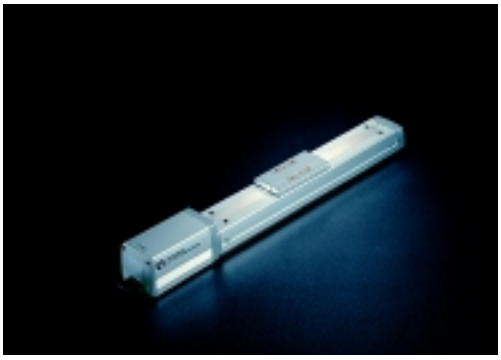
Robo Cylinder RCP Actuator

Operating Manual



Intelligent Actuator, Inc.

This publication was written to assist you in better understanding this part of your IA system. If you require further assistance, please contact IA Technical Support. For Central and East Coast Time Zones, please call our Itasca, IL office at 1-800-944-0333 or FAX630-9912. For Mountain and Pacific Time Zones, please call our Torrance, CA office at 1-800-736-1712 or FAX 310-891-0815; Monday thru Friday from 8:30AM to 5:00PM.

Intelligent Actuator, Inc.
U.S. Headquarters
2690 W. 237th Street
Torrance, CA 90505
310-891-6015 / 310-891-0815 FAX

Intelligent Actuator, Inc.
Midwest Regional Office
1261 Hamilton Parkway
Itasca, IL 60143
630-467-9900/ 630-467-9912 FAX

www.intelligentactuator.com

© February 2000 Intelligent Actuator, Inc. All rights reserved.
No portion of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechnical, recording, or otherwise, without the prior written permission of Intelligent Actuator, Inc.

Disclaimer
The information and technical data contained herein are subject to change without notice. Intelligent Actuator, Inc.. assumes no responsibility for any errors or omissions regarding the accuracy of the information contained in this publication.

1. Foreword

Thank you for purchasing the Robo Cylinder Actuator. This manual explains the structure, correct operation and maintenance of the Robo Cylinder Actuator. Please read this manual carefully before using the actuator. For more complete information on operating the actuator, please refer to the controller operating manual.

2. Safety Precautions

Basic Operating Instructions

- Please do not attempt to use or operate the actuator in any manner not indicated in this manual or the controller manual.
- Please be sure to use only the cable provided by IAI to connect the actuator and controller.
- Please do not allow people within the moving range of the unit when it is in operation or when the power is ON since this is dangerous.

Maintenance and Inspection

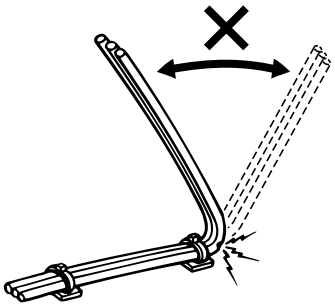
- When doing maintenance and inspection work, always shut down the controller power first.
- When doing inspection, make sure that no one can inadvertently turn the power ON.
- Make sure that a sign indicating work in progress is clearly visible.
- If several persons are working, be sure to watch out for each other's safety. In particular, check before turning power ON or OFF and let others know if you are doing work involving axis movement.

3. Cabling Precautions

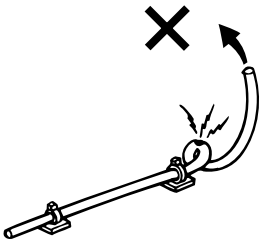
When using the Robo Cylinder actuator and controller to build an application system, it is important to position and lay out the cable correctly. If this is not done, the cable may snap or have a faulty connection that could lead to a variety of problems which in turn could cause the actuator to run out of control. Below, we explain the things not to do to ensure that the cables are connected in the correct fashion.

Ten "Do's and Don'ts" When Laying Out Cable (Please make sure to observe these rules!)

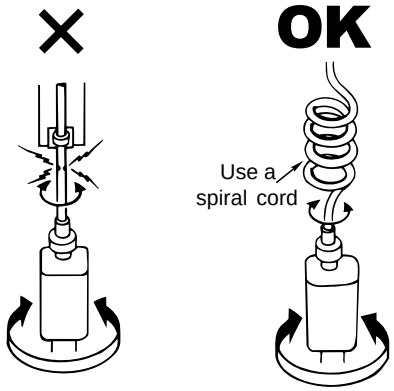
(1) Make sure there is no excessive bending at one spot.



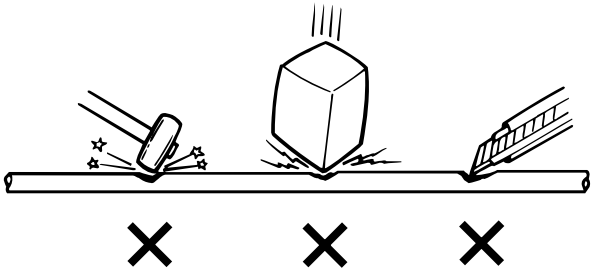
(2) Do not twist or crease the cable.

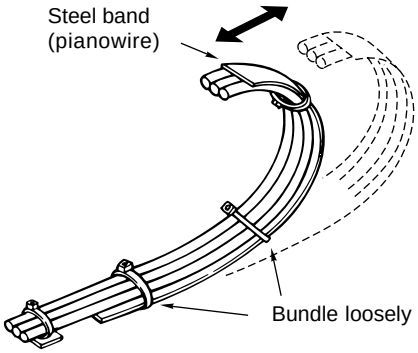


(3) Do not exerte a rotational force at a single spot on the cable.

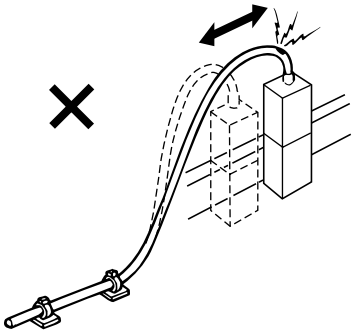


(4) Do not let the cable be caught in anything, or get dented or cut.

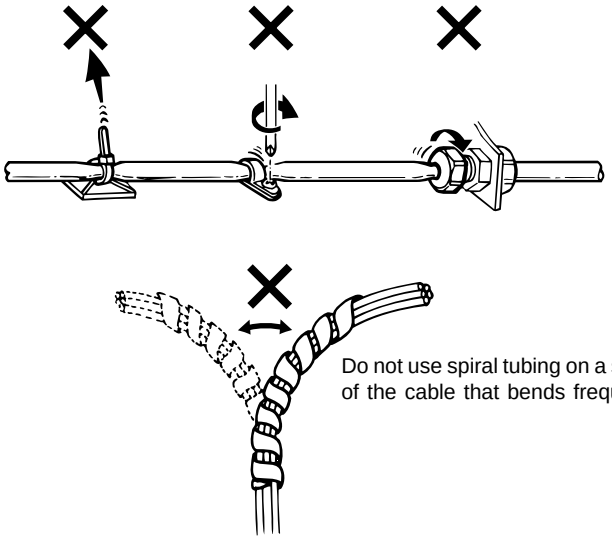




(5) Do not place the cable under excess tension.

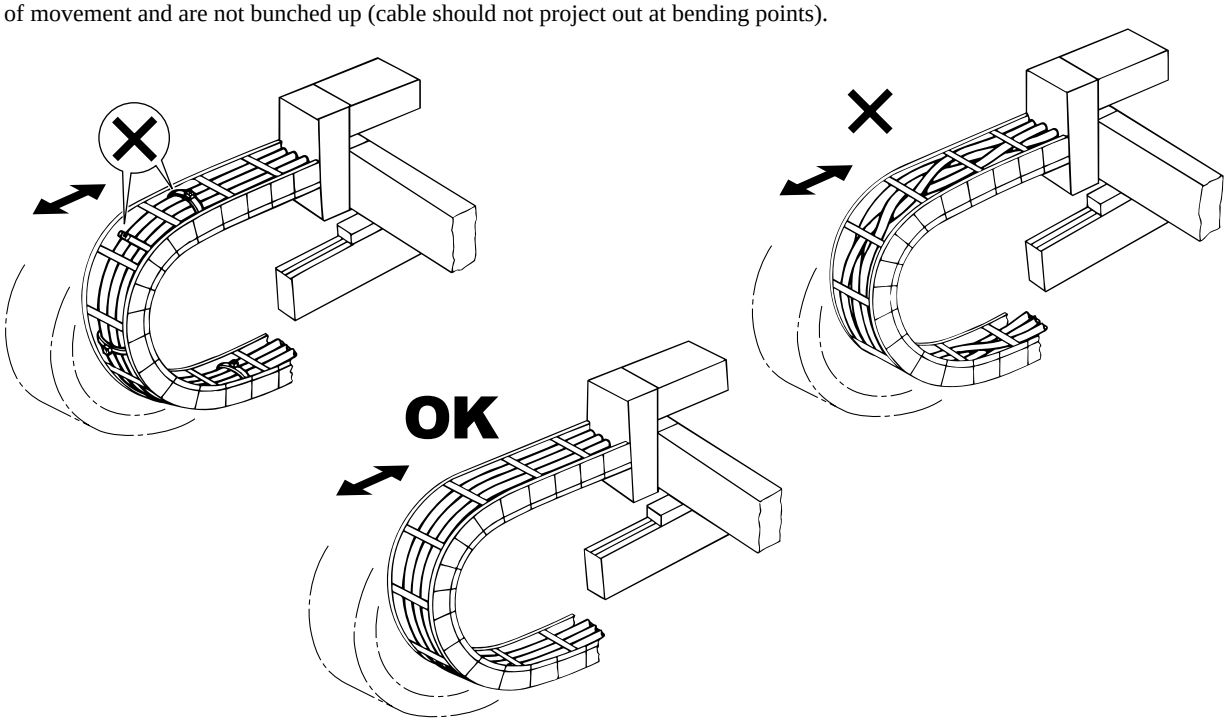


(6) When affixing the cable, do not clamp it too tightly.

