

ROBO Cylinder[®]

Long Stroke Gripper

RCP6-GRST6C/GRST7C
RCP6S-GRST6C/GRST7C
RCP6-GRST6R/GRST7R
RCP6S-GRST6R/GRST7R

Instruction Manual First Edition ME3787-1J



Specifications	ch. 1
Installation	ch. 2
Connecting with the Controller	ch. 3
Operation	ch. 4
Maintenance and Inspection	ch. 5
External Dimensions	ch. 6
Life	ch. 7
Warranty	ch. 8

Please Read Before Use

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, providing the information you need in order 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.

Please download the user's manual from our website.

You can download it free of charge. User registration is required for the first time downloading.

URL : www.iai-robot.co.jp/data_dl/CAD_MANUAL/

When using the product, print out of the necessary portions of the relevant manual, or please display it on your computer, tablet terminal, etc. so that you can check it immediately.

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

[Important]

- This instruction manual is an original document dedicated for this product.
- This product cannot be used in ways not shown in this instruction manual. IAI shall not be liable for any result whatsoever arising from the use of the product in any other way than what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of product improvement.
- If any issues arise regarding the information contained in this instruction manual, contact our customer center or the nearest sales office.
- Use or reproduction of this instruction manual in full or in part without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the text are registered trademarks.

RCP6 Long Stroke Gripper Type Instruction Manual Configuration

Product name	Instruction manual name	Control number
RCP6/RC6S Long Stroke Gripper	First Step Guide	ME3768
RCP6/RC6S Long Stroke Gripper	Instruction Manual (this document)	ME3787
PCON-CB/CGB Controller	PCON-CB/CGB Controller Instruction Manual	ME0342
PCON-CYB/PLB/POB Controller	PCON-CYB/PLB/POB Controller Instruction Manual	ME0353
MCON-C/CG Controller	MCON-C/CG Controller Instruction Manual	ME0341
RCON Controller	RCON Controller Instruction Manual	ME0384
MSEL-PC/PG Controller	MSEL-PC/PG Controller Instruction Manual	ME0336
PC Compatible Software for RC/EC	RCM-101-MW/RCM-101-USB Instruction Manual	ME0155
PC Compatible Software for XSEL	IA-101-X-MW/IA-101-X-USB Instruction Manual	ME0154
PC Teaching Software	IA-OS First Step Guide	ME0391
Touch Panel Teaching Pendant	TB-01/01D/01DR Instruction Manual Applicable for Position Controller	ME0324
Touch Panel Teaching Pendant	TB-02/02D Instruction Manual Applicable for Position Controller	ME0355
Touch Panel Teaching Pendant	TB-03 Instruction Manual Applicable for Position Controller	ME0376
Touch Panel Teaching Pendant	TB-01/01D/01DR Instruction Manual Applicable for Program Controller	ME0325
Touch Panel Teaching Pendant	TB-02/02D Instruction Manual Applicable for Program Controller	ME0356
Touch Panel Teaching Pendant	TB-03 Instruction Manual Applicable for Program Controller	ME0377

Contents

Safety Guide	Intro-1
Precautions for Handling	Intro-8
International Standard Compliance	Intro-11
Names of the Parts	Intro-12

Chapter 1 Specifications

1.1	Checking the Product	1-1
1.1.1	Parts	1-1
1.1.2	How to Read the Model Nameplate	1-2
1.1.3	How to Read the Model Number	1-3
1.2	Specifications	1-4
1.2.1	Specifications	1-4
1.2.2	Duty Ratio	1-10
1.3	Operating Conditions	1-11
1.4	Option	1-17
1.4.1	With Brake (Model Code: B)	1-17
1.4.2	Cable Exit Direction Changed (Model Code: CJT, CJR, C JL, CJB, CJO)	1-17
1.4.3	Motor Reversed Direction (Model Code: ML, MR)	1-17
1.4.4	Finger Attachment Installation Tool (Model Code: MJF)	1-18
1.4.5	Reversed-home Specification (Model Code: NM)	1-19
1.4.6	Slider Roller Specification (Model Code: SR)	1-19
1.4.7	Slider Spacer (Model Code: SS)	1-19

Chapter 2 Installation

2.1	Transportation	2-1
2.1.1	Handling of the Robot	2-1
2.1.2	Handling in Condition of being assembled in Machinery Equipment (System)	2-2
2.2	Installation and Storage/preservation Environment	2-3
2.2.1	Installation Environment	2-3
2.2.2	Storage/preservation Environment	2-4
2.3	How to Install	2-5
2.3.1	Installation Orientation	2-5
2.3.2	Precautions Regarding Stainless Steel Sheet	2-6
2.3.3	Installation Surface	2-7
2.3.4	Installation of the Main Unit	2-8
2.3.5	Finger Attachment, Mounting Transported Objects	2-12
2.3.6	Mounting on Finger Attachment Installation Tool (MJF Option)	2-13

Chapter 3 Connecting with the Controller

3.1	Connecting with the Controller	3-1
3.2	Motor • Encoder Cables	3-7
3.2.1	Dedicated connection cable for other than RCON, RSEL, and RCM-P6PC	3-7
3.2.2	Dedicated connection cable for RCON, RSEL, and RCM-P6PC	3-9

Chapter 4 Operation

4.1	Operation of the Fingers	4-1
4.1.1	Movement Stroke	4-1
4.1.2	Home Return Direction	4-1
4.1.3	Position Indication	4-1
4.1.4	Indication of Speed and Acceleration	4-1
4.2	Release of the Gripped Work Piece	4-2

Chapter 5 Maintenance and Inspection

5.1	Precautions for Maintenance and Inspection Work	5-1
5.2	Inspection	5-3
5.2.1	Inspection items and schedule	5-3
5.3	Visual Inspection	5-4
5.3.1	External Visual Inspection	5-4
5.3.2	Internal Visual Inspection	5-5
5.4	Cleaning	5-8
5.4.1	External Cleaning	5-8
5.4.2	Internal Cleaning	5-8
5.5	Grease Supply	5-9
5.5.1	Grease used	5-9
5.5.2	Grease Supply procedure	5-10
5.6	How to Replace Components	5-15
5.6.1	Stainless Steel Sheet Replacement/adjustment	5-15
5.6.2	Timing belt Replacement/adjustment	5-18
5.6.3	Replacement Work of Motor Unit and Coupling Spacer	5-23

Chapter 6 External Dimensions

6.1	External Dimensions	6-1
6.1.1	Standard Specification RCP6-GRST6C	6-1
6.1.2	Built-in Controller Specification RCP6S-GRST6C	6-2
6.1.3	Standard Specification RCP6-GRST7C	6-3
6.1.4	Built-in Controller Specification RCP6S-GRST7C	6-4
6.1.5	Standard Specification RCP6-GRST6R	6-5
6.1.6	Built-in Controller Specification RCP6S-GRST6R	6-6
6.1.7	Standard Specification RCP6-GRST7R	6-7
6.1.8	Built-in Controller Specification RCP6S-GRST7R	6-8

Chapter 7 Life

7.1 Concept of Gripper Life	7-1
-----------------------------------	-----

Chapter 8 Warranty

8.1 Warranty period	8-1
8.2 Scope of the warranty	8-1
8.3 Honoring the warranty	8-1
8.4 Limited liability	8-2
8.5 Conformance with applicable standards/regulations, etc., and application conditions	8-2
8.6 Limited liability	8-2

Index	Post-1
-------------	--------

Revision history	Post-3
------------------------	--------

Safety Guide

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

Safety Precautions for Our Products

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

No.	Operation Description	Description
1	Model Selection	- This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications. 1) Medical equipment used to maintain, control or otherwise affect human life or physical health. 2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility) 3) Important safety parts of machinery (Safety device, etc.) - Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product. - Do not use it in any of the following environments. 1) Location where there is any inflammable gas, inflammable object or explosive 2) Place with potential exposure to radiation 3) Location with the ambient temperature or relative humidity exceeding the specification range 4) Location where radiant heat is added from direct sunlight or other large heat source 5) Location where condensation occurs due to abrupt temperature changes 6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid) 7) Location exposed to significant amount of dust, salt or iron powder 8) Location subject to direct vibration or impact - For an actuator used in vertical orientation, select a model which is equipped with a brake. If selecting a model with no brake, the moving part may drop when the power is turned OFF and may cause an accident such as an injury or damage on the work piece.

No.	Operation Description	Description
2	Transportation	• When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane. • When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • When in transportation, consider well about the positions to hold, weight and weight balance and pay special attention to the carried object so it would not get hit or dropped. • Transport it using an appropriate transportation measure. The actuators available for transportation with a crane have eyebolts attached or there are tapped holes to attach bolts. Follow the instructions in the instruction manual for each model. • Do not step or sit on the package. • Do not put any heavy thing that can deform the package, on it. • When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work. • When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit. • Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength. • Do not get on the load that is hung on a crane. • Do not leave a load hung up with a crane. • Do not stand under the load that is hung up with a crane.
3	Storage and Preservation	• The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation. • Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.
4	Installation and Start	(1) Installation of Robot Main Body and Controller, etc. • Make sure to securely hold and fix the product (including the work part). A fall, drop or abnormal motion of the product may cause a damage or injury. Also, be equipped for a fall-over or drop due to an act of God such as earthquake. • Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life. • When using the product in any of the places specified below, provide a sufficient shield. 1) Location where electric noise is generated 2) Location where high electrical or magnetic field is present 3) Location with the mains or power lines passing nearby 4) Location where the product may come in contact with water, oil or chemical droplets

No.	Operation Description	Description
4	Installation and Start	(2) Cable Wiring ● Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. ● Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error. ● Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. ● When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction. ● Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product. ● Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire. (3) Grounding ● The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation. ● For the ground terminal (PE) on the AC power cable of the controller and the grounding plate in the control panel, make sure 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 standards and criteria). For detail, follow the description in [an instruction manual of each controller or controller built-in actuator]. ● Conduct functional grounding on the FG terminal for a controller supplying 24V DC or a controller built-in type actuator. In order to minimize influence to mechanical operation given by electromagnetic interference (noise) to an electrical device or insulation failure, conduct grounding on a terminal or a conductor that is electrically stable. The reference impedance should be Type D (Former Class 3, ground resistance 100Ω or less).

No.	Operation Description	Description
4	Installation and Start	(4) Safety Measures • When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot’s movable range. When the robot under operation is touched, it may result in death or serious injury. • Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation. • Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product. • Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input. • When the installation or adjustment operation is to be performed, give clear warnings such as “Under Operation; Do not turn ON the power!” etc. Sudden power input may cause an electric shock or injury. • Take the measure so that the work part is not dropped in power failure or emergency stop. • Wear protection gloves, goggle or safety shoes, as necessary, to secure safety. • Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.
5	Teaching	• When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well. • When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. • When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. • Place a sign “Under Operation” at the position easy to see. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.

No.	Operation Description	Description
6	Trial Operation	• When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation. • When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation. • Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc. • Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.
7	Automatic Operation	• Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence. • Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication. • Make sure to operate automatic operation start from outside of the safety protection fence. • In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product. • When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.

No.	Operation Description	Description
8	Maintenance and Inspection	• When the work is carried out with 2 or more persons, make it clear who is to be the “leader” and who to be the “follower(s)” and communicate well with each other to ensure the safety of the workers. • Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well. • When the work is to be performed inside the safety protection fence, basically turn OFF the power switch. • When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. • When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. • Place a sign “Under Operation” at the position easy to see. • For the grease for the guide or ball screw, use appropriate grease according to the instruction manual for each model. • Do not perform the dielectric strength test. Failure to do so may result in a damage to the product. • When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. • The slider or rod may get misaligned OFF the stop position if the servo is turned OFF. Be careful not to get injured or damaged due to an unnecessary operation. • Pay attention not to lose the removed cover or screws, and make sure to put the product back to the original condition after maintenance and inspection works. Use in incomplete condition may cause damage to the product or an injury. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.
9	Modification and Dismantle	• Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.
10	Disposal	• When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste. • When removing the actuator for disposal, pay attention to drop of components when detaching screws. • Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.
11	Other	• Do not come close to the product or the harnesses if you are a person who requires a support of medical devices such as a pacemaker. Doing so may affect the performance of your medical device. • See Overseas Specifications Compliance Manual to check whether complies if necessary. • For the handling of actuators and controllers, follow the dedicated instruction manual of each unit to ensure the safety. • Using the devise in a way not indicated by IAI may lose the protection performance equipped to the device.

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

Precautions for Handling

1. The Safety Guide attached with the product is intended to permit safe use of the product and thus to prevent risks and property damage. Be sure to read it before handling the product.

2. Do not attempt any handling or operation that is not indicated in this instruction manual.

3. Make sure to secure the actuator properly in accordance with this instruction manual.

If the actuator is not securely fixed, this may lead to abnormal noise, vibration, breakdown or shortened product life.

4. Make sure to observe the usage conditions and environment of the product.

Operation outside the warranty could cause decreased performance or product breakdown.

Use within the allowable range for each item.

Item	Cautions for use	Problems or breakdowns which may occur if the allowable range is exceeded
Speed and acceleration/deceleration	Use within the allowable range	May lead to abnormal noise, vibration, breakdown, or shortened product life.
Allowable load moment	Use within the allowable range	May lead to abnormal noise, vibration, breakdown, or shortened product life. In extreme cases, flaking may occur on the guide.
Overhang length		

5. Pay attention to the finger moving part to avoid contamination getting in.

Contamination may get pinched and cause damage on components.

6. When it is necessary to remove a workpiece while the power is turned OFF, do not attempt to pull the workpiece forcefully to remove it.

Either twist the open/close screw or take off the finger attachment on one side to remove the workpiece.

Pulling the workpiece forcefully to remove it may cause damage to the machinery.

Refer to [4.2 Release of the Gripped Work Piece]

7. Remove a workpiece in case of stop for a long period of time.

Leaving a workpiece remained for a long time may cause performance drop and bad impact to the guides.

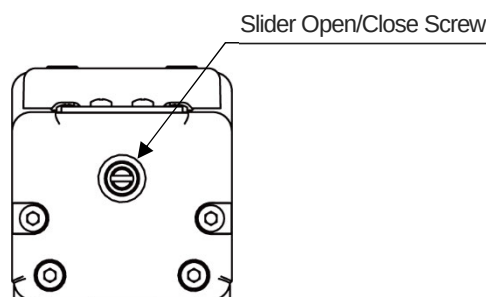
8. Lead 2 possesses the self-lock feature, but Lead 8 does not have the self-lock feature.

Lead 2 is constructed to maintain the workpiece grip force with the self-lock feature on the feed screw even if the servo gets turned OFF or the power of the controller gets turned OFF, but Lead 8 does not have the self-lock feature.

When using Lead 8, consider an equipment construction that would not require grip force to be remained when the servo gets turned OFF or the controller power gets turned OFF. If a brake feature is required, select an option equipped with a brake. However, it should be considered in the condition that remaining of the workpiece grip force is not to be asked.

9. When equipped with a brake (option), do not attempt to twist the slider open/close screw while the brake is working.

It could shorten the brake life.



10. PCON-CB and MCON Controller (Option: T) are capable for switching between high-output setting valid and invalid with the parameter setting, but use it with setting high-output setting invalid.

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

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

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

Controller	Parameter	Remarks
PCON-CB	No.152 High-output Setting 0: Ineffective, 1: Effective	
MCON	No.152 High-output Setting 0: Ineffective, 1: Effective	

International Standard Compliance

This actuator complies with the following overseas standard.

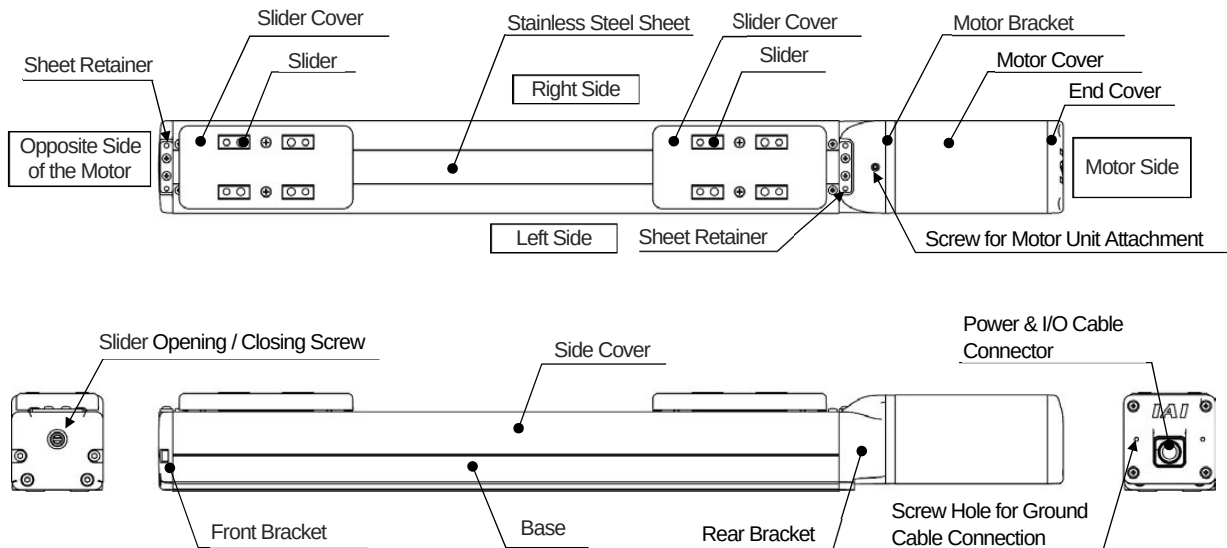
Refer to the Overseas Standard Compliance Manual (ME0287) for more detailed information.

RoHS3 Directive	CE Marking
○	○

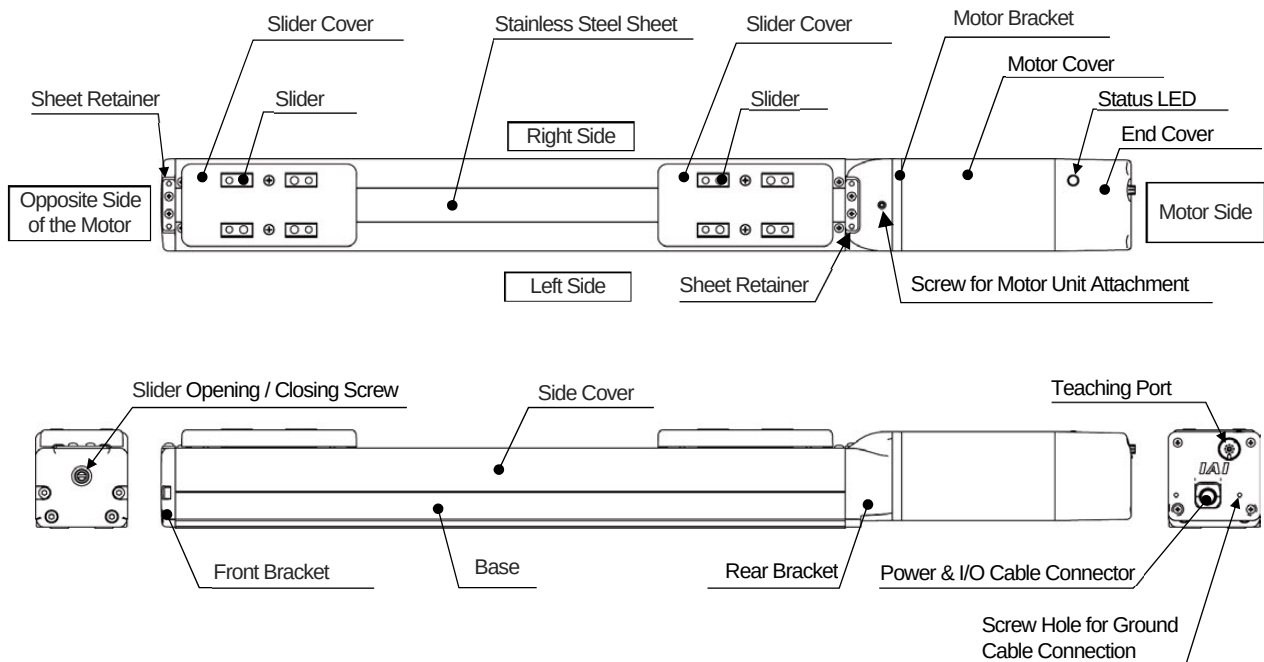
Names of the Parts

In this manual, the actuator left/right sides and motor/opposite sides are shown as in the figure below.

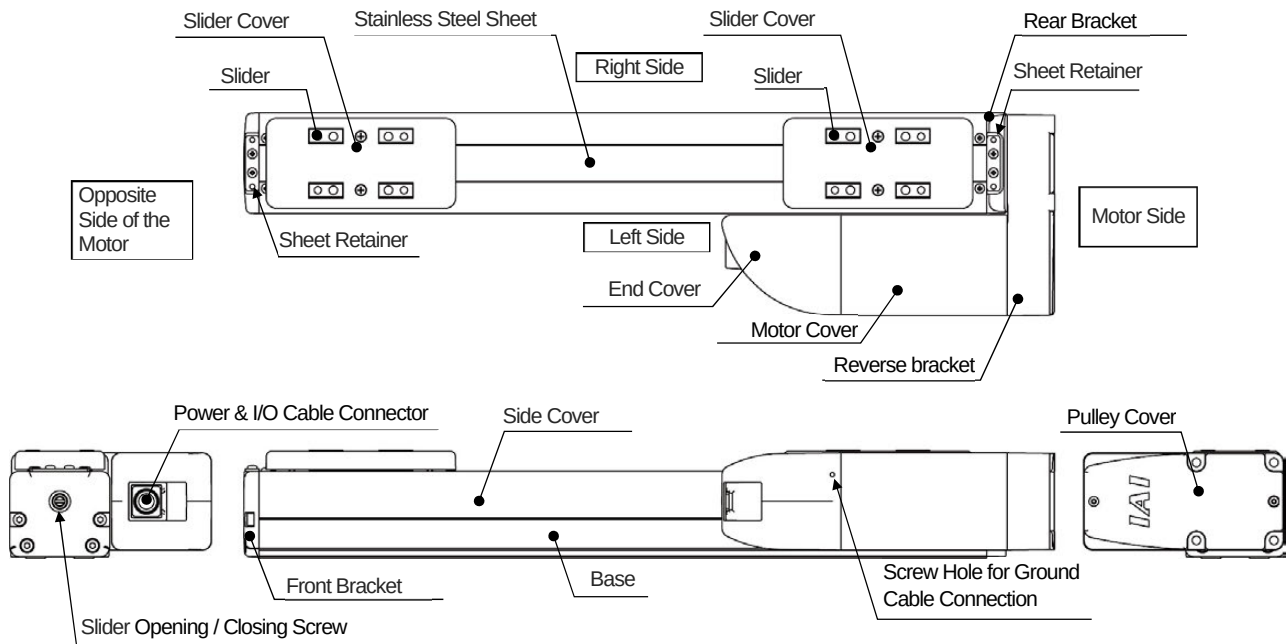
Standard Specification Motor Straight Type



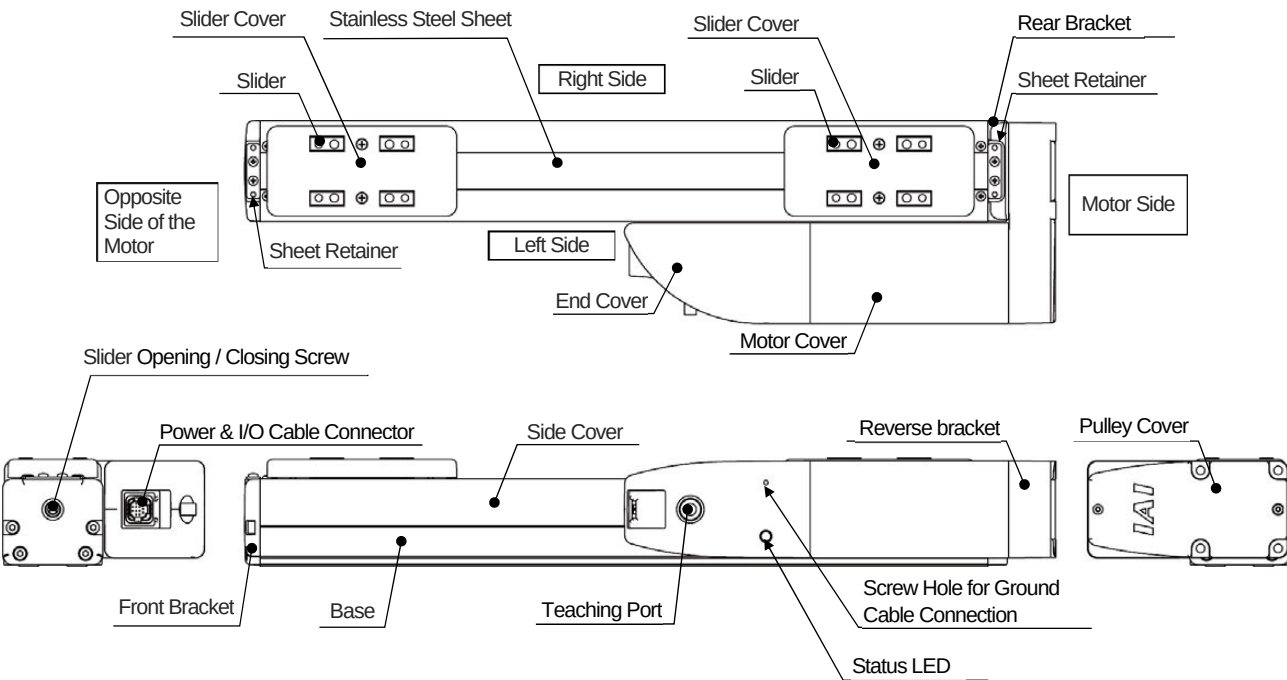
Built-in Controller Specification Motor Straight Type

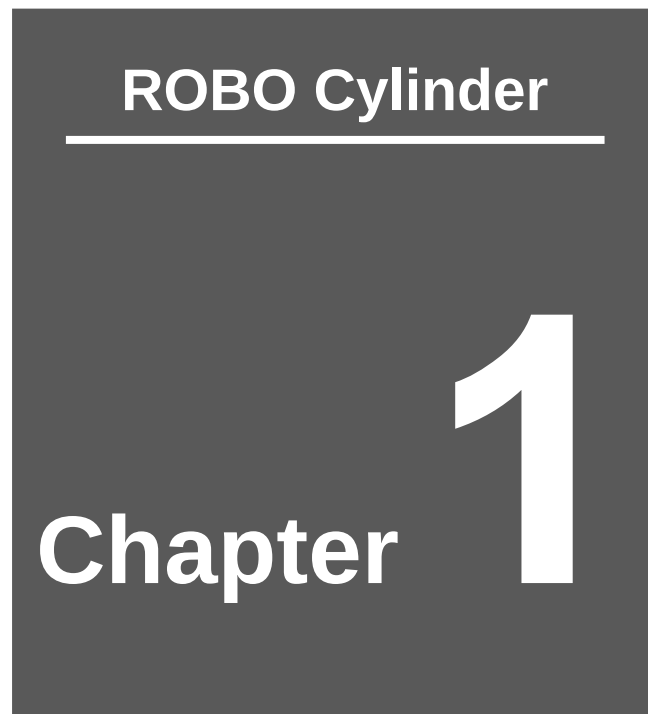


Standard Specification Motor Reversing Type



Built-in Controller Specification Motor Reversing Type





Specifications

1.1	Checking the Product	1-1
1.1.1	Parts	1-1
1.1.2	How to Read the Model Nameplate	1-2
1.1.3	How to Read the Model Number	1-3
1.2	Specifications	1-4
1.2.1	Specifications	1-4
1.2.2	Duty Ratio	1-10
1.3	Operating Conditions	1-11
1.4	Option	1-17
1.4.1	With Brake (Model Code: B)	1-17
1.4.2	Cable Exit Direction Changed (Model Code: CJT, CJR, C JL, CJB, CJO)	1-17
1.4.3	Motor Reversed Direction (Model Code: ML, MR)	1-17
1.4.4	Finger Attachment Installation Tool (Model Code: MJF)	1-18
1.4.5	Reversed-home Specification (Model Code: NM)	1-19
1.4.6	Slider Roller Specification (Model Code: SR)	1-19
1.4.7	Slider Spacer (Model Code: SS)	1-19

1.1 Checking the Product

1.1.1 Parts

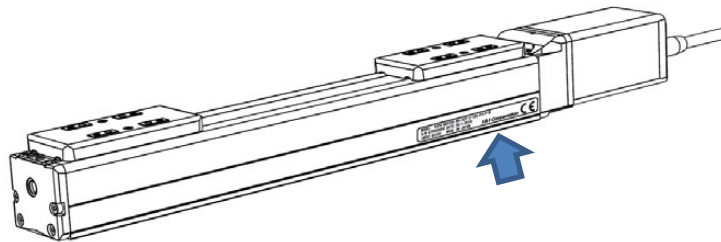
The following table shows the product configuration for the standard specification.
See the component list for the details of the enclosed components. If you find any fault or missing parts, contact your local IAI distributor.

