



Slim Small Linear Gripper

First Step Guide First Edition

Thank you for purchasing our product.

Make sure to read the Safety Guide and detailed Instruction Manual (CD) included with the product in addition to this First Step Guide to ensure correct use.

This Instruction Manual is original.

Warning : Operation of this equipment requires detailed installation and operation instructions which are provided on the CD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A copy of the CD Manual can be requested by contacting your nearest IAI Sales Office listed at the back cover of the Instruction Manual or on the First Step Guide.

- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Product Check

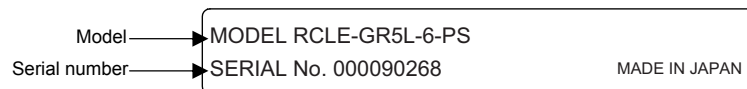
The standard configuration of this product is comprised of the following parts.

If you find any fault with the product you have received, or any missing parts, contact us or our distributor.

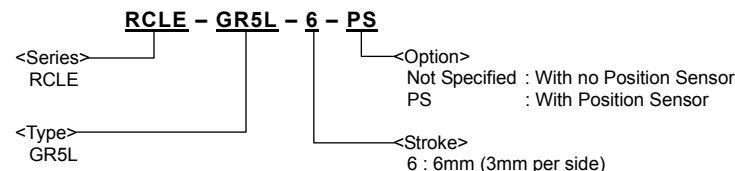
1. Parts (The option is excluded.)

No.	Part Name	Model	Reference
1	Actuator Main Body	Refer to "How to read the model plate", "How to read the model"	
Accessories			
2	Instruction Manual (CD)		
3	Safety Guide		

2. How to read the model plate



3. How to read the model



Precautions in Handling

Warning : Influence of Permanent Magnet
There is a high performance rare earth permanent magnet (neodymium magnet) used in the actuator.
It may cause an error to the operation of medical devices such as a pacemaker. Do not get close to the product if you use such a device like a pacemaker.

1. Handling of the Packed Product

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

- Do not damage or drop. The package is not applied with any special treatment that enables it to resist an impact caused by a drop or crash.
- Follow the instruction if there is any for the packaging condition.
- Do not step or sit on the package.
- Do not put any load that may cause a deformation or breakage of the package.

2. Handling of Robot without Package

- Do not carry the actuator by holding the cable, or do not move it by pulling the cable.
- When carrying the actuator, exercise caution not to bump it against nearby objects or structures.
- Do not give any excessive force to any of the sections in the actuator.

3. Handling in Assembled Condition

If it is out of the package, cover up the whole unit for protection and do not apply any damage to it.

Installation and Storage/Preservation Environment

1. Installation Environment

Do not use this product in the following environment.

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

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

- Location exposed to radiant heat from a huge heat source such as the heat treatment
- Location where the surrounding air temperature exceeds the range of 0 to 40°C
- Location where condensation occurs due to abrupt temperature changes
- Location where relative humidity exceeds 85%RH
- Location exposed to direct sunlight
- Location exposed to corrosive gases or combustible gases
- Location exposed to significant amount of dust, salt or iron powder (Outside of ordinary assembly plant)
- Location where water, oil (includes oil mist and cutting fluid) or chemical is splashed
- Location where the product main body receives vibration or hit impact

When using the product in any of the locations specified below, provide a sufficient shield.

- Location subject to electrostatic noise
- Location where exposed to the influence of strong electric or magnetic field
- Location where exposed to the influence of ultraviolet or radiant rays

2. Storage and Preservation Environment

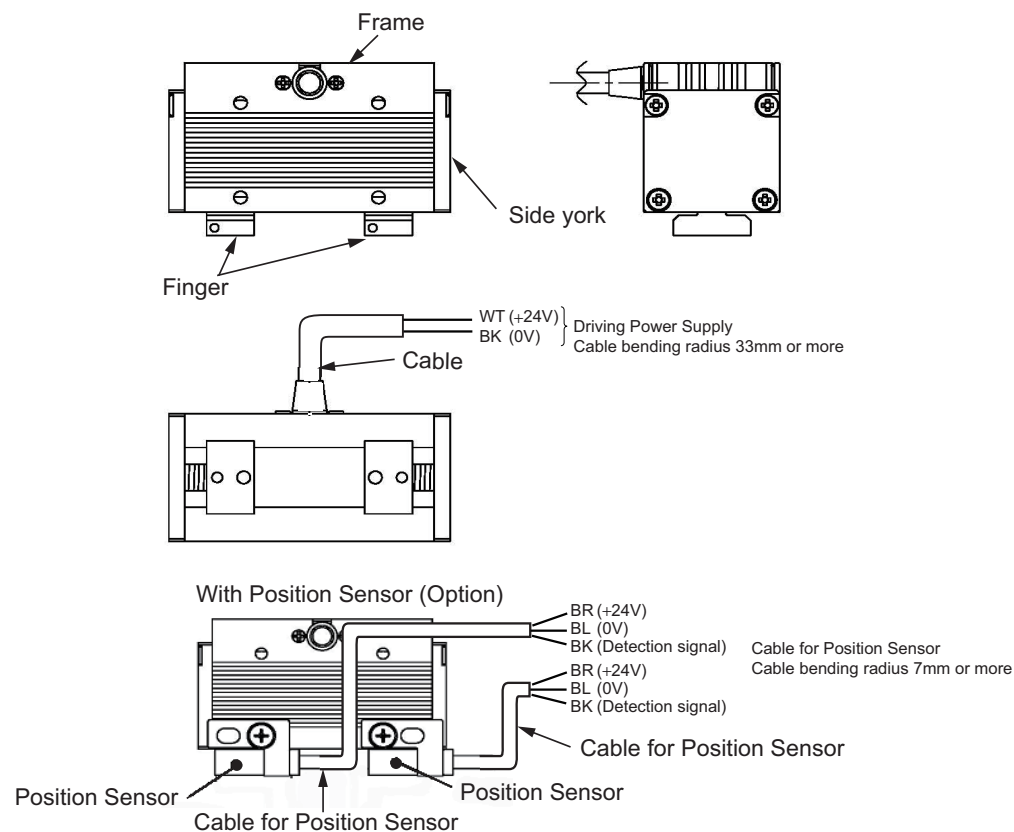
The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored for a long time, pay close attention to environmental conditions so that no dew condensation forms.

Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored and preserved in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.

For storage and preservation temperature, the machine withstands temperatures up to 60°C for a short time, but in the case of the storage and preservation period of 1 month or more, control the temperature to 50°C or less.

Storage and preservation should be performed in the horizontal condition. In the case it is stored in the packaged condition, follow the posture instruction if any displayed on the package.

Names of the Parts



Attachment

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

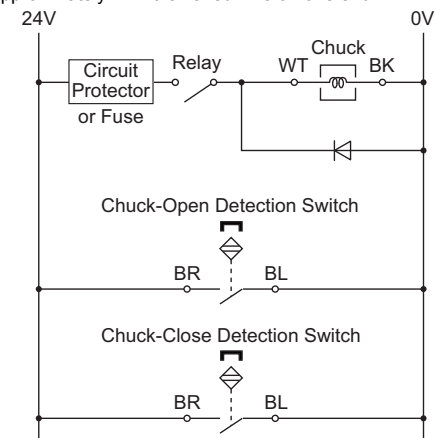
Danger : This product generates heat. The temperature may get high depending on how to install it.
Watch out for a burn or injury.

[Precautions for Attachments]

No.	Item	Precautions
1	Installation	<ul style="list-style-type: none">• Mount the unit so the finger comes down at the bottom. Mounting the finger in an orientation other than downwards may allow foreign object to get in the unit from the openings, which may result in a bad operation of the finger or malfunction of the unit. This product generates heat. The temperature may get high depending on how to install it. Make sure to follow the instructions below when installing. <ul style="list-style-type: none">• Install the unit on a material with high heat conductivity. To prevent a temperature rise on the unit, install it on a material such as metal, which possesses the characteristic of good heat conductivity. Installing the unit on a material with insufficient heat conductivity may cause the unit to raise its temperature and may result in a malfunction.• Do not use this product under conditions with bad heat radiation, such as fixing the unit body on an insulation material or use the unit in a closed area which would not allow heat to be released. Using this product in a condition with bad heat radiation may cause the unit to raise its temperature and may result in a malfunction.• To block heat from being conducted to the work part, use a material with low heat conductivity such as polyacetal for the finger attachments. The heat of the unit is conducted from the fingers to the work part via the finger attachments. (Reference) When operated with duty 50%, the temperature rises in approximately 40°C at the unit attachment surface (side surface) and finger attachment surfaces.
2	Bolts to be used	<ul style="list-style-type: none">• The size of the tapped holes to mount the unit and the holes for the finger attachment is M3 with depth 5. Use a screw with 5mm or less for mating length when you utilize the tapped holes.
3	Tightening Torque	<ul style="list-style-type: none">• Tightening torque should be 154N·cm when the screwed face is steel and 83N·cm when aluminum. Make sure to follow the specified values. Failure to do so may cause an operation problem.
4	Load Moment	<ul style="list-style-type: none">• Please follow the specified value stated in the Instruction Manual (CD) for the allowable load moment. If a load beyond the range is applied, it may shorten the product life.

Wiring

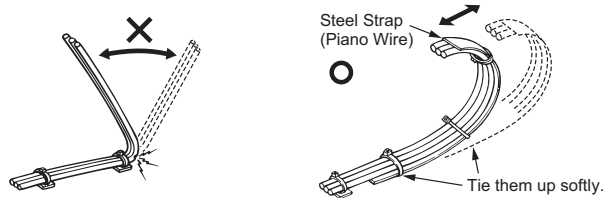
Follow the example of driver circuit shown below to apply diode, relay and circuit protector (or fuse) to the cable tips and connect to the 24V DC power supply. To protect the gripper, make sure to apply the circuit protector (or fuse). Please prepare diode, relay and circuit protector (or fuse) separately from the product. The cable length should be approximately 1m. It is naked wire on one end.