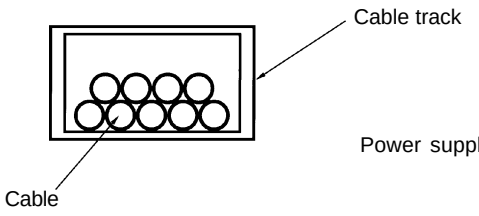


Do not use spiral tubing on a section of the cable that bends frequently.

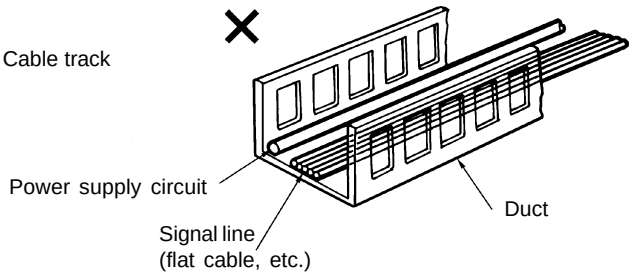
(7) If placing cable in a cable track or flexible tube, make sure it does not twist around. Also, make sure the cables have some freedom of movement and are not bunched up (cable should not project out at bending points).



(8) The amount of cable placed inside a cable track should fill about 60% of the space in the cable track.

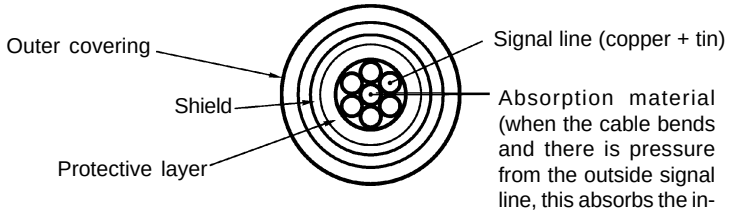


(9) Do not mix the signal line in with a high voltage circuit.



(10) In a case where the cable will be subject to forced bending, always use robot cable.*

[Standard structure]
Varies according to manufacturer and type



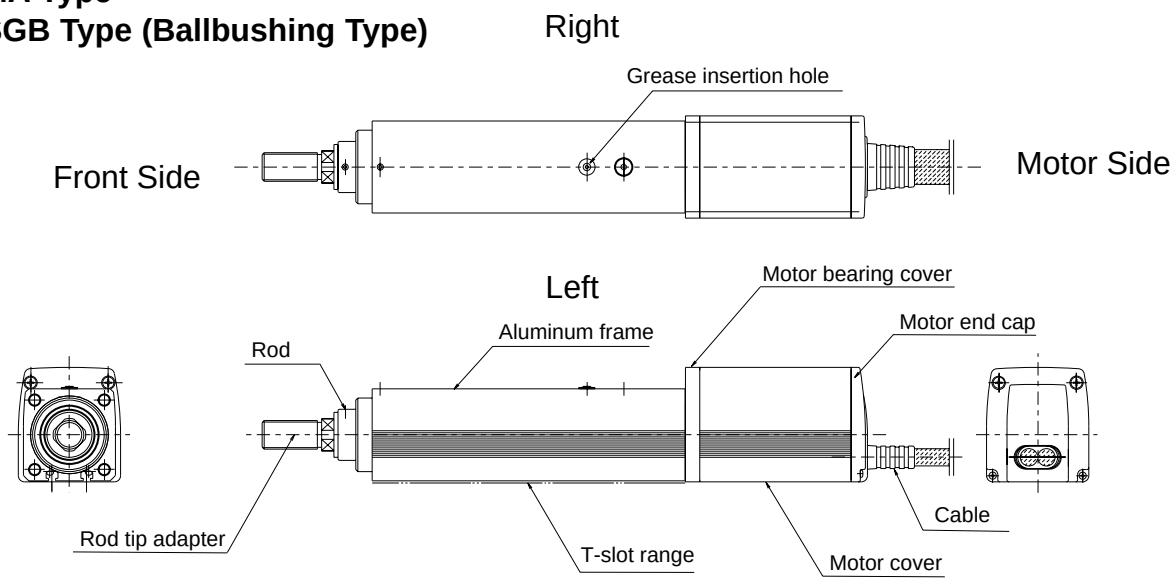
*When to use Robot Cable

When assembling two or three axes and connecting cable to the moving parts, bending weight will be repeatedly applied to the base of the cable. In this case, the cable core is very likely to snap. To prevent this from happening, we strongly recommend the use of robot cable which has greatly improved capacity to withstand bending.

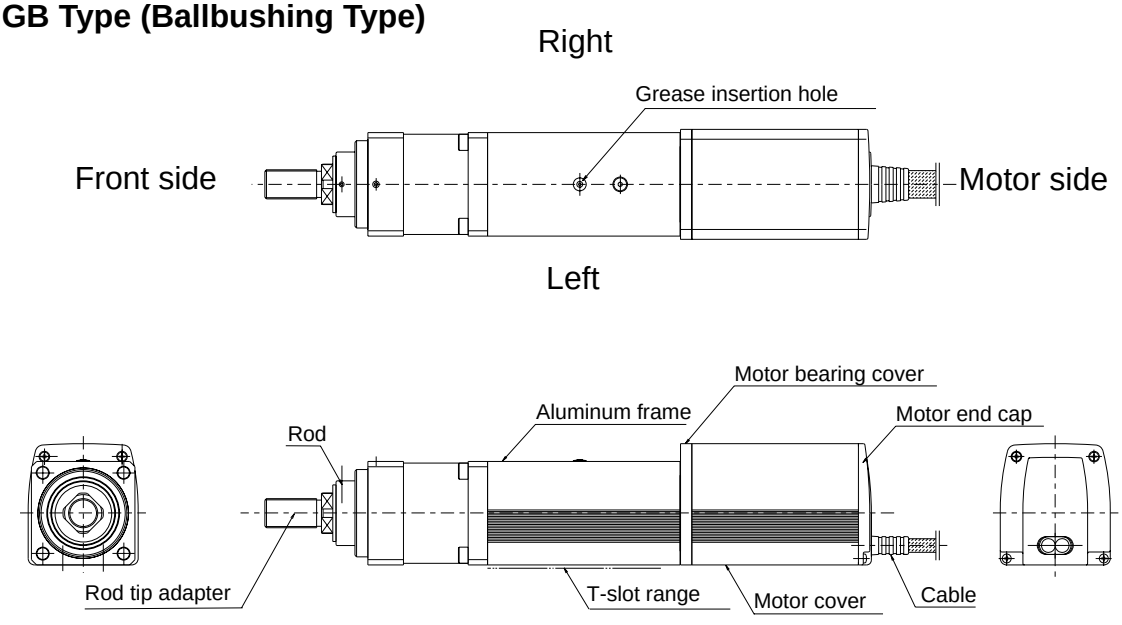
4. Names of the Parts

The name of the actuator parts are indicated below. The left and right sides are indicated by looking at the actuator from the motor end with the actuator set down horizontally. Front end means the side opposite the motor end.

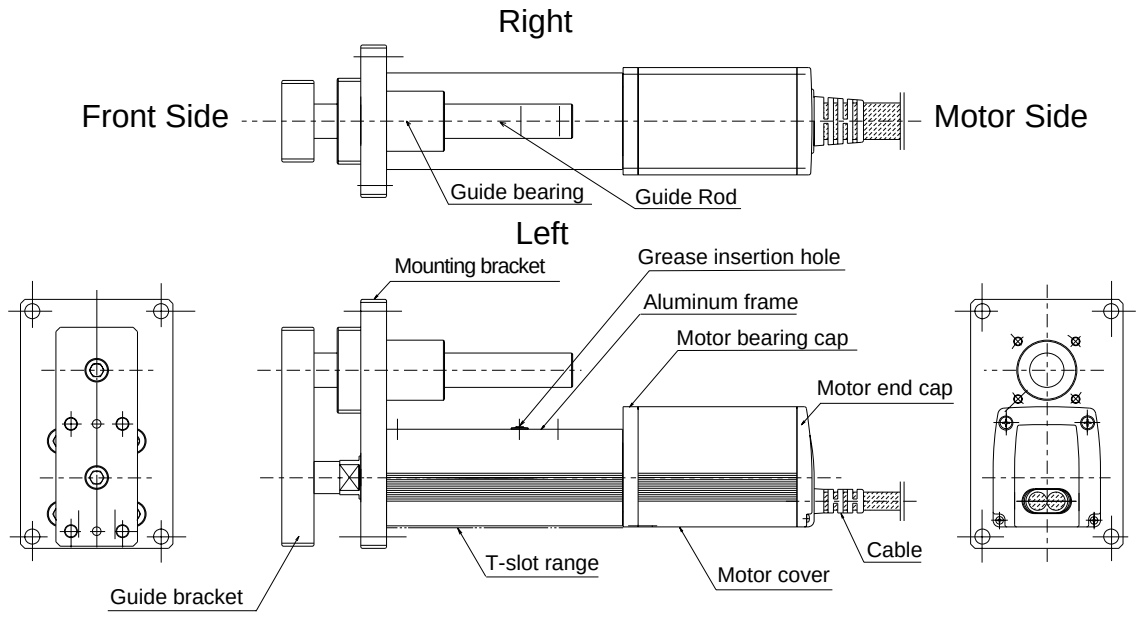
RSA Type
RMA Type
RSGB Type (Ballbushing Type)