Actuator	
Actuator Quantity 1 	
Accessories	
Motor • Encoder Cable Quantity 1 Motor Encoder Integrated Cable or Motor Encoder Integrated Robot Cable 	Safety Guide Quantity 1 M0194 

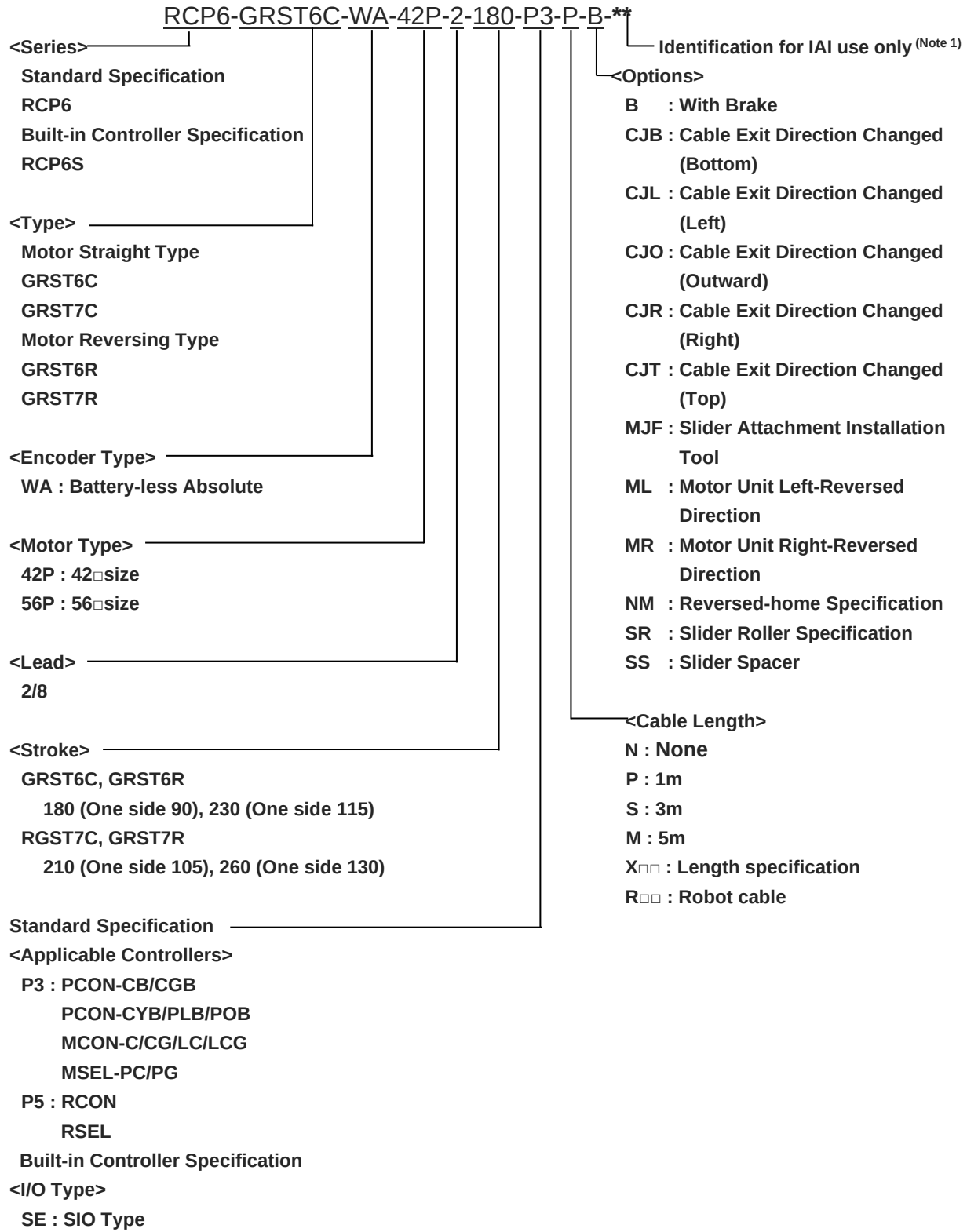
1.1.2 How to Read the Model Nameplate

Model	→ MODEL: RCP6-GRST6C-WA-42P-2-180-P3-P-B
Serial number	→ S/N: A70000000 DATE: 30/1/2018 INPUT: DC24V MADE IN JAPAN
IAI Corporation 	

[Nameplate Position]



1.1.3 How to Read the Model Number



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

1.2 Specifications

1.2.1 Specifications

[1] RCP6(S)-GRST6C, GRST6R

[Stroke, Maximum Grip Force]

Model	Lead (mm)	Stroke (mm)	Maximum Grip force (N)
RCP6(S)-GRST6C-WA-42P-2-①-②-③-④ RCP6(S)-GRST6R-WA-42P-2-①-②-③-④	2	180 230 (One side 90), (One side 115)	310 (One side 155)
RCP6(S)-GRST6C-WA-42P-8-①-②-③-④ RCP6(S)-GRST6R-WA-42P-8-①-②-③-④	8	180 230 (One side 90), (One side 115)	110 (One side 55)

Legend ①: Stroke ②: Actuator Cable length ③: Option

[Opening and Closing Maximum Speed] Stroke common

Lead (mm)	Opening and Closing Maximum Speed (mm/s)
2	45 (One side)
8	180 (One side)

(Note) It may not reach the maximum velocity in some conditions for the operation stroke and acceleration.

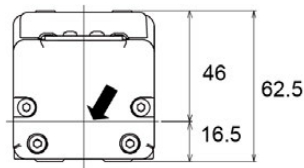
[Actuator Specifications]

Item		Content
Drive system		Trapezoid screw
Positioning repeatability		±0.01mm
Backlash	Lead 2	0.25mm or less
	Lead 8	0.3mm or less
Lost motion	Lead 2	0.25mm or less
	Lead 8	0.3mm or less
Allowable static moment		Ma : 48.5N·m Mb : 69.3N·m Mc : 103N·m
Allowable dynamic moment		Ma : 11.6N·m Mb : 16.6N·m Mc : 24.6N·m
Brake grip force (option)	Lead 2	-
	Lead 8	5.5N
Ambient operating temperature/humidity		0 to 40°C, 85%RH or less (Non-condensing)

(Note) Lead 2 possesses the self-locking feature, which maintains the grip force on a workpiece even after the power gets turned off.

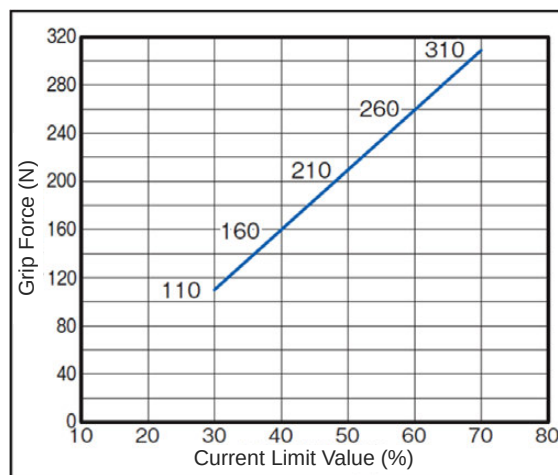
[Allowable Moment Reference Position for Offset]

Calculate M_a and M_c moment based on the arrow position.

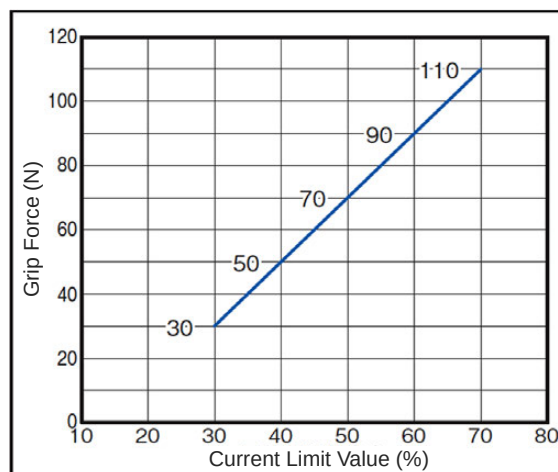
**[Relation between the Current Limit Value and the Grip Force]**

The graph shows the total grip force of both fingers when the grip point distance (L and H) is 0.

Lead 2



Lead 8

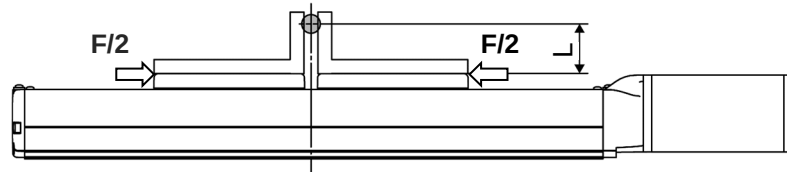
**Caution**

- The dispersion of grip force should be +/-25% (F.S.) (reference).



Caution

- It is a reference when assuming the speed is 5mm/s (lead 2), 10mm/s (lead 8).
- The maximum grip force shown in the table is a value under the conditions below.
Total value of grip force of both slides at the top surface of the slides (grip point = 0mm, overhang = 0mm)



- The relation between the current limit value and the grip force is a reference and the grip force could vary in the actual use.
The variance of the gripping becomes large when the current limit value is low.
- Use the product within the range in the graph for the current limit value. The gripping will not be stable if used below 30%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
- For CON-system controllers such as PCON, when the approach speed to the pressing start position (setting in the position table) is 5mm/s or less, pressing will be performed with the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
For SEL-system controllers, such as MSEL, press at the speed set by PAPR instruction, regardless of the approach speed up to the pressing start position.

[2] RCP6(S)-GRST7C, GRST7R**[Stroke, Maximum Grip Force]**

Model	Lead (mm)	Stroke (mm)	Maximum Grip force (N)
RCP6(S)-GRST7C-WA-56P-2-①-②-③-④ RCP6(S)-GRST7R-WA-56P-2-①-②-③-④	2	210 260 (One side 105), (One side 130)	880 (One side 440)
RCP6(S)-GRST7C-WA-56P-8-①-②-③-④ RCP6(S)-GRST7R-WA-56P-8-①-②-③-④	8	210 260 (One side 105), (One side 130)	340 (One side 170)

Legend ①: Stroke ②: Actuator Cable length ③: Option

[Opening and Closing Maximum Speed] Stroke common

Lead (mm)	Opening and Closing Maximum Speed (mm/s)
2	45 (One side)
8	180 (One side) << 140 (One side) >>

(Note) It may not reach the maximum velocity in some conditions for the operation stroke and acceleration.

(Note) In brackets << >> shows the specifications in used ambient operating temperature at 5°C or lower.

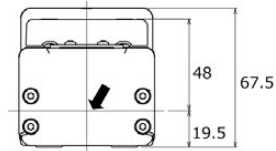
[Actuator Specifications]

Item		Content
Drive system		Trapezoid screw
Positioning repeatability		±0.01mm
Backlash	Lead 2	0.25mm or less
	Lead 8	0.3mm or less
Lost motion	Lead 2	0.25mm or less
	Lead 8	0.3mm or less
Allowable static moment		Ma : 115N·m Mb : 115N·m Mc : 229N·m
Allowable dynamic moment		Ma : 44.7N·m Mb : 44.7N·m Mc : 89.1N·m
Brake grip force (option)	Lead 2	-
	Lead 8	17N
Ambient operating temperature/humidity		0 to 40°C, 85%RH or less (Non-condensing)

(Note) Lead 2 possesses the self-locking feature, which maintains the grip force on a workpiece even after the power gets turned off.

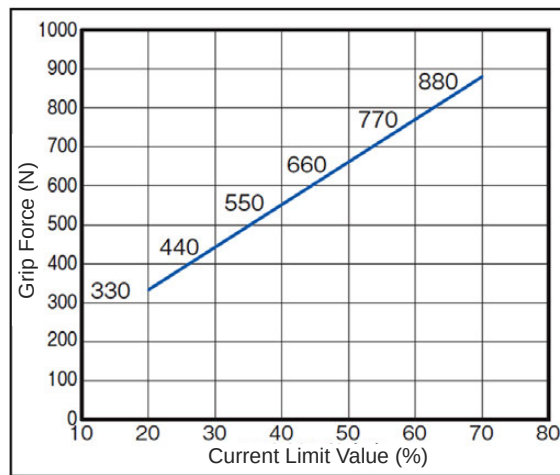
[Allowable Moment Reference Position for Offset]

Calculate M_a and M_c moment based on the arrow position.

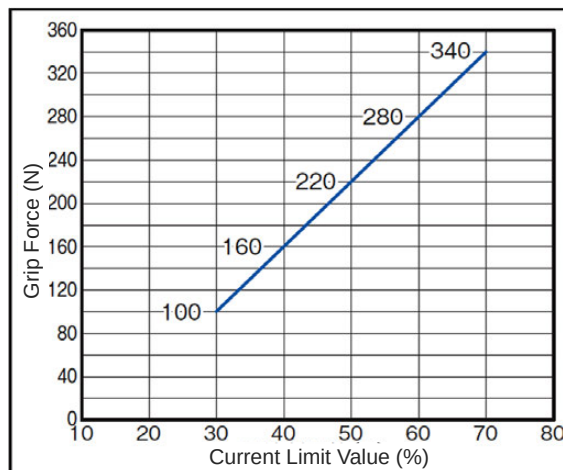
**[Relation between the Current Limit Value and the Grip Force]**

The graph shows the total grip force of both fingers when the grip point distance (L and H) is 0.

Lead 2



Lead 8

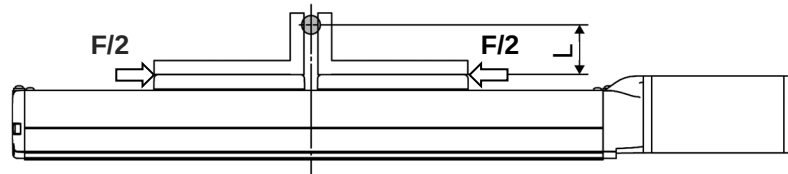
**Caution**

- The dispersion of grip force should be +/-25% (F.S.) (reference).



Caution

- It is a reference when assuming the speed is 5mm/s (lead 2), 10mm/s (lead 8).
- The maximum grip force shown in the table is a value under the conditions below.
Total value of grip force of both slides at the top surface of the slides (grip point = 0mm, overhang = 0mm)



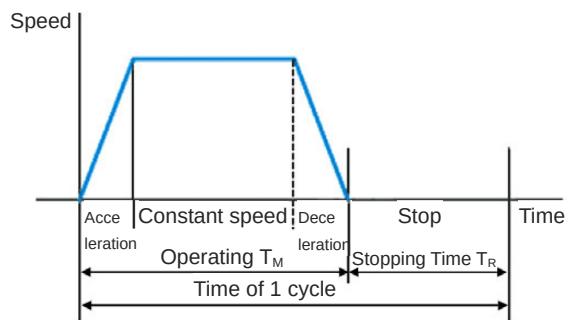
- The relation between the current limit value and the grip force is a reference and the grip force could vary in the actual use. The variance of the gripping becomes large when the current limit value is low.
- Use the product within the range in the graph for the current limit value. The gripping will not be stable if used below 20% (lead 2), below 30% (lead 8). 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.
- For CON-system controllers such as PCON, when the approach speed to the pressing start position (setting in the position table) is 5mm/s or less, pressing will be performed with the approach speed in such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using. For SEL-system controllers, such as MSEL, press at the speed set by PAPR instruction, regardless of the approach speed up to the pressing start position.

1.2.2 Duty Ratio

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

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

D :Duty ratio
 T_M :Operating time (including pressing operation)
 T_R :Stop time



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

1.3 Operating Conditions

It is necessary to satisfy the conditions stated below to use the product. Conduct the following calculation to make sure it is satisfied.

[Procedure 1] Check for the necessary grip force and transportable work piece mass



[Procedure 2] Check for the vertical allowable load of the fingers and allowable moment

[Procedure 1] Check for the necessary grip force and transportable work piece mass

If a work piece is to be gripped on the fingers with the friction force created by the grip force, the formula to calculate the necessary grip force is as follows;

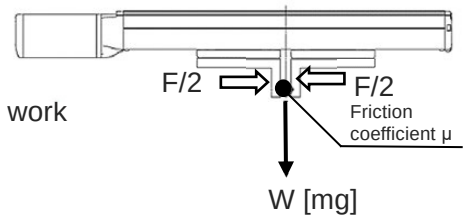
(1) In case of ordinary transportation

F : Grip force (N).....Sum of pressing force on each finger

μ : Coefficient of static friction between finger attachment and work piece

m : Mass of work piece (kg)

g : Gravitational acceleration ($= 9.8\text{m/s}^2$)



The condition to grip the work piece statically and that the work piece would not drop is;

$$F\mu > W$$

$$F > \frac{mg}{\mu}$$

The necessary grip force assuming the safety factor recommended for ordinary transportation is 2 should be;

$$F > \frac{mg}{\mu} \times 2 \text{ (safety factor)}$$

When coefficient of friction is $\mu 0.1$ to 0.2 ;

$$F > \frac{mg}{0.1 \text{ to } 0.2} \times 2 = (10 \text{ to } 20) \times mg$$

- * The mass of a transportable work piece will get higher as the coefficient of static friction is higher.

However it is necessary to that enables it to obtain a grip force of 10 to 20 times or more to ensure the safety.

For ordinary work piece transportation;

Necessary grip force $\Rightarrow$ 10 to 20 times or more of work piece mass

Transportable work piece mass $\Rightarrow$ 1/10 to 1/20 or less of grip force

- (2) In case of high acceleration/deceleration speed or a big impact is applied to the work piece during transportation

High inertial force, in addition to the gravity, will be applied to the work piece. In such cases, consider an even higher safety factor if it is necessary.

When high acceleration/deceleration speed or a big impact is applied;

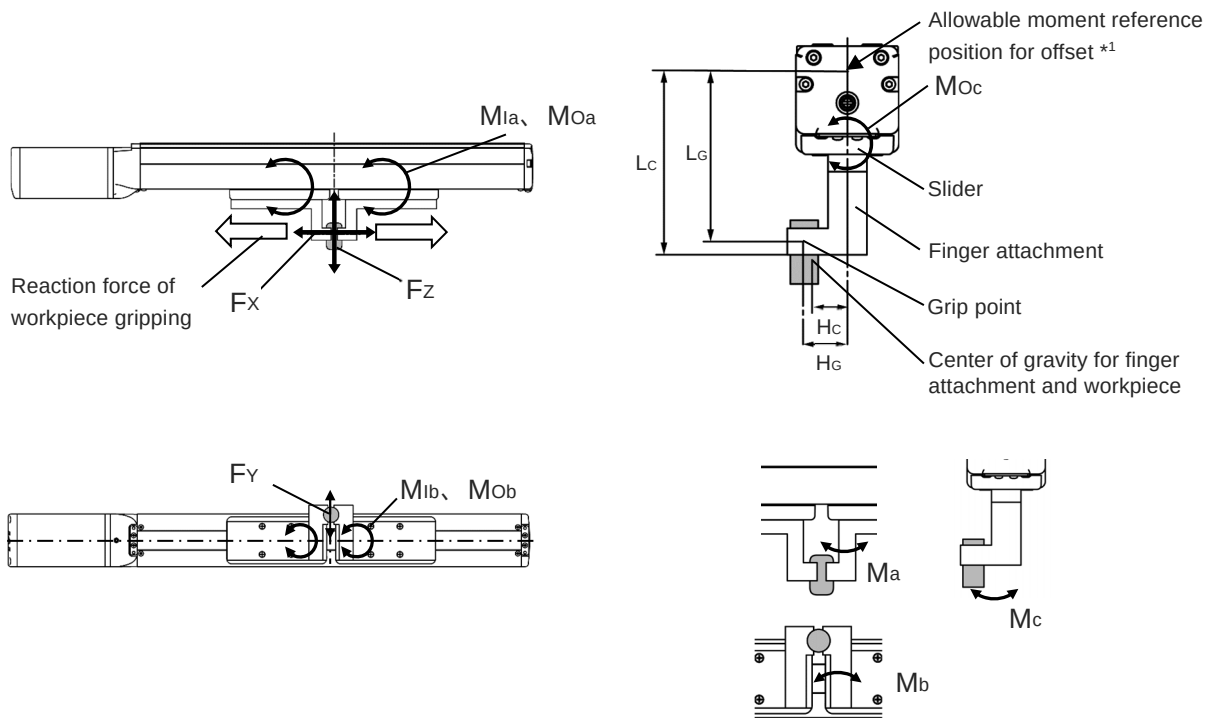
Necessary grip force $\Rightarrow$ 30 to 50 times or more of the work piece mass

Transportable work piece mass $\Rightarrow$ 1/30 to 1/50 or less of the grip force

[Procedure 2] Check for the vertical allowable load of the slider and allowable moment

Check the vertical load and the moment applicable to the finger. Calculate F_z , M_a , M_b and M_c by referring to (1) to (3) described below, and select a model considering not to exceed the allowable value. Or, consider to make the overhang smaller at the grip point or reduce the grip force so it would not exceed the allowable value.

Load and the moment applicable to the slider



F_x : External force in X direction applied to work piece and finger (N)

F_y : External force in Y direction applied to work piece and finger (N)

F_z : External force in Z direction applied to work piece and finger (N)

L_g : Distance from slider attachment surface to grip point (mm) ^(Note 1)

H_g : Distance from center of slider to grip point (Overhang) (mm) ^(Note 1)

L_c : Distance from slider attachment surface to center of gravity for work piece and slider attachment (mm)

H_c : Distance from center of slider to center of gravity for work piece and slider attachment (mm)

M_{la} : Moment in M_a direction generated on slider due to grip force (N•m)

M_{lb} : Moment in M_b direction generated on slider due to grip force (N•m)

M_{oa} : Moment in M_a direction generated on slider due to external force (N•m)

M_{ob} : Moment in M_b direction generated on slider due to external force (N•m)

M_{oc} : Moment in M_c direction generated on slider due to external force (N•m)

M_a : All moments in M_a direction generated on slider (N•m)

M_b : All moments in M_b direction generated on slider (N•m)

M_c : All moments in M_c direction generated on slider (N•m)

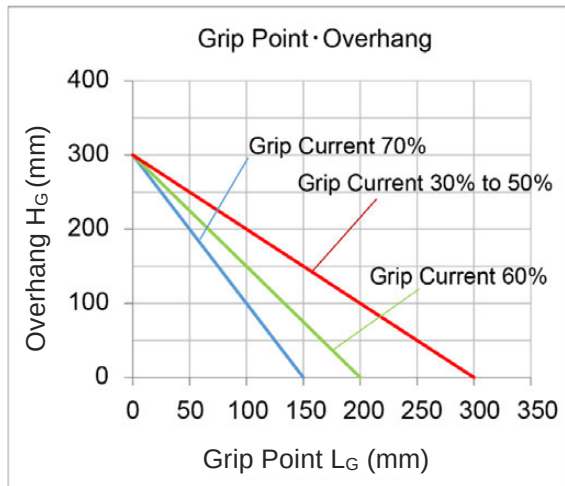
Note1 For L_g and H_g , have the values below as the upper limit. Exceeding the allowable range may generate an excessive moment on the slider sliding mechanism, which may be a cause of a bad impact to the product life.

*1 Allowable moment reference position for offset, refer to [1.2 Specifications].

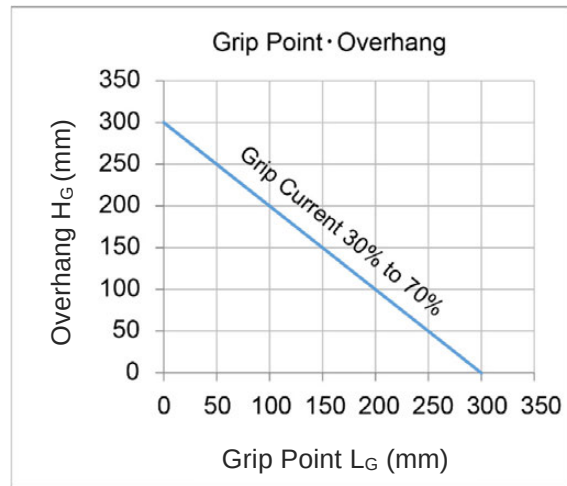
Upper Limit for Grip Point L_G and Overhang H_G

[GRST6]

- Lead 2

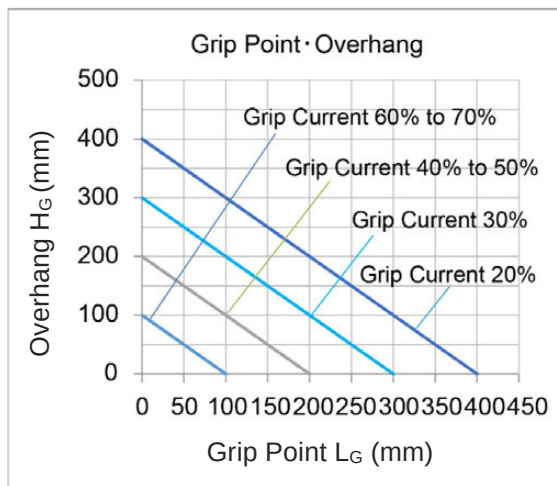


- Lead 8



[GRST7]

- Lead 2



- Lead 8

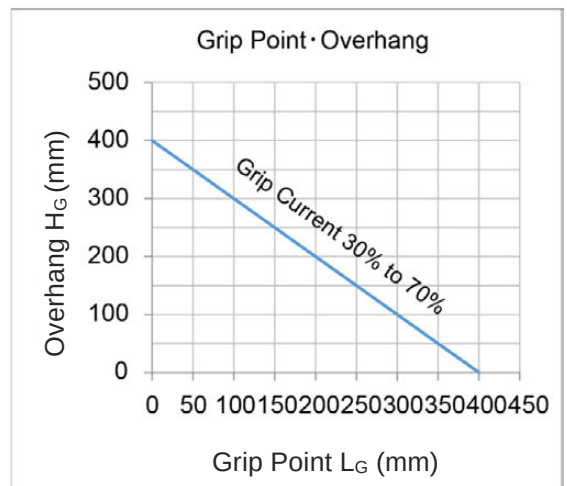


Table 1: Allowable Load and Allowable Moment on the Slider (Note 1)

Model	Allowable Load in Vertical (N) F_{Zmax}	Max. Allowable Moment (N•m) (Note 2)		
		M_{amax}	M_{bmax}	M_{cmax}
GRST6	1080	48.5	69.3	103
GRST7	1400	115	115	229

Note 1 : The slider shows the values for allowable load and allowable moment in static on one finger.

Note 2 : The values for the allowable moment are those when the load is applied in one direction only.

The values become one half when the load is applied from in two directions.

(1) Moment generated on slider due to grip force

1) Moment in M_{Ia} direction (M_{Ia})

$$M_{Ia} = L_G \frac{1.5F_G}{2} \times 10^{-3}$$

F_G : Grip force of gripper (N)

2) Moment in M_{Ib} direction (M_{Ib})

$$M_{Ib} = H_G \frac{1.5F_G}{2} \times 10^{-3}$$

F_G : Grip force of gripper (N)

Refer to [1.2 Relation between the Current Limit Value and the Grip Force] for grip force F_G .

As the grip force is a reference value, it is multiplied by 1.5 for the safety margin in the moment calculation.

