INDELAC

CONTROLS, INC.

Electric Spring Return Actuator Installation, Operation & Maintenance Manual

For Use with All ES2 Models

REV 732025

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FOR A DIGITAL COPY OF THIS INSTALLATION & OPERATION MANUAL, PRODUCT DATASHEETS, CAD DRAWINGS, TRAINING VIDEOS, OR TO REQUEST ADDITIONAL SUPPORT:
VISIT OUR WEBSITE AT WWW.INDELAC.COM

INTRODUCTION:

Thank you for selecting Indelac Controls, Inc. (*ICI*) for your valve or damper automation requirement. We at *ICI* are proud of our products and feel confident they will meet or exceed your expectations of quality and reliability.

Every precaution has been taken to ensure that your equipment will arrive undamaged; however, accidents do occur. Therefore, the first thing you must do upon receipt of your package is to inspect it for damage. If the box is damaged there is a possibility that the equipment inside the box may be damaged as well. If this is the case YOU MUST FILE A CLAIM with the delivering CARRIER. All shipments are F.O.B. our factory and it is YOUR RESPONSIBILITY to file a claim for damages.

STORAGE:

If the actuators are scheduled for installation at a later date:

1. Store off the floor.
2. Store in a climate-controlled building.
3. Store in a clean and dry area.

FOR FUTURE REFERENCE RECORD:

1. Actuator Model Number_____
2. Actuator Enclosure Type: NEMA 4____, NEMA 4X___, NEMA 7___, NEMA 4 & 7____
3. Actuator Output Torque_____LB-IN
4. Motor Characteristics, Voltage_____Hertz_____Phase_____
5. Actuator Serial Number_____
6. Date of Installation_____Put into operation_____
7. Valve Data:
   - 7a. Manufacturer_____
   - 7b. Style & Fig. No._____
   - 7c. Size_____
   - 7d. End Connection_____
   - 7e. Material of Construction: Body_____Stem & Ball_____
   - 7f. Brake Away Torque_____LB-IN @_____PSI
   - 7g. Other helpful data_____
     _____
8. Fail OPEN (CCW) ____ or Fail CLOSE (CW) ____

MEDIA:

1. System media_____
2. Temperature,_____(deg. F.) Maximum,_____. Minimum,_____.
3. Pressure_____PSI

*As this information is listed it is important to pay attention to all of the actuator specifications relative to the valve specifications and system requirements. If the actuator is not properly sized for the valve and application the life will be shortened or it may not work at all.

ABOUT ELECTRIC SPRING RETURN ACTUATORS:

ICI's electric spring return actuators are fail-safe actuators designed to prevent catastrophic loss of system media or production caused by a sudden loss of electricity. They are not designed for control applications. When used in the manner for which they were designed they will deliver years of protection for your system. Please read these instructions completely before installing and using your new ICI electric spring return actuator.

INSTALLATION:

The actuator is shipped in the DESIGNATED FAIL position from the factory; make sure the valve and actuator are in the same position before mounting.

1. Manually position valve to the designated failure position, if the actuator is to fail-close on loss of power, the valve must be in the closed position when mounting the actuator.
2. Remove valve mechanical stops.
   CAUTION: DO NOT REMOVE ANY PARTS NECESSARY FOR THE PROPER OPERATION OF THE VALVE, I.E., PACKING GLAND, GLAND NUT, ETC.
3. Check again that the valve and actuator are in the same position.
4. Install mounting hardware on valve, do not tighten bolts securely at this time, mount actuator to valve, and once actuator screws have been started securely tighten all nuts and bolts.

NOTE: ACTUATOR CONDUIT ENTRY IS NORMALLY POSITIONED PERPENDICULAR TO PIPE LINE.