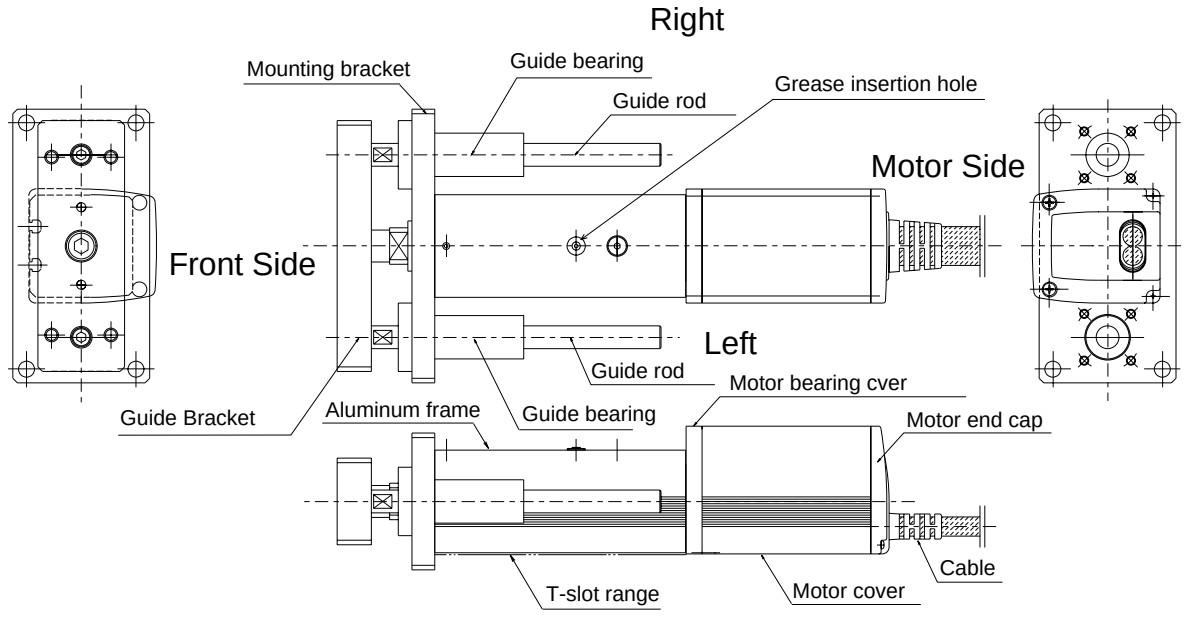
RMGB Type (Ballbushing Type)



RSGS Type
RMGS Type (Single Guide Type)

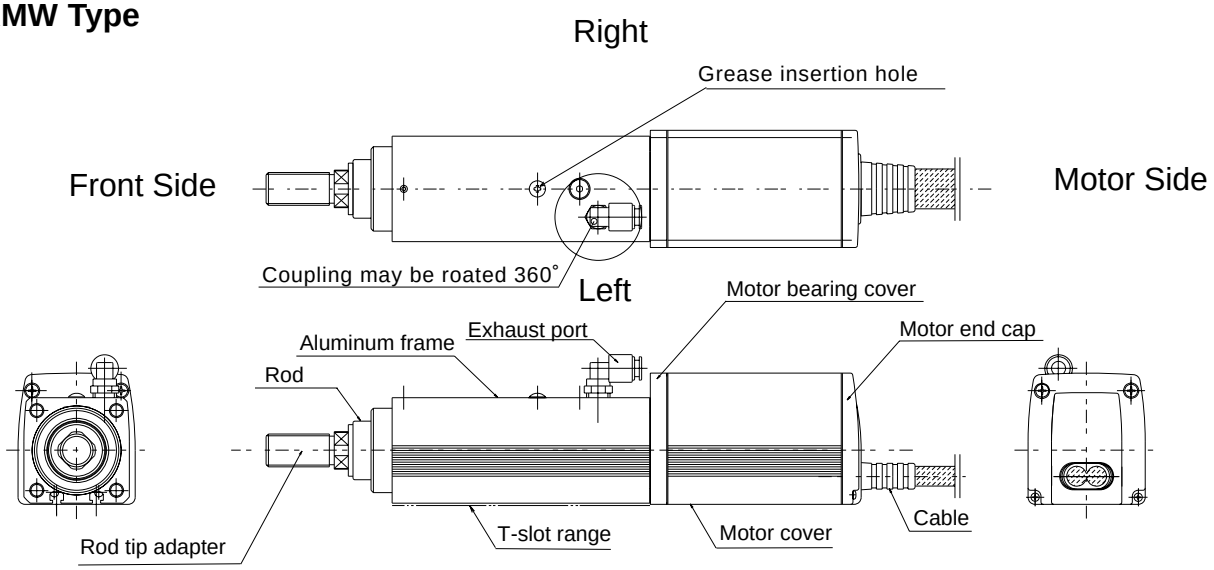


RSGD Type
RMGD Type (Double GuideType)



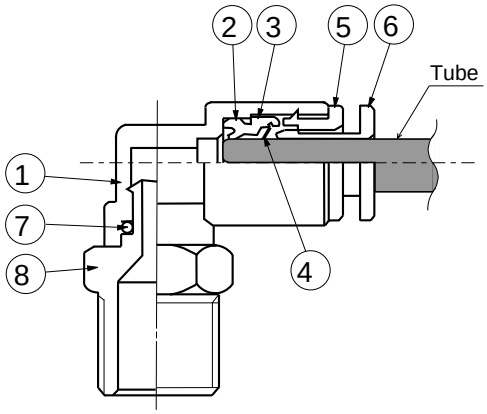
Dust Proof • Splash Proof Type

RSW Type
RMW Type



• As for the exhaust port, insert a tube with an outer diameter of ϕ6 and extend it to a place where water will not reach.

Exhaust port internal structure



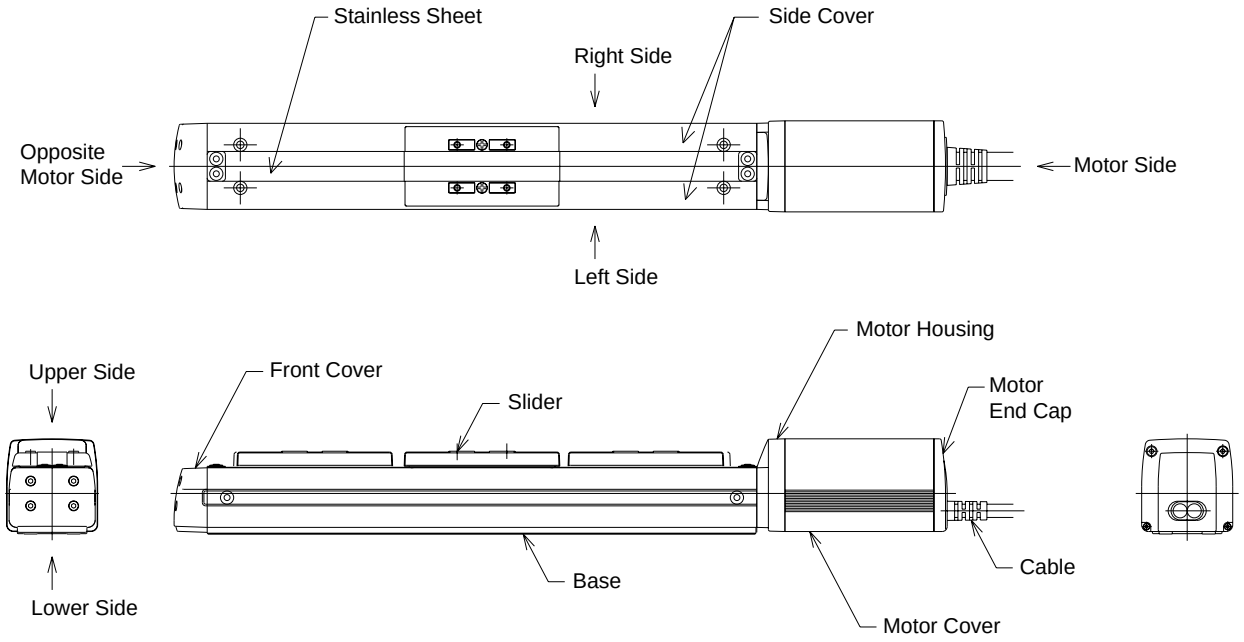
• As for the tube, inserted it completely up to the packing area (see left diagram ②). When push is incomplete, the tube tip will stop at the chuck area (see left diagram ④), thus allowing water to intrude which will contribute to breakdown.

Part Number	Name	Material
1	Main Body	PBT
2	Packing	NBR
3	Holder	C360 4BD
4	Chuck	SUS301
5	Outer Ring	C3604BD
6	Push Ring	Polyacetal
7	O Ring	NBR
8	Drive Nipple	C3604BD

Exhaust port
Coupling (Aoi CL-061)
Applicable tube (Aoi)

Model Number	Outer diameter X Inner diameter	Material
U-9506	6X4	Polyurethane

Slider Type


Stainless Sheet
Side Cover
Right Side
Opposite
Motor Side
Motor Side
Left Side
Motor Housing
Upper Side
Front Cover
Slider
Motor
End Cap
Cable
Base
Lower Side
Motor Cover

5. Transporting and Handling

5-1 Handling the Packed Unit

Unless there are special instructions, the actuator is shipped with each axis packed separately. Please take care that the shipping box is not dropped or subjected to strong impact during transport.

- The operator should not carry heavy shipping boxes by himself.
- If the shipping box is left standing, it should be in a horizontal position.
- Do not climb on top of the shipping box.
- Do not place heavy objects on top of the shipping box.

