	285	300	1.9	2.0
360	603	634	479	434	100	3	10	50	3	12	285	300	2.0	2.2
410	653	638	529	484	50	4	12	100	3	12	385	400	2.1	2.3

(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 25mm.

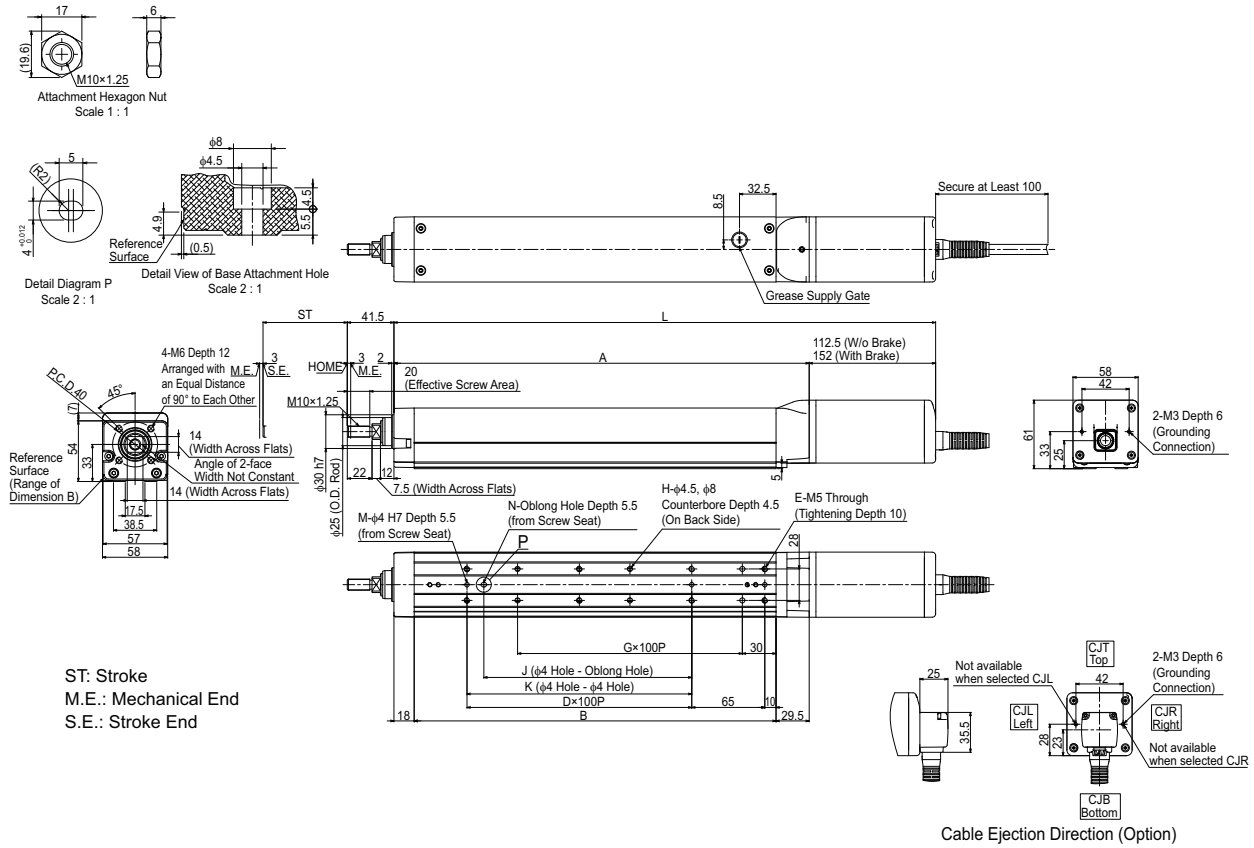
6.2 Built-in Controller Specification RCP6S-RA4C



Stroke	L (Battery-less Absolute)		A	B	C	D	E	F	G	H *1	J	K	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
60	346	372	179	134	50	0	6	50	0	6	35	50	1.4	1.6
110	396	422	229	184	50	1	6	100	0	6	85	100	1.6	1.7
160	446	472	279	234	100	1	6	50	1	8	85	100	1.7	1.8
210	496	522	329	284	50	2	8	100	1	8	185	200	1.8	2.0
260	546	572	379	334	100	2	8	50	2	10	185	200	1.9	2.1
310	596	622	429	384	50	3	10	100	2	10	285	300	2.1	2.2
360	646	672	479	434	100	3	10	50	3	12	285	300	2.2	2.3
410	696	722	529	484	50	4	12	100	3	12	385	400	2.3	2.5

(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.

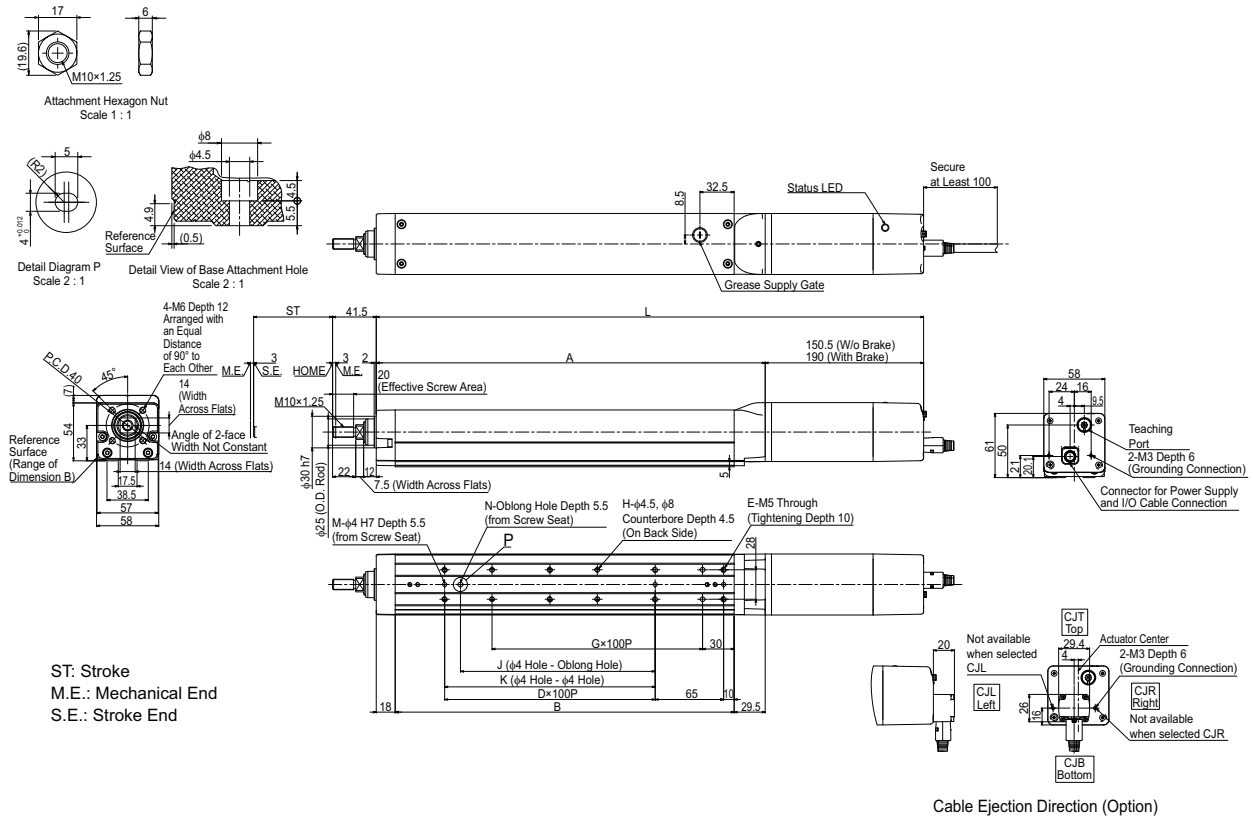
6.3 Standard Specification RCP6-RRA6C



Stroke	L (Battery-less Absolute)		A	B	D	E	G	H	J	K	M	N	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
65	332	371.5	219.5	172	0	4	1	4	0	0	2	0	2.1	2.4
115	382	421.5	269.5	222	1	6	1	4	85	100	3	1	2.3	2.6
165	432	471.5	319.5	272	1	6	2	6	85	100	3	1	2.6	2.8
215	482	521.5	369.5	322	2	8	2	6	185	200	3	1	2.8	3.0
265	532	571.5	419.5	372	2	8	3	8	185	200	3	1	3.0	3.3
315	582	621.5	469.5	422	3	10	3	8	285	300	3	1	3.2	3.5
365	632	671.5	519.5	472	3	10	4	10	285	300	3	1	3.5	3.7
415	682	721.5	569.5	522	4	12	4	10	385	400	3	1	3.7	3.9

(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 25mm.

