

# Rotary Actuator

## Operating Manual



**Intelligent Actuator, Inc.**

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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 FAX 630-467-9912. 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.



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## 1 General Advice

- ◆ To operate the actuator properly, please read this manual carefully.
- ◆ You are not allowed to use or reproduce this manual or any portion thereof without permission.
- ◆ Please do not attempt to use or operate the actuator in any manner not indicated in this manual.
- ◆ We cannot accept any responsibility for possible damage resulting from the use of this manual.
- ◆ We reserve the right to change the information contained in this manual without prior notice.

## 2 Foreword

Thank you for purchasing the IA Intelligent Actuator Rotary System (RS). The Rotary System actuators combines a servo motor with a speed reduction device and is used to move loads in a circular or a swinging motion with a high degree of accuracy. When used in combination with our IS or FS Series actuators, the rotary actuator works as a Theta axis to achieve precise angular control.

Without knowing beforehand how to correctly use or operate the rotary actuator, not only will the user be unable to take full advantage of all the functions built into this product but he might inadvertently cause damage to the actuator or shorten the life of the equipment. Please read this manual carefully to acquire an understanding of the proper method of handling and operating the actuator and keep it handy when using the actuator so that you can refer to individual sections as necessary. For proper use of the controller or other actuators in conjunction with the rotary actuator, please refer to the manuals provided with those components.

## 3 Safety Precautions

- ◆ Please use only the cable provided by IAI to connect the actuator and the controller.
- ◆ If the encoder cable (PG) becomes disconnected, it could cause the actuator to run out of control so please be careful when handling the cable.
- ◆ Please do not allow people within the moving range of the unit when it is in operation or when the controller is turned ON. If the unit is operating in an area where people can come into contact with the unit, use some kind of barrier to close off the area. While the actuator is in operation, make sure that a sign indicating this is clearly visible.
- ◆ Always disconnect the power cord first before making adjustments to or performing maintenance work on the actuator. Pull in the disconnected cord and leave it near you so that someone else cannot inadvertently plug in the power cord. Another method is to put a lock on the power outlet or use a safety plug.
- ◆ For everyone's safety when there are several persons working at the same time, decide on a method for signalling to one other. In particular, make sure you let others know when you are about to begin any work involving axis movement regardless of whether the power is ON or OFF.
- ◆ If you use a power cord extension, improper connections can lead to faulty actuator operation. Make sure the connections are done properly before plugging in the power cord.

## 4 Handling

### 4-1 Handling the packed unit

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

### 4-2 Handling the unit after unpacking

- ◆ Hold the actuator securely with both hands when lifting it from the shipping box.
- ◆ When carrying the actuator, take care not to drop or bump it.

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## 5 Operating and Storage Environment

### 5-1 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 ~ 40°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 used in cutting.
- ◆ The unit should not be subject to vibrations greater than 0.3G.
- ◆ Avoid extreme electromagnetic waves, ultraviolet rays and radiation.
- ◆ The operator should be able to work without protective gear.

### 5-2 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 60°C during a short storage interval but only up to 50°C if the storage period is longer than one month.

## 6 Installation

### 6-1 Installing the main body

- ◆ To mount the actuator, use bolts appropriately sized for the mounting holes and slots.
- ◆ We recommend high strength bolts of ISO - 10.9 or higher.
- ◆ Use hexagon sockets for the bolts to mount the main body.
- ◆ Do not use common spring washers since they tend to become loose.

## 6-2 Mounting the main body

- ◆ Remove the screws in the actuator cover and slide the cover to the back.
- ◆ Use the mounting bolts to fix the actuator in a suitable position.
- ◆ Return the cover and reattach it with the screws.

## 6-3 Attaching an arm or tool

- ◆ Use a split structure or a span ring to attach an arm or tool to the actuator spindle (main axis).

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## 7 Connecting the Controller

When the actuator is used as a stand-alone unit, we include a standard 3 meter connection cable. Please attach the connector at the end of the cable directly to the controller.

- ◆ In an application where the cable cannot be anchored, place the cable so as to minimize any load on it.
- ◆ Do not cut the cable and then lengthen, shorten or reconnect it.
- ◆ Do not pull or force the cable to bend.
- ◆ If you wish to alter the cable, please consult with IAI before doing so.

## 8 Maintenance

Periodic maintenance must be performed to continue operating the actuator safely and without any breakdowns. We indicate below the visual inspection checks that should be done before and after each time the actuator is operated. Always remember to disconnect the power plug before performing any of these checks.

Check Item	What to Look For
Body	Loose mounting bolts
Cables	Damage to cables Faulty connection to connector
General	Unusual noise or vibrations

### 8-2 Cleaning

- ◆ Clean the exterior surfaces occasionally.
- ◆ Wipe off any dirt with a soft cloth.
- ◆ Do not use strong compressed air on the actuator that might force dust into the crevices.
- ◆ Do not use petroleum-based solvents as they damage plastic parts and painted surfaces.
- ◆ If the unit gets extremely dirty, apply a neutral detergent or alcohol to a soft cloth and wipe lightly.

## 9 Warranty

### 9-1 Warranty period

The warranty period is whichever of the following occurs first.

- 18 months after IAI ships the unit.
- 12 months after delivery to the designated location.
- After 2500 hours of operation.

### 9-2 Scope of warranty

If a breakdown occurs within the period specified above and is clearly due to the manufacturer's error, we will repair the unit at no cost. 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. 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 failure to perform proper maintenance.
- ◆ Any alterations made by other than IAI or its representatives.
- ◆ Breakdowns resulting from the use of controllers made by other manufacturers.
- ◆ Any damage caused by fire and other natural disasters or accidents.

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