5-2 Handling the Actuator After It is Unpacked

Lift the actuator up by the base to remove it from the packing.

- When carrying the actuator, take care not to bump it. Take particular care with the front cover, motor housing and the motor end cap. Do not carry by the cable.
- Do not exert excessive force on any part of the actuator. Take particular care with the screw cover and cable.

* Please refer to Section 3 above for the names of the actuator parts.

6. Operating and Storage Environment

6.1 Operating Environment

The actuator should be set up in an environment which meets the following criteria:

- Avoid direct sunlight.
- Avoid radiant heat from strong heat sources such as a furnace.
- Ambient temperature should be 0 ~ 40º C.
- The humidity should be less than 85% and there should be no condensation.
- Avoid exposure to corrosive or combustible gases.
- The area should have very little dust and be suitable for normal assembly operations.
- Avoid exposure to oil mist or fluids using in cutting.
- The unit should not be subject to vibrations greater than 0.3G.
- Avoid extreme electromagnetic waves, ultraviolet rays and radiation.

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

6.2 Storage Environment

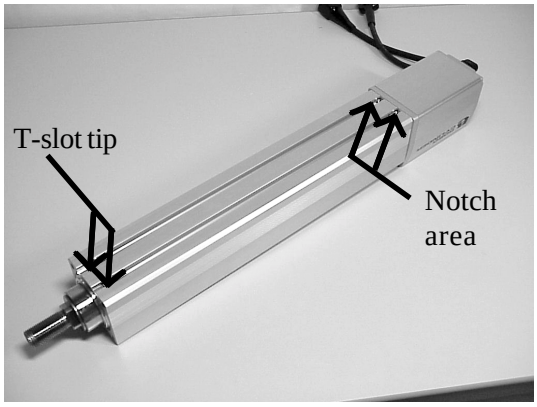
The storage environment should be similar to the operating environment. In addition, you must take precautions against condensation if the unit is to be stored for a long period of time. Unless there are special instructions, we do not include moisture absorption agents when shipping the unit. If you are storing the unit where condensation might occur, then you must treat the entire packing or treat the unit itself after it is unpacked to prevent condensation. The unit can withstand up to 60ºC during a short storage interval but only up to 50ºC if the storage period is longer than one month.

7. Installation - Rod Type

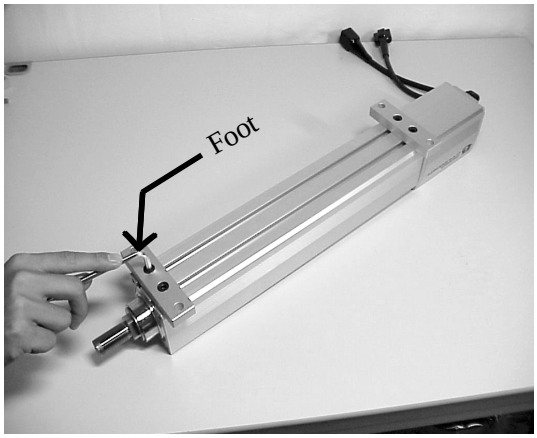
7.1 Installing the Main Body

There are 3 following installation methods available.

(1) How to attach the foot onto the actuator and mount the foot onto the foundation

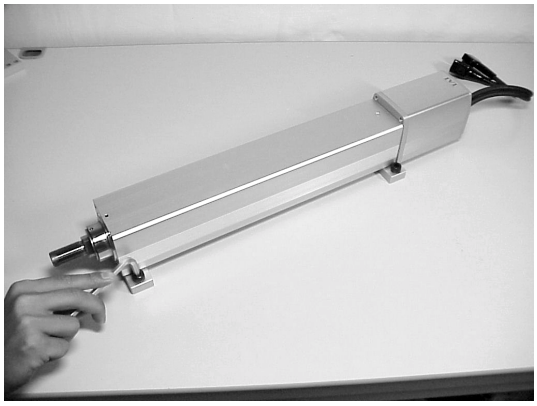


Insert square head nut for foot (accessory piece) into the T-slot located on the bottom side of the aluminum. As for the RSA • RSW • RSGB types, insert from the notch area. As for the RSGS • RSGD type, insertion is done at the time of shipment.



As shown in the left diagram, with the tool, attach the foot onto the actuator using a bolt with hexagonal hole.

Model Type	Mounting bolt
RSA•RSW•RSGB•RSGS•RSGD Type	M3 X 12
RMA•RMW•RMGB•RMGS•RMGS•RMGD Type	M6 X 15



Attach the foot onto the foundation using bolts.

Model Type	Mounting bolt
RSA•RSW•RSGB•RSGS•RSGD Type	M6
RMA•RMW•RMGB•RMGS•RMGS•RMGD Type	M8

7.2 Mounting Surface

- The mounting table should have sufficient rigidity to avoid generating vibration.
- The surface where the actuator will be mounted should be machined or be equally level and the flatness tolerance between the actuator and the table should be within 0.05mm.
- Provide enough space around the actuator to permit maintenance work to be done.
- The slider travelling plane is the reference plane for the actuator base and the lower surface. When travelling precision is required, use this as the reference plane for mounting.

Foot Clamp Screws

- For the bolts, we recommend high strength bolts of ISO- 10.9 or higher.
- Make sure the bolt and screw engagement length is the following value or greater:

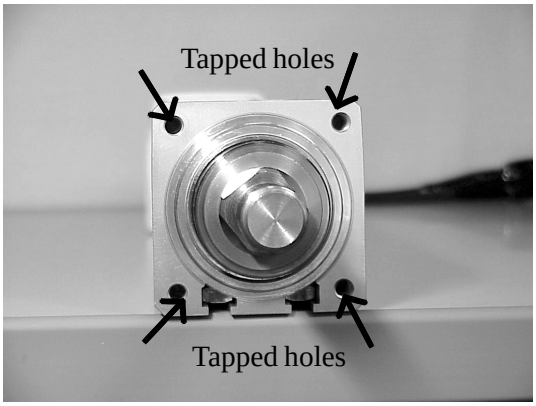
  Steel screw → same length as the nominal diameter

  Aluminum screw → twice as long as the nominal diameter
- When attaching the base to a mounting table, use the special washer made for high strength bolts that comes with the actuator if the bolt is M8 or larger. This is unnecessary for M6 or smaller bolts. Do not use a common spring washer.
- The recommended screw torque is given to the right diagram.

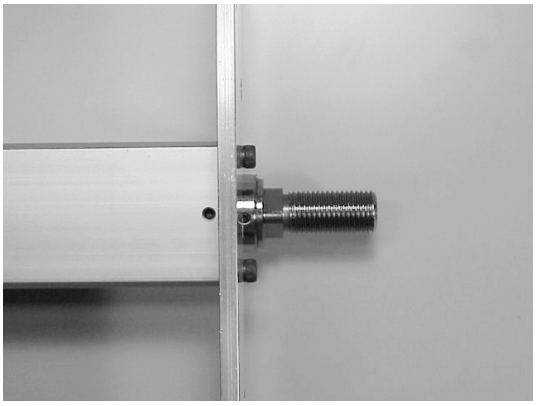
Screw nominal diameter	Clamping torque
M6	6.7N •m (0.68Kgf • m)
M8	14N • m (1.43Kgf •m)

(2) How to use the tapped holes located on the actuator standard side

Caution: This mounting method may not be done on the RSGS • RMGS (Single Guide Type) and RSGD • RMGD (Double Guide Type).

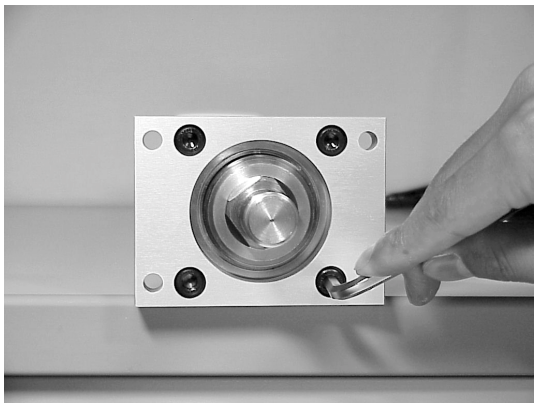


With the tap holes as shown on the left photo, attach from the foundation side, using hexagon sockets.



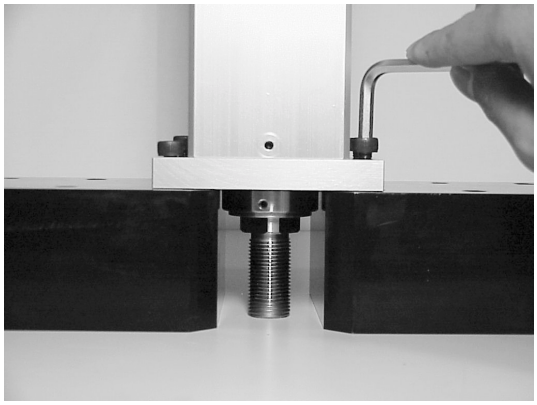
Model type	Tap diameter	Screw effective depth
RSA • RSW • RSGB Type	M6	12mm
RMA • RMW • RMGB Type	M8	15mm

(3) How to attach the flange onto the actuator and mount the flange onto the foundation



Mount the flange into the tapped hole using the hexagon sockets.

Model Type	Mounting Bolt
RSA • RSW • RSGB • RSGD Type	M6X12
RMA • RMW • RMGB • RMGD Type	M8 X15



Mount from the actuator side.