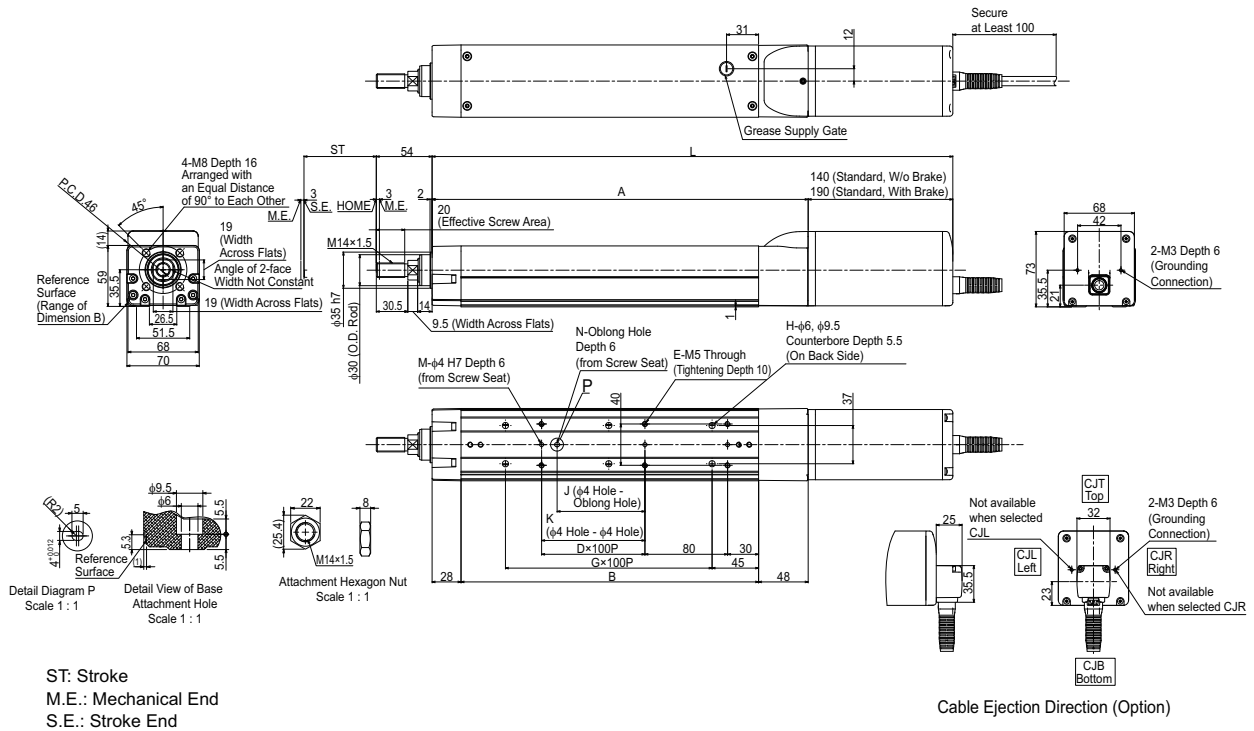
6.4 Built-in Controller Specification RCP6S-RR A6C



Stroke	L (Battery-less Absolute)		A	B	D	E	G	H	J	K	M	N	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
65	370	409.5	219.5	172	0	4	1	4	0	0	2	0	2.3	2.5
115	420	459.5	269.5	222	1	6	1	4	85	100	3	1	2.5	2.7
165	470	509.5	319.5	272	1	6	2	6	85	100	3	1	2.7	3.0
215	520	559.5	369.5	322	2	8	2	6	185	200	3	1	2.9	3.2
265	570	609.5	419.5	372	2	8	3	8	185	200	3	1	3.2	3.4
315	620	659.5	469.5	422	3	10	3	8	285	300	3	1	3.4	3.6
365	670	709.5	519.5	472	3	10	4	10	285	300	3	1	3.6	3.8
415	720	759.5	569.5	522	4	12	4	10	385	400	3	1	3.8	4.1

(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 20mm.

6.5 Standard Specification RCP6-RA7C

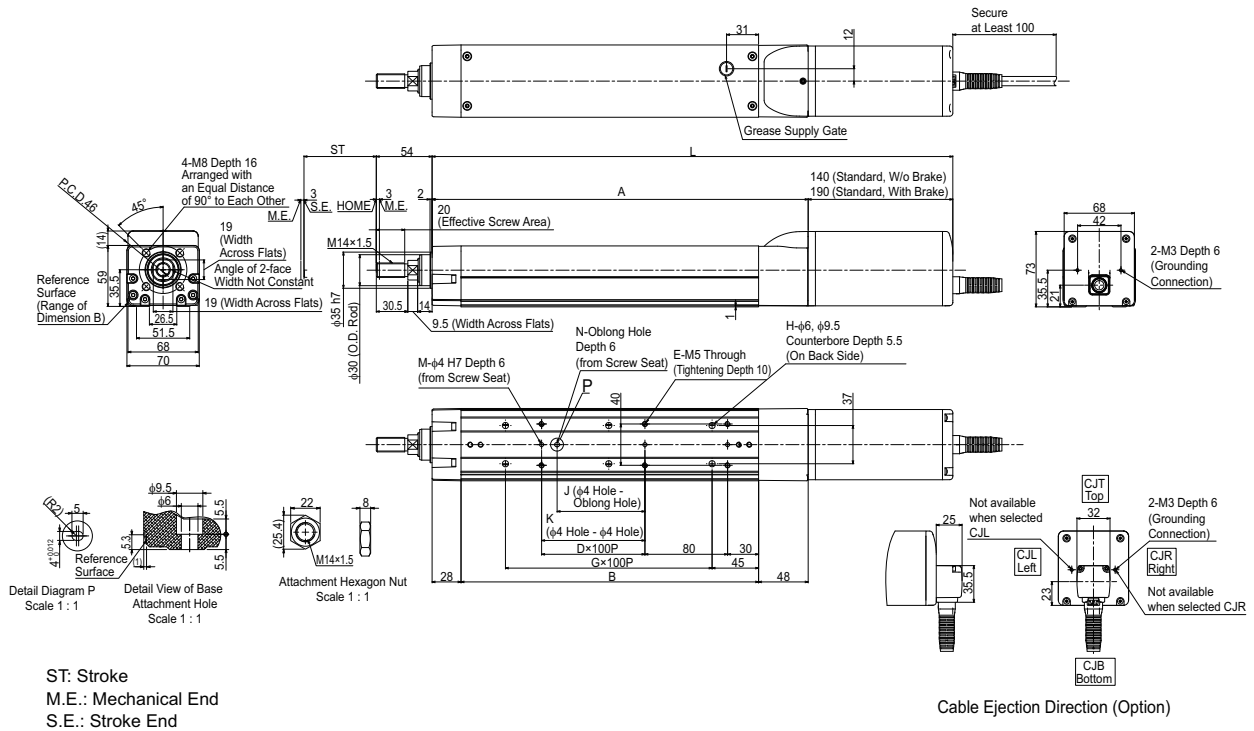


Stroke	L (Battery-less Absolute)		A	B	D	E	G	H	J	K	M	N	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
70	404	454	264	188	0	4	1	4	0	0	2	0	4.0	4.4
120	454	504	314	238	1	6	1	4	85	0	2	1	4.3	4.7
170	504	554	364	288	1	6	2	6	85	100	3	1	4.6	5.0
220	554	604	414	338	2	8	2	6	185	200	3	1	4.8	5.3
270	604	654	464	388	2	8	3	8	185	200	3	1	5.1	5.5
320	654	704	514	438	3	10	3	8	285	300	3	1	5.4	5.8
370	704	754	564	488	3	10	4	10	285	300	3	1	5.7	6.1
420	754	804	614	538	4	12	4	10	385	400	3	1	5.9	6.4
470	804	854	664	588	4	12	5	12	385	400	3	1	6.2	6.7
520	854	904	714	638	5	14	5	12	485	500	3	1	6.5	6.9

(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 25mm.