(2) Moment generated on the slider due to an external force

External force as well as grip force will be applied to the work piece and the finger attachment in the movements such as moving straight or turning in the condition of the gripper being attached on a Cartesian Robot, Articulated Robot or other actuators.

Have the following calculation.

◆ External force applied on the work piece and finger attachment [F_x , F_y , F_z]

Figure out the following types of external forces in three directions, X, Y and Z, applied on the work piece and finger attachment considering the condition of the gripper use, and sum up all the values to determine F_x , F_y and F_z .

a) Weight of the work piece and finger attachment

$$F = mg$$

m : mass of the work piece and finger attachment (kg),

g : gravitational acceleration ($= 9.8\text{m/s}^2$)

b) Inertial force in the gripper moving straight

$$F = ma \quad a : \text{Acceleration/deceleration during transportation (m/s}^2\text{)}$$

c) Centrifugal force in gripper turning

$$F = mr\omega^2 \quad r : \text{Radius of turning (m), } \omega : \text{Angular velocity (deg/s)}$$

Confirm that F_z is below the allowable load vertical direction, $F_{z\text{max}}$ in Table 1.

◆ Moment generated on the slider due to an external force

Figure out the moment in each direction due to external forces F_x , F_y and F_z calculated above.

$$1) \text{ Moment in } M_a \text{ direction } [M_{oa}] \quad M_{oa} = LcF_x \times 10^{-3}$$

$$2) \text{ Moment in } M_b \text{ direction } [M_{ob}] \quad M_{ob} = HcF_x \times 10^{-3}$$

$$3) \text{ Moment in } M_c \text{ direction } [M_{oc}] \quad M_{oc} = LcF_y \times 10^{-3} + HcF_z \times 10^{-3}$$

(3) All moments in each direction generated to the slider

$$M_a = M_{la} + M_{oa}, \quad M_b = M_{lb} + M_{ob}, \quad M_c = M_{oc}$$

Confirm that the value figured out in the calculation above is below the allowable moment stated in Table 1.

(Note) Attempt to have the finger attachment minimized in size and weight even if it is in the allowable range. If the fingers are long and big in size and heavy in mass, the moment caused by an impact at gripping may cause a performance drop or give a bad impact to the guide area.

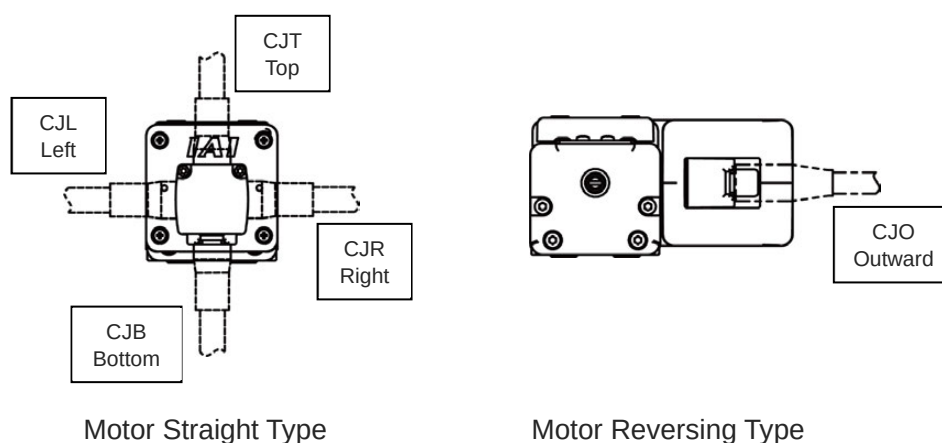
1.4 Option

1.4.1 With Brake (Model Code: B)

This is a feature to retain the fingers and rotary part when the power is off or the servo is off.

1.4.2 Cable Exit Direction Changed (Model Code: CJT, CJR, CJL, CJB, CJO)

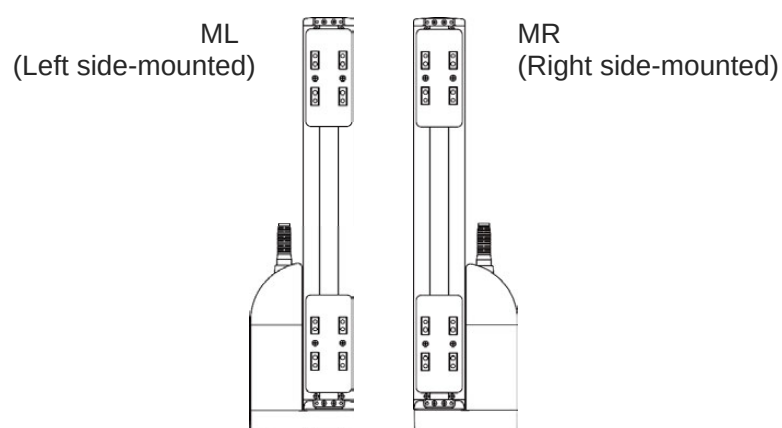
The orientation of the actuator cable to apply can be changed to top/bottom/right/left.



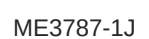
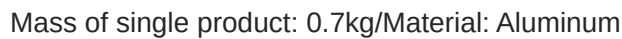
1.4.3 Motor Reversed Direction (Model Code: ML, MR)

It is a symbol to indicate the direction to reverse the motor unit.

ML shows reversed to left and MR to right.



Mass of single product: 0.7kg/Material: Aluminum



1.4.5 Reversed-home Specification (Model Code: NM)

For the grippers, the home position in normal is on the side that the fingers open.

When it is required to have it on the opposite side due to such reason as layout of equipment, the home position can be set reversed in an option.

1.4.6 Slider Roller Specification (Model Code: SR)

The structure of the slider in the standard type can be changed to the roller structure same as the one in the cleanroom type.

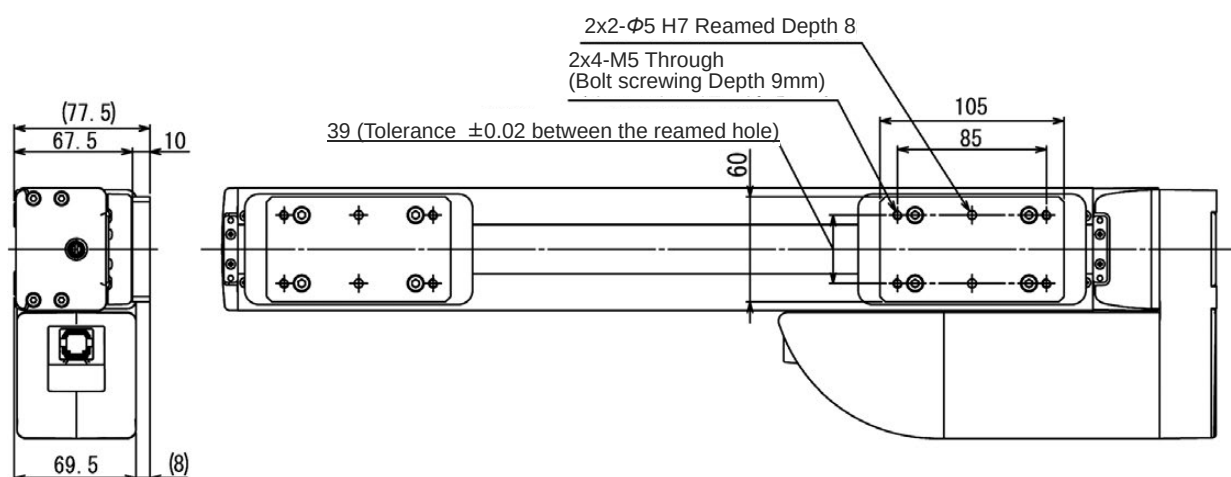
1.4.7 Slider Spacer (Model Code: SS)

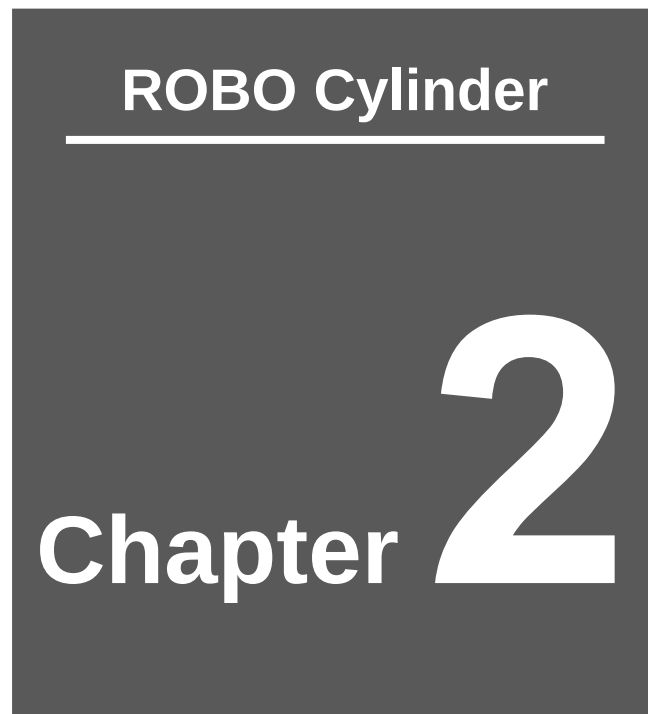
It is a spacer to set the top of the slider higher than the top of the motor cover.

Applicable Models :RCP6-GRST7

Model number of single product RCP6-SS-GRST7 (2 pcs in 1 set)

Mass: 0.4kg/Material: Aluminum





Installation

2.1	Transportation	2-1
2.1.1	Handling of the Robot	2-1
2.1.2	Handling in Condition of being assembled in Machinery Equipment (System)	2-2
2.2	Installation and Storage/preservation Environment	2-3
2.2.1	Installation Environment	2-3
2.2.2	Storage/preservation Environment	2-4
2.3	How to Install	2-5
2.3.1	Installation Orientation	2-5
2.3.2	Precautions Regarding Stainless Steel Sheet	2-6
2.3.3	Installation Surface	2-7
2.3.4	Installation of the Main Unit	2-8
2.3.5	Finger Attachment, Mounting Transported Objects	2-12
2.3.6	Mounting on Finger Attachment Installation Tool (MJF Option)	2-13

2.1 Transportation

2.1.1 Handling of the Robot

[1] Handling of the Carton

Unless otherwise specified, the robot is delivered in the package as shown in the figure below.

- Do not damage or drop the package. The package is not specially designed to withstand dropping or shock due to collision.
- Keep the unit in horizontal orientation for stationary positioning or transportation. Follow the instruction if there is any for the packaging condition.
- Do not climb onto the package.
- Do not put anything that could deform the package on it.

[2] How to Handle after Unpackaged

- 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.

Supplement : For the names of each part of the actuator, refer to [Names of the Parts].



2.1.2 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 slider so they would not accidentally move during transportation.
- If the actuator or any moving part is overhanging, fix it appropriately to avoid large wobbles due to external vibration. When transporting without fixing the tip, do not apply impact of 0.3G or more.
- When suspending machinery (system) with ropes, be careful not to catch the rope on the actuator or cable.

2.2 Installation and Storage/preservation Environment

Usage is possible in environments of pollution degree 3 or equivalent.

Pollution degree 3: Environment with conductive pollution or dry nonconductive pollution but may get to conductive pollution due to occasional temporary condensation. (IEC 60664-1)

2.2.1 Installation Environment

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

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

- 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

Provide sufficient work space for the following maintenance and inspection:

- Space to replenish grease
- Space to replace the motor

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

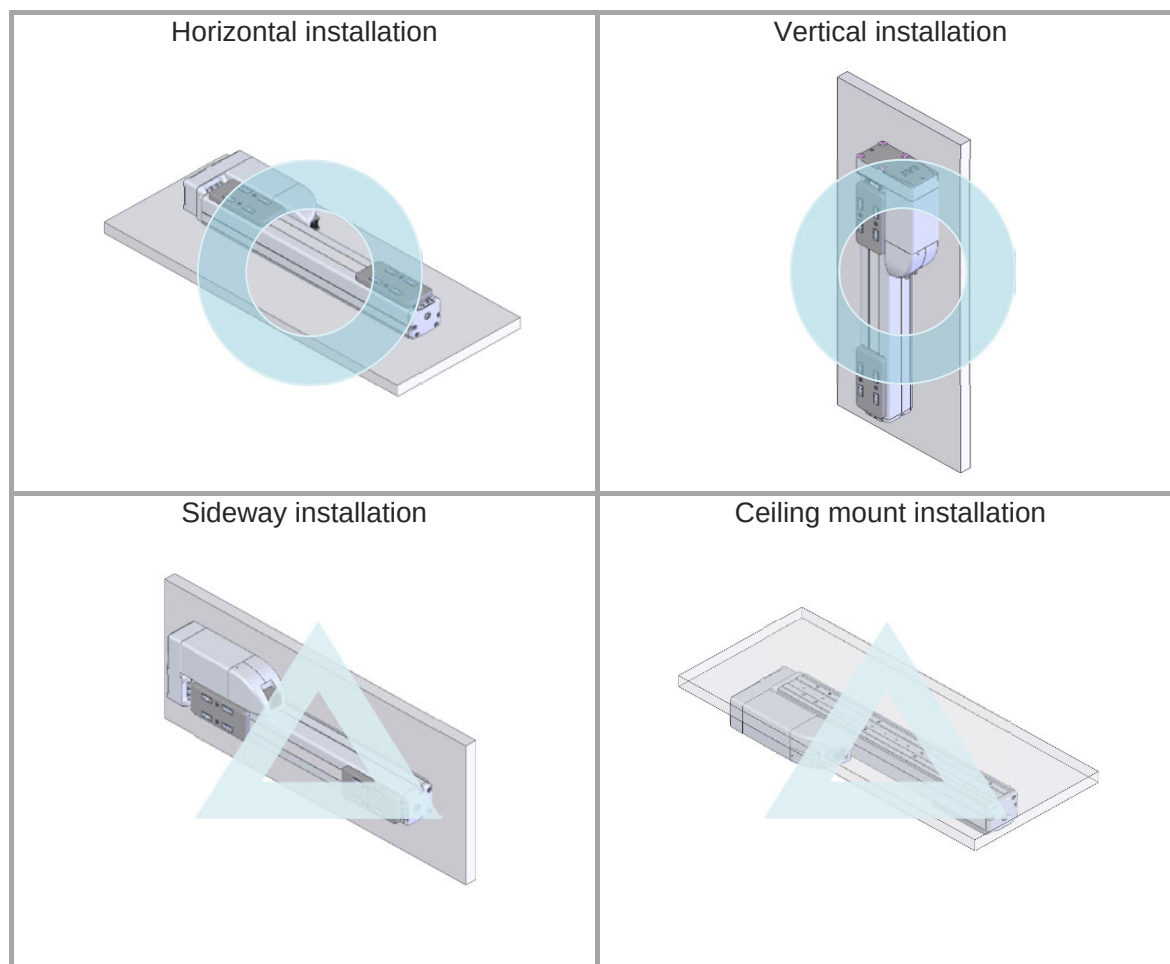
- Where noise generates due to static electricity, etc
- Where the actuator is subject to a strong electric or magnetic field
- Where the actuator is subject to ultraviolet ray or radiation

2.2.2 Storage/preservation Environment

- For the storage and preservation environment, see the installation environment.
However, give especial consideration to the prevention of condensation during long-term storage/preservation.
- Unless especially specified, desiccant is not included in the package at shipping.
If the product is to be stored/preserved in an environment where condensation is anticipated, take condensation preventive measures.
- For short-term storage, it can be stored at 60°C or below.
For storage of one month or more, make sure that the temperature does not exceed 50°C.
- The product should be placed horizontally for storage and preservation.
If storing in the packaged condition, observe the conditions, if any, regarding storage orientation.

2.3 How to Install

2.3.1 Installation Orientation



○ : Available for Installation △ : Daily inspection is required × : Unavailable for Installation



Caution

- Orientation with the motor located on top is recommended for the vertical installation.
- It is recommended to have the motor installed on top for the vertical orientation. Can be installed sideways or ceiling mount, but the actuators must be checked daily. If the actuator is installed sideways or ceiling mount, the stainless steel sheet may be slacked or displaced. If the actuator is used continuously while the stainless steel sheet is slacked or displaced, the stainless steel sheet may break or other problems may occur. Check the actuator daily and if the stainless steel sheet is found slacked or displaced, make installation adjustment of the stainless steel sheet. Refer to [5.6.1 Stainless Steel Sheet Replacement/adjustment]

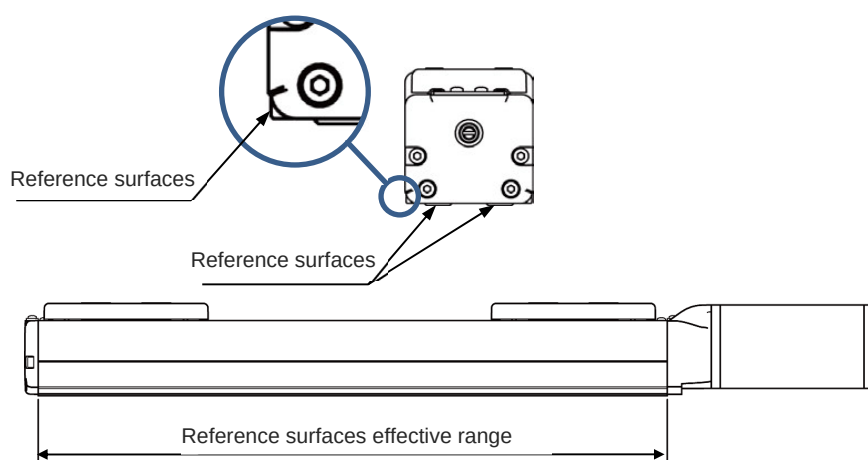
2.3.2 Precautions Regarding Stainless Steel Sheet

- During installation and transport, do not grasp or press on the stainless steel sheet.
Otherwise, this may lead to stainless steel sheet damage.
- Although lateral or ceiling installation is possible, it may cause slackness or misalignment of the stainless steel sheet.
Continued usage in this orientation may lead to damage to the stainless steel sheet.
(It is the reason posture is judged △ in the previous page.)
- Adjust the stainless steel sheet if slackness or misalignment occurs.
- Install the unit with a measure to prevent any object that possesses viscosity such as adhesive or paint from being applied on the stainless steel sheet.
It could cause a slider operation error or damage on the stainless steel sheet if any object that possesses viscosity such as adhesive or paint dropped on the stainless steel sheet.

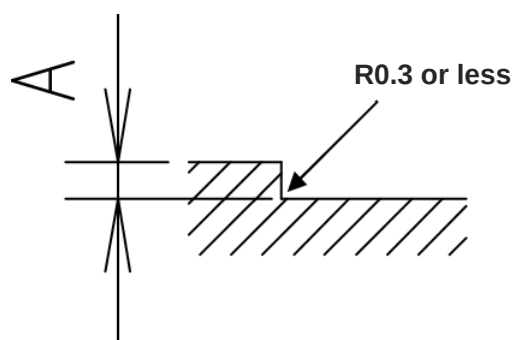
2.3.3 Installation Surface

- The body mounting surface should be a machined surface or a plane with similar accuracy.
- The mounting stand should have a structure rigid enough to prevent the generation of vibration, etc.
- Also consider enough space necessary for maintenance work such as actuator replacement and inspection.
- The bottom surface and both side surfaces of the body base serve as the reference surfaces for slider running accuracy.

Use these surfaces as the reference surfaces for mounting when running accuracy is required.



When mounting using the side reference surface, machine the installation surface according to the figure below.

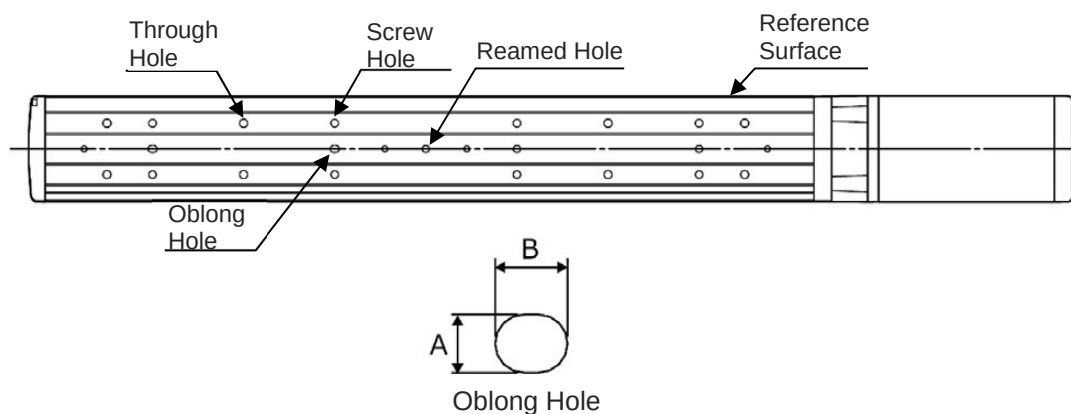


A dimension	
GRST6C	2 to 4mm
GRST6R	
GRST7C	
GRST7R	

2.3.4 Installation of the Main Unit

[When using the screw holes on the bottom of the base]

There are attachment threaded holes equipped so the unit can be fixed at the back of the base. There also are a reamed hole and an oblong hole equipped for positioning pins. For details regarding the position and dimensions, Refer to [Chapter 6 External Dimensions].



Type	Screw Hole Size	Screw Holes Depth (Screwing depth should)	Tightening torque		Reamed Hole (mm)	Oblong Hole
			When the bolt seating surface is steel	When the bolt seating surface is aluminum		
GRST6□	M5	Through (10mm or less)	7.27N·m	3.42N·m	Φ4H7 Depth 5.5	A: $4^{+0.010}_0$ B: 5 Depth 5.5mm or less
GRST7□	M5	Through (10mm or less)	7.27N·m	3.42N·m	Φ4H7 Depth 6	A: $4^{+0.010}_0$ B: 5 Depth 6mm or less

- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.

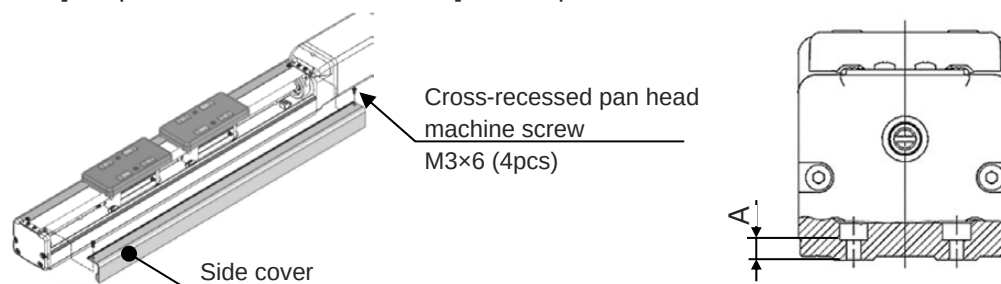


Caution

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

[Using the Through Holes on the Top of the Base]

There are through holes equipped for installation from the top. Detach the side covers when installing. Refer to [Chapter 6 External Dimensions] for the positions of the screw holes.



• Tightening Screws

For mounting screws, use hexagonal socket head screws indicated in the following table.

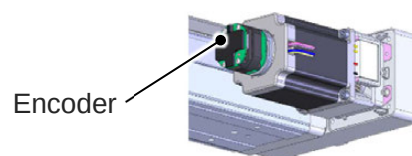
Type	Through Hole	Mounting Bolt	A (mm)	Tightening Torque
GRST6□	Φ4.5 drilled hole, Φ8 counter boring depth 4.5	M4	5.5	1.76N·m
GRST7□	Φ6 drilled hole, Φ9.5 counter boring depth 5.5	M5	5.5	3.42N·m

- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.



Caution

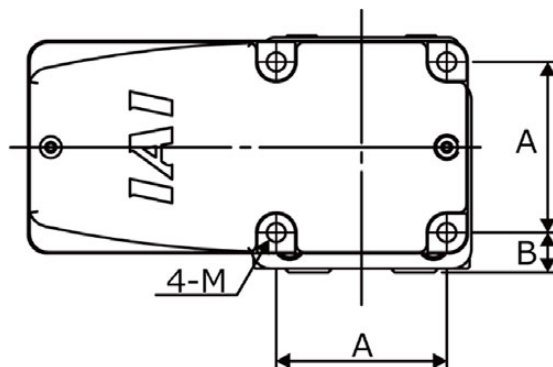
- Attempt not to drop the bolts, tools, etc. on the stainless steel sheet when tightening the bolts. Please avoid making a dent mark or scratches.
- For reversed specification the motor cover will interfere with the side cover, take the motor cover off before taking the side cover off.
Refer to [5.6.3 Replacement Work of Motor Unit and Coupling Spacer].
- Do not touch the encoder part directly with hands. If touched with hands, the encoder phase may change, resulting in an error.



- Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the damage of the actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.
- The slider cannot be driven only with ROBO Cylinder itself if it is equipped with a brake. Connect a controller and have JOG operation to move the slider.
It is also available to move with using a brake release box (BKR-01).

[When Using Attachment Holes on Bracket in Motor Reversing Type]

As there are screw holes on the reversing bracket, it is available to screw in from the back.
Refer to [Precautions When Using Reversing Brackets] in the next page.



Type	A	B	Attachment Hole M	Tightening Torque	
				When the bolt seating surface is steel	When the bolt seating surface is aluminum
GRST6R	45	10.5	M6 Depth 12	12.3N·m	5.4N·m
GRST7R	55	8	M8 Depth 16	30.0N·m	11.5N·m

- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.

**Caution**

- Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the damage of the screw holes and actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.
- In case of attaching the unit on the back side with using the reversing bracket, it is necessary without failure to have a support block to support the unit body.
Avoid installation using the reversing bracket if it is not available to have a support block to support the unit body.

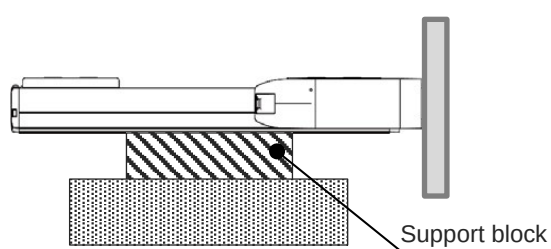
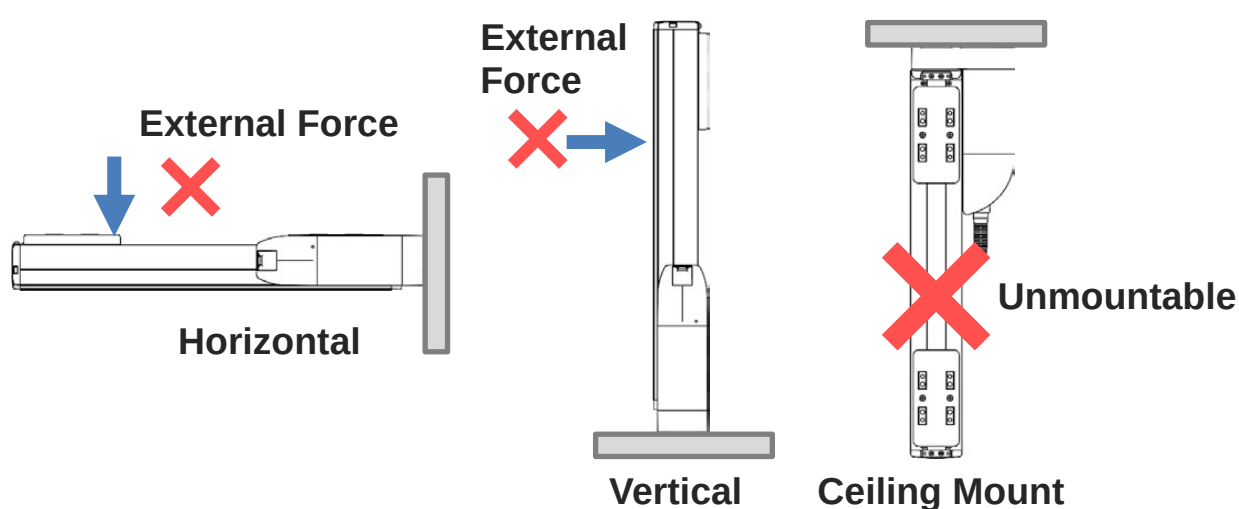
[Precautions when using reversing brackets]

Pay attention to the following when installation is conducted with using the attachment holes on the side-mounted bracket.