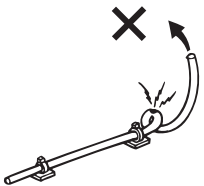
- (1) Selection of Circuit Protector or Fuse
Select ones with the following performance:
 - Rated Current : 2A
 - Transient Characteristics : Should cut the power within 3sec at 200% of rated current
Select from high-speed type or transient type if circuit protector.
- (2) Relay
Select ones that satisfy the following conditions:
 - Select solid state relays when open and close operation is frequently conducted.
 - Output rated load voltage : 24V DC \pm 10%
 - Output load current : 1A or less
(Reference) G3FD-X102SN DC5-24 manufactured by OMRON is available.
- (3) Diode
Counter EMF is generated when turning the power OFF from being ON to close the chuck of the gripper from being open. Select a diode that is able to cut the voltage caused by the counter EMF.
 - Counter electromotive voltage : Approx. 40V
 - Counter electromotive current : Approx. 0.1A
(Reference) D1N60 manufactured by Shindengen Electric Manufacturing is available.

[Prohibited Items in the Cable Processing]

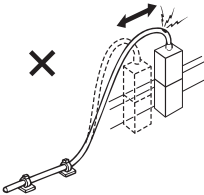
- Fix the cables so they would not flex, bend or get twisted at the root.
(Make sure to keep 33mm or more for the radius of cable bend. For the position sensor cable, keep at least 7mm for the bending radius.)
- In a use of the actuator with the cables not fixed, consider to ease the load to the cables by using the actuator in the range of the cable bends only with its weight or by using a stand-alone cable hose to gain a large radius bending.
- Do not cut and extend, shorten or rejoin the cables.
- Be careful so the cables do not get pinched.
- Do not let the cable flex at a single point.



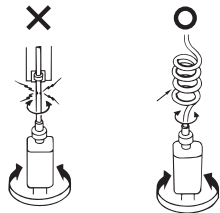
- Do not let the cable bend, kink or twist.



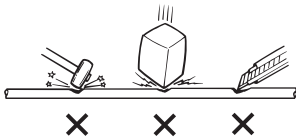
- Do not pull the cable with a strong force.



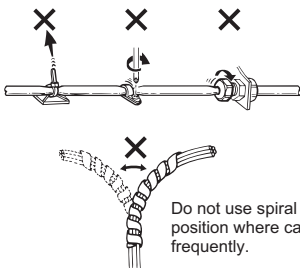
- Do not let the cable receive a turning force at a single point.



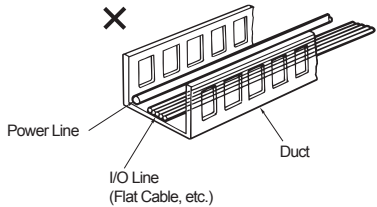
- Do not pinch, drop a heavy object onto or cut the cable.



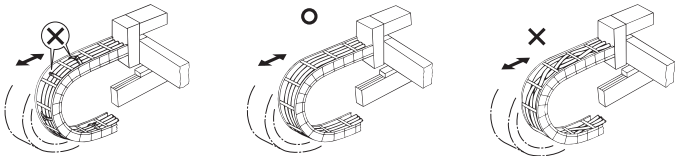
- When fixing the cable, provide a moderate slack and do not tension it too tight.



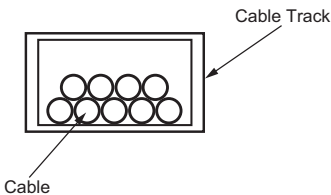
- Separate the I/O line, communication line and power line from each other.
Do not put them in the same duct.



- If using a cable track, make sure to use robot cables so the cables do not get twisted or entangled inside the cable track or flexible tube, and also make the cables free to avoid the cables getting tied.
(Make sure the cables do not get pulled when being bent.)



- The occupied volume rate for the cables, etc., inside the cable track should be 60% or less.



Note:

- When the cable is connected or disconnected, make sure to turn off the power to the controller.
When the cable is connected or disconnected with the controller power turned ON, it might cause a malfunction of the actuator and result in a serious injury or damage to the machinery.
- When the connector connection is not correct, it would be dangerous because of a malfunction of the actuator. Make sure to confirm that the connector is connected correctly.



IAI Corporation

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

Technical Support available in USA, Europe and China

IAI America, Inc.

Head Office: 2690 W, 237th Street Torrance, CA 90505
TEL (310) 891-6015 FAX (310) 891-0815
Chicago Office: 1261 Hamilton Parkway Itasca, IL 60143
TEL (630) 467-9900 FAX (630) 467-9912
Atlanta Office: 1220 Kennestone Circle Suite 108 Marietta, GA 30066
TEL (678) 354-9470 FAX (678) 354-9471
website: www.intelligentactuator.com

IAI Industrieroboter GmbH

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

IAI (Shanghai) Co., Ltd.

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

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