Model Type	Mounting Bolt
RSA • RSW • RSGB • RSGD Type	M6
RMA • RMW • RMGB • RMGD Type	M8

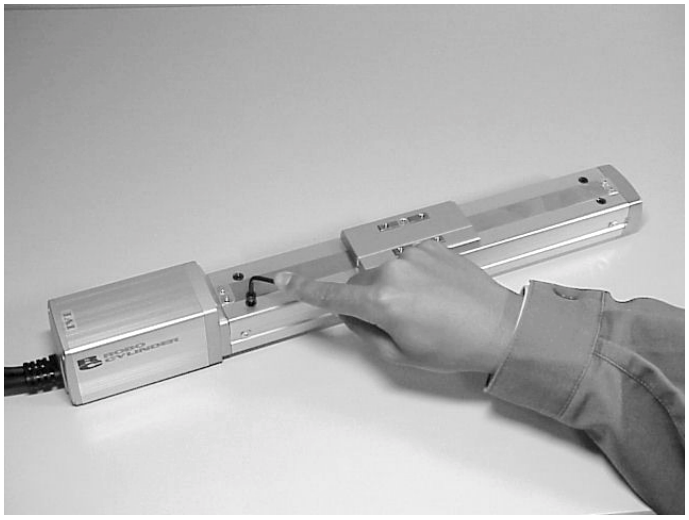
7.3 Exhaust Port Connection

The exhaust port must be vented to the atmosphere. Do not seal this port or apply vacuum pressure as this can damage the actuator.

7. Installation - Slider Type

Mount the actuator to a machined surface or one of comparable precision. Install the actuator as shown below.

7.1 Installing the Main Body



The actuator base and lower surface are parallel to the guide. When travelling precision is required, use this surface as a reference to mount the actuator. For basic mounting, use the four mounting holes located on the upper surface of the actuator.

Reset the actuator on the mounting surface and check to see that a 0.1mm thickness gauge cannot be inserted at the four mounting holes. If the bolts go in a steel surface with tapped holes, then use hexagon sockets with length shown in (1) and if the surface is a light metal, use the length in (2).

(1)	(2)
M4X40	M4X45

If the actuator has an overhang, you can use the two mounting holes at the motor end and the tapped holes on the underside of the base but please make note of the following:

- The depth of the tapped hole is 5mm.
- Select a bolt with an engagement length of greater than 3mm and less than 5mm, and adjust the washer length if necessary.
- The flatness of the mounting surface should be more precise than for basic mounting. If the level of the flatness is poor when the overhang is mounted, the actuator could warp and cause travelling impedance. Correct the flatness if the slider motion slows at the home end or generates noise since this will reduce the life of the actuator.

7.2 Attaching the Slider Carrying the Payload

Use the four tapped holes at the top of the slider to attach the work piece.

To attach the work piece, select bolts that will have the engagement lengths indicated in the table below and adjust the length of the washer if necessary. Also, make sure that the work piece does not touch the slider cover.

Slider Mounting Area	Screw effective depth
M4 depth 9mm	Over 4mm Under 9mm

8. Wiring Cable

The actuator cable is resistant to bending fatigue but it is not a robot cable. Avoid housing the cable in movable wire duct with a small radius. In an application where the cable cannot be anchored, try to place the cable so that it sags only under its own weight or use self-standing type cable as large radial wire duct to limit the load on the cable.

For cable modification, please contact your IA sales representative.

9. Load on the Actuator

- Do not exceed the load shown in the load specification column. Note Slider Type moment and overhang limits.
- Make sure that the rod axis center and load transfer direction are the same.

> ***When side load exists, there is a chance that an actuator breakdown will occur so please be careful. (Rod Type)***
>
> ***When a side load exists, please use guide on the load transfer direction.***

Slider Type actuator bases warp easily under excessive Ma and Mc moments. Please use the actuator so that these moment loads are appoximately 1/2 the rated value.

RSA Rod (Standard) Type

RCP-RSA □-□-□□□-□-□

Encoder Type
A: Absolute
I: Incremental

Speed Type
L: Low Speed Type
M: Medium Type
H: High Speed Type

Stroke
50~300

Cable Length
P: 1m S: 3m M: 5m
X □□: Length Custom
R □□: Robot Cable

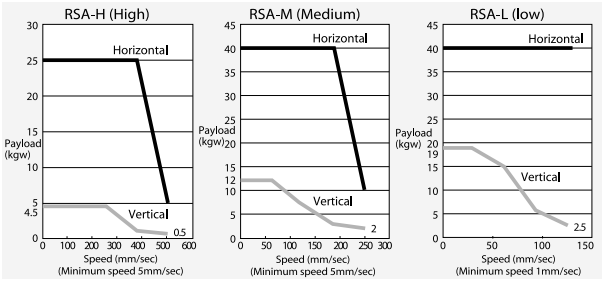
Options
B: With Brake
(see diagram below)

Stroke	50 ~ 300mm
Motor	AC Servo Motor (Encoder Single Unit)
Base	Extruded Aluminum
Rod Diameter	ϕ 25mm
Rod Tip Screw Diameter	M14 Pitch 1.5
Maximum Push Power N (kgf)*1	L:294 (30) M: 236 (24,1) H:100 (10.2)
Repeatability	± 0.02m
Attachment	M3 Square Head Nut (4 pieces) +M14 Hexagonal Nut (1 piece)

Note: No side loading is recommended for non-guided rod type actuators.

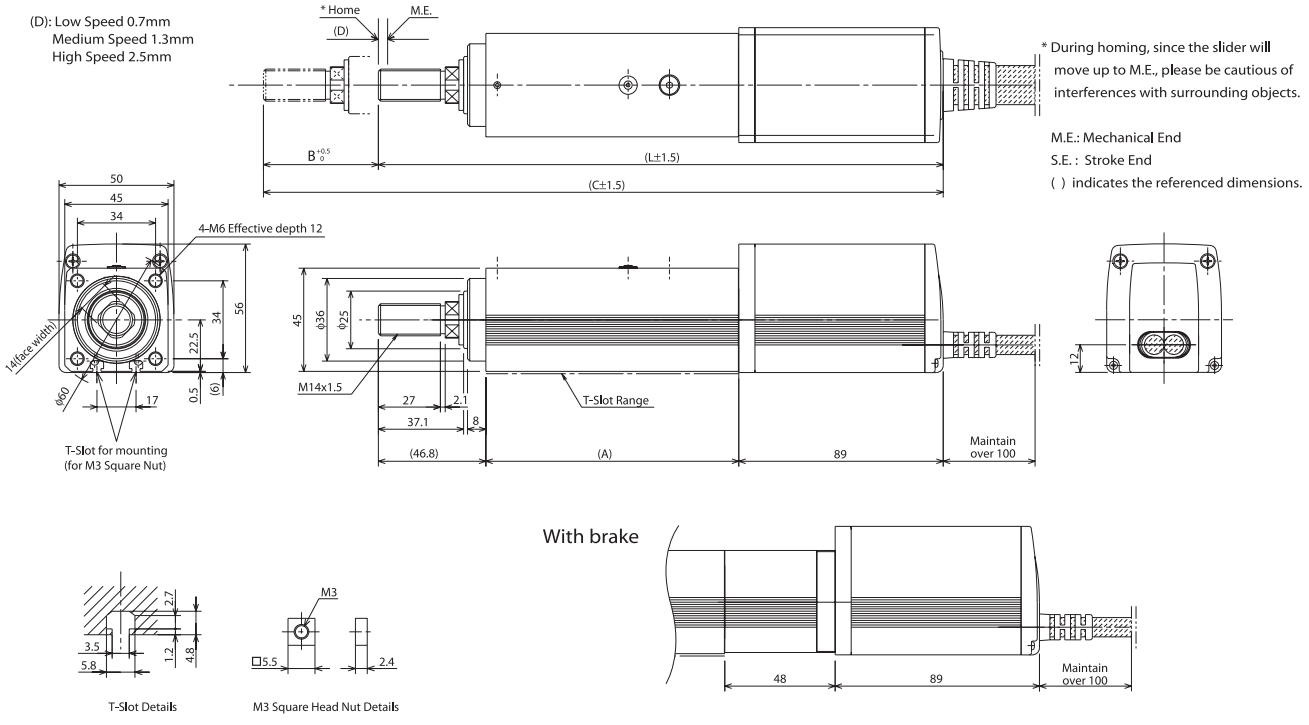
*1: The maximum push power is the maximum sustainable power during stop of the push movement.
* Due to its structure, home reversed specification is not available for the Rod Type.

Speed Vs. Payload Diagram (when acc. is 0.2G) * For horizontal, in case with guide



Note: The maximum speed for 250 stroke is (H:475mm/sec, M:237mm/sec, L:118mm/sec) and for 300 stroke is (H:350mm/sec, M:175mm/sec, L:87mm/sec).