5. Remove actuator cover.
6. Wire actuator using the wiring diagram inside of the actuator. If there is no wiring diagram call the factory to obtain the proper wiring diagram before attempting to wire the actuator. Equipment failure due to improper wiring is not covered under the factory warranty.
   CAUTION: BE SURE POWER IS OFF AT THE MAIN POWER BOX.
7. Turn on power to actuator.
   CAUTION: USE EXTREME CAUTION, AS THERE ARE LIVE CIRCUITS THAT COULD CAUSE ELECTRICAL SHOCK OR DEATH.
8. Operate the valve to the close position, check the alignment.
9. Operate the valve to the open position, check the alignment.
10. Check to ensure that the cover gasket is properly set in its groove.
    - If the gasket is out of the groove, manipulate it back into place with your fingers to ensure a proper seal to eliminate the ingress of water, dust, or other debris.
11. Replace cover and secure cover screws.

FOR QUESTIONS REGARDING ES2 MODELS PAIRED WITH AN EXTERNALLY MOUNTED MANUAL OVERRIDE GEARBOX PLEASE CONSULT THE FACTORY.

CALIBRATION – OPEN POSITION:

AFTER CHECKING THE ALIGNMENT OF THE VALVE PORT, CALIBRATION MAY BE REQUIRED.

To Set The Open Position:

Operate valve to the open position by applying power to terminal connections #1 and #2, the valve will rotate counter clockwise, CCW, viewing top of actuator.

NOTE: **WHEN THE ACTUATOR IS IN THE OPEN POSITION THE SETSCREW SECURING THE CAM TO THE SHAFT IS EASILY ACCESSIBLE.**

1. If the valve did not open completely.
   - **a.** Loosen 8-32 set screw in top cam.
   - **b.** Rotate cam clockwise (CW) until the switch makes contact, listen carefully for a slight click. The valve will begin to rotate CCW, by making small incremental CW movements of the cam the valve can be positioned precisely in the desired position.
   - **c.** Securely tighten the setscrew.

2. If valve traveled too far open.

   CAUTION: VALVES WITH MECHANICAL STOPS MAY BE DAMAGED OR CAUSE DAMAGE TO THE ACTUATOR IF ALLOWED TO TRAVEL TOO FAR.
   - **a.** Apply power to terminal connections #1 and #3, the valve will begin to rotate CW, allow it to travel to the mid position.
   - **b.** Follow directions of “To set open position”.

3. **SET MECHANICAL STOP ADJUSTMENT SCREW**

   After the position is set, and if **OPEN** is the designated **FAIL POSITION:**
   - **a.** Rotate the mechanical stop adjusting screw clockwise until the screw touches the mechanical stop.
   - **b.** Next, rotate the mechanical stop adjusting screw counter clockwise (CCW) one full turn and lock the jam nut so the mechanical stop adjusting screw remains in position.

   By doing this the mechanical stop never comes in contact with the adjusting screw except upon loss of power.

   CAUTION: IF THE MECHANICAL STOP COMES IN CONTACT WITH THE ADJUSTMENT SCREW DURING NORMAL POWERED OPERATION IT WILL CAUSE DAMAGE AND PREMATURE FAILURE OF THE ACTUATOR.

CALIBRATION – CLOSE POSITION:

To Set The Close Position:

Operate valve to the close position by applying power to terminal connections #1 and #3, the valve will rotate CW viewing the top of the actuator.

NOTE: **WHEN THE ACTUATOR IS IN THE OPEN POSITION THE SETSCREW SECURING THE CAM TO THE SHAFT IS EASILY ACCESSIBLE.**

1. If valve did not close completely.

- **a.** Loosen 8-32 set screw in bottom cam.
- **b.** Rotate cam CCW until the switch makes contact, listen for a slight click. The valve will begin to rotate CW, by making small CCW incremental movements of the cam the valve can be positioned precisely in the close position.
- **c.** Securely tighten the setscrew.

2. If the valve has traveled too far closed.

CAUTION: VALVES WITH MECHANICAL STOPS MAY BE DAMAGED OR CAUSE DAMAGE TO THE ACTUATOR IF ALLOWED TO TRAVEL TOO FAR CLOSED.

- **a.** Apply power to terminal connections #1 and #2, the valve will begin to rotate CCW, allow it to travel to the mid position.
- **b.** Follow directions of “To Set Close Position”.