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

- Do not attempt to affix the unit only with the screw holes on the side-mounted bracket.
- Do not apply external force to the main body.

Availability of installation for each installation posture is as shown below.



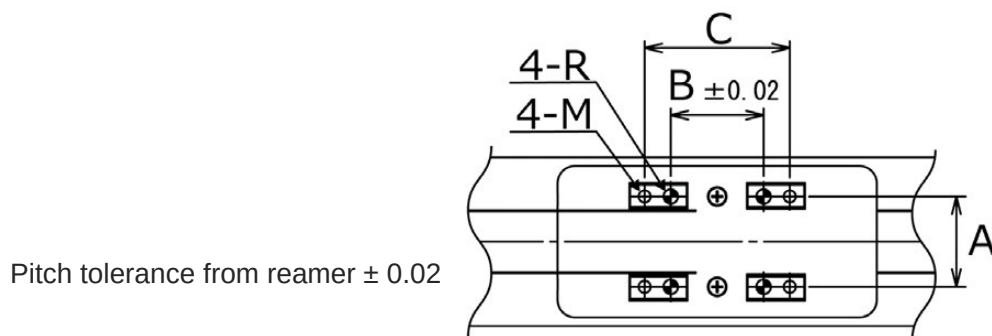
Support block etc.	Installation Posture		
	Horizontal	Vertical	Ceiling Mount
No	×	×	×
Yes	○	○	×

2.3.5 Finger Attachment, Mounting Transported Objects

- Use the tapped mounting holes on the top surface of the slider to fix finger attachment and transported objects.
- Make sure to keep the weight shown below on one end for a finger attachment.

Type	Mass	
	Lead 2	Lead 8
GRST6□	10kg or less	4kg or less
GRST7□	12kg or less	6kg or less

- There are 4 reamed holes on the top surface of the slider.
Use these reamed holes if repeated attaching and detaching is required.
- If fine-tuning of perpendicularity, etc. is required, use one of the reamed holes for this adjustment.
- Refer to the figure below for the screw-in depth and reamed hole depth.



Type	A	B	C	Reamed Hole R	Screw Hole M	Mounting Bolt		
						Bolt Nominal Diameter	Tightening Torque	
							When the bolt seating surface is steel	When the bolt seating surface is aluminum
GRST6□	31	32	50	$\phi 5H7$ Depth 6	M5 Depth 10	M5	7.27N·m	3.42N·m
GRST7□	39	42	65	$\phi 5H7$ Depth 10	M5 Depth 10	M5	7.27N·m	3.42N·m

- The use of high-strength bolts of ISO-10.9 or higher is recommended.
- Make sure the internal thread and bolt effective engagement length is approximately 1.8 times the nominal diameter or more.



Caution

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

2.3.6 Mounting on Finger Attachment Installation Tool (MJF Option)

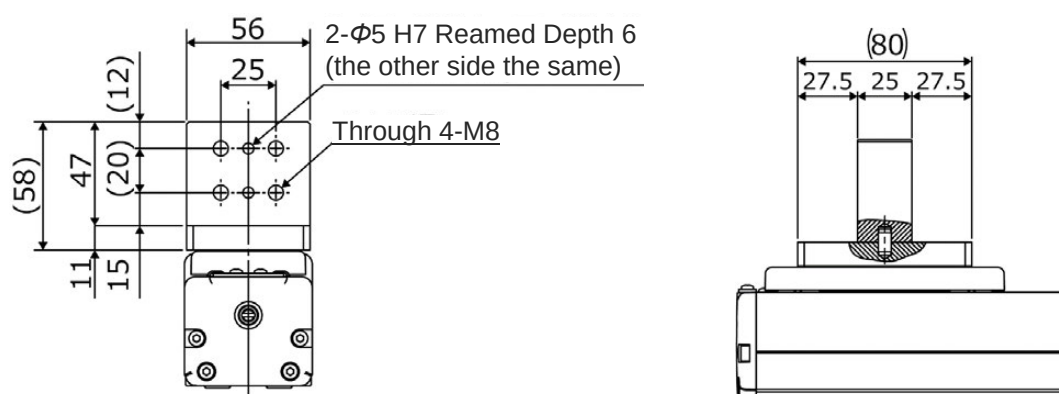
- It is not available to attach the finger attachment fixture (Model Code: MJF) on the slider spacer (Model Code: SS).
- Make sure to keep the weight shown below on one end for a finger attachment.
The numbers shown in the table are the weight that 0.33kg of the attachment jig for a finger attachment is extracted.

Type	Mass	
	Lead 2	Lead 8
GRST6□	9.67kg or less	3.67kg or less
GRST7□	11.67kg or less	5.67kg or less

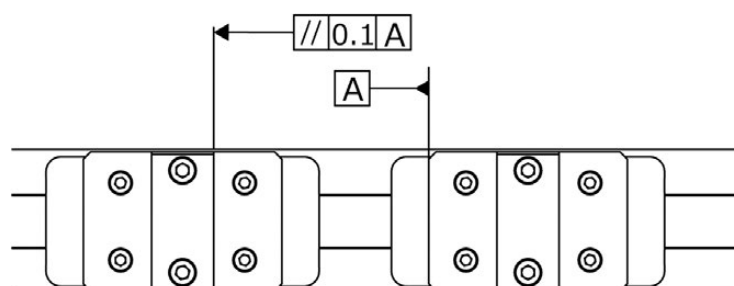
The fixture is equipped with a tapped hole to affix a finger attachment and a reamed hole for positioning.

Use these reamed holes if repeated attaching and detaching is required.

If fine-tuning of perpendicularity, etc. is required, use one of the reamed holes for this adjustment.

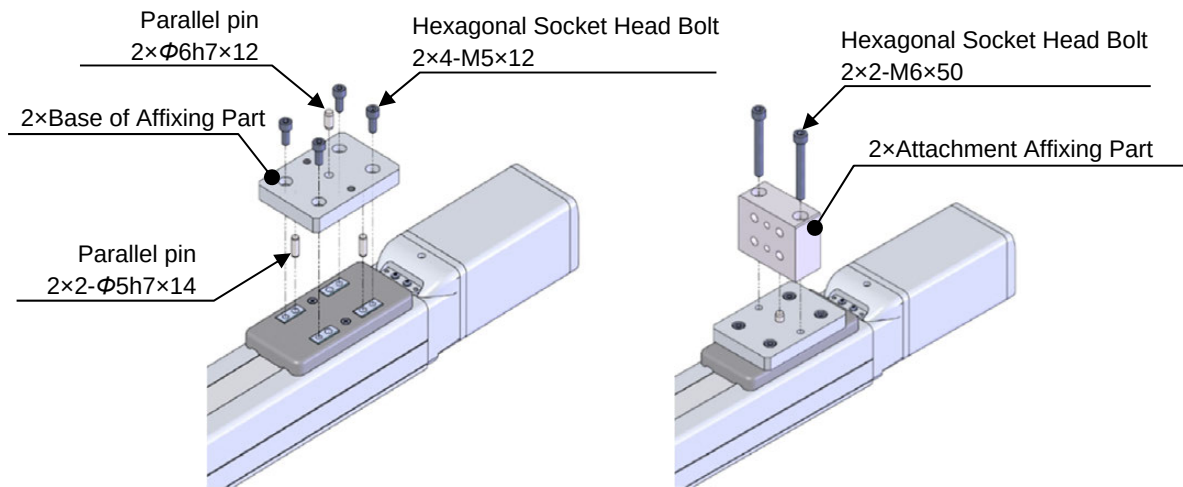


* The dimensions of MJF option are in common for GRST6C/GRST6R/GRST7C/GRST7R. In case it is assembled in our factory before shipping, the parallelism between fixtures should be adjusted as shown in the figure below.



2.3 How to Install

The structure of the fixture is as shown in the figure below. When affixing the fixture again, fix it with the tightening torque shown in the table below.

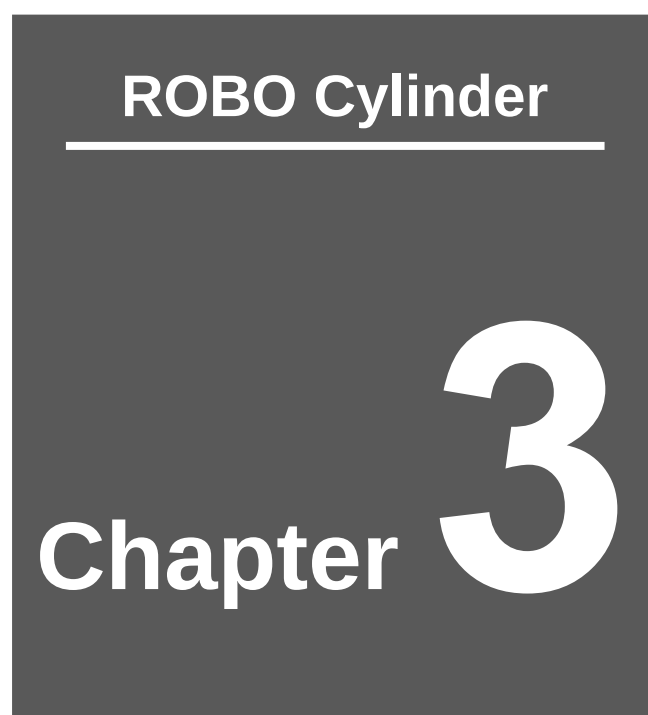


Bolts	Tightening Torque
M5	4.11N · m
M6	6.44N · m



Caution

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



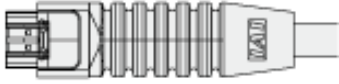
Connecting with the Controller

3.1	Connecting with the Controller.....	3-1
3.2	Motor • Encoder Cables	3-7
3.2.1	Dedicated connection cable for other than RCON, RSEL, and RCM-P6PC.....	3-7
3.2.2	Dedicated connection cable for RCON, RSEL, and RCM-P6PC.....	3-9

3.1 Connecting with the Controller

As the connection cable for the controller and the actuator, use the IAI-dedicated connection cable.

Dedicated Connection Cable

Standard Connector Type (Actuator side)	4-way Connector Type (Actuator side)
	
CB-CAN-MPA□□□ (-RB)	CB-CAN2-MPA□□□ (-RB)
CB-ADPC-MPA□□□ (-RB)	CB-ADPC2-MPA□□□ (-RB)

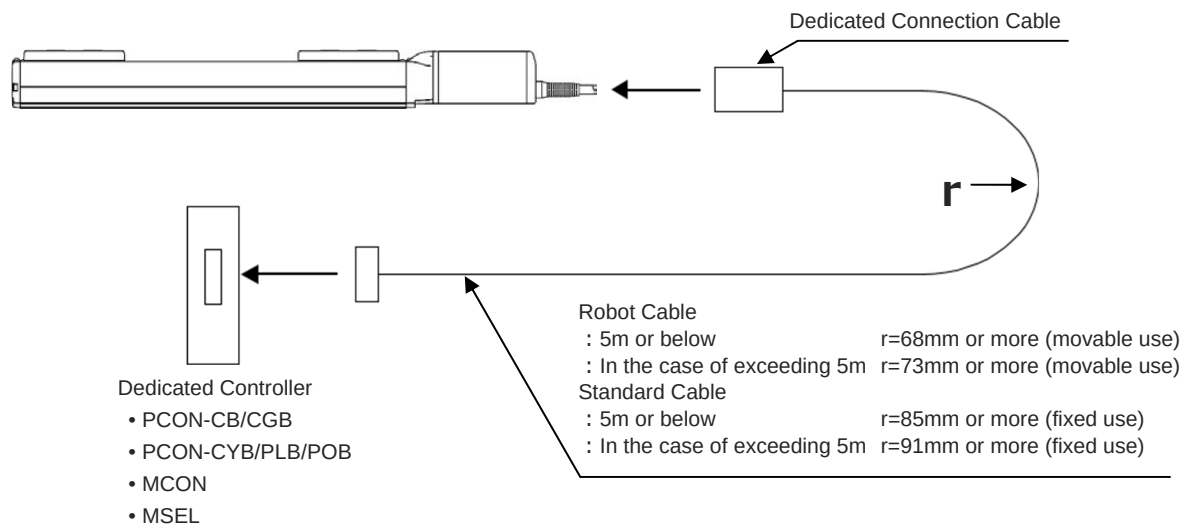


Caution

- 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 4-way connector type should not rotate in 360degC. It can be turned "1 time to left" and "2 times to right" from the datum point. (Have the count of rotation at 10 times or less)



[1] For Controllers PCON, MCON and MSEL

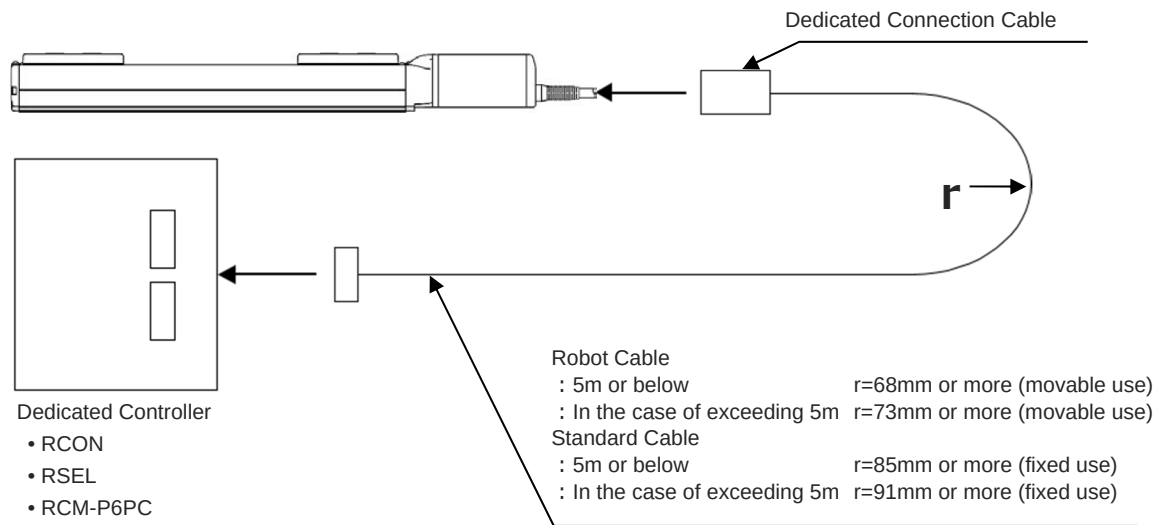


Dedicated Connection Cable Model Code

Cable	Model Code
Motor Encoder Integrated Cable	CB-CAN-MPA□□□
Motor Encoder Integrated Robot Cable	CB-CAN-MPA□□□-RB
Motor Encoder Integrated Cable 4-way Connector Type	CB-CAN2-MPA□□□
Motor Encoder Integrated Robot Cable 4-way Connector Type	CB-CAN2-MPA□□□-RB

* □□□ represents the cable length. The longest corresponds to 20m. e.g.) 080 = 8m

[2] For Controllers RCON, RSEL and RCM-P6PC



Dedicated Connection Cable Model Code

Cable	Model Code
Motor Encoder Integrated Cable	CB-ADPC-MPA□□□
Motor Encoder Integrated Robot Cable	CB-ADPC-MPA□□□-RB
Motor Encoder Integrated Cable 4-way Connector Type	CB-ADPC2-MPA□□□
Motor Encoder Integrated Robot Cable 4-way Connector Type	CB-ADPC2-MPA□□□-RB

* □□□ represents the cable length. The longest corresponds to 20m. e.g.) 080 = 8m



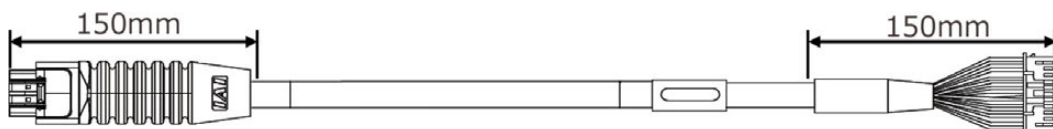
Caution

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.

- Applying force to the actuator cable ejected from the motor unit may cause malfunction. Affix the cable so it would not move.
- 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 carrier.
- 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 attempt to bend the cable at any point within 150mm from the end of the connector.

Standard Cables CB-CAN-MPA□□□, CB-ADPC-MPA□□□

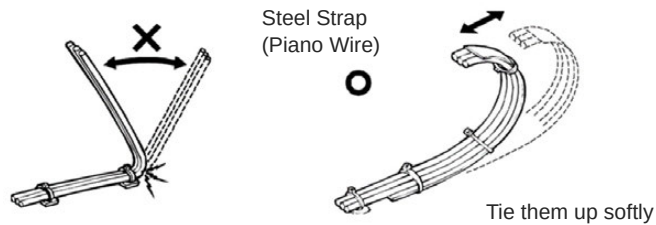
Robot Cables CB-CAN-MPA□□□-RB, CB-ADPC-MPA□□□-RB



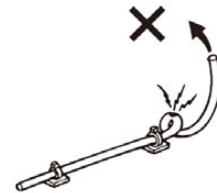
- For wiring, please follow the warnings stated below. When constructing a system as the machinery equipment, pay attention to the wiring and connection of each cable so they are conducted properly. Not following them may cause not only a malfunction such as cable breakage or connection failure, or an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



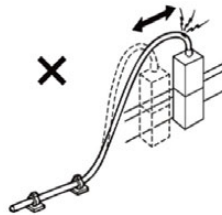
- Have a sufficient radius for bending, and avoid a bend concentrating on one point.



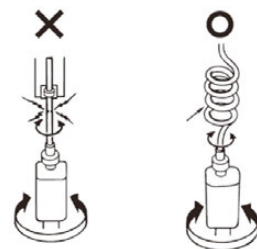
- Do not let the cable bend, kink or twist.



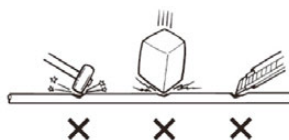
- Do not pull the cable with a strong force.



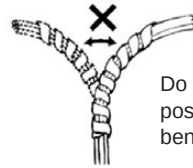
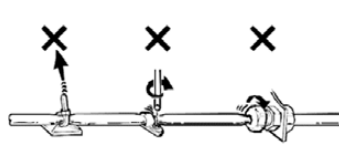
- Pay attention not to concentrate the twisting force to one point on a cable.



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

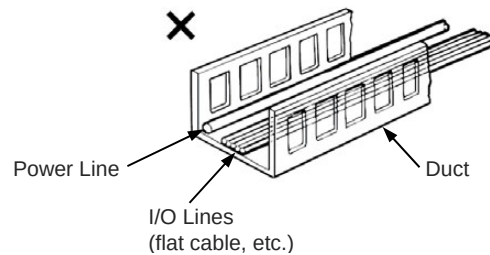


- When a cable is fastened to affix, make sure to have an appropriate force and do not tighten too much.



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

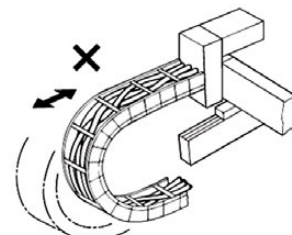
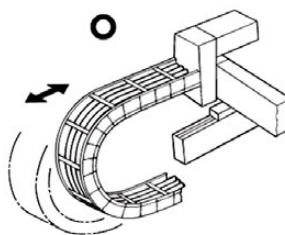
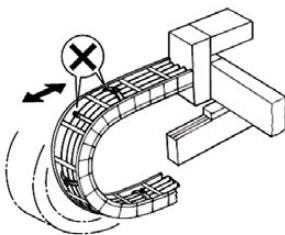
- PIO line, communication line, power and driving lines are to be put separately from each other and do not tie them together. Arrange so that such lines are independently routed in the duct.



[Follow the instructions below when using a cable carrier.]

- If there is an indication to the cable for the space factor in a cable carrier, refer to the wiring instruction given by the supplier when storing the cable in the cable carrier.
- Avoid the cables to get twined or twisted in the cable carrier, and also to have the cables move freely and do not tie them up. (Avoid tension being applied when the cables are bent.)

Do not pile up cables. It may cause faster abrasion of the sheaths or cable breakage.



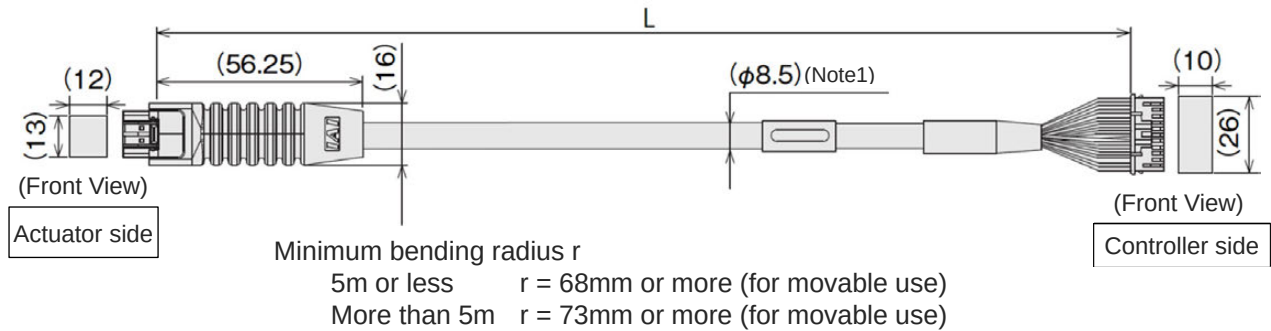
3.2 Motor • Encoder Cables

3.2.1 Dedicated connection cable for other than RCON, RSEL, and RCM-P6PC

[1] Motor • Encoder Integrated Cables

Model code **CB-CAN-MPA□□□ / CB-CAN-MPA□□□-RB** (Robot Cable)

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



* A robot cable is a cable with high bending resistance performance.
 A robot cable is to be used when cables laid through in a cable carrier.

(Note1) It should be $\phi 9.1$ when the cable length is 5m or longer.

Connection diagram

DF62DL-24S-2.2C (Hirose)

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

PADP-24V-1-S (JST)

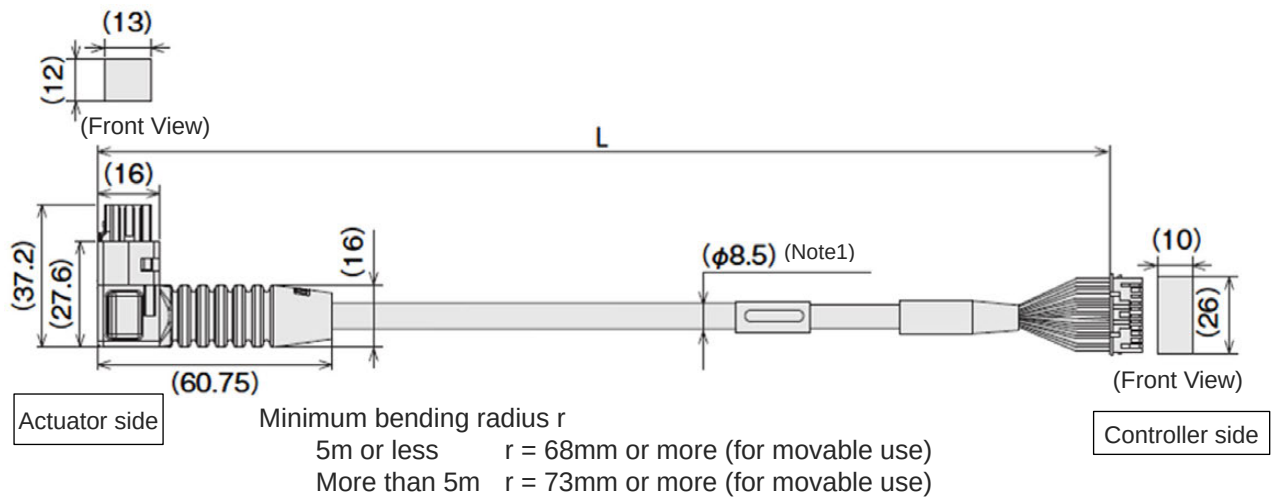
Pin No.	Symbol
1	ϕA
2	VMM
3	ϕB
4	VMM
5	ϕ_A
6	ϕ_B
11	SA[mABS]
12	SB[mABS]
13	A+
14	A-
15	B+
16	B-
18	VPS
7	LS+
9	BK+
10	BK-
17	VCC
19	GND
8	LS-
20	LS_GND
22	-
21	CF_VCC
23	-
24	FG

Standard : Purple (AWG26)
 Robot : Gray (AWG26)

[2] Motor • Encoder Integrated Cables 4-way Connector

Model code CB-CAN2-MPA□□□ / CB-CAN2-MPA□□□-RB (Robot Cable)

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



* A robot cable is a cable with high bending resistance performance.
A robot cable is to be used when cables laid through in a cable carrier.

(Note1) It should be $\phi 9.1$ when the cable length is 5m or longer.

Connection diagram

DF62DL-24S-2.2C (Hirose)

Color (Thickness)			Symbol	Pin No.
Standard cable	Robot cable			
	July 2022 and later	July 2022 and earlier		
Blue(AWG22/19)	Black(AWG22/19)	Blue(AWG22/19)	ΦA	3
Orange(AWG22/19)	White(AWG22/19)	Orange(AWG22/19)	VMM	5
Brown(AWG22/19)	Green(AWG22/19)	Brown(AWG22/19)	ΦB	10
Gray(AWG22/19)	Yellow(AWG22/19)	Gray(AWG22/19)	VMM	9
Green(AWG22/19)	Brown(AWG22/19)	Green(AWG22/19)	Φ_A	4
Red(AWG22/19)	Red(AWG22/19)	Red(AWG22/19)	Φ_B	15
Light Blue(AWG26)	White(AWG26)	Light Blue(AWG26)	SA[mABS]	12
Orange(AWG26)	Yellow(AWG26)	Orange(AWG26)	SB[mABS]	17
Green(AWG26)	Red(AWG26)	Green(AWG26)	A+	1
Brown(AWG26)	Green(AWG26)	Brown(AWG26)	A-	6
Gray(AWG26)	Black(AWG26)	Gray(AWG26)	B+	11
Red(AWG26)	Brown(AWG26)	Red(AWG26)	B-	16
Black(AWG26)	Blue(AWG26)	Black(AWG26)	VPS	18
Yellow(AWG26)	Pink(AWG26)	Yellow(AWG26)	LS+	8
Light Blue(AWG26)	Black(AWG26)	Light Blue(AWG26)	BK+	20
Orange(AWG26)	Brown(AWG26)	Orange(AWG26)	BK-	2
Gray(AWG26)	White(AWG26)	Gray(AWG26)	VCC	21
Red(AWG26)	Yellow(AWG26)	Red(AWG26)	GND	7
Brown(AWG26)	Red(AWG26)	Brown(AWG26)	LS-	14
Green(AWG26)	Green(AWG26)	Green(AWG26)	LS_GND	13
-	-	-	-	19
Pink(AWG26)	Orange(AWG26)	Pink(AWG26)	CF_VCC	22
-	-	-	-	23
Black(AWG26)	Green(AWG26)	Black(AWG26)	FG	24

PADP-24V-1-S (JST)

Pin No.	Symbol
1	ϕA
2	VMM
3	ϕB
4	VMM
5	ϕ_A
6	ϕ_B
11	SA[mABS]
12	SB[mABS]
13	A+
14	A-
15	B+
16	B-
18	VPS
7	LS+
9	BK+
10	BK-
17	VCC
19	GND
8	LS-
20	LS_GND
22	-
21	CF_VCC
23	-
24	FG

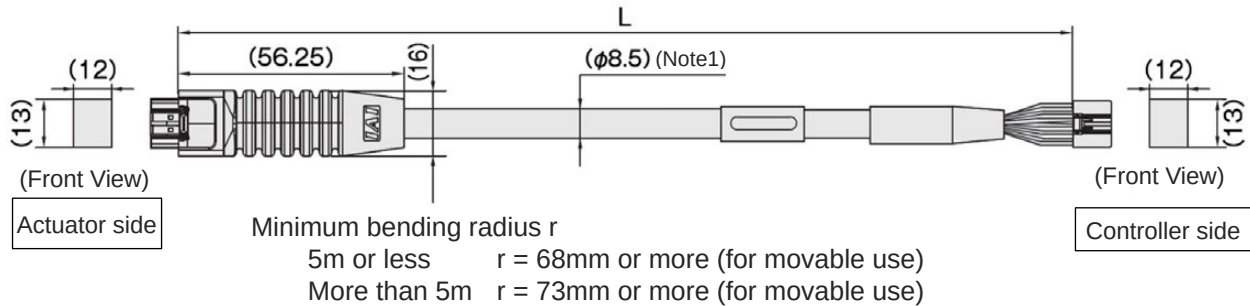
Standard : Purple (AWG26)
Robot : Gray (AWG26)

3.2.2 Dedicated connection cable for RCON, RSEL, and RCM-P6PC

[1] Motor • Encoder Integrated Cables Standard Connector

Model code CB-ADPC-MPA□□□ / CB-ADPC-MPA□□□-RB (Robot Cable)

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



* A robot cable is a cable with high bending resistance performance.
A robot cable is to be used when cables laid through in a cable carrier.