Dimensions



Stroke	50	100	150	200	250	300
Weight (kgw)	1.6	1.9	2.2	2.5	2.7	3.0
L	246	296	346	396	446	496
A	110.2	160.2	210.2	260.2	310.2	360.2
B	50	100	150	200	250	300
C	296	396	496	596	696	796

With brake

Stroke	50	100	150	200	250	300
Weight (kgw)	2.1	2.4	2.7	3.0	3.2	3.5
L	294	344	394	444	494	544
A	110.2	160.2	210.2	260.2	310.2	360.2
B	50	100	150	200	250	300
C	344	444	544	644	744	844

RMA Rod (Standard) Type

ROBO CYLINDER

RCP-RMA □-□-□□□□-□-□

Encoder Type
A: Absolute
I: Incremental

Speed Type
L: Low Speed Type
M: Medium Type
H: High Speed Type

Stroke
50~300

Cable Length
P: 1m S: 3m M: 5m
X □□: Length Custom
R □□: Robot Cable

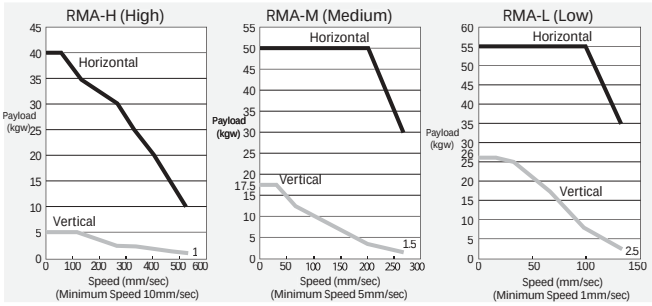
Options
B: With Brake
(see diagram below)

Stroke	50 ~ 300mm
Motor	AC Servo Motor (Encoder Single Unit)
Base	Extruded Aluminum
Rod Diameter	ϕ 40mm
Rod Tip Screw Diameter	M18 Pitch 1.5
Maximum Push Power N (kgf)	L:784 (80) M:360 (36.7) H:182 (18.6)
Repeatability	±0.02mm
Attachment	M6 Square Head Nut (4 pieces) + M18 Hegagonal Nut (1 piece)

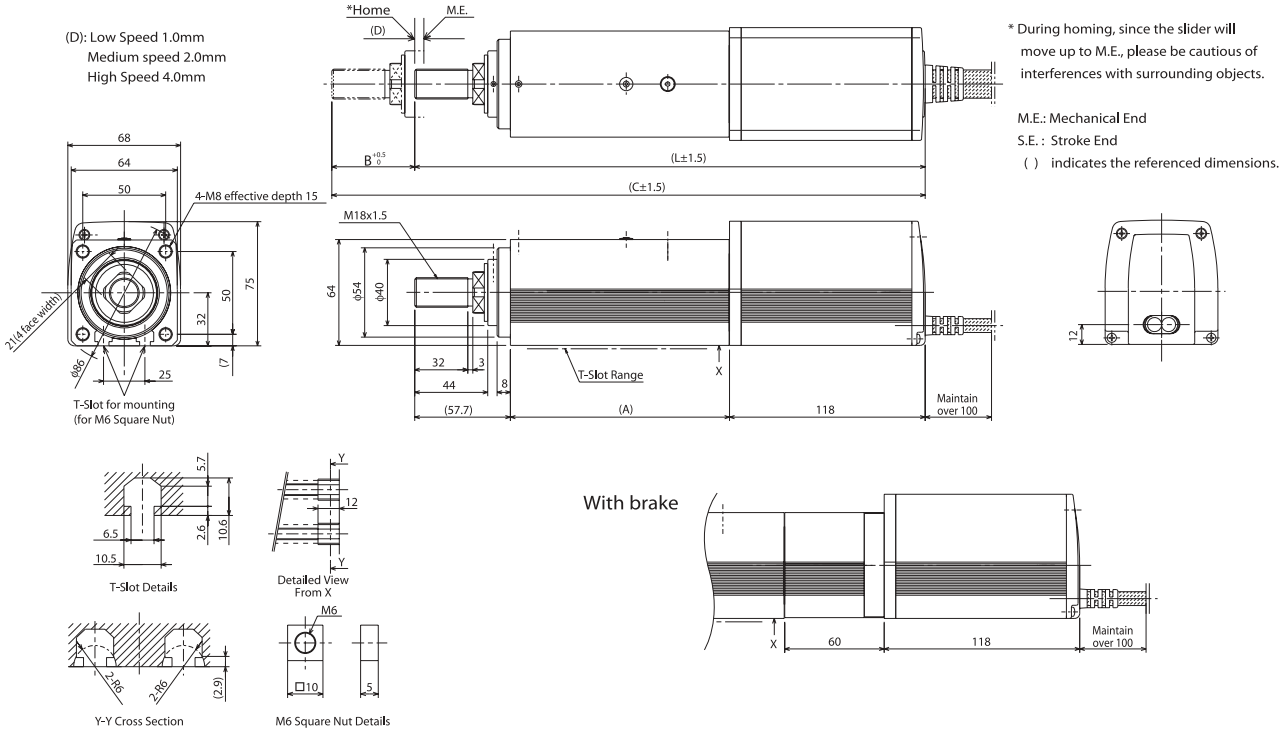
Note: No side loading is recommended for non-guided rod type actuators.

*1: The maximum push power is the maximum sustain power during stop of the push movement.
* Due to its structure, home reversed specification is not available for the Rod Type.

Speed Vs. Payload Diagram (when acc. is 0.2G) * For horizontal, in case with guide)



Dimensions



* During homing, since the slider will move up to M.E., please be cautious of interferences with surrounding objects.

M.E.: Mechanical End
S.E.: Stroke End
( ) indicates the referenced dimensions.

Stroke	50	100	150	200	250	300
Weight (kgw)	3.5	4.2	5.0	5.7	6.4	7.1
L	308	358	408	458	508	558
A	132.3	182.3	232.3	282.3	332.3	382.3
B	50	100	150	200	250	300
C	358	458	558	658	758	858

With brake

Stroke	50	100	150	200	250	300
Weight (kgw)	4.3	5.0	5.8	6.5	7.2	7.9
L	368	418	468	518	568	618
A	132.3	182.3	232.3	282.3	332.3	382.3
B	50	100	150	200	250	300
C	418	518	618	718	818	918

SA5 Slider (Straight) Type

RCP-SA5 □-□-□□□□-□-□

Encoder Type
A: Absolute
I: Incremental

Speed Type
L: Low Speed Type
M: Medium Type
H: High Speed Type

Stroke
50~500

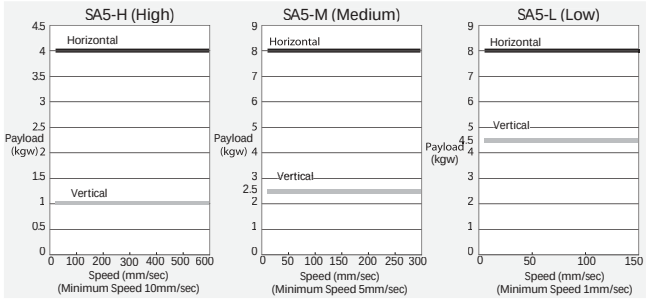
Cable Length
P: 1m S: 3m M: 5m
X □□: Length Custom
R □□: Robot Cable

Options
Brake Options: BR, BL, BE
(see diagram below)

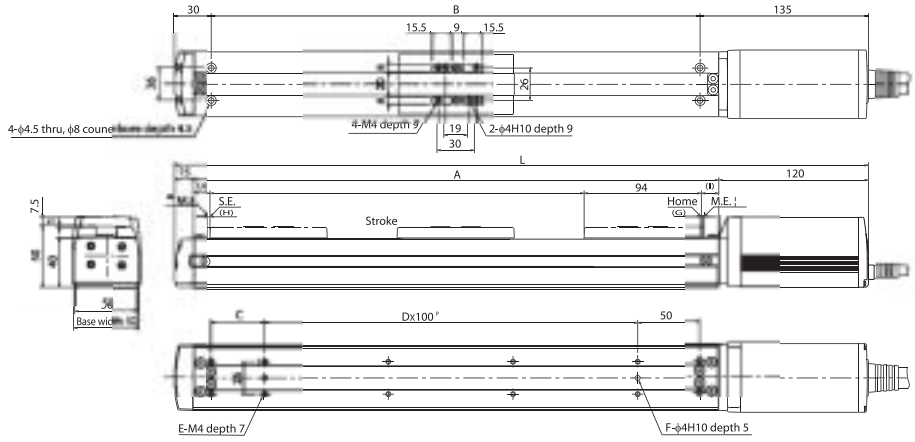
Stroke	50 ~ 500mm (50mm increments)		
Motor	AC Servo Motor (Encoder Single Unit)		
Ballscrew	ϕ10mm		
Guide	SA5 Exclusive Single Unit		
Base	Extruded Aluminum		
Load Moment	Ma: 4.9N·m (0.5kgf·m)	Mb: 6.8N·m (0.7kgf·m)	Mc: 11.7N·m * (1.2kgf·m)
Overhang Load Length	Ma, Mb, Mc: 150mm or less		
Repeatability	±0.02mm		

* MC7.8N·m (0.8kgf·m) for stroke over 350

Speed Vs. Payload Diagram (when acc./dec. is 0.3G)



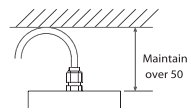
Dimensions



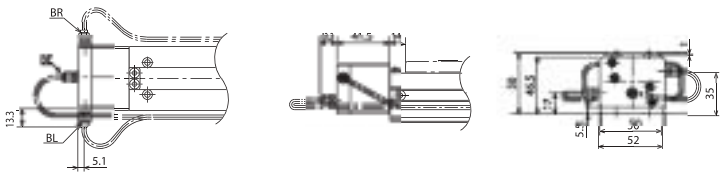
*During home, since the slider will move to M.E., please be cautious of interferences with surrounding objects.

M.E.: Mechanical End
S.E.: Stroke End
( ) Indicates the referenced dimensions

Brake area dimensions
* Brake wiring removal direction:
Select either BR, BL or BE.