6.6 Built-in Controller Specification RCP6S-RA7C

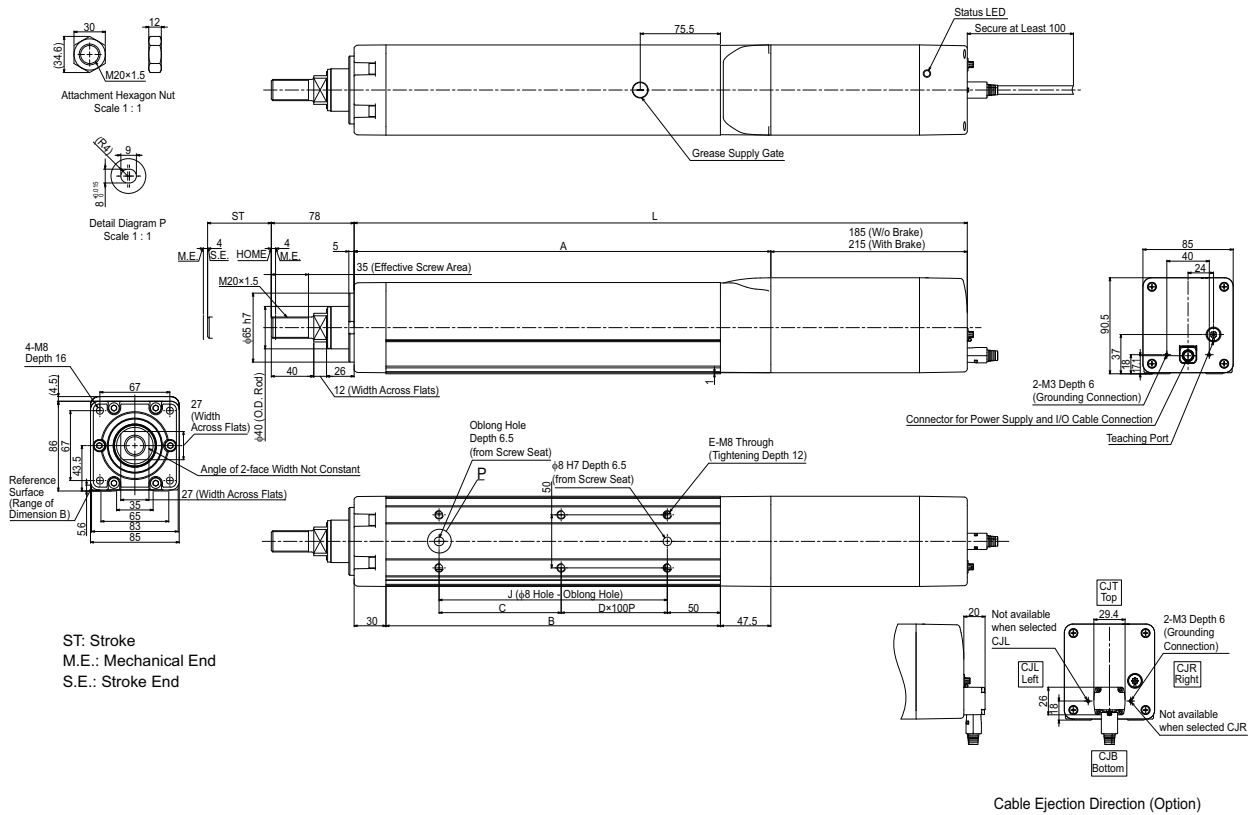


Stroke	L (Battery-less Absolute)		A	B	D	E	G	H	J	K	M	N	Mass [kg]	
	w/o Brake	With Brake											w/o Brake	With Brake
70	429	479	264	188	0	4	1	4	0	0	2	0	4.2	4.6
120	479	529	314	238	1	6	1	4	85	0	2	1	4.5	4.9
170	529	579	364	288	1	6	2	6	85	100	3	1	4.7	5.2
220	579	629	414	338	2	8	2	6	185	200	3	1	5.0	5.5
270	629	679	464	388	2	8	3	8	185	200	3	1	5.3	5.7
320	679	729	514	438	3	10	3	8	285	300	3	1	5.6	6.0
370	729	779	564	488	3	10	4	10	285	300	3	1	5.8	6.3
420	779	829	614	538	4	12	4	10	385	400	3	1	6.1	6.6
470	829	879	664	588	4	12	5	12	385	400	3	1	6.4	6.8
520	879	929	714	638	5	14	5	12	485	500	3	1	6.7	7.1

(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 20mm.