(Note1) It should be $\phi 9.1$ when the cable length is 5m or longer.

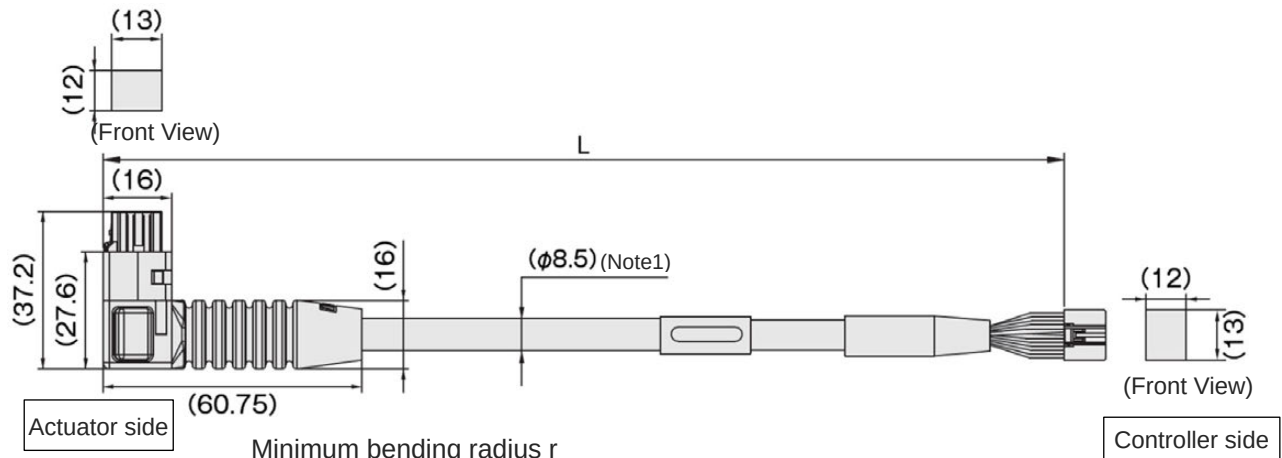
Connection diagram

DF62DL-24S-2.2C (Hirose)				DF62DL-24S-2.2C (Hirose)				
Color (Thickness)		Symbol	Pin No.		Pin No.	Symbol	Color (Thickness)	
Standard cable	Robot cable						Standard cable	Robot cable
Blue(AWG22/19)	Black(AWG22/19)	ΦA	3		3	ΦA	Blue(AWG22/19)	Black(AWG22/19)
Orange(AWG22/19)	White(AWG22/19)	VMM	5		5	VMM	Orange(AWG22/19)	White(AWG22/19)
Brown(AWG22/19)	Green(AWG22/19)	ΦB	10		10	ΦB	Brown(AWG22/19)	Green(AWG22/19)
Gray(AWG22/19)	Yellow(AWG22/19)	VMM	9		9	VMM	Gray(AWG22/19)	Yellow(AWG22/19)
Green(AWG22/19)	Brown(AWG22/19)	Φ_A	4		4	Φ_A	Green(AWG22/19)	Brown(AWG22/19)
Red(AWG22/19)	Red(AWG22/19)	Φ_B	15		15	Φ_B	Red(AWG22/19)	Red(AWG22/19)
Light Blue(AWG26)	White(AWG26)	SA[mABS]	12		12	SA[mABS]	Light Blue(AWG26)	White(AWG26)
Orange(AWG26)	Yellow(AWG26)	SB[mABS]	17		17	SB[mABS]	Orange(AWG26)	Yellow(AWG26)
Green(AWG26)	Red(AWG26)	A+	1		1	A+	Green(AWG26)	Red(AWG26)
Brown(AWG26)	Green(AWG26)	A-	6		6	A-	Brown(AWG26)	Green(AWG26)
Gray(AWG26)	Black(AWG26)	B+	11		11	B+	Gray(AWG26)	Black(AWG26)
Red(AWG26)	Brown(AWG26)	B-	16		16	B-	Red (AWG26)	Brown(AWG26)
Black(AWG26)	Blue(AWG26)	VPS	18		18	VPS	Black(AWG26)	Blue(AWG26)
Yellow(AWG26)	Pink(AWG26)	LS+	8		8	LS+	Yellow(AWG26)	Pink(AWG26)
Light Blue(AWG26)	Black(AWG26)	BK+	20		20	BK+	Light Blue(AWG26)	Black(AWG26)
Orange(AWG26)	Brown(AWG26)	BK-	2		2	BK-	Orange(AWG26)	Brown(AWG26)
Gray(AWG26)	White(AWG26)	VCC	21		21	VCC	Gray(AWG26)	White(AWG26)
Red(AWG26)	Yellow(AWG26)	GND	7		7	GND	Red (AWG26)	Yellow(AWG26)
Brown(AWG26)	Red(AWG26)	LS-	14		14	LS-	Brown(AWG26)	Red(AWG26)
Green(AWG26)	Green(AWG26)	LS_GND	13		13	LS_GND	Green(AWG26)	Green(AWG26)
-	-	-	19		19	-	-	-
Pink(AWG26)	Orange(AWG26)	CF_VCC	22		22	CF_VCC	Pink(AWG26)	Orange(AWG26)
-	-	-	23		23	-	-	-
Black(AWG26)	Green(AWG26)	FG	24	Purple (AWG26)	24	FG	Black(AWG26)	Green(AWG26)

[2] Motor • Encoder Integrated Cables 4-way Connector

Model code CB-ADPC2-MPA□□□ / CB-ADPC2-MPA□□□-RB (Robot Cable)

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

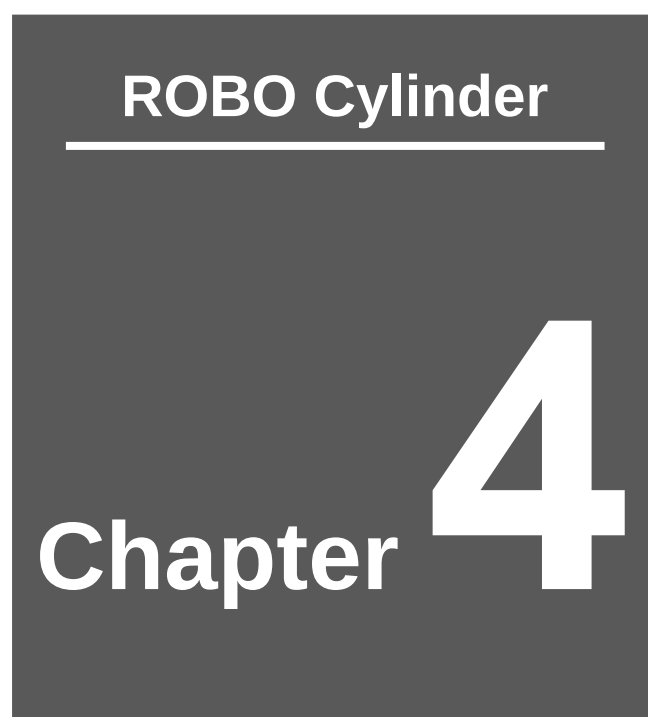


* A robot cable is a cable with high bending resistance performance.
A robot cable is to be used when cables laid through in a cable carrier.

(Note1) It should be φ9.1 when the cable length is 5m or longer.

Connection diagram

DF62DL-24S-2.2C (Hirose)					DF62DL-24S-2.2C (Hirose)			
Color (Thickness)		Symbol	Pin No.		Pin No.	Symbol	Color (Thickness)	
Standard cable	Robot cable						Standard cable	Robot cable
Blue(AWG22/19)	Black(AWG22/19)	ΦA	3		3	ΦA	Blue(AWG22/19)	Black(AWG22/19)
Orange(AWG22/19)	White(AWG22/19)	VMM	5		5	VMM	Orange(AWG22/19)	White(AWG22/19)
Brown(AWG22/19)	Green(AWG22/19)	ΦB	10		10	ΦB	Brown(AWG22/19)	Green(AWG22/19)
Gray(AWG22/19)	Yellow(AWG22/19)	VMM	9		9	VMM	Gray(AWG22/19)	Yellow(AWG22/19)
Green(AWG22/19)	Brown(AWG22/19)	Φ_A	4		4	Φ_A	Green(AWG22/19)	Brown(AWG22/19)
Red(AWG22/19)	Red(AWG22/19)	Φ_B	15		15	Φ_B	Red(AWG22/19)	Red(AWG22/19)
Light Blue(AWG26)	White(AWG26)	SA[mABS]	12		12	SA[mABS]	Light Blue(AWG26)	White(AWG26)
Orange(AWG26)	Yellow(AWG26)	SB[mABS]	17		17	SB[mABS]	Orange(AWG26)	Yellow(AWG26)
Green(AWG26)	Red(AWG26)	A+	1		1	A+	Green(AWG26)	Red(AWG26)
Brown(AWG26)	Green(AWG26)	A-	6		6	A-	Brown(AWG26)	Green(AWG26)
Gray(AWG26)	Black(AWG26)	B+	11		11	B+	Gray(AWG26)	Black(AWG26)
Red(AWG26)	Brown(AWG26)	B-	16		16	B-	Red (AWG26)	Brown(AWG26)
Black(AWG26)	Blue(AWG26)	VPS	18		18	VPS	Black(AWG26)	Blue(AWG26)
Yellow(AWG26)	Pink(AWG26)	LS+	8		8	LS+	Yellow(AWG26)	Pink(AWG26)
Light Blue(AWG26)	Black(AWG26)	BK+	20		20	BK+	Light Blue(AWG26)	Black(AWG26)
Orange(AWG26)	Brown(AWG26)	BK-	2		2	BK-	Orange(AWG26)	Brown(AWG26)
Gray(AWG26)	White(AWG26)	VCC	21		21	VCC	Gray(AWG26)	White(AWG26)
Red(AWG26)	Yellow(AWG26)	GND	7		7	GND	Red (AWG26)	Yellow(AWG26)
Brown(AWG26)	Red(AWG26)	LS-	14		14	LS-	Brown(AWG26)	Red(AWG26)
Green(AWG26)	Green(AWG26)	LS_GND	13		13	LS_GND	Green(AWG26)	Green(AWG26)
-	-	-	19		19	-	-	-
Pink(AWG26)	Orange(AWG26)	CF_VCC	22		22	CF_VCC	Pink(AWG26)	Orange(AWG26)
-	-	-	23		23	-	-	-
Black(AWG26)	Green(AWG26)	FG	24	Purple (AWG26)	24	FG	Black(AWG26)	Green(AWG26)



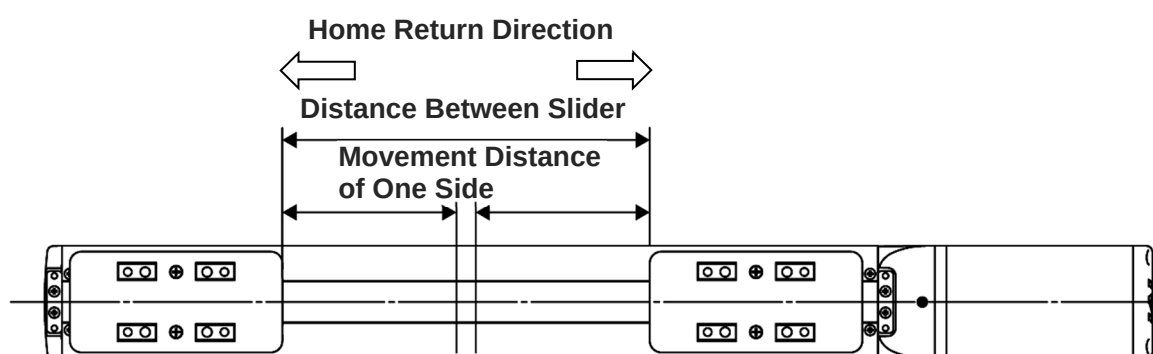
Operation

4.1	Operation of the Fingers	4-1
4.1.1	Movement Stroke	4-1
4.1.2	Home Return Direction	4-1
4.1.3	Position Indication	4-1
4.1.4	Indication of Speed and Acceleration	4-1
4.2	Release of the Gripped Work Piece	4-2

4.1 Operation of the Fingers

4.1.1 Movement Stroke

The stroke stated in the specifications is the sum of the movement distance for both sliders.
The movement distance of one finger is 1/2 of the stroke.



4.1.2 Home Return Direction

The open side moving end of the slider is the home position.
The home position is on the closing end for the home reversed type (NM).

4.1.3 Position Indication

The movement distance from the home position of one slider to the closing side is the position value.
(Indication of max. position value = 1/2 of stroke)

4.1.4 Indication of Speed and Acceleration

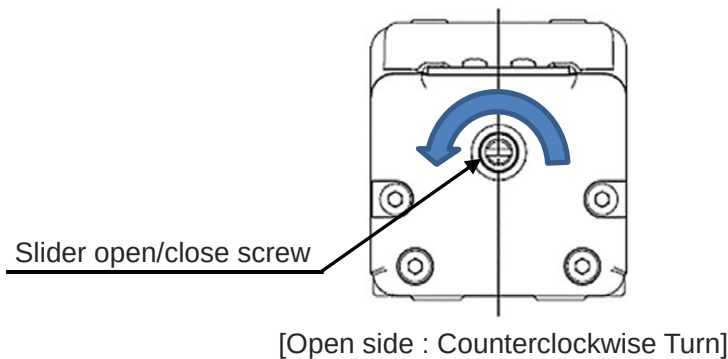
Indication value is the value for one slider.
Relative speed and acceleration are double of the indicated values.

		GRST6C/GRST6R		GRST7C/GRST7R	
Open/Close Stroke (mm)		180	230	210	260
Movement Distance of One Side (mm)		90	115	105	130
Distance Between Slider (mm)	MAX	190	240	220	270
	MIN	10	10	10	10

4.2 Release of the Gripped Work Piece

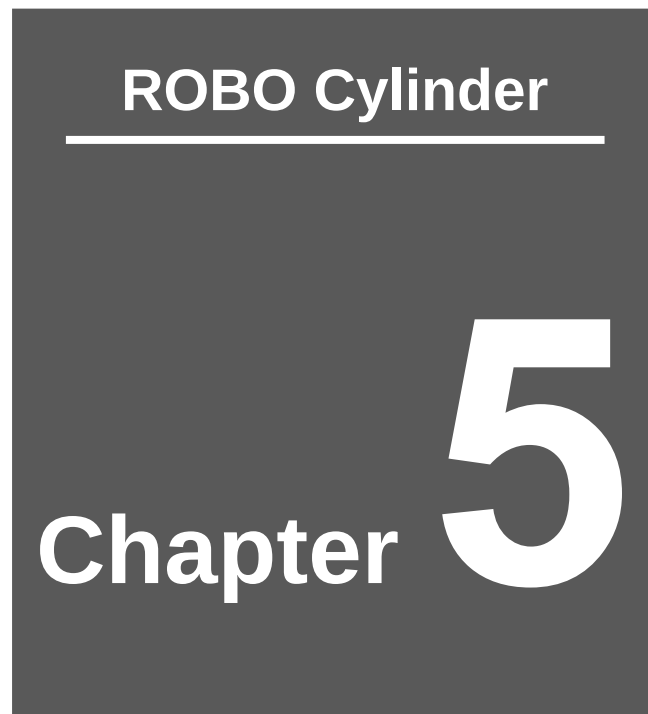
This gripper possesses a structure to keep the lead 2 force by the self-locking feature even when the servo is OFF or the power to the controller is OFF.

When it is necessary to remove a workpiece off the gripper while the power is OFF, it you need to either twist the slider open/close screw with using a slotted screwdriver or take off the finger attachment on one side of slider.



Caution

- When the work piece removal is required at the power OFF, do not attempt to pull off the work piece forcefully to remove it. Remove the work piece either by twisting the slider open/close screw or detaching one side of the finger attachment. Pulling off the work piece forcefully may cause damage to the product.
- Remove the gripped work piece when the device would not be used for long time. Leaving the product with a work piece being held for a long term may drop the performance or give a bad impact to the guide.



Maintenance and Inspection

5.1	Precautions for Maintenance and Inspection Work.....	5-1
5.2	Inspection	5-3
5.2.1	Inspection items and schedule	5-3
5.3	Visual Inspection	5-4
5.3.1	External Visual Inspection	5-4
5.3.2	Internal Visual Inspection	5-5
5.4	Cleaning	5-8
5.4.1	External Cleaning	5-8
5.4.2	Internal Cleaning	5-8
5.5	Grease Supply	5-9
5.5.1	Grease used	5-9
5.5.2	Grease Supply procedure	5-10
5.6	How to Replace Components	5-15
5.6.1	Stainless Steel Sheet Replacement/adjustment	5-15
5.6.2	Timing belt Replacement/adjustment	5-18
5.6.3	Replacement Work of Motor Unit and Coupling Spacer	5-23

5.1 Precautions for Maintenance and Inspection Work

Make sure to read the following precautions before conducting any maintenance or inspection.



Caution

- Do not climb on or put anything on the actuator.
Otherwise, this may lead to accidental falling, injury or damage to the product due to falling objects, product loss of function or performance degradation, or shortening of product life.
- Before releasing the brake, make sure to check there is nothing that will interfere with moving parts within the operation range.
- The slider may fall, possibly injuring the operator or people nearby and damaging the actuator, workpiece or equipment.
- Check that the power to the actuator is OFF before conducting any maintenance or inspections.
- Be careful not to lose the cover or any removed screws. Be sure to return the product to the original condition after maintenance and inspection work. Mounting in an incomplete state may cause injuries or damage to the product.
- Do not modify, disassemble/assemble, or use maintenance parts not specified on your own discretion under any circumstances.
- The grease film may run out if the actuator performs return operation continuously over a distance of 30mm or less. As a guideline, every 5,000 to 10,000 cycles, have approximately 5 cycles of return operation over a 50mm distance or more to regenerate the oil film.
The trapezoid screw or guide may be damaged if the oil film runs out.



Notice

- First, be sure to wipe off the old grease, and then supply new grease.
 - The degradation speed of grease may differ depending on the operating environment (temperature, humidity and ambient atmosphere).
It is recommended to shorten the grease supply period if the actuator is used under poor environmental conditions such as high temperatures, high humidity or dusty atmospheres.
 - It is recommended to improve the environmental conditions in case the grease changes color notably due to poor operating conditions.
 - Base oil may separate from the grease due to the mounting orientation or operating conditions.
Base oil may also leak from the inside of the actuator to the exterior through gaps.
Check visually for oil drips when supplying grease.
 - An actuator stored for 6 months or more may suffer from grease degradation.
Supply grease before the start of use.
For details, refer to [5.5 Grease Supply].
-

5.2 Inspection

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.

5.2.1 Inspection items and schedule

Inspection period	External inspection	Internal inspection	Grease Supply	
			Screw	Guide
Start of work inspection	○	-	-	-
1-month inspection	○	-	-	-
3-month inspection	-	-	○	○
6-month inspection	○	○	○	○
Every 6 months thereafter	○	○	○	○

5.3 Visual Inspection

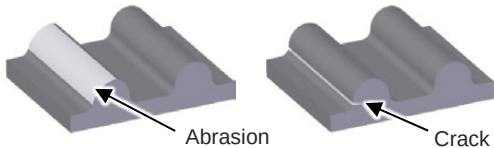
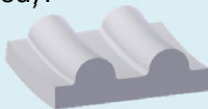
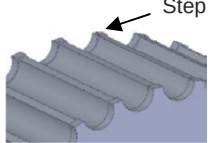
For the detailed way to supply grease, refer to [5.5 Grease Supply] and [5.6 How to Replace Components].

5.3.1 External Visual Inspection

Inspection items	Maintenance work
Is abnormal noise or vibration generated?	Take an action by referring to [Troubleshooting in Controller Instruction Manual].
Are actuator mounting bolts loose?	Tighten them further.
Is the cable scratched?	Replace if the damage is severe.
Is the connector loose?	Re-insert correctly.
Is grease dripping out? (especially if vertically mounted)	Clean up any drips. Replenish the grease.
Is the stainless steel sheet scratched?	Replace the stainless steel sheet.
Is the stainless steel sheet misaligned or slack?	Adjust the alignment and hang.

* Reference of life of stainless steel sheet :5,000km

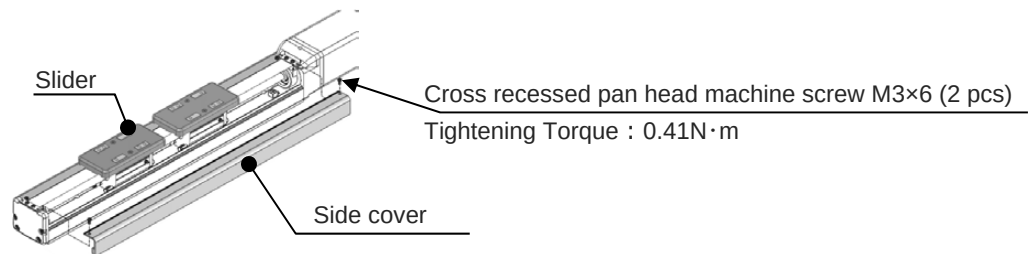
5.3.2 Internal Visual Inspection

Inspection items	Maintenance work
Wear debris found?	The trapezoid screw guide may be damaged. Contact IAI.
Has foreign matter penetrated inside?	Remove the foreign matter, clean, and inspect the interior for any damage.
Is the trapezoid screw or guide grease not lubricating well? (Even if the grease is brown, lubrication is adequate if the running surface is shiny)	Wipe away the old grease, then replenish with new grease.
Is dust or foreign matter adhered to the trapezoid screw or guide?	Replenish with new grease after cleaning.
Is the belt significantly worn out on the teeth area? Is there any crack on the teeth area? Is there any chipped tooth? 	Replace the timing belt in case any of those stated on the left is found. Refer to [5.6.2 Timing belt Replacement/adjustment]. Applicable Models: Motor reversed type
Is the timing belt hardened, softened or deformed (shrunk or expanded)? 	Replace the timing belt in case any of those stated on the left is found. Refer to [5.6.2 Timing belt Replacement/adjustment]. Applicable Models: Motor reversed type
Is there any significant abrasion on pulley teeth? 	Consult with IAI in case any of those stated on the left is found.

Caution : Turn the power off before start working.

◆ Internal inspection method

1. Remove the cross recessed pan head machine screws (2 pcs) and take the side cover off.
2. Check inside.
3. Attach the side cover with the cross recessed pan head machine screws (2 pcs).
Put a shim (approx. 0.1 to 0.2mm) between the stainless steel sheet and the side cover so the side cover slightly offsets.
The stainless steel sheet contacting the side cover may cause damage or waviness on the stainless steel sheet which could lead to early degradation or abrasion.
4. Make sure that the slider and the side cover do not interfere, moving the slider backwards and forwards between the strokes.



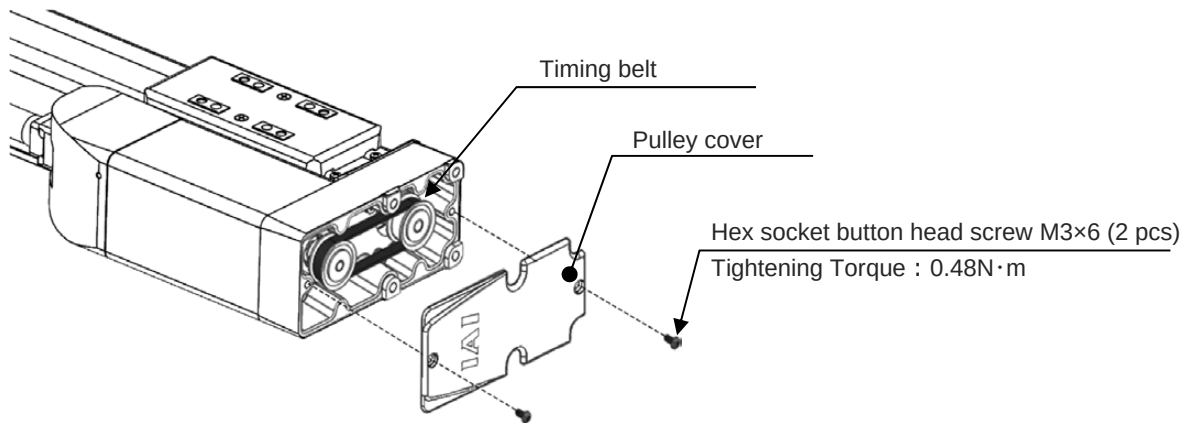
Caution

- Do not damage the stainless steel sheet by bending it forcefully during internal inspection. Do not tug on the stainless steel sheet or in any way attempt to reposition it. Change in the attached condition may cause the sheet to be mounted unevenly or impact the product life.
 - Keep in mind that the edges of the stainless steel sheet can cause injuries. Always wear gloves when working on it.
-

◆ Timing belt Inspection

Applicable Models :GRST6R, GRST7R

- 1.** Remove the hex socket button head screws (2 pcs) and take the pulley cover off.
- 2.** Check the condition of the timing belt visually.
- 3.** Attach the pulley cover with the hex socket button head screws (2 pcs).



5.4 Cleaning

5.4.1 External Cleaning

- Clean exterior surfaces as necessary.
- Use a soft cloth when wiping up appearance.
- 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.

5.4.2 Internal Cleaning

- When cleaning up inside, use a soft cloth to wipe up dirt.
- 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.

5.5 Grease Supply

5.5.1 Grease used

Use an equivalent product.

Application location	Recommended product grease
Guide	Kyodo Yushi/Multemp LRL No.3 (Lithium-based grease)
Trapezoid screw	Kyodo Yushi/Multemp AC-D (Lithium-based grease)

[Reference] Grease used on delivery

Guide : Kyodo Yushi/Multemp LRL No.3

Trapezoid screw : Kyodo Yushi/Multemp AC-D



Caution

- Do not attempt to apply any grease other than lithium grease.
Mixing with grease types other than lithium grease not only reduces the performance of the grease, but it may even cause damage to the actuator.

5.5.2 Grease Supply procedure



Caution

- Supplying too much grease may increase sliding resistance and load to the motor, resulting in a drop of performance.
Also, excess grease on the ball screw may be splashed around in the ambience.
- Do not damage the stainless steel sheet by bending it forcefully during work.
- Keep in mind that the edges of the stainless steel sheet can cause injuries. Always wear gloves when working on it.
- The front bracket is supporting the ball screw. Do not detach it.
If the front bracket loses its tuned condition, it may cause an increase of driving resistance, shortened life of each component or abnormal noise due to the center of the axis being off the right position.
- Pay attention not to pinch your hand or finger to the slider when operating the slider with a teaching tool.
- In case the grease got into your eye, wash it with clean water for 15 minutes and 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.