Brake wiring side space



Stroke	50	100	150	200	250	300	350	400	450	500
Weight (kgw)	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.7	2.8	3.0
L	307	357	407	457	507	557	607	657	707	757
A	172	222	272	322	372	422	472	522	572	622
B	142	192	242	292	342	392	442	492	542	592
C	92	42	92	42	92	42	92	42	92	42
D	0	1	1	2	2	3	3	4	4	5
E	2	4	4	6	6	8	8	10	10	12
F	1	2	2	2	2	2	2	2	2	2

Dimensions according to speed type

Speed Type	Low	Medium	High
G	0.75	1.5	3
H	5.25	4.5	3
I	11.75	12.5	14
J	16.25	15.5	14

11. Maintenance - Rod Type

11.1 Maintenance Schedule

Perform maintenance work according to the schedule below.

Maintenance Checkpoints

	Visual inspection	Check for loose dust shield	Check interior	Lubrication
Start of operation	❍			
After 1 month of operation	❍	❍		
After 6 months of operation	❍	❍	❍	
After 1 year of operation	❍	❍	❍	❍
Seminually thereafter	❍	❍		
Annually thereafter	❍	❍	❍	❍

Note 1: The above schedule assumes running time is 8 hours per day. When running time is high such as continuous day and night operation, shorten the maintenance intervals as required.

Note 2: The end cover supports the ball screw so please do not remove it. Do not remove the encoder cover as this contains precision equipment

11.2 Visual Inspection of the Machine Exterior

Check the following when doing the visual inspection.

Body	Loose mounting bolts?
Cables	Damage to cables or connection to connector box?
General	Unusual noise or vibrations?

11.3 Cleaning the Exterior

① Wipe off dirt with a soft cloth.
② Wipe the dust shield gently so that it does not bend.
③ Do not use strong compressed air on the actuator as this may force dust into the crevices.
④ Do not use petroleum-based solvents on plastic parts or painted surfaces.
⑤ If the unit is badly soiled, apply a neutral detergent or alcohol to a soft cloth and wipe lightly.

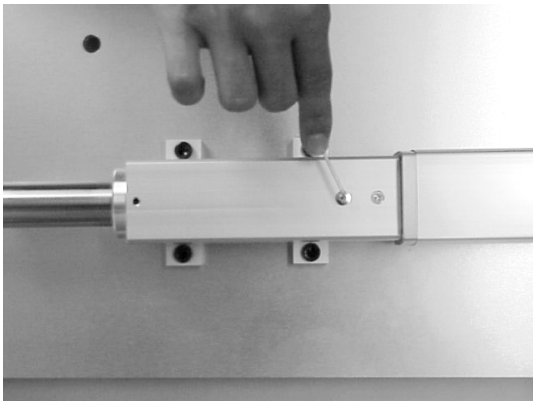
11.4 Lubricating the Guide Bearing Block

11.4-1 What Grease to Use

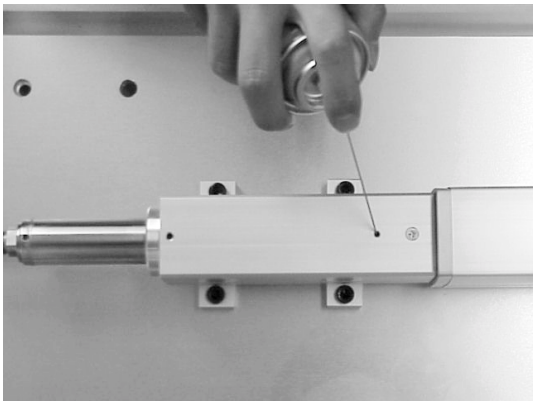
Use lithium grease no.2. When we ship the unit, we use the following grease.
Idemitsu Kosan Daphne Eponex Grease No.2

Other companies also sell a grease similar to this. If odering from another maker, give the name of this product and request something comparable. Comparable products include the following:
Showa Shell Oil Albania Grease No. 2
Mobil Oil Mobilux 2

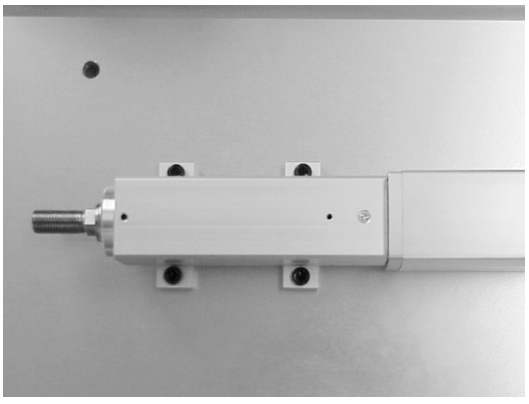
11.4-2 Lubrication



Step 1:
Remove the flat head screw with Allen wrench 1.5.
Do not remove the other screw.



Step 2:
Pull out the rod over half ot stroke length.
Use spray grease (lithium base grease is recommended) through the hole.



Step 3:
Move the rod back and forth several times by hand.

Step 4:
Apply silicon on the area where the screw was removed. Then, remount the removed screw.

11. Maintenance - Slider Type

11.1 Maintenance Schedule

Perform maintenance work according to the schedule below.

Maintenance Checkpoints

	Visual inspection	Check for loose dust shield	Check interior	Lubrication
Start of operation	❍			
After 1 month of operation	❍	❍		
After 6 months of operation	❍	❍	❍	
After 1 year of operation	❍	❍	❍	❍
Seminually thereafter	❍	❍		
Annually thereafter	❍	❍	❍	❍

Note 1: The above schedule assumes running time is 8 hours per day. When running time is high such as continuous day and night operation, shorten the maintenance intervals as required.

Note 2: The end cover supports the ball screw so please do not remove it. Do not remove the encoder cover as this contains precision equipment

11.2 Visual Inspection of the Machine Exterior

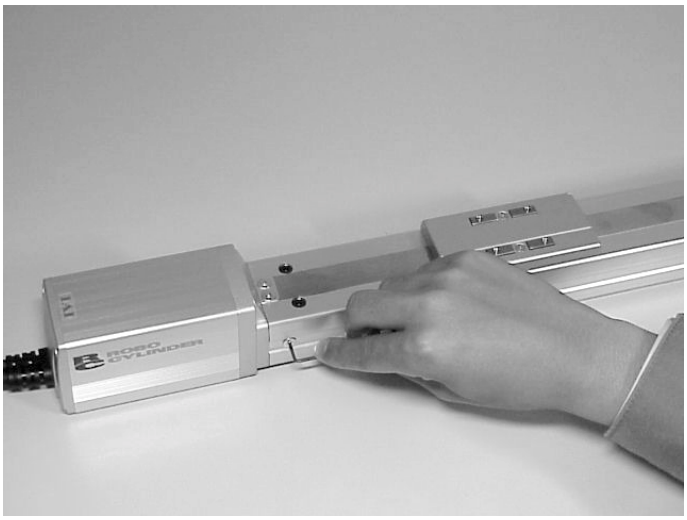
Check the following when doing the visual inspection.

Body	Loose mounting bolts?
Cables	Damage to cables or connection to connector box?
General	Unusual noise or vibrations?

11.3 Cleaning the Exterior

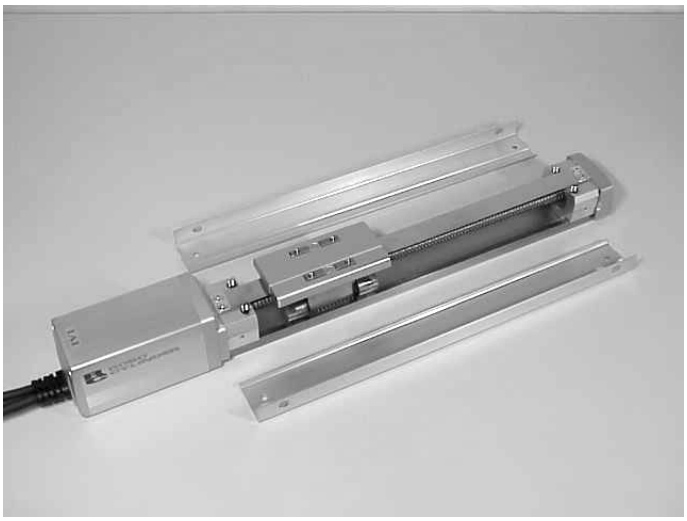
① Wipe off dirt with a soft cloth.
② Wipe the dust shield gently so that it does not bend.
③ Do not use strong compressed air on the actuator as this may force dust into the crevices.
④ Do not use petroleum-based solvents on plastic parts or painted surfaces.
⑤ If the unit is badly soiled, apply a neutral detergent or alcohol to a soft cloth and wipe lightly.

11.4 Inspecting the Interior



(1) Remove the cover

Turn the power OFF. Using a 1.5mm hexagonal wrench, remove the cover as shown in the picture and visually inspect the interior.



(2) Visual Check of the Interior

Make a visual check of the interior to see if there is any dust or foreign matter in the unit and check the lubrication. Even if the grease you see around the parts is brown, the lubrication is fine as long as the travelling surface appears shiny.

11-5 Lubricating the Ball Screw

11.5-1 Ballscrew Grease

When we ship the units, we use the following grease which is specifically for ball screws.