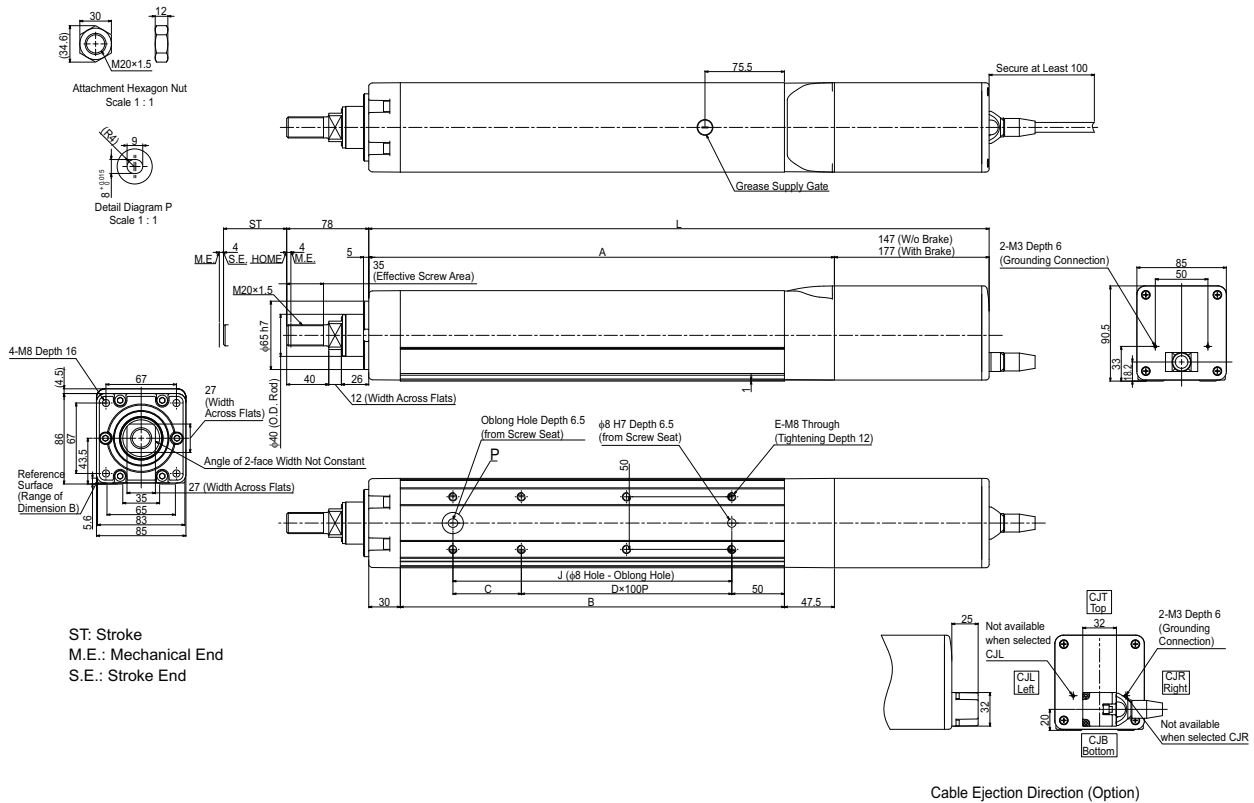
6.7 Standard Specification RCP6-RRA8C



Stroke	L (Battery-less Absolute)		A	B	C	D	E	J	Mass [kg]	
	w/o Brake	With Brake							w/o Brake	With Brake
50	439.5	469.5	292.5	215	115	0	4	115	6.6	7.2
100	489.5	519.5	342.5	265	65	1	6	165	7.1	7.7
150	539.5	569.5	392.5	315	115	1	6	215	7.6	8.2
200	589.5	619.5	442.5	365	65	2	8	265	8.0	8.6
250	639.5	669.5	492.5	415	115	2	8	315	8.5	9.1
300	689.5	719.5	542.5	465	65	3	10	365	9.0	9.6
350	739.5	769.5	592.5	515	115	3	10	415	9.5	10.1
400	789.5	819.5	642.5	565	65	4	12	465	9.9	10.5
450	839.5	869.5	692.5	615	115	4	12	515	10.4	11.0
500	889.5	919.5	742.5	665	65	5	14	565	10.9	11.5
550	939.5	969.5	792.5	715	115	5	14	615	11.4	11.9
600	989.5	1019.5	842.5	765	65	6	16	665	11.8	12.4
650	1039.5	1069.5	892.5	815	115	6	16	715	12.3	12.9
700	1089.5	1119.5	942.5	865	65	7	18	765	12.8	13.4

(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 25mm.

6.8 Built-in Controller Specification RCP6S-RRA8C

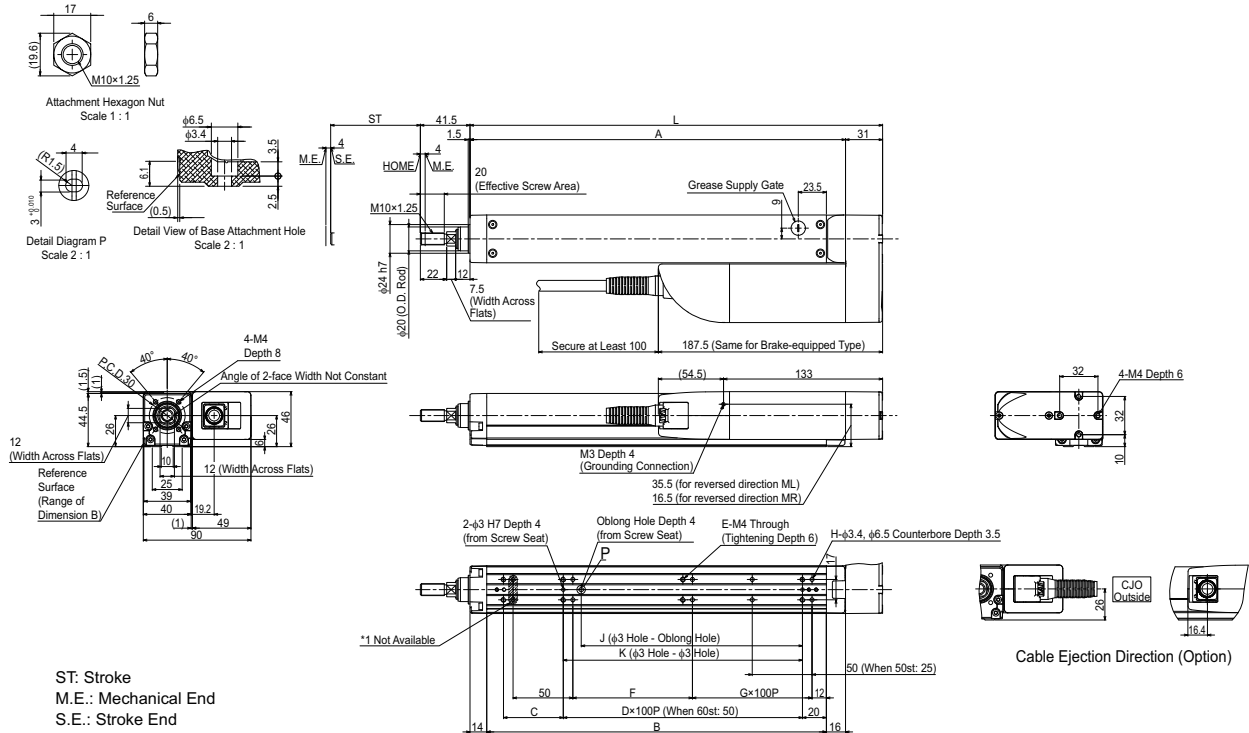


Stroke	L (Battery-less Absolute)		A	B	C	D	E	J	Mass [kg]	
	w/o Brake	With Brake							w/o Brake	With Brake
50	477.5	507.5	292.5	215	115	0	4	115	7.0	7.5
100	527.5	557.5	342.5	265	65	1	6	165	7.4	8.0
150	577.5	607.5	392.5	315	115	1	6	215	7.9	8.5
200	627.5	657.5	442.5	365	65	2	8	265	8.4	9.0
250	677.5	707.5	492.5	415	115	2	8	315	8.8	9.4
300	727.5	757.5	542.5	465	65	3	10	365	9.3	9.9
350	777.5	807.5	592.5	515	115	3	10	415	9.8	10.4
400	827.5	857.5	642.5	565	65	4	12	465	10.3	10.8
450	877.5	907.5	692.5	615	115	4	12	515	10.7	11.3
500	927.5	957.5	742.5	665	65	5	14	565	11.2	11.8
550	977.5	1007.5	792.5	715	115	5	14	615	11.7	12.3
600	1027.5	1057.5	842.5	765	65	6	16	665	12.1	12.7
650	1077.5	1107.5	892.5	815	115	6	16	715	12.6	13.2
700	1127.5	1157.5	942.5	865	65	7	18	775	13.1	13.7

(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.

6.9 Standard Specification RCP6-RRA4R Left Reversed (Model No.: ML)

(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).