◆ Preparation

- Protection Gear (Rubber gloves, etc.)
- Waste cloth
- Grease Gun (For Grease Supply to Guide)

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

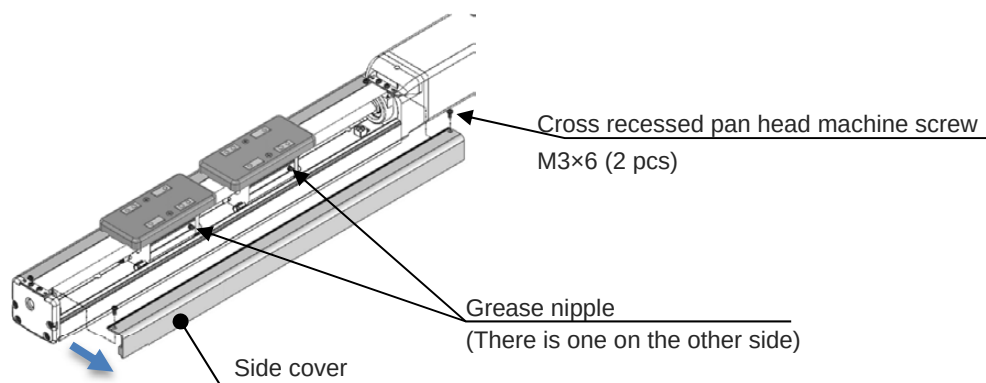
- Grease

Type	Grease Supply Volume to 1 Slider (Reference)
GRST6□	0.5cc to 1.0cc
GRST7□	1.0cc to 1.5cc

◆ Grease Supply Procedure

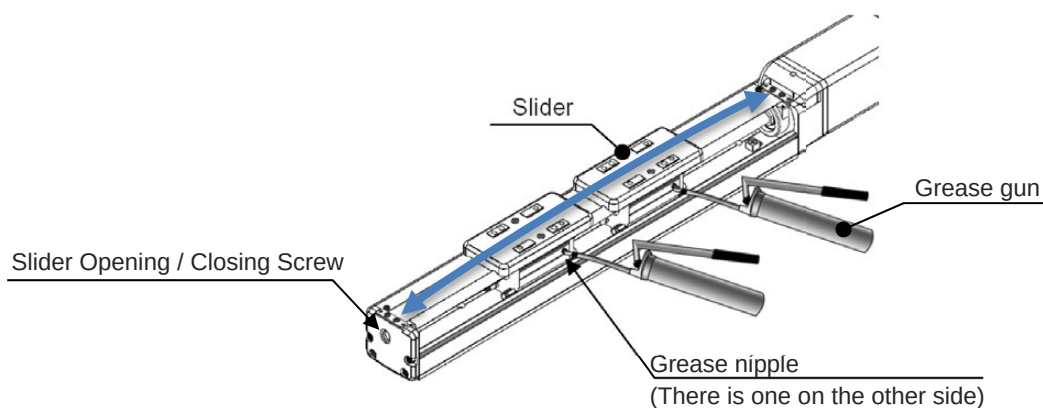
[1] Guide

1. Remove the cross recessed pan head machine screws (2 pcs) on either side of the side covers and take the side cover off. * There is another grease nipple on the other side.

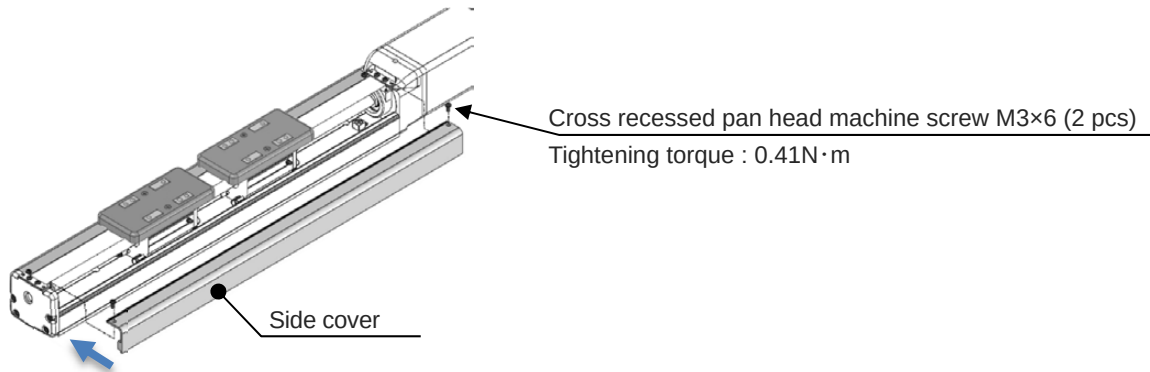


2. Supply grease with a grease gun at the grease nipple.
Wipe off the grease before supplying new in case it is extremely dirty.
* There is another grease nipple available for grease supply on the other side.
Either side is available for grease supply on the ball screw and the guides.

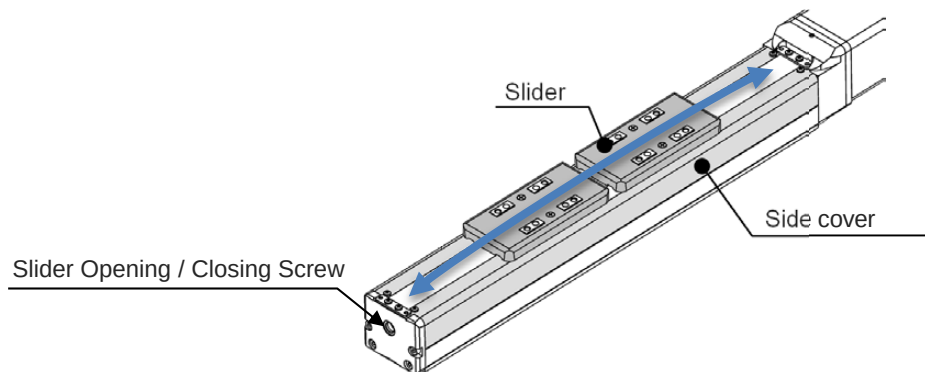
3. Move the slider in the full stroke range to spread the grease evenly.
 - Confirm the surface on the ball screw and the ball feeding area on the guides are glossy with grease oil.
If grease is not spread evenly, supply grease again.
 - Wipe off excess grease.
 - * For Lead 2, the slider cannot be moved with hand. Use the slider open/close screw to move it.
 - * In case it is equipped with a brake, use a teaching tool to move it at around 20mm/s.



4. Put the side cover on with the cross recessed pan head machine screws (2 pcs).
 (Note) Put a shim (approx. 0.1 to 0.2mm) between the stainless steel sheet and the side cover so the side cover slightly offsets.
 The stainless steel sheet contacting the side cover may cause damage or waviness on the stainless steel sheet which could lead to early degradation or abrasion.

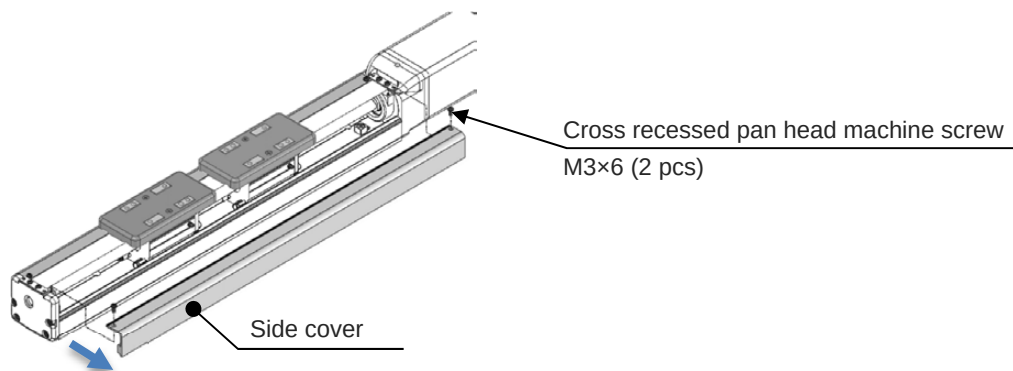


5. Move the slider in the full stroke range to make sure there is no interference of the slider and the side covers.
 * For Lead 2, the slider cannot be moved with hand. Use the slider open/close screw to move it.
 * In case it is equipped with a brake, use a teaching tool to move it at around 20mm/s.

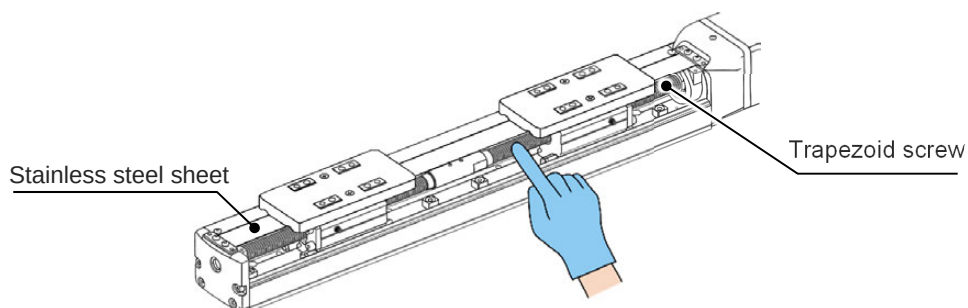


[2] Trapezoid screw

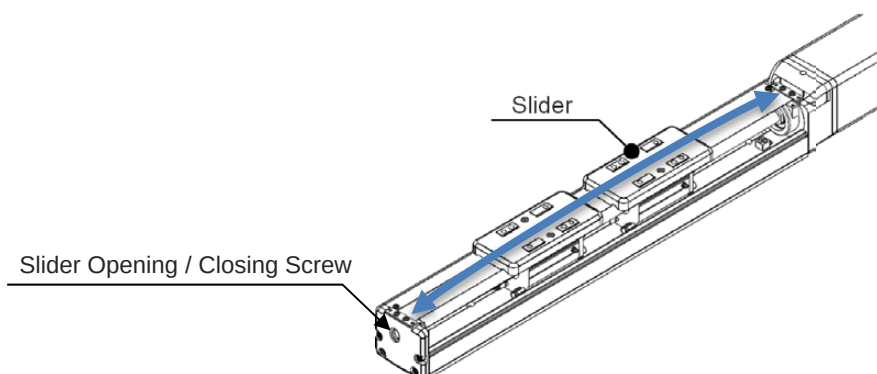
1. Remove the cross recessed pan head machine screws (2 pcs) on either side of the side covers and take the side cover off.



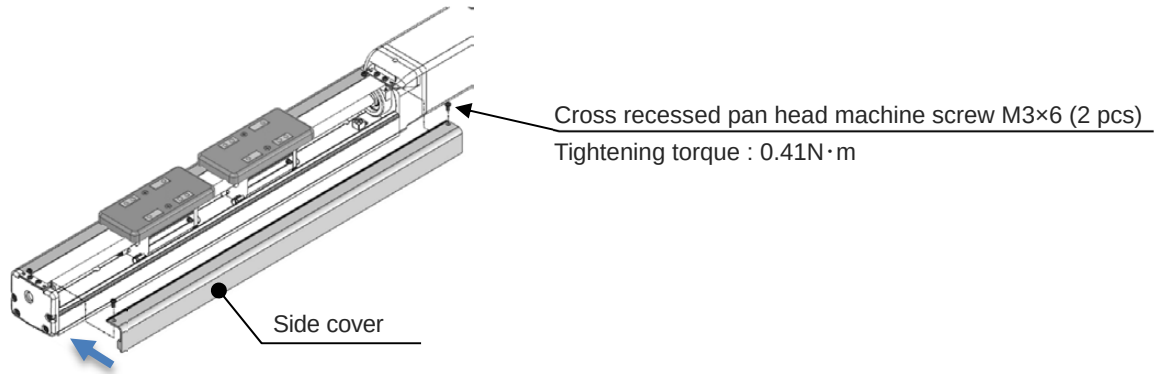
2. Wipe off old grease on the trapezoid thread with cloth, and then apply new grease with hand.
* Pay attention to the stainless steel sheet not to touch it.



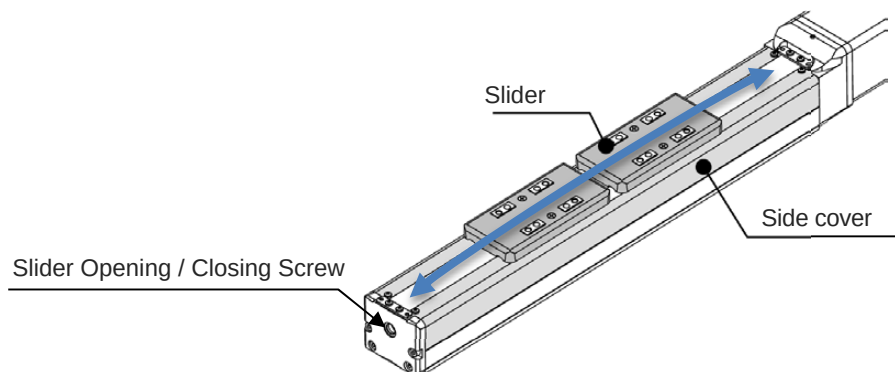
3. Move the slider in the full stroke range to spread the grease evenly.
 - Confirm the surface on the ball screw and the ball feeding area on the guides are glossy with grease oil.
If grease is not spread evenly, supply grease again.
 - Wipe off excess grease.
 * For Lead 2, the slider cannot be moved with hand. Use the slider open/close screw to move it.
 * In case it is equipped with a brake, use a teaching tool to move it at around 20mm/s.



4. Put the side cover on with the cross recessed pan head machine screws (2 pcs).
 (Note) Put a shim (approx. 0.1 to 0.2mm) between the stainless steel sheet and the side cover so the side cover slightly offsets.
 The stainless steel sheet contacting the side cover may cause damage or waviness on the stainless steel sheet which could lead to early degradation or abrasion.



5. Move the slider in the full stroke range to make sure there is no interference of the slider and the side covers.
 * For Lead 2, the slider cannot be moved with hand. Use the slider open/close screw to move it.
 * In case it is equipped with a brake, use a teaching tool to move it at around 20mm/s.



5.6 How to Replace Components

5.6.1 Stainless Steel Sheet Replacement/adjustment

◆ Preparation

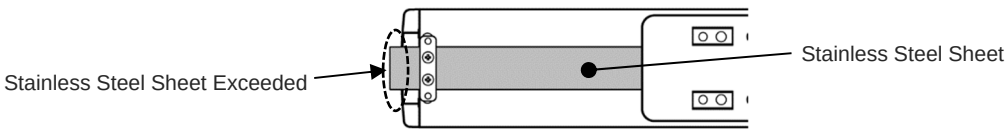
- Phillips screwdriver
- Protection Gear (e.g. Cotton Work Gloves)
- Scale
- Tape
- Scissors
- Replacement stainless steel sheet

Type	Model Code
GRST6□	ST-6A6 (Stroke)
GRST7□	ST-6A7 (Stroke)



Caution

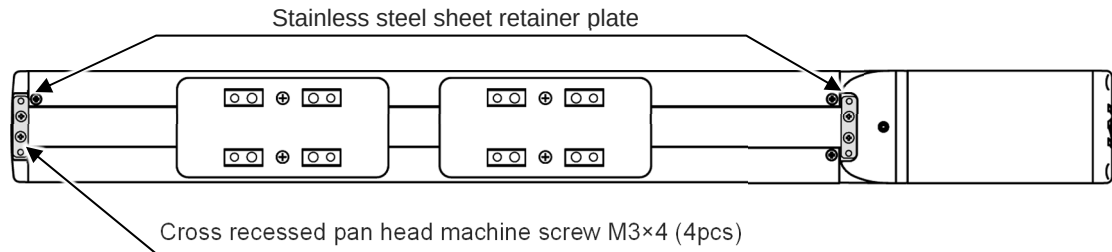
- Degradation and wear-out of the stainless steel sheet relies on its tension of attachment. If the stainless steel sheet is pulled with a huge force and the gap between the sheet and the slider cover is large, there is a risk of metal fatigue. On the other hand, if the tensile strength is too low, the stainless steel sheet would interfere with the back side of the slider cover and make dust to be generated.
- Ensure that the stainless steel sheet does not stick out of the end of the actuator when it is mounted. It may lead to a risk of cutting your finger on the stainless steel sheet.



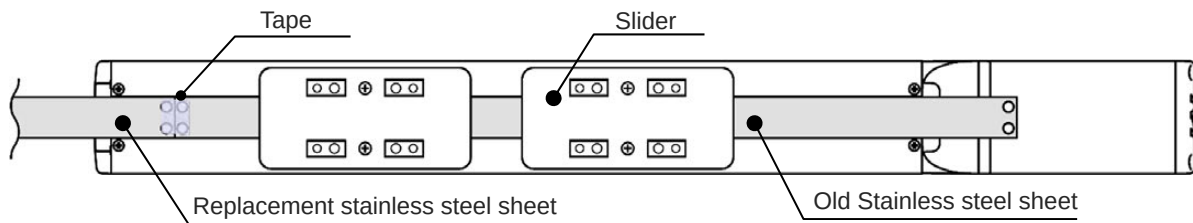
- As a guideline, the stainless steel sheet should last for about 5,000km of motion. However, depending on the usage or environment, replace the stainless steel sheet appropriately.

◆ Procedure for Replacement

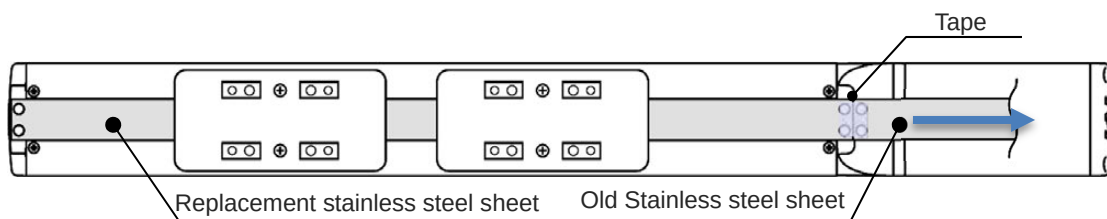
1. Remove the cross recessed pan head machine screws (4 pcs) and take the stainless steel sheet retainers off.



2. Join the old stainless steel sheet with a stainless steel sheet for replacement.
* Make sure width of adhesive tape would not go out of the stainless steel sheet width.

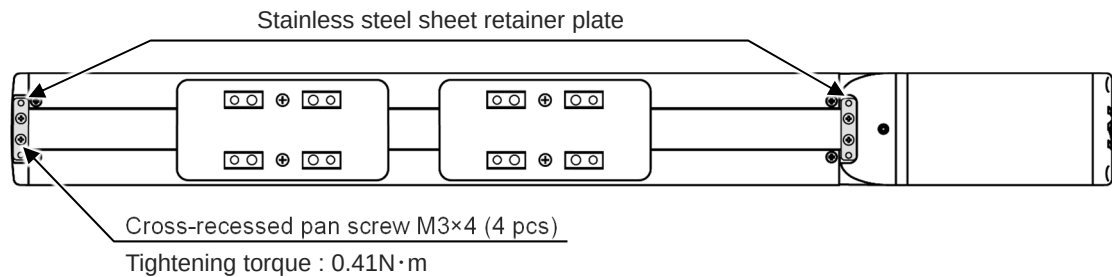


3. Pull the old stainless steel sheet slowly to replace it with the stainless steel sheet for replacement, and take off the old stainless steel sheet and the tape.



4. Attach the stainless steel sheet retainers with the cross recessed pan head machine screws (4 pcs).

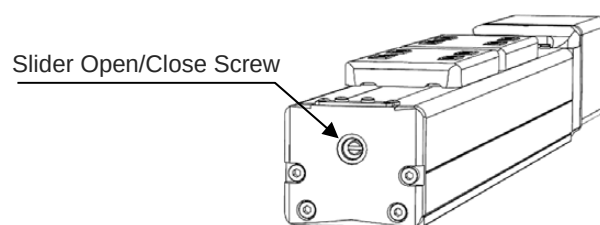
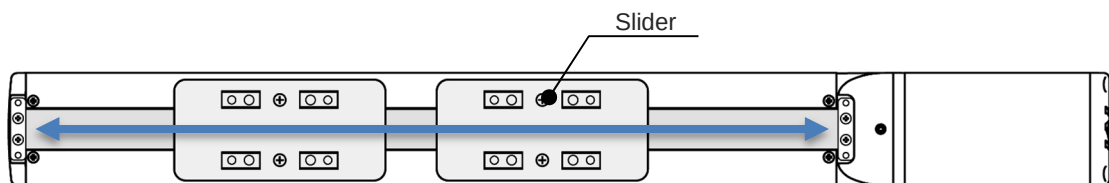
- * There are two grooves on the main body for the stainless steel sheet attachment guide.
Set the stainless steel sheet in the center between the two grooves.



5. Move the slider in the full stroke range to make sure there is no waviness or looseness on the stainless steel sheet.

Redo the from Procedure 4 if there is any problem.

- * For Lead 2, the slider cannot be moved with hand. Use the slider open/close screw to move it.
- * In case it is equipped with a brake, use a teaching tool to move it at around 20mm/s.

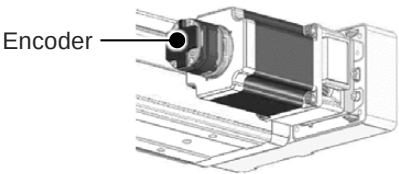


5.6.2 Timing belt Replacement/adjustment



Caution

- Do not attempt to touch on the encoder part of the motor directly with hand.
If touched with hands, the encoder phase may change, resulting in an error.

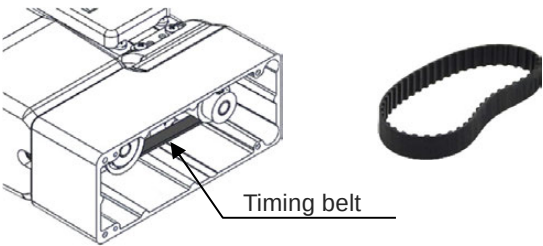


- In case of replacing the timing belt while keeping the vertical orientation, fix the slider in advance. The slider will drop and cause danger.

◆ Preparation

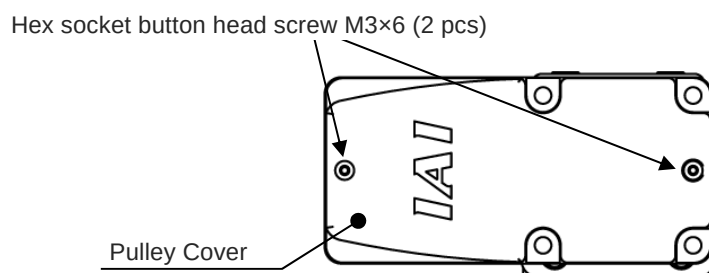
- Hexagon Wrench 2mm, 2.5mm, 3mm
- Phillips screwdriver
- Tension Gauge (capable thing of tensioning to 90N or greater)
- Long zip ties, etc. (thin string)
- Protection Gear (e.g. Cotton Work Gloves)
- Replacement timing belt

Type	Model Code
GRST6R	TB-RCP6-STRA6R
GRST7R	TB-RCP6-STRA7R



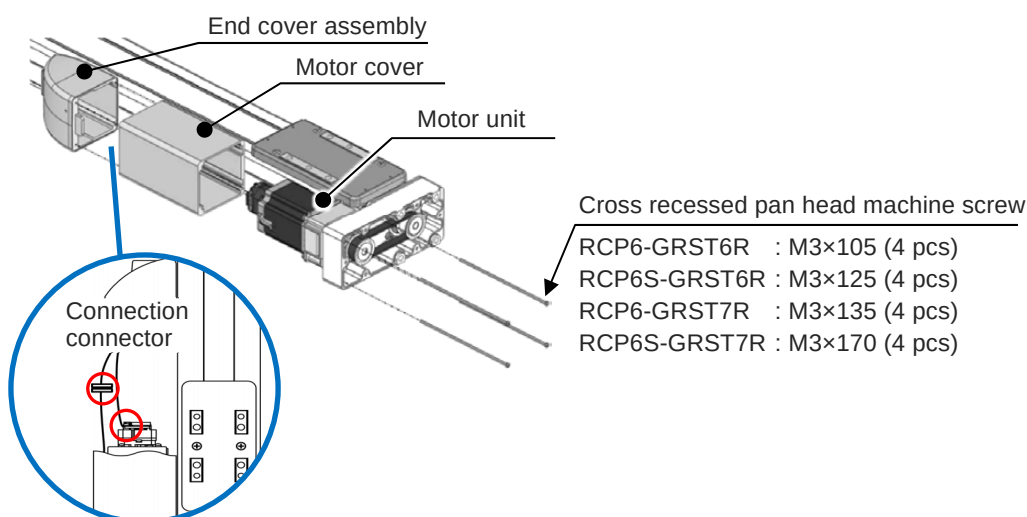
◆ Procedure for Replacement

1. Remove the hex socket button head screws (2 pcs) and take the pulley cover off.



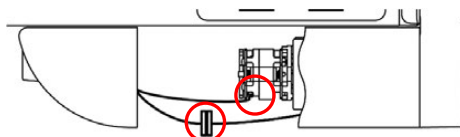
2. Remove the cross recessed pan head machine screws (4 pcs), unplug the connectors on the motor unit and end cover assembly at two places and take the motor cover off.

* The connectors should be at three places for the RCP6 brake-equipped type and one place for RCP6S.

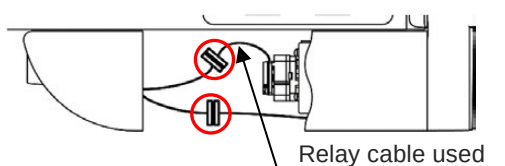


◆ For RCP6-GRST6R, there are two types of motor units, which the position and profile of connector should differ.

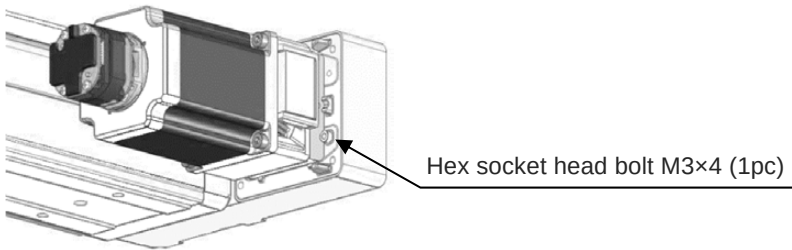
Motor unit in may 2023 and earlier



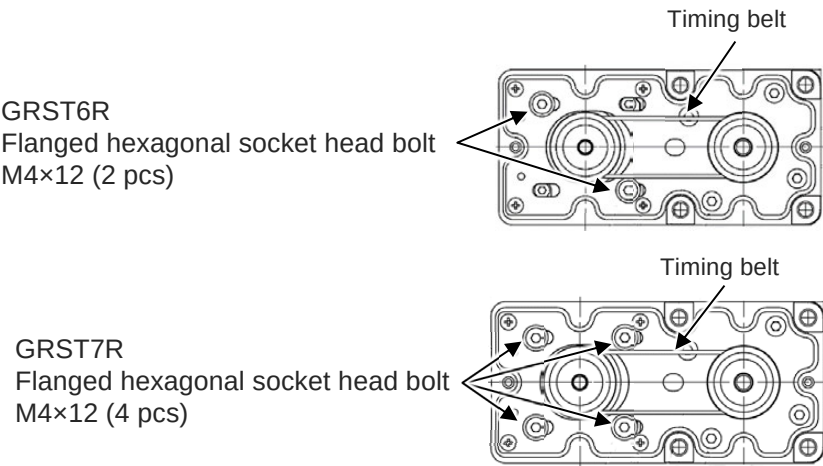
Motor unit in may 2023 and later



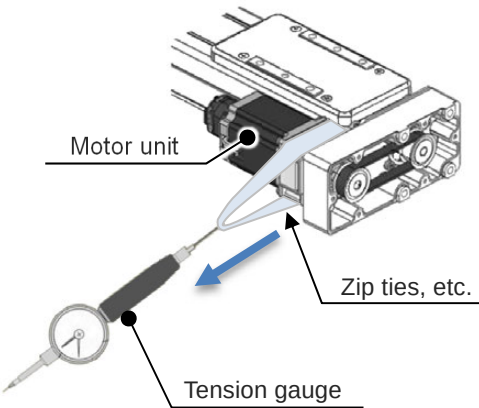
3. Loosen the hex socket head bolt (1 pc).