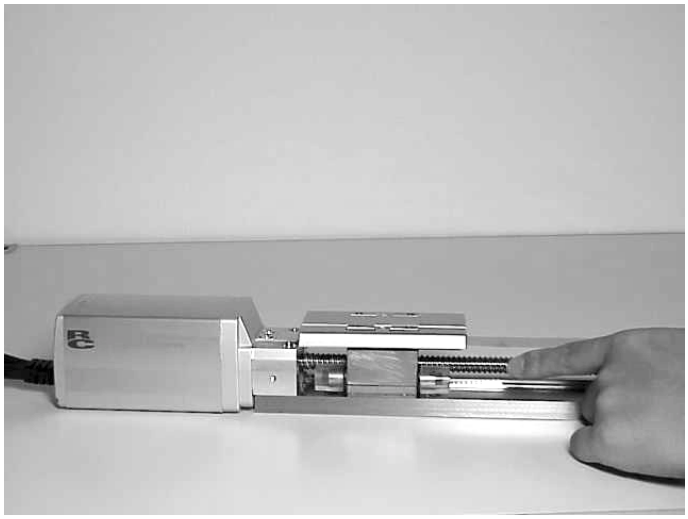
Kyodo Yushi Ball temp LRL3

This product is well suited for ball screws and has excellent properties such as low heat generation. We recommend it when doing maintenance work but for consistency it is all right to use the same grease used for the guide. There is no problem using the two together since both are lithium type grease.

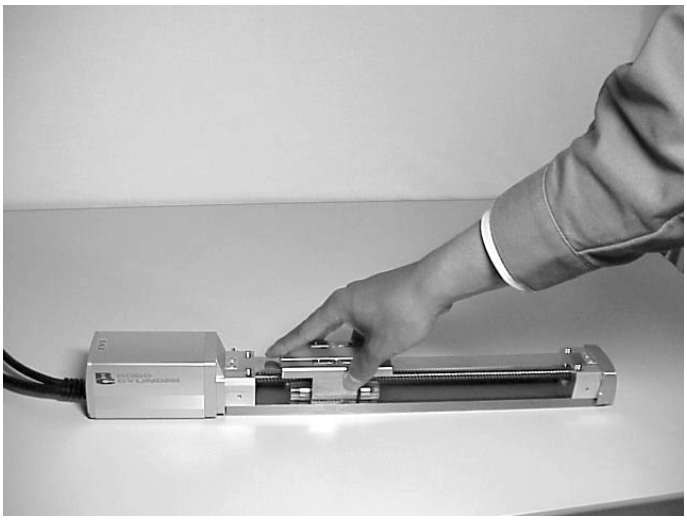
!! WARNING !! ***Never use any fluorine based grease. When mixed with a lithium based grease, not only does the grease lose its performance but it can actually damage the actuator.***

11-5-2 Lubrication

When the grease contains dust, dull in color or begins to wear away through extended use, lubricate the actuator using the procedure below.



To lubricate the ballscrew, apply grease to the screw with your finger then spread it out by moving the slider back and forth.



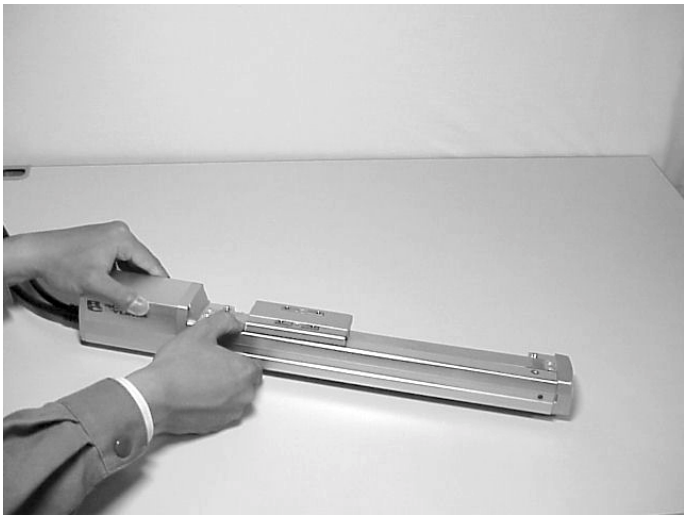
To lubricate the guide, apply grease to the guide side with your finger, then spread it out by moving the slider back and forth.

Use lithium grease no. 2. When we ship the unit, we use the following grease:

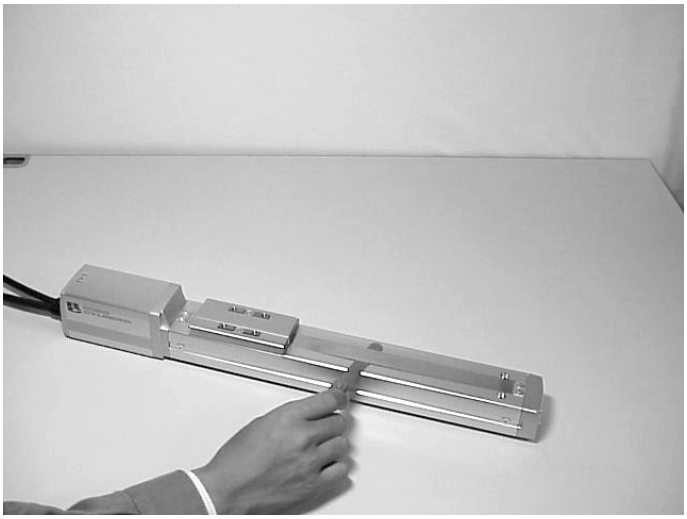
Idemitsu Kosan Daphne Eponex Grease No. 2

Caution: Do not use cleaning oil, Molybdate Grease and lubricating anticorrosive solvent. If the grease becomes dirty, wipe off the grease and lubricate the actuator using a new grease.

11.5-3 Replacing the Cover



Inside the slider cover is a spring that allows it to follow along the dust shield. Lift the shield up from the bottom and attach the side cover.



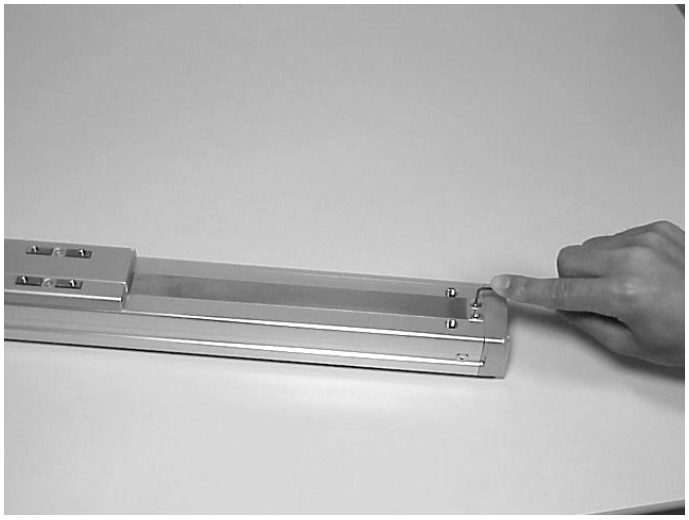
If the shield is not straight, move the slider slightly to straighten out the shield. Or, lift the shield gently to straighten it out. Tighten the bolts on the side cover. The torque should be for a small plus screw (0.6Nm, 6 kgcm).

After completing the inspection, replace the cover.

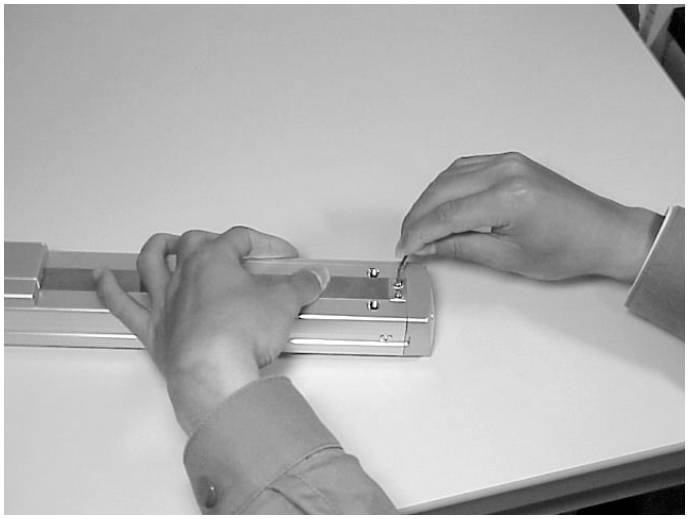
11.6 Checking the Stainless Sheet

11.6-1 Ballscrew Grease

The strip cover sheet utilizes a stainless sheet that is 0.1mm in thickness and is adjusted at the time of shipment. If the shield slackens with use, make the following adjustments.



Move the slider to the end. Loosen the screw at the front end with a 1.5mm wrench.



Take up the slack in the dust shield and tighten the screw enough to avoid looseness. The torque should be for a small plus screw under 4N (at 400 gf :24° C). Move the slider manually to make sure it moves easily. If there is resistance in the movement, there is too much tension in the shield (increase should remain about 1N (100grf).

12. Warranty

12.1 Warranty Period

The warranty period is one year after Intelligent Actuator ships the unit.

12.2 Scope of Warranty

If a breakdown occurs within the period specified above and is due to the manufacturer's error, we will repair the unit at no cost. However, the following items are not covered by this warranty.

- Faded paint or other changes that occur naturally over time.
- Consumable components that wear out with use.
- Unit seems to be noisy or similar impressions that do not affect machinery performance.
- Damage resulting from improper handling by the user or lack of proper maintenance.
- Any alterations made by other than Intelligent Actuator or its representatives.
- Breakdowns caused by using controllers made by other manufacturers.
- Any damages caused by fire and other natural disasters or accidents.

The warranty pertains to the purchased product itself and does not cover any damages that might arise from a breakdown of the supplied product. Any repairs will be done at our factory. Even if the product is still covered under the warranty period, we will assess a separate charge for sending technicians to the customer's site.

Intelligent Actuator, Inc
2690 W. 237th Street
Torrance, CA 90505
310-891-6015 / 310-891-0815 (Fax)
www.intelligentactuator.com

Publication Date: February 2000
Publication No.: IAI-054C, 055C, 069C