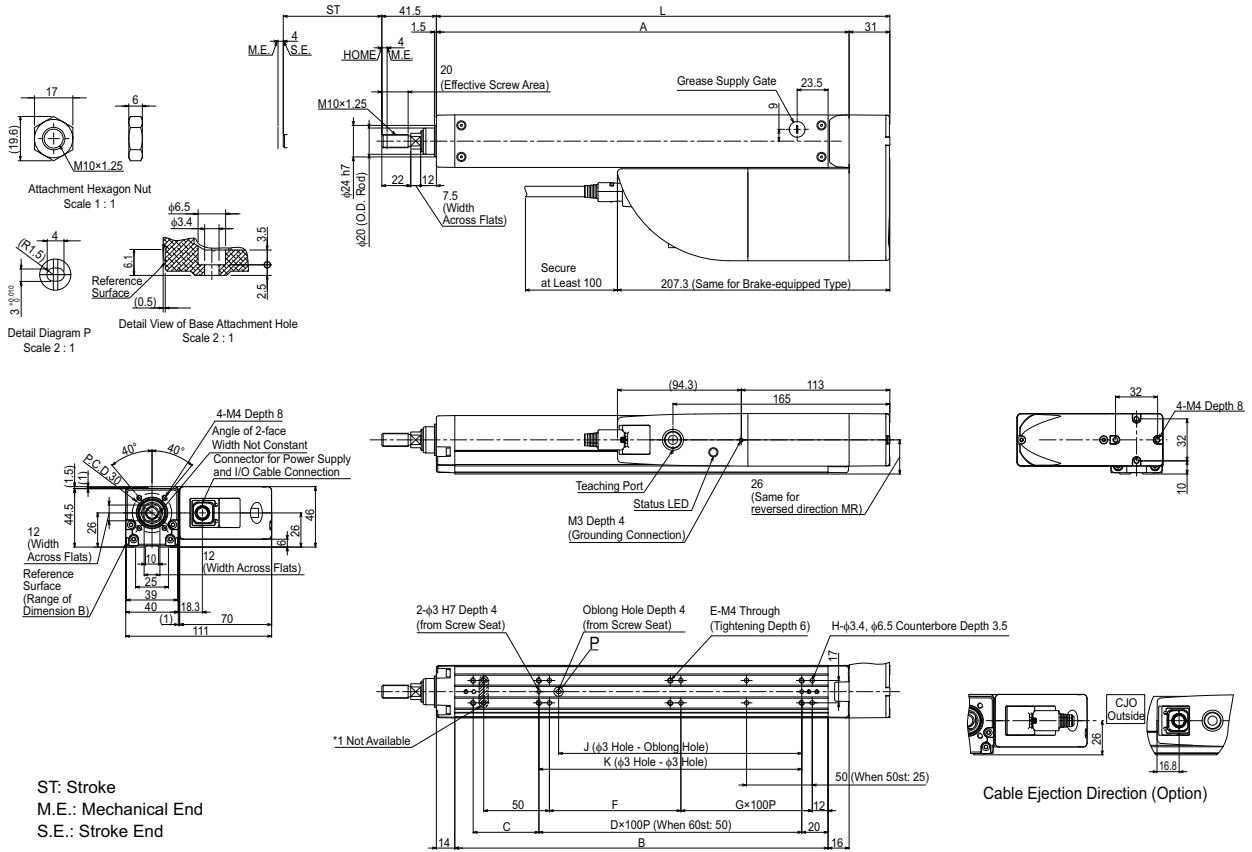


*1 The two holes on the rod side in attachment holes on the base top (H) cannot be used.
Also the number of holes (H) shown in the table excludes those not available to use.

Stroke	L	A	B	C	D	E	F	G	H *1	J	K	Mass [kg]	
												w/o Brake	With Brake
60	195	164	134	50	0	6	50	0	6	35	50	1.4	1.4
110	245	214	184	50	1	6	100	0	6	85	100	1.5	1.6
160	295	264	234	100	1	6	50	1	8	85	100	1.6	1.7
210	345	314	284	50	2	8	100	1	8	185	200	1.8	1.8
260	395	364	334	100	2	8	50	2	10	185	200	1.9	1.9
310	445	414	384	50	3	10	100	2	10	285	300	2.0	2.1
360	495	464	434	100	3	10	50	3	12	285	300	2.1	2.2
410	545	514	484	50	4	12	100	3	12	385	400	2.3	2.3

6.10 Built-in Controller Specification RCP6S-RRA4R Left Reversed (Model No.: ML)

(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).

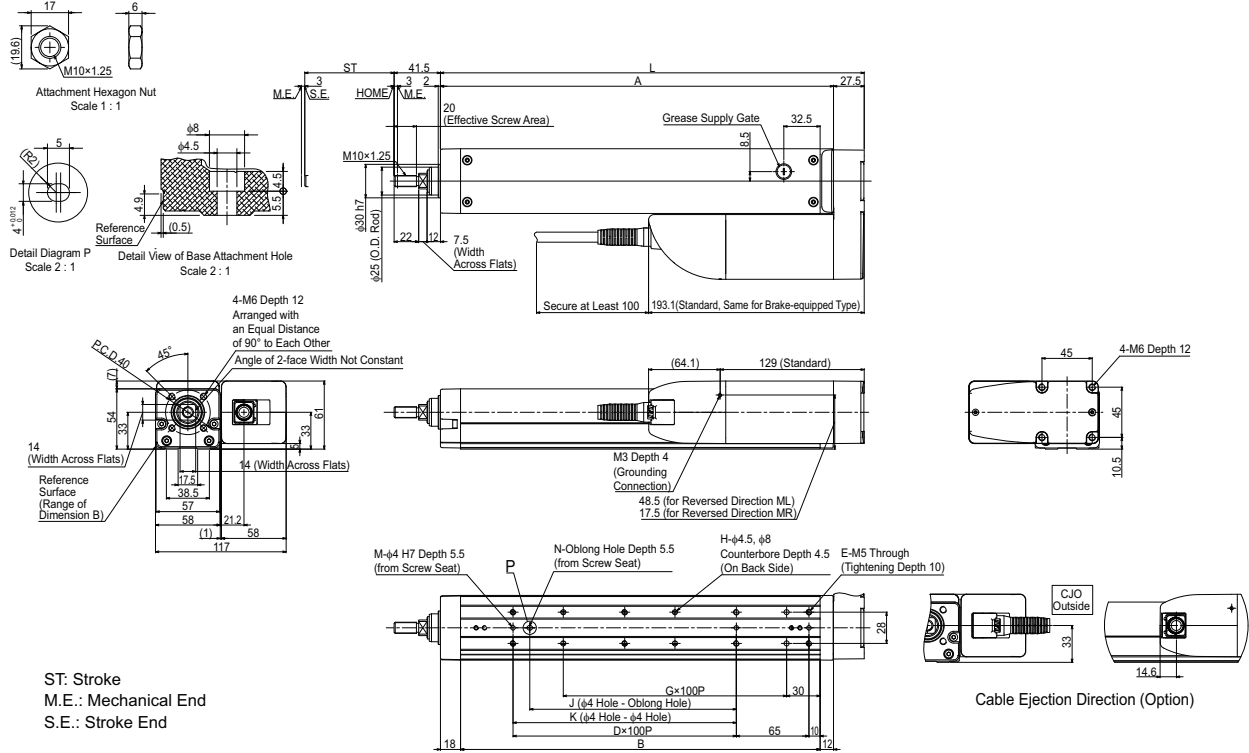


*1 The two holes on the rod side in attachment holes on the base top (H) cannot be used.
Also the number of holes (H) shown in the table excludes those not available to use.

Stroke	L	A	B	C	D	E	F	G	H *1	J	K	Mass [kg]	
												w/o Brake	With Brake
60	195	164	134	50	0	6	50	0	6	35	50	1.5	1.6
110	245	214	184	50	1	6	100	0	6	85	100	1.6	1.7
160	295	264	234	100	1	6	50	1	8	85	100	1.8	1.8
210	345	314	284	50	2	8	100	1	8	185	200	1.9	1.9
260	395	364	334	100	2	8	50	2	10	185	200	2.0	2.1
310	445	414	384	50	3	10	100	2	10	285	300	2.1	2.2
360	495	464	434	100	3	10	50	3	12	285	300	2.3	2.3
410	545	514	484	50	4	12	100	3	12	385	400	2.4	2.4