4. Loosen the flanged hexagonal socket head bolts and replace the timing belt.

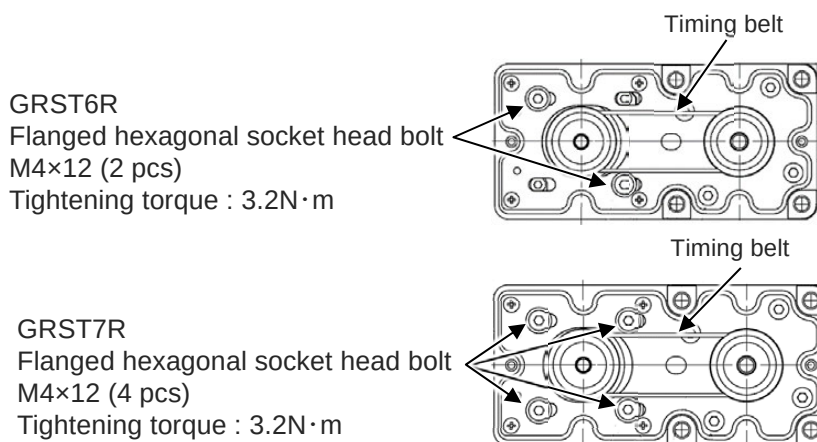


5. Hang a zip tie or equivalent on the motor unit and apply the specified load (tensile strength) with a tension gauge.

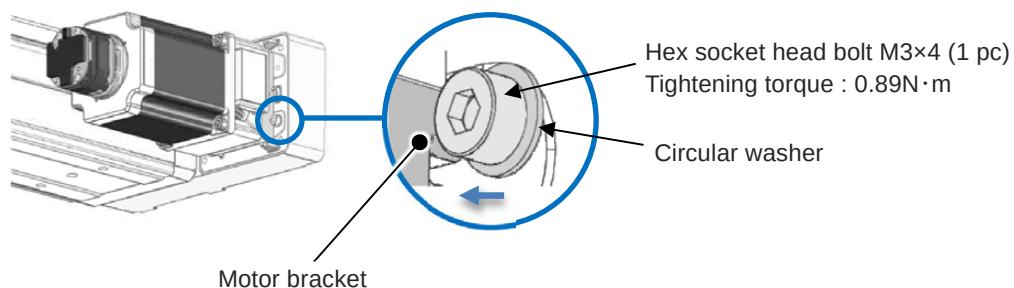


Type	Tensile Strength
GRST6R	25 to 30N
GRST7R	80 to 90N

6. While the specified load (tensile strength) is applied, tighten up the flanged hex socket set screw to hold the motor.

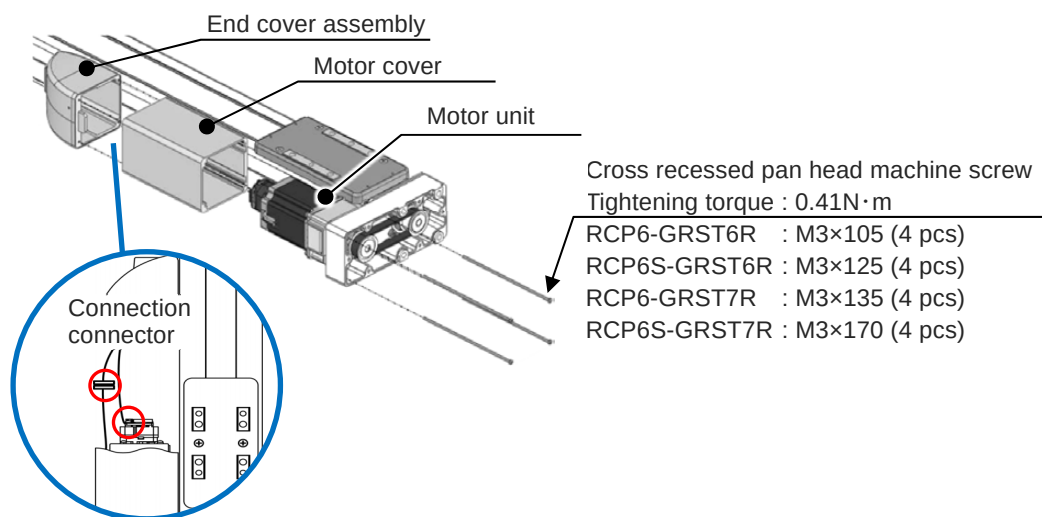


7. Put the circular washer tightly on the motor bracket and tighten it up with the hex socket head cap screw (1 pc).



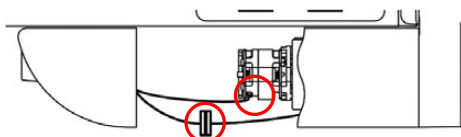
8. Put the motor cover over the motor unit, plug in the connectors on the motor unit and end cover assembly at two places, and fix them with the cross recessed pan head machine screws (4 pcs).

* The connectors should be at three places for the RCP6 brake-equipped type and one place for RCP6S.

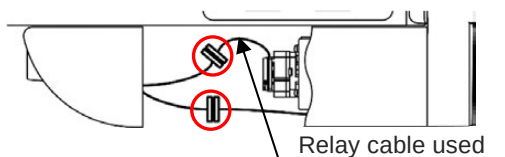


- ◆ For RCP6-GRST6R, there are two types of motor units, which the position and profile of connector should differ.

Motor unit in may 2023 and earlier

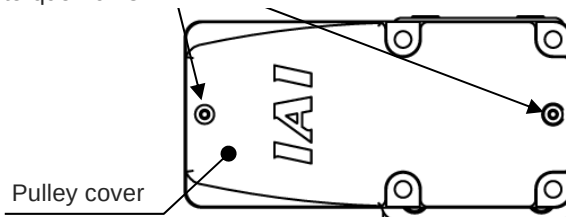


Motor unit in may 2023 and later



9. Attach the pulley cover with the hex socket button head screws (2 pcs).

Hex socket button head screw M3×6 (2 pcs)
Tightening torque : 0.48N·m



5.6.3 Replacement Work of Motor Unit and Coupling Spacer

[1] Motor straight type GRST6C, GRST7C

◆ Preparation

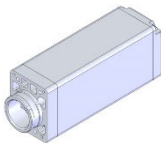
- Hexagonal wrench 2mm, 2.5mm-sized
- Motor unit for replacement

Example of Model Code : For RCP6 GRST6C equipped with Brake with Cable Ejected in Right Orientation

Model Code : RCP6-MUSRTA6C-B-CJR

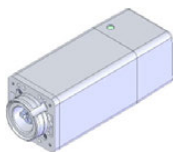
Series	Type	Basic Model Code	Brake	Cable Ejected Orientation (Option)
RCP6	GRST6	RCP6-MUSRTA6C	No Description (w/o brake) B (with brake)	CJT/CJR CJL/CJB
	GRST7	RCP6-MUSTA7C		
RCP6S	GRST6	RCP6S-MUSRTA6C		
	GRST7	RCP6S-MUSTA7C		

Motor unit for RCP6



GRST6C, GRST7C

Motor unit for RCP6S



GRST6C, GRST7C

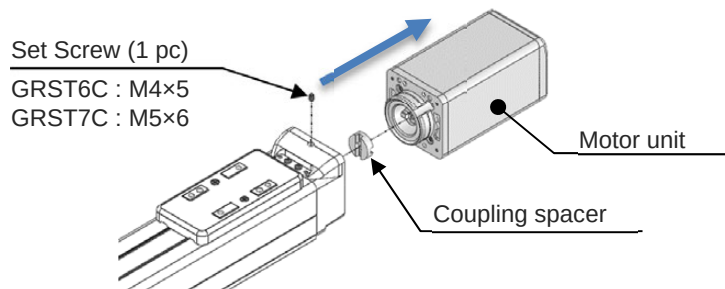
- Coupling Spacer for Replacement (In Common for RCP6 and RCP6S)

Type	Model Code
GRST6C	CPG-RCP6-S
GRST7C	CPG-RCP6-M

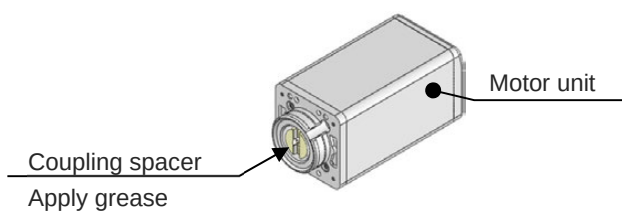


◆ Procedure for Replacement

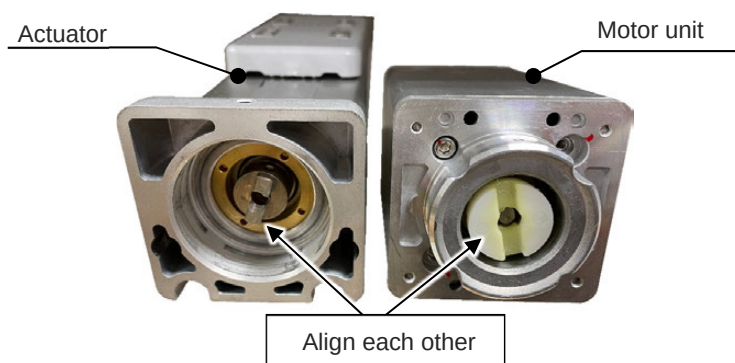
1. Remove the set screw (1 pc) to take off the motor unit and coupling spacer.



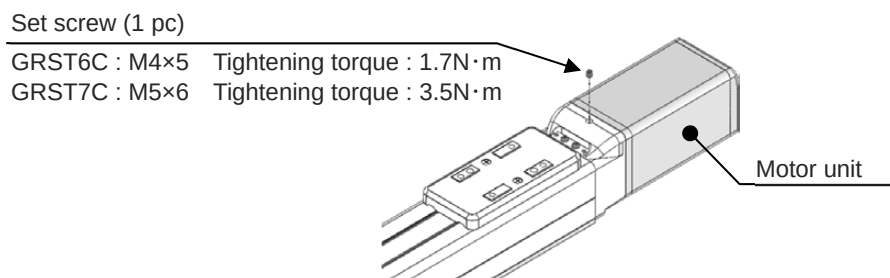
2. Apply grease (NOXLUB TL1010 Grease manufactured by NOK) on a coupling spacer for replacement for appropriate amount and put it on a motor unit for replacement.



3. Align the convex on the actuator side and the recess on the motor unit for replacement and attach them.



4. Attach the motor unit with the set screw (1 pc).



5. Make sure to conduct a home return on a PC teaching software or a touch panel teaching.

[2] Motor reversed type GRST6R, GRST7R

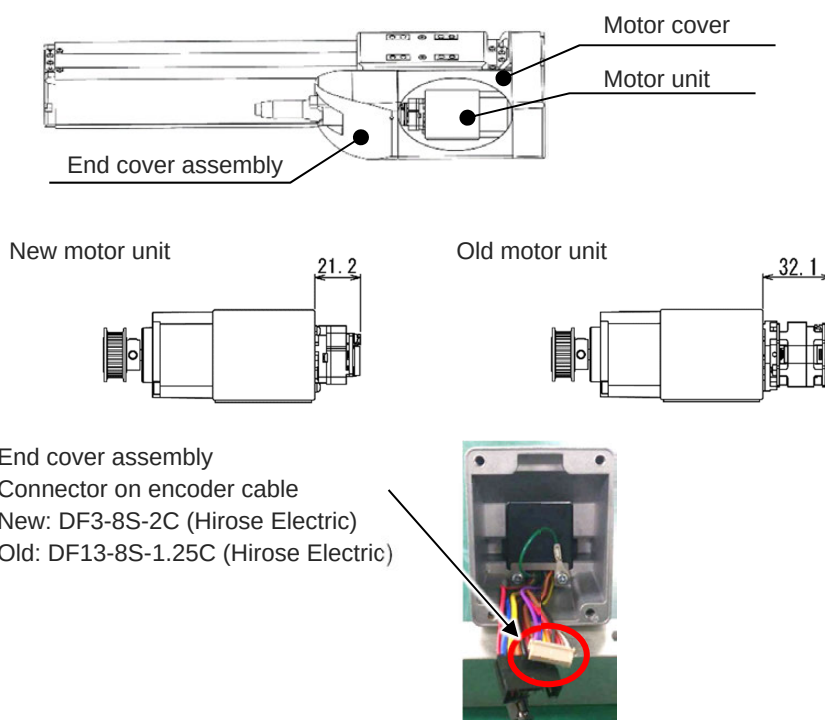
**Caution**

- The motor unit has changed since may 2023.

Pay attention to the following points regarding changes.

- RCP6-GTST6R: A change was made to the end cover assembly.

There may be a case that a relay cable is necessary depending on the combination of the motor unit and end cover assembly.



End cover assembly	Motor unit	Relay cable
Old	Old	Not necessary
Old	New	Necessary ^{Note 1}
New	New	Necessary
New	Old	Necessary

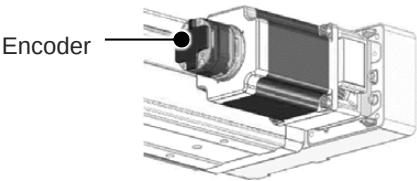
Note 1: Although a relay cable is not necessary for connection, it is recommended to use the new end cover assembly + relay cable as the connection on the motor side is positioned at a place difficult to connect.

Relay cable



* Consult with IAI for purchasing

- Do not attempt to touch on the encoder part of the motor directly with hand.
If touched with hands, the encoder phase may change, resulting in an error.



- Do not attempt to touch the control circuit board except for the replacement work of the control circuit board of RCP6S.
- Static electricity may cause malfunction.
Do not attempt to do the replacement work in any place that is easy to cause static electricity (such as on a carpet).
Touch a metal to remove static electricity from the body before start replacement work.

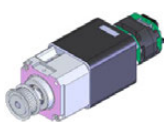
◆ Preparation

- Hexagonal wrench 2mm, 2.5mm, 3mm-sized
 - Phillips screwdriver
 - Tension gauge (capable thing of tensioning to 90N or greater)
 - Stiff string or long zip ties
 - Relay cable * Refer to caution in the previous page
 - Motor unit for replacement (In Common for RCP6 and RCP6S)
- Example of Model Code : For RCP6 GRST6R equipped with Brake

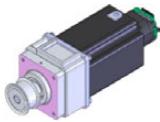
Model Code : RCP6-MUSRTA6WSRA12R-B-PU

Type	Basic Model Code	Brake	Pulley
GRST6R	RCP6-MUSRTA6WSRA12R	B	PU
GRST7R	RCP6-MUSTA7WSA14R		

In Common for RCP6 and RCP6S



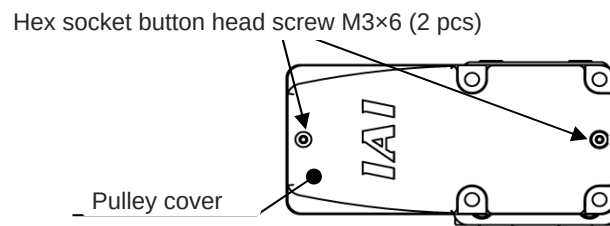
GRST6R



GRST7R

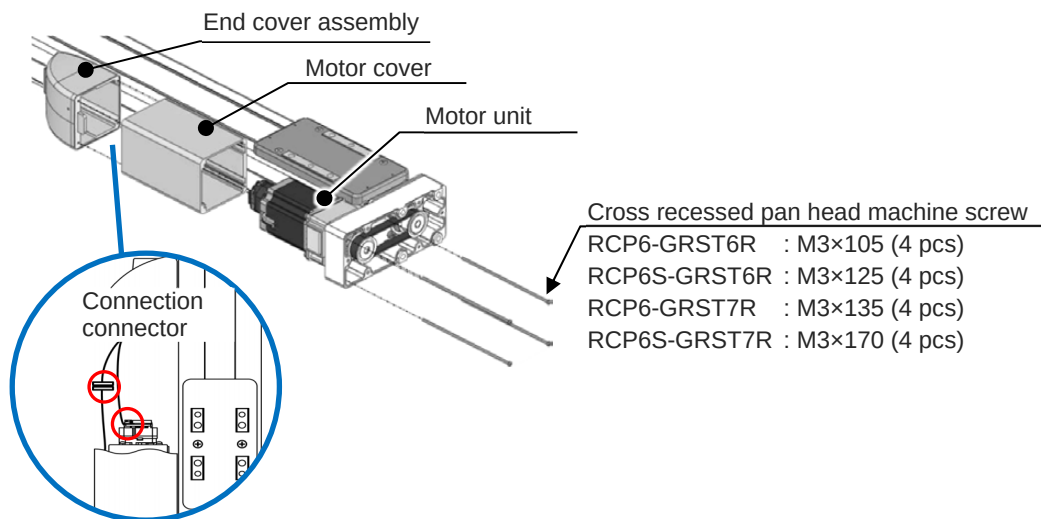
◆ Procedure for Replacement

1. Remove the hex socket button head screws (2 pcs) to take the pulley cover off.



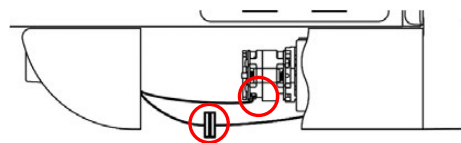
2. Remove the cross recessed pan head machine screws (4 pcs), unplug the connectors on the motor unit and end cover assembly at two places and take the motor cover off.

* The connectors should be at three places for the RCP6 brake-equipped type and one place for RCP6S.

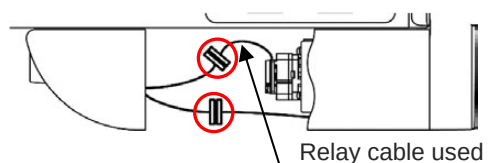


- ◆ For RCP6-GRST6R, there are two types of motor units, which the position and profile of connector should differ.

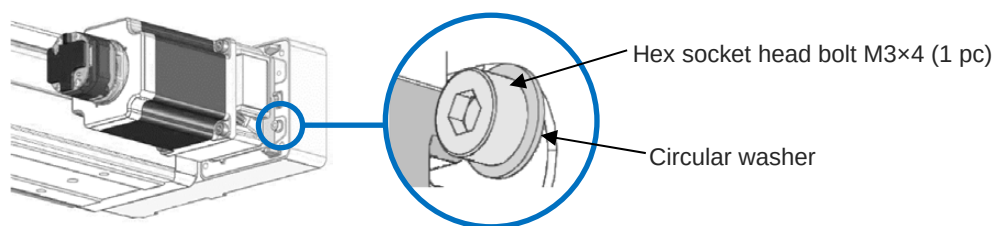
Motor unit in may 2023 and earlier



Motor unit in may 2023 and later



3. Take off the hex socket head cap screw (1 pc) and the circular washer.

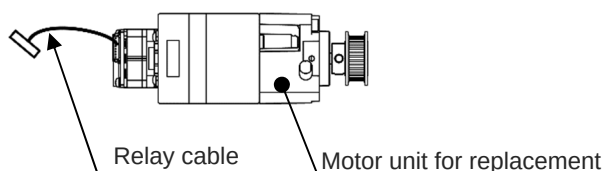


4. Remove the flanged hex socket set screw to take off the motor unit and timing belt.

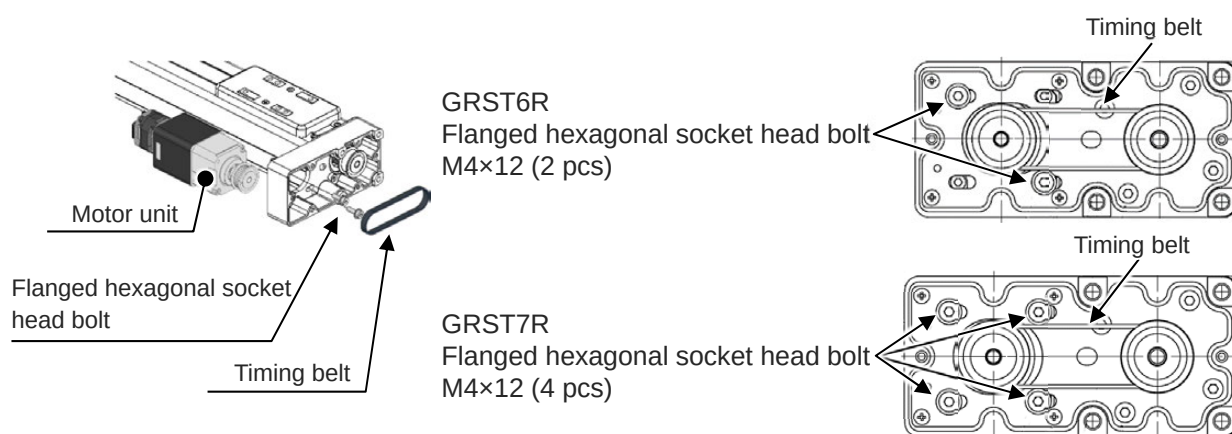
* For RCP6-GRST6R only

Take the relay cable off the motor unit that was taken off, and put a motor unit for replacement on.

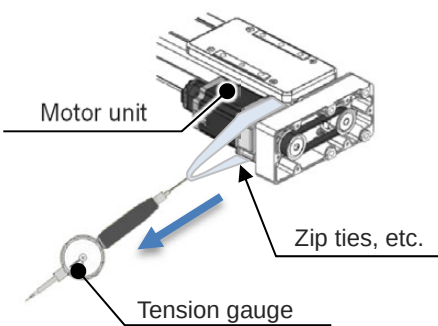
A new relay cable is to be put on in this step when it is required to be applied.



5. Tighten the flanged hex socket set screw loosely on the motor unit for replacement and put the timing belt on.

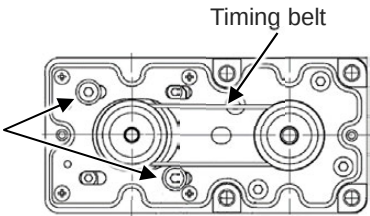


6. Adjust the tension of the timing belt.
- Hang a tool such as a zip tie on the edge of the motor unit and apply load with a tension gauge and pull it.
- Once it has reached the specified load, tighten up the flanged hex socket set screws to fix it.

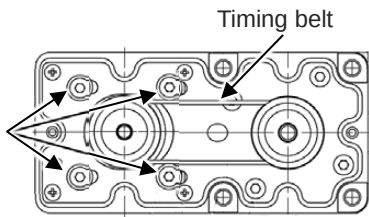


Type	Tensile Strength
GRST6R	25 to 30N
GRST7R	80 to 90N

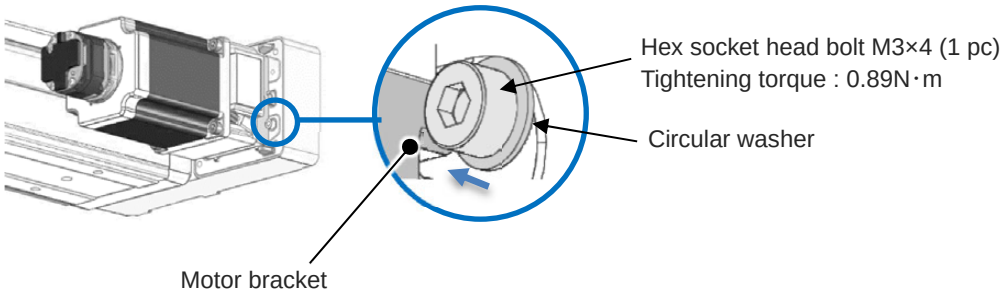
GRST6R
Flanged Hexagonal Socket Head Bolt
M4×12 (2 pcs)
Tightening torque : 3.2N·m



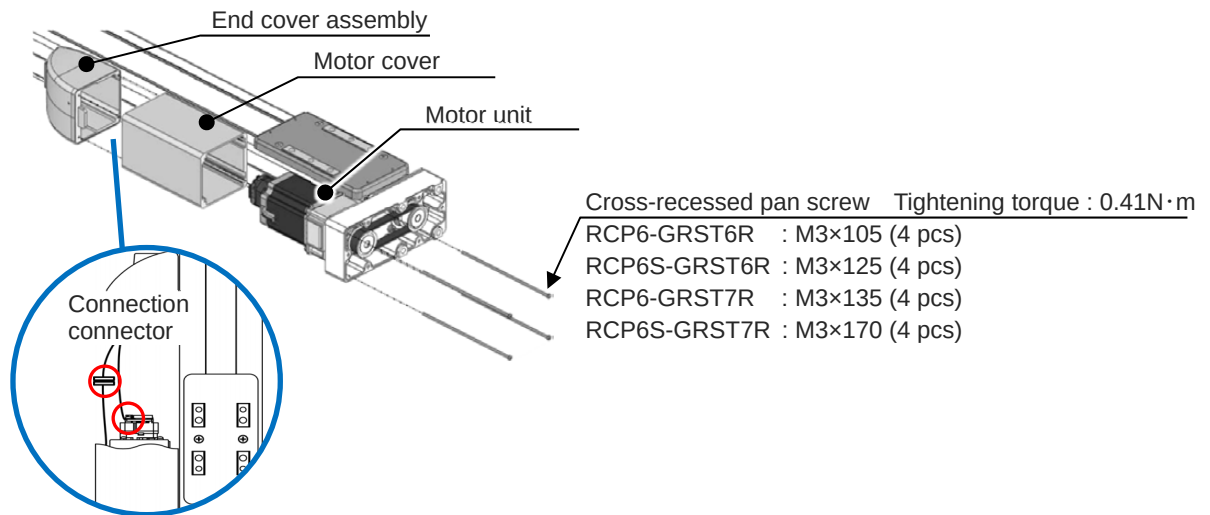
GRST7R
Flanged Hexagonal Socket Head Bolt
M4×12 (4 pcs)
Tightening torque : 3.2N·m



7. Put the circular washer tightly on the motor bracket and tighten it up with the hex socket head cap screw (1 pc).

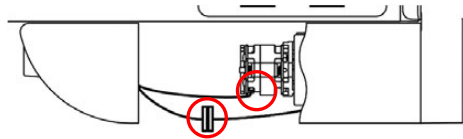


8. Put the motor cover over the motor unit, plug in the connectors on the motor unit and end cover assembly at two places, and fix them with the cross recessed pan head machine screws (4 pcs).
 * The connectors should be at three places for the RCP6 brake-equipped type and one place for RCP6S.

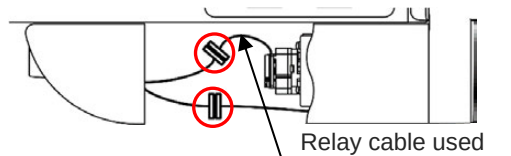


- ◆ For RCP6-GRST6R, there are two types of motor units, which the position and profile of connector should differ.