3. **SET MECHANICAL STOP ADJUSTMENT SCREW**

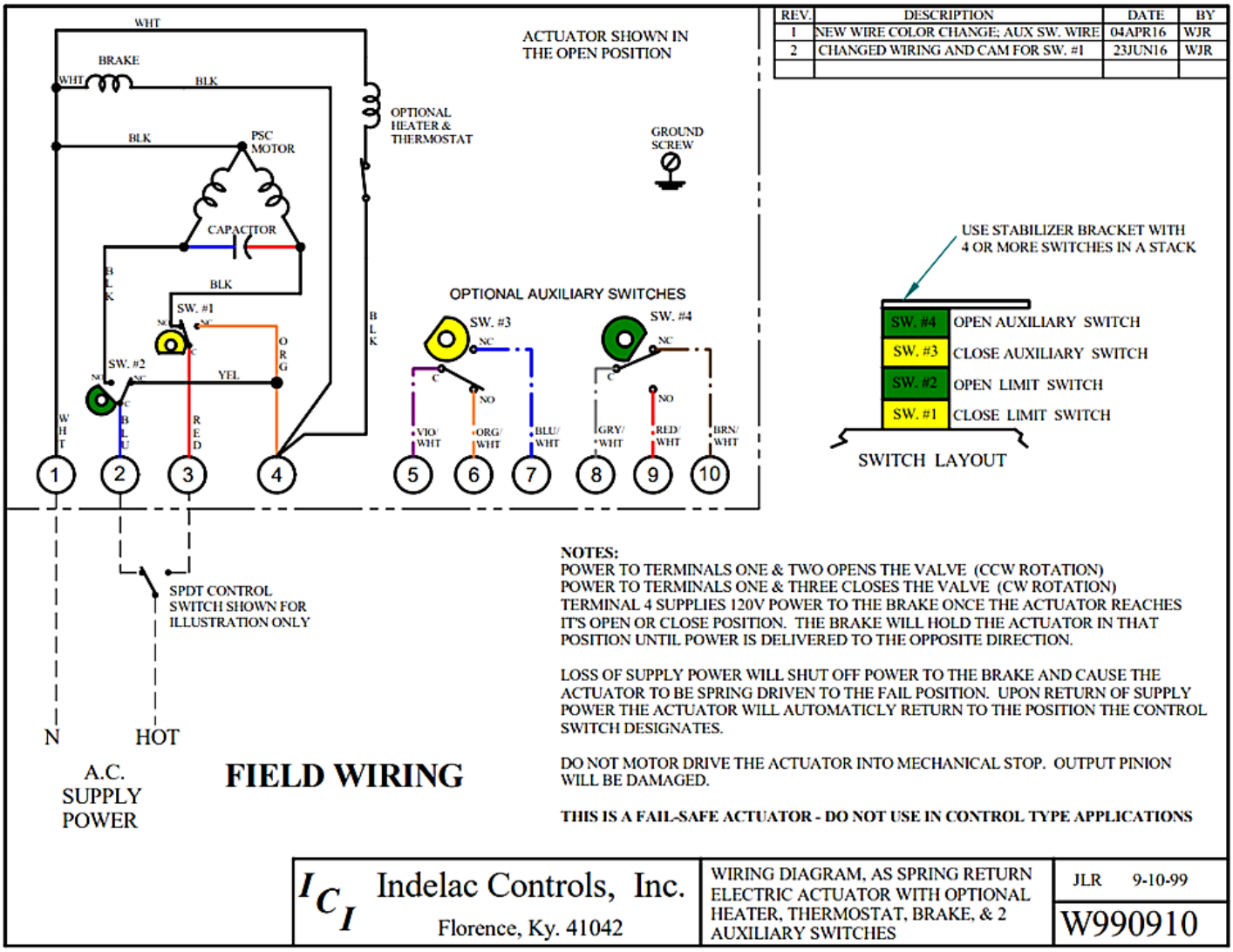
After the position is set, and if **CLOSE** is the designated **FAIL POSITION:**

- **c.** Rotate the mechanical stop adjusting screw clockwise until the screw touches the mechanical stop.
- **d.** Next, rotate the mechanical stop adjusting screw counter clockwise (CCW) one full turn and lock the jam nut so the mechanical stop adjusting screw remains in position.

By doing this the mechanical stop never comes in contact with the adjusting screw except upon loss of power.