6.11 Standard Specification RCP6-RRA6R Left Reversed (Model No.: ML)

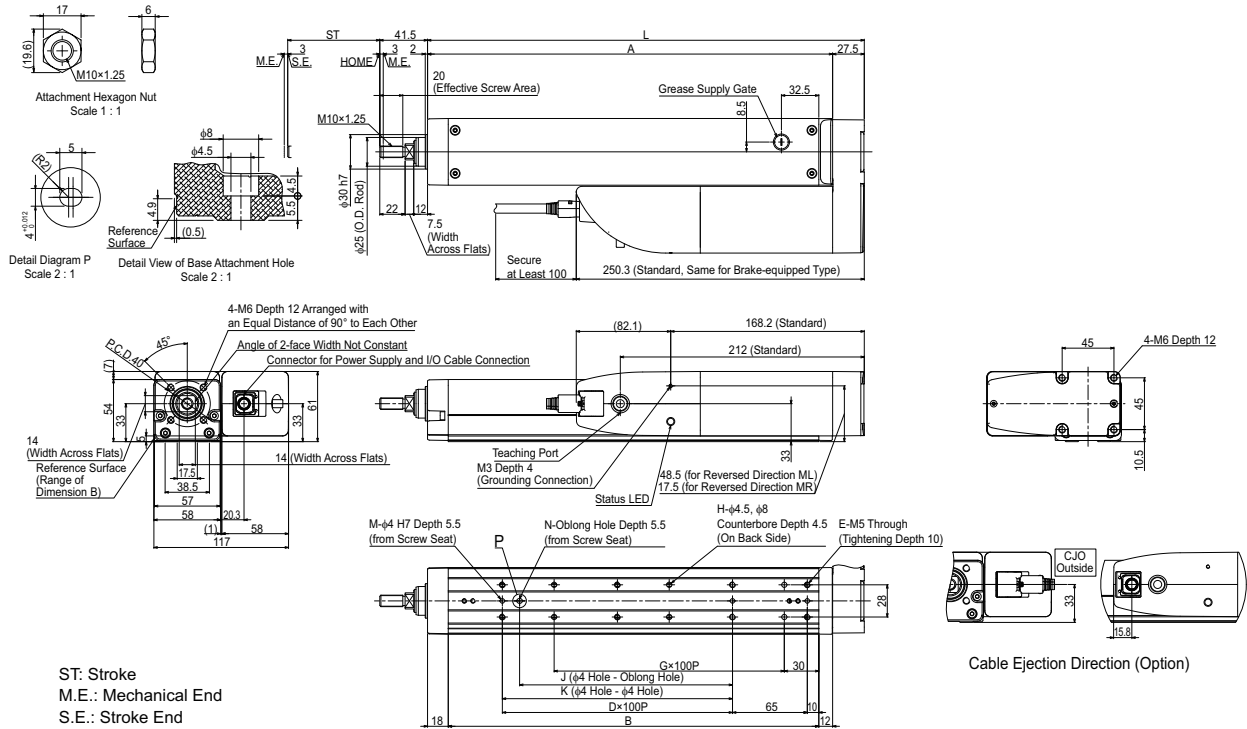
(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).



Stroke	L	A	B	D	E	G	H	J	K	M	N	Mass [kg]	
												w/o Brake	With Brake
65	229.5	202	172	0	4	1	4	0	0	2	0	2.4	2.5
115	279.5	252	222	1	6	1	4	85	100	3	1	2.6	2.7
165	329.5	302	272	1	6	2	6	85	100	3	1	2.9	2.9
215	379.5	352	322	2	8	2	6	185	200	3	1	3.1	3.2
265	429.5	402	372	2	8	3	8	185	200	3	1	3.3	3.4
315	479.5	452	422	3	10	3	8	285	300	3	1	3.5	3.6
365	529.5	502	472	3	10	4	10	285	300	3	1	3.8	3.8
415	579.5	552	522	4	12	4	10	385	400	3	1	4.0	4.1

6.12 Built-in Controller Specification RCP6S-RRA6R Left Reversed (Model No.: ML)

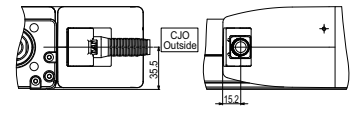
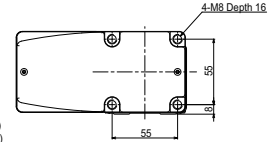
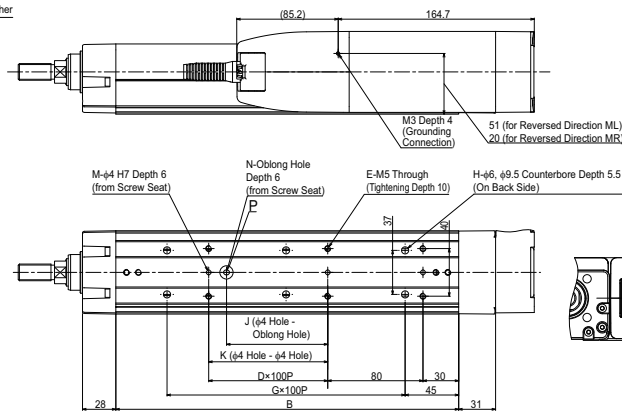
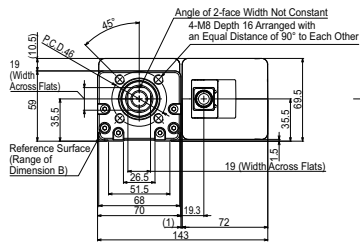
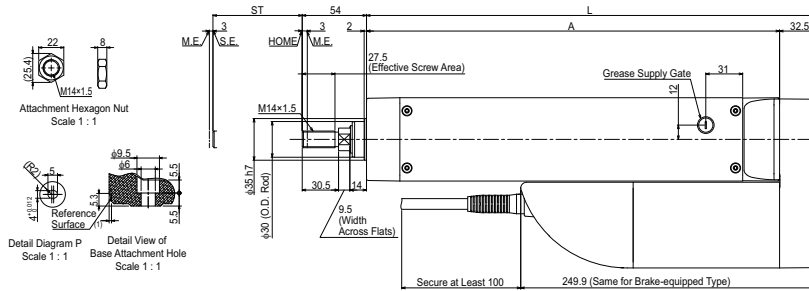
(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).



Stroke	L	A	B	D	E	G	H	J	K	M	N	Mass [kg]	
												w/o Brake	With Brake
65	229.5	202	172	0	4	1	4	0	0	2	0	2.6	2.6
115	279.5	252	222	1	6	1	4	85	100	3	1	2.8	2.8
165	329.5	302	272	1	6	2	6	85	100	3	1	3.0	3.1
215	379.5	352	322	2	8	2	6	185	200	3	1	3.2	3.3
265	429.5	402	372	2	8	3	8	185	200	3	1	3.4	3.5
315	479.5	452	422	3	10	3	8	285	300	3	1	3.7	3.7
365	529.5	502	472	3	10	4	10	285	300	3	1	3.9	4.0
415	579.5	552	522	4	12	4	10	385	400	3	1	4.1	4.2

6.13 Standard Specification RCP6-RRA7R Left Reversed (Model No.: ML)

(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).



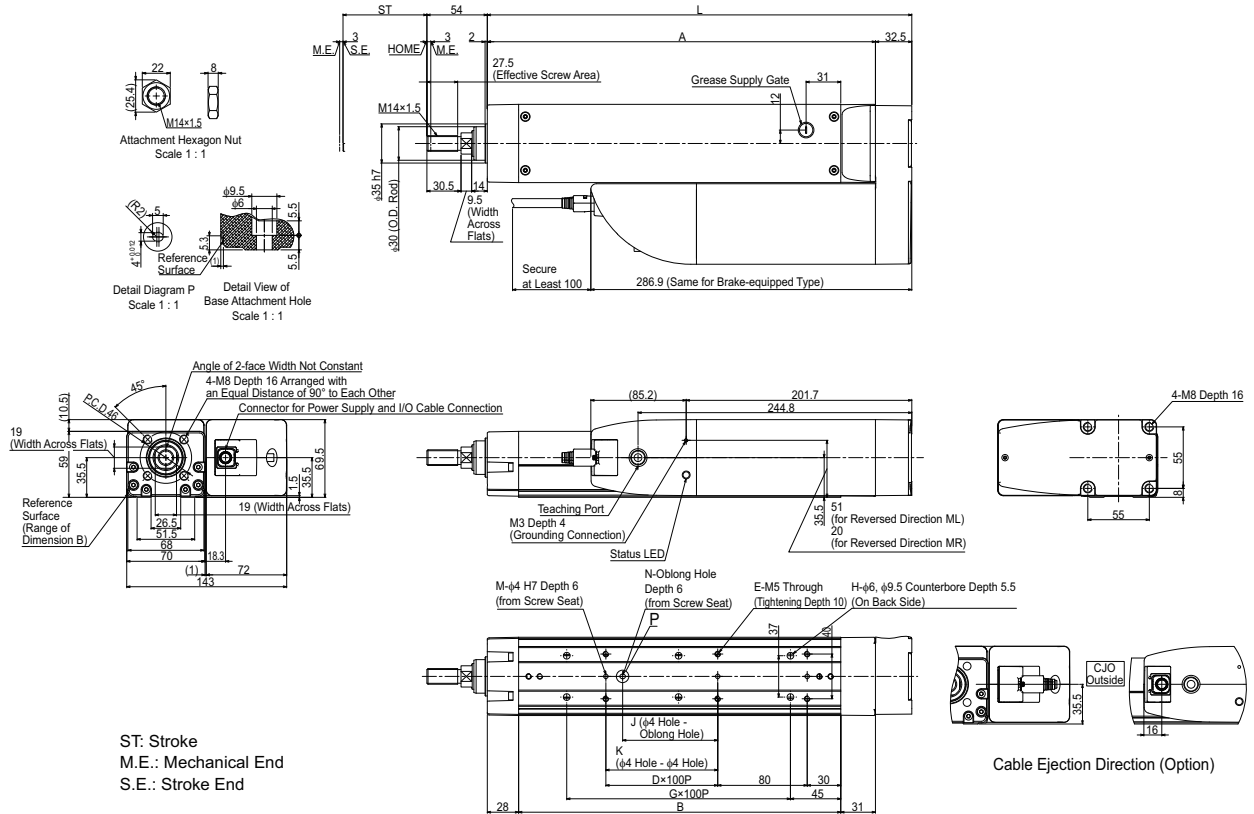
ST: Stroke
M.E.: Mechanical End
S.E.: Stroke End