Motor unit in may 2023 and earlier

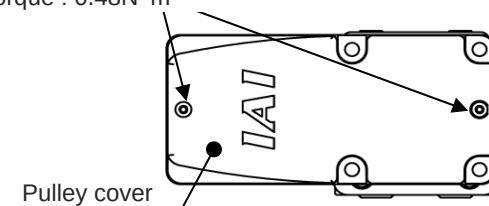


Motor unit in may 2023 and later

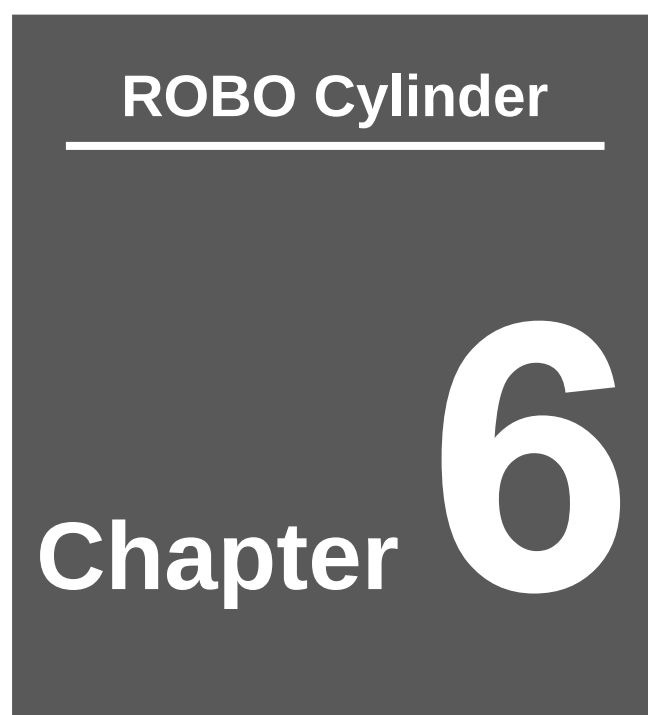


9. Attach the pulley cover with the hex socket button head screws (2 pcs).

Hex socket button head screw M3×6 (2 pcs)
 Tightening torque : 0.48N·m



10. Make sure to conduct a home return on a PC teaching software or a touch panel teaching.



External Dimensions

6.1	External Dimensions	6-1
6.1.1	Standard Specification RCP6-GRST6C	6-1
6.1.2	Built-in Controller Specification RCP6S-GRST6C	6-2
6.1.3	Standard Specification RCP6-GRST7C	6-3
6.1.4	Built-in Controller Specification RCP6S-GRST7C	6-4
6.1.5	Standard Specification RCP6-GRST6R	6-5
6.1.6	Built-in Controller Specification RCP6S-GRST6R	6-6
6.1.7	Standard Specification RCP6-GRST7R	6-7
6.1.8	Built-in Controller Specification RCP6S-GRST7R	6-8

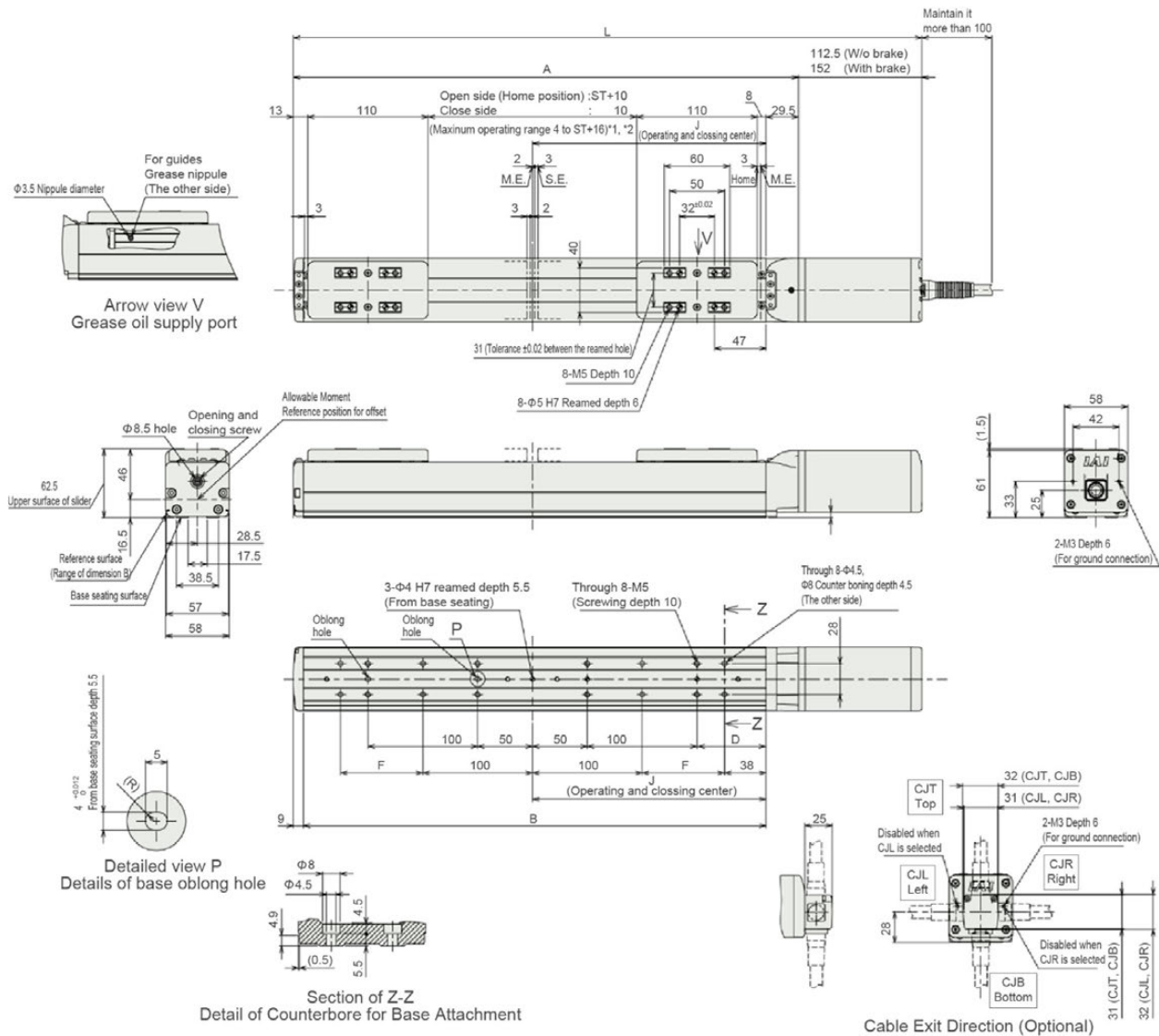
6.1 External Dimensions

6.1.1 Standard Specification RCP6-GRST6C

*1 When the home-return operation is performed, the slider moves to the mechanical end.

Pay attention to interference to peripherals.

*2 The both sliders should operate in the opposite side at the same time.



Dimensions unit by Stroke

(mm)

Stroke		180	230
L	W/o Brake	573	623
	With Brake	612.5	662.5
A		460.5	510.5
B		422	472
D		63	88
F		75	100
J		213	238

Mass by Stroke

Stroke		180	230
Mass (kg)	W/o Brake	3.2	3.4
	With Brake	3.4	3.6

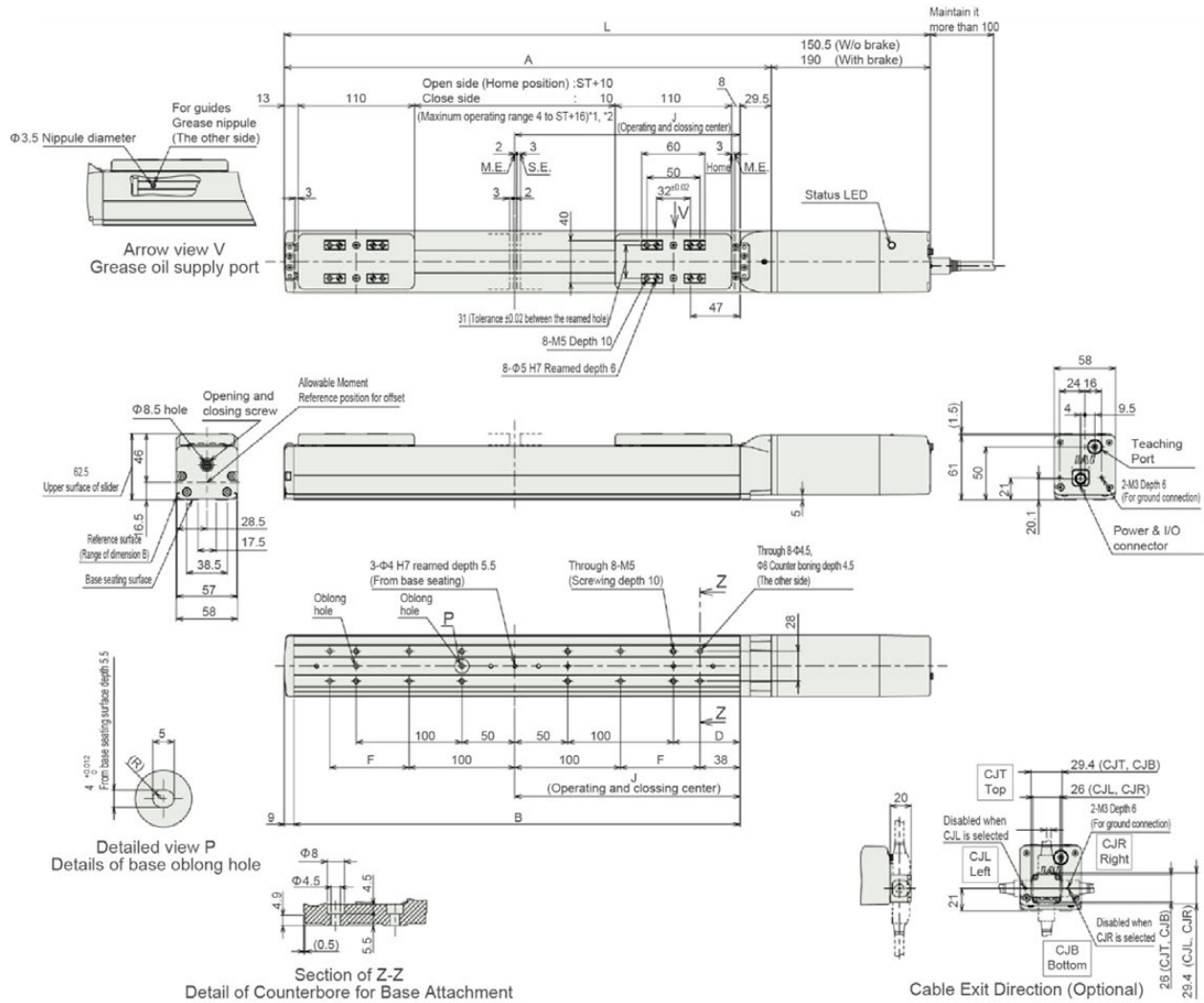
6.1 External Dimensions

6.1.2 Built-in Controller Specification RCP6S-GRST6C

*1 When the home-return operation is performed, the slider moves to the mechanical end.

Pay attention to interference to peripherals.

*2 The both sliders should operate in the opposite side at the same time.



Dimensions unit by Stroke

(mm)

Stroke	180	230
L		
W/o Brake	611	661
With Brake	650.5	700.5
A	460.5	510.5
B	422	472
D	63	88
F	75	100
J	213	238

Mass by Stroke

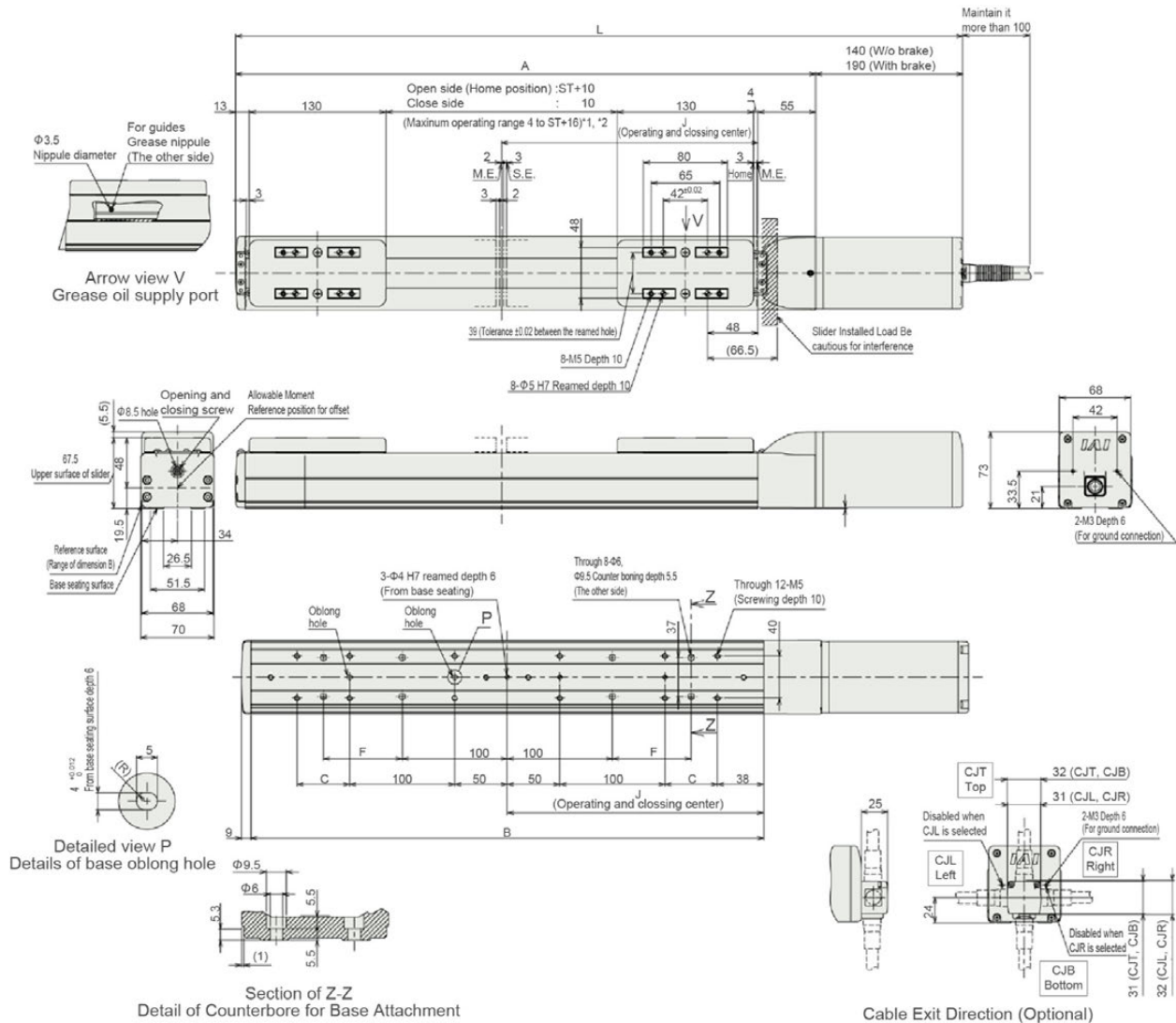
Stroke	180	230
Mass (kg)		
W/o Brake	3.3	3.5
With Brake	3.5	3.7

6.1.3 Standard Specification RCP6-GRST7C

*1 When the home-return operation is performed, the slider moves to the mechanical end.

Pay attention to interference to peripherals.

*2 The both sliders should operate in the opposite side at the same time.



Dimensions unit by Stroke

Stroke		210	260
L	W/o Brake	692	742
	With Brake	742	792
A		552	602
B		488	538
C		50	100
D		44	19
F		75	100
J		244	269

(mm) Mass by Stroke

Stroke		210	260
Mass (kg)	W/o Brake	5.4	5.6
	With Brake	5.8	6.0

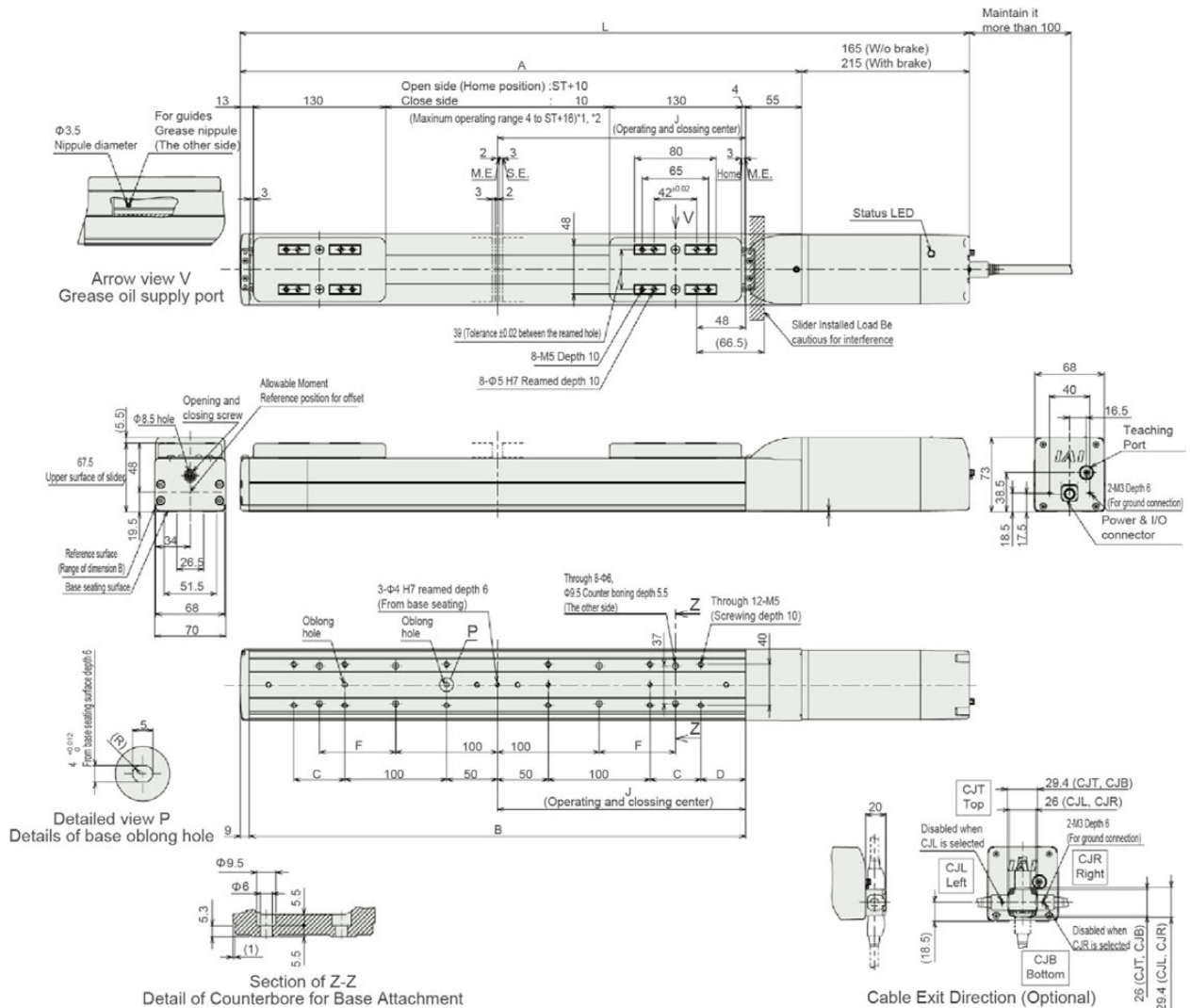
6.1 External Dimensions

6.1.4 Built-in Controller Specification RCP6S-GRST7C

*1 When the home-return operation is performed, the slider moves to the mechanical end.

Pay attention to interference to peripherals.

*2 The both sliders should operate in the opposite side at the same time.



Dimensions unit by Stroke

Stroke		210	260
L	W/o Brake	717	767
	With Brake	767	817
A		552	602
B		488	538
C		50	100
D		44	19
F		75	100
J		244	269

Mass by Stroke

Stroke		210	260
Mass (kg)	W/o Brake	5.5	5.8
	With Brake	6.0	6.2

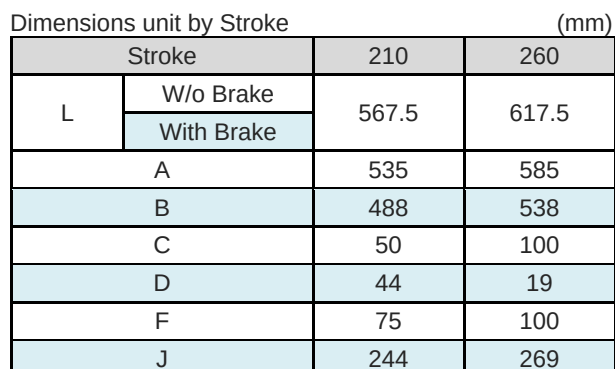
(Note) Shown in the figure below is the case of motor left reversed type (model code: ML).



(Note) Shown in the figure below is the case of motor left reversed type (model code: ML).



(Note) Shown in the figure below is the case of motor left reversed type (model code: ML).

6-7

(Note) Shown in the figure below is the case of motor left reversed type (model code: ML).



Stroke		210	260
Mass (kg)	W/o Brake	6.1	6.3
	With Brake	6.2	6.4

ROBO Cylinder

Chapter 7

Life

7.1	Concept of Gripper Life.....	7-1
-----	------------------------------	-----

7.1 Concept of Gripper Life

The gripper life is as shown below.

Life (Reference): 10,000,000 times of gripping operation

The gripper life could vary largely depending on the condition of use, environment and maintenance.



ROBO Cylinder

Chapter 8

Warranty

8.1	Warranty period	8-1
8.2	Scope of the warranty	8-1
8.3	Honoring the warranty	8-1
8.4	Limited liability	8-2
8.5	Conformance with applicable standards/regulations, etc., and application conditions	8-2
8.6	Limited liability	8-2

8.1 Warranty period

Whichever of the following periods is shorter:

- 18 months after shipment from IAI
- 12 months after delivery to a specified location
- 2,500 operational hours

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

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

- Anything other than our product
- Modification or repair performed by a party other than IAI (unless approved by IAI)
- Anything that could not be easily predicted with the level of science and technology available at the time of shipment from IAI
- Natural disaster, unnatural disaster, incident or accident for which we are not liable
- Natural fading of paint or other symptoms of aging
- Wear, depletion or other expected results of use
- Operation noise, vibration or other subjective sensations 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 consigned to IAI for repair under warranty.

8.4 Limited liability

- (1) We 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 assume no liability for any program or control method created by the customer to operate our product or for the results of any such program or control method.

8.5 Conformance with applicable standards/regulations, etc., and application conditions

- (1) If our product is combined with another product or any system, equipment, 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 assume no liability 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 IAI if you must use our product for any of these applications:
 - Medical equipment used to maintain, control or otherwise affect human life or physical health
 - Mechanisms and machinery designed for the purpose of moving or transporting people (vehicles, railway facilities, aviation facilities etc.)
 - Machinery components essential for safety (safety devices etc.)
 - Equipment used to handle cultural assets, art or other irreplaceable items
- (3) Contact IAI in advance if our product is to be used in any condition or environment that differs from that specified in the catalog or instruction manual.

8.6 Limited liability

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:

- Guidance for mounting/adjustment and witnessing of test operation
- Maintenance and inspection
- Technical guidance and education on operating/wiring methods, etc.
- Technical guidance and education on programming and other items related to programs

Index

A

- Allowable static moment 1-4, 1-7
- Allowable dynamic moment 1-4, 1-7
- Ambient operating temperature/humidity 1-4, 1-7

B

- Backlash 1-4, 1-7
- Brake grip force (option) 1-4, 1-7

C

- Cable Exit Direction Changed (Model Code: CJT, CJR, CJL, CJB, CJO) 1-17
- Connecting with the Controller 3-1 to 6
- Cleaning 5-8

D

- Drive System 1-4, 1-7
- Duty Ratio 1-10

E

- External Visual Inspection 5-4
- External cleaning 5-8
- External Dimensions
 - RCP6-GRST6C 6-1
 - RCP6S-GRST6C 6-2
 - RCP6-GRST7C 6-3
 - RCP6S-GRST7C 6-4
 - RCP6-GRST6R 6-5
 - RCP6S-GRST6R 6-6
 - RCP6-GRST7R 6-7
 - RCP6S-GRST7R 6-8

F

- Finger Attachment Installation Tool (Model Code: MJF) 1-18
- Finger Attachment, Mounting Transported Objects 2-12

G

- Grease Supply 5-9 to 14
- Grease Supply procedure 5-10 to 14
- Grease used 5-9

H

- Handling in Condition of being assembled in Machinery Equipment (System) 2-2
- Handling of the Robot 2-1
- How to Read the Model Number 1-3
- How to Read the Model Nameplate 1-2

- Home Return Direction 4-1

I

- International Standard Compliance Intro-11
- Installation Environment 2-3
- Installation Orientation 2-5
- Installation Surface 2-7
- Installation of the Main Unit 2-8 to 11
- Indication of Speed and Acceleration 4-1
- Inspection Items and Schedule 5-3
- Internal Visual Inspection 5-5 to 7
- Internal Cleaning 5-8

L

Life

- Concept of Gripper Life 7-1
- Lost Motion 1-4, 1-7

M

Mass

- RCP6-GRST6C 6-1
- RCP6S-GRST6C 6-2
- RCP6-GRST7C 6-3
- RCP6S-GRST7C 6-4
- RCP6-GRST6R 6-5
- RCP6S-GRST6R 6-6
- RCP6-GRST7R 6-7
- RCP6S-GRST7R 6-8

- Maximum Grip Force 1-4, 1-7

Motor • Encoder Cables

- Dedicated connection cable for other than RCON, RSEL, and RCM-P6PC 3-7 to 8
- Dedicated connection cable for RCON, RSEL, and RCM-P6PC 3-9 to 10
- Motor Encoder Integrated Cables 1-1

- Motor Encoder Integrated Robot Cables Type 1-1

Motor Reversed Direction

- (Model Code: ML, MR) 1-17

- Movement Stroke 4-1

- Mounting on Finger Attachment Installation Tool (MJF Option) 2-13 to 14

N

Names of the Parts

- Standard Specification
- Motor Straight Type Intro-12

Built-in Controller Specification
 Motor Straight Type.....Intro-12
 Standard Specification
 Motor Reversing Type Intro-13
 Built-in Controller Specification
 Motor Reversing Type Intro-13

O

Open/Close Maximum Speed.....1-4, 1-7
 Operation of the Fingers 4-1
 Operating Conditions 1-11 to 16

P

Precautions for Handling Intro-8 to 10
 Parts 1-1
 Positioning Repeatability 1-4, 1-7
 Precautions Regarding Stainless Steel Sheet
2-6
 Position Indication 4-1
 Precautions for Maintenance and Inspection
 Work.....5-1 to 2

R

Relation between the Current Limit Value and the
 Grip Force 1-5, 1-8
 Release of the Gripped Work Piece.....4-2
 Replacement Work of Motor Unit and Coupling
 Spacer
 Motor straight type GRST6C, GRST7C
5-23 to 24
 Motor reversed type GRST6R, GRST7R
5-25 to 30
 Reversed-home Specification
 (Model Code: NM) 1-19

S

Slider Spacer (Model Code: SS) 1-19
 Slider Roller Specification
 (Model Code: SR).....1-19
 Storage/preservation Environment 2-4
 Stainless Steel Sheet Replacement/ adjustment
5-15 to 17

T

Timing belt Replacement/adjustment ..5-18 to 22
 Transportation 2-1 to 2

W

With brake (Model Code: B) 1-17
 Warranty.....8-1 to 2

Revision history

Revision date	Revised content
2018.04	First Edition
2018.05	Edition 1B • Pg. 1-5 and 1-8 Brake (option) grip force added • Pg. 1-7 and 1-10 Lead 8 pressing velocity 10mm/s added
2018.07	Edition 1C • Pg. 3-2 Correction made
2020.04	Edition 1D • Pg. 1-22 Electric wire color changed
2020.09	Edition 1E • Pg. 2-5 Description added stating installation with motor on the bottom not recommended • Pg. 6-1 to 6-8 D dimension added
2021.02	Edition 1F • Pg. 2-14 and 2-16 Note added for mass applicable on one end of finger attachment
2021.05	Edition 1G • Pg. 1-22 and 1-23 Change made to tables in cable drawing and connection diagram.

Revision history

Revision date	Revised content
2024.03	Edition 1H • Changed to “Revised RoHS Directive” in compliance with overseas standards • 1.1.1 DVD deleted for Parts • 1.1.3 How to Read the Model Number Controller RSEL added • 1.4 Option model codes re-ordered in alphabetical orders • 1.5 Accessories moved to Chapter 3 • 2.3.1 Installation Orientation correction made in caution • 3.2 Motor • Encoder Cables added • 5.3.2 Internal Visual Inspection Timing belt added • 5.6.2, 5.6.3 Motor Unit changed and note added • Chapter 7 Life added • Chapter 8 Appendix deleted • Correction made • Terms integrated • Overall layout corrected
2026.02	Edition 1I • Change made in accordance with discontinuation of including First Step Guide
2026.07	Edition 1J • Terms integrated (cable carrier)



IAI Corporation

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

IAI America, Inc.

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

Technical Support available in Europe

IAI Industrieroboter GmbH

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

Technical Support available in Great Britain



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

IAI (Shanghai) Co., Ltd.

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

IAI Robot (Thailand) Co., Ltd.

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

The information contained in this document is subject to change without notice for purposes of product improvement.

Copyright © 2026.Jul. IAI Corporation. All rights reserved.