Cable Ejection Direction (Option)

Stroke	L	A	B	D	E	G	H	J	K	M	N	Mass [kg]	
												w/o Brake	With Brake
70	279.5	247	188	0	4	1	4	0	0	2	0	4.6	4.8
120	329.5	297	238	1	6	1	4	85	0	2	1	4.9	5.0
170	379.5	347	288	1	6	2	6	85	100	3	1	5.2	5.3
220	429.5	397	338	2	8	2	6	185	200	3	1	5.5	5.6
270	479.5	447	388	2	8	3	8	185	200	3	1	5.7	5.9
320	529.5	497	438	3	10	3	8	285	300	3	1	6.0	6.1
370	579.5	247	488	3	10	4	10	285	300	3	1	6.3	6.4
420	629.5	597	538	4	12	4	10	385	400	3	1	6.6	6.7
470	679.5	647	588	4	12	5	12	385	400	3	1	6.8	7.0
520	729.5	697	638	5	14	5	12	485	500	3	1	7.1	7.2

6.14 Built-in Controller Specification RCP6S-RRA7R Left Reversed (Model No.: ML)

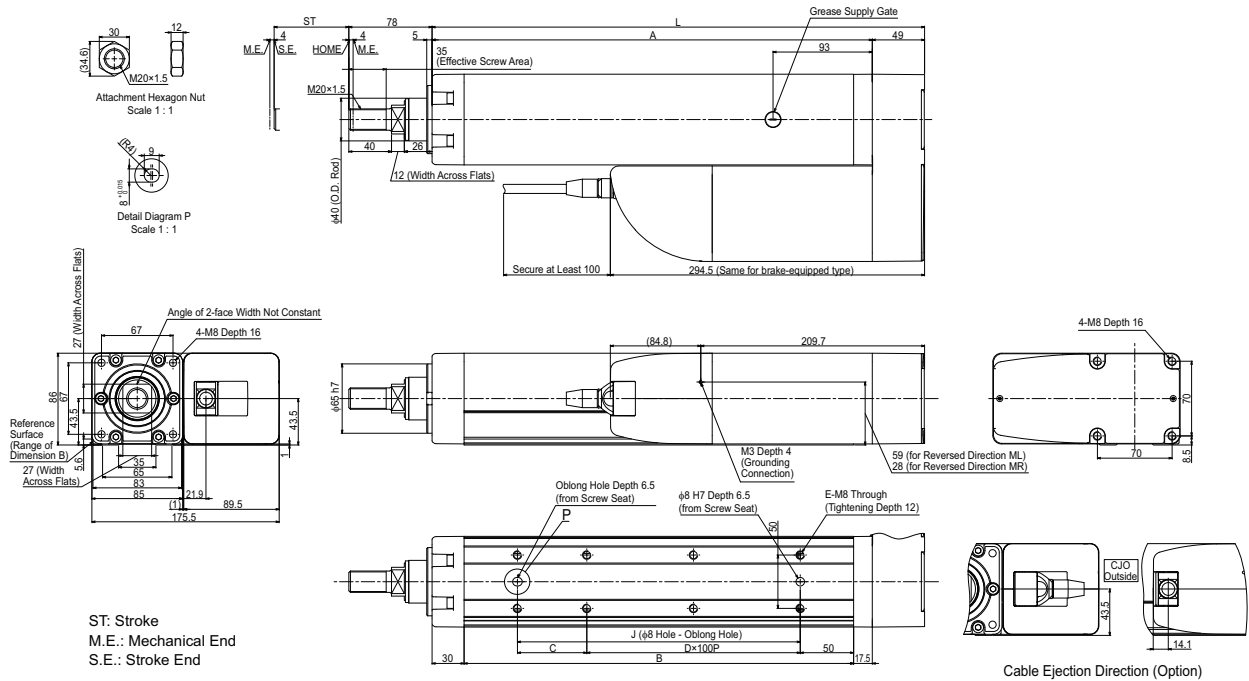
(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).



Stroke	L	A	B	D	E	G	H	J	K	M	N	Mass [kg]	
												w/o Brake	With Brake
70	279.5	247	188	0	4	1	4	0	0	2	0	4.8	4.9
120	329.5	297	238	1	6	1	4	85	0	2	1	5.0	5.1
170	379.5	347	288	1	6	2	6	85	100	3	1	5.3	5.4
220	429.5	397	338	2	8	2	6	185	200	3	1	5.6	5.7
270	479.5	447	388	2	8	3	8	185	200	3	1	5.9	6.0
320	529.5	497	438	3	10	3	8	285	300	3	1	6.1	6.2
370	579.5	547	488	3	10	4	10	285	300	3	1	6.4	6.5
420	629.5	597	538	4	12	4	10	385	400	3	1	6.7	6.8
470	679.5	647	588	4	12	5	12	385	400	3	1	7.0	7.1
520	729.5	697	638	5	14	5	12	485	500	3	1	7.2	7.3

6.15 Standard Specification RCP6-RRA8R Left Reversed (Model No.: ML)

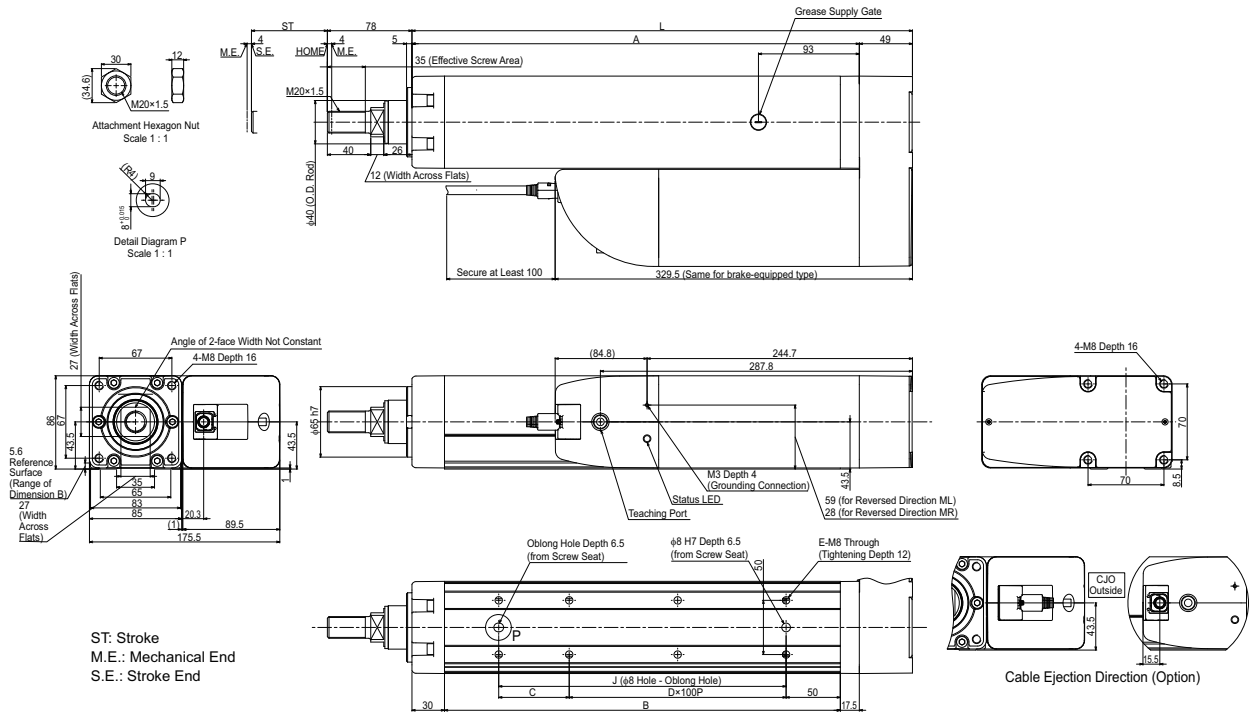
(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).



Stroke	L	A	B	C	D	E	J	Mass [kg]	
								w/o Brake	With Brake
50	311.5	262.5	215	115	0	4	115	7.9	8.1
100	361.5	312.5	265	65	1	6	165	8.3	8.6
150	411.5	362.5	315	115	1	6	215	8.8	9.1
200	461.5	412.5	365	65	2	8	265	9.3	9.6
250	511.5	462.5	415	115	2	8	315	9.8	10.0
300	561.5	512.5	465	65	3	10	365	10.2	10.5
350	611.5	562.5	515	115	3	10	415	10.7	11.0
400	661.5	612.5	565	65	4	12	465	11.2	11.5
450	711.5	662.5	615	115	4	12	515	11.7	11.9
500	761.5	712.5	665	65	5	14	565	12.1	12.4
550	811.5	762.5	715	115	5	14	615	12.6	12.9
600	861.5	812.5	765	65	6	16	665	13.1	13.4
650	911.5	862.5	815	115	6	16	715	13.6	13.8
700	961.5	912.5	865	65	7	18	765	14.0	14.3

6.16 Built-in Controller Specification RCP6S-RRA8R Left Reversed (Model No.: ML)

(Note) The motor reversed direction in the drawing below becomes right for the right-reversed type (Model Code: MR).



Stroke	L	A	B	C	D	E	J	Mass [kg]	
								w/o Brake	With Brake
50	311.5	262.5	215	115	0	4	115	8.1	8.3
100	361.5	312.5	265	65	1	6	165	8.5	8.8
150	411.5	362.5	315	115	1	6	215	9.0	9.3
200	461.5	412.5	365	65	2	8	265	9.5	9.8
250	511.5	462.5	415	115	2	8	315	10.0	10.2
300	561.5	512.5	465	65	3	10	365	10.4	10.7
350	611.5	562.5	515	115	3	10	415	10.9	11.2
400	661.5	612.5	565	65	4	12	465	11.4	11.7
450	711.5	662.5	615	115	4	12	515	11.9	12.1
500	761.5	712.5	665	65	5	14	565	12.3	12.6
550	811.5	762.5	715	115	5	14	615	12.8	13.1
600	861.5	812.5	765	65	6	16	665	13.3	13.6
650	911.5	862.5	815	115	6	16	715	13.8	14.0
700	961.5	912.5	865	65	7	18	765	14.2	14.5

7. Life

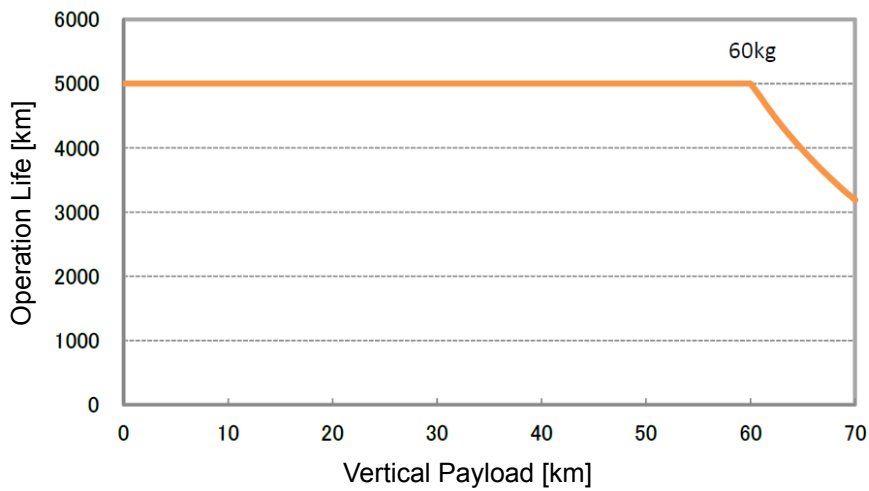
7.1 RRA4C, RRA4R, RRA6C, RRA6R, RRA7C and RRA7R

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

7.2 RRA8C and RRA8R

The life of Lead 10 and 20 is assumed 5,000km (reference) under the condition of maximum payload, maximum acceleration and deceleration.

The graph below shows the relation of payload and life.



8. Warranty

8.1 Warranty Period

One of the following periods, whichever is shorter:

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

8.2 Scope of the Warranty

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

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

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

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

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

8.3 Honoring the Warranty

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

8.4 Limited Liability

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

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

- (1) If our product is combined with another product or any system, device, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules. The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc. In such a case we will not be liable for the conformance of our product with the applicable standards, etc.
- (2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact us if you must use our product for any of these applications:
 - [1] Medical equipment 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.

8.6 Other Items Excluded from Warranty

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

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

Change History

Revision Date	Description of Revision								
2016.01	First edition								
2016.03	1B edition <ul style="list-style-type: none"> • P.20 Correction Number of encoder pulse → 800 • P.54 Dimensions are added to the figure of flange for RRA8C/RRA8R. • P.78 and P.79 “In the delivery of IAI, the bolts are glued.” is deleted. • P.78 to P.80 The strokes for which front flange (option) cannot be installed are changed. • P.90 and P.91 The contents about grease supply on rod sliding surface and cleaning are added. • P.95 Maker and type of belt for RRA4R to RRA7R are changed. • P.102 “Apply grease to the coupling.” is deleted. 								
2016.04	1C edition <ul style="list-style-type: none"> • P.39, P.42, P.45 and P.48 Correction Rod Tip Dynamic Allowable Load [N] → [kg] 								
2016.05	1D edition <ul style="list-style-type: none"> • P.99 Caution notes added for static electricity at motor replacement work 								
2016.06	Second edition <p>Specifications of when high-output setting is ineffective added</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">6. External Dimensions</td> <td>RCP6(S)-RRA6C/R, RRA7C/R</td> </tr> <tr> <td></td> <td>Tolerance change in oblong hole dimension +0.010 → +0.012</td> </tr> <tr> <td></td> <td>RCP6(S)-RRA6C/R, RRA8C/R</td> </tr> <tr> <td></td> <td>Tolerance change in oblong hole dimension +0.010 → +0.015</td> </tr> </table> <ul style="list-style-type: none"> • P.50, 53, 56, 59 Unit changed from kg to N for the dynamic allowable load on rod tip • P.64 Change made to graph of duty 	6. External Dimensions	RCP6(S)-RRA6C/R, RRA7C/R		Tolerance change in oblong hole dimension +0.010 → +0.012		RCP6(S)-RRA6C/R, RRA8C/R		Tolerance change in oblong hole dimension +0.010 → +0.015
6. External Dimensions	RCP6(S)-RRA6C/R, RRA7C/R								
	Tolerance change in oblong hole dimension +0.010 → +0.012								
	RCP6(S)-RRA6C/R, RRA8C/R								
	Tolerance change in oblong hole dimension +0.010 → +0.015								
2016.08	2B edition <ul style="list-style-type: none"> • P.105, 106 Amount of Grease Supply (Reference) added • P.134, 135 Correction made to ejecting position for Home ME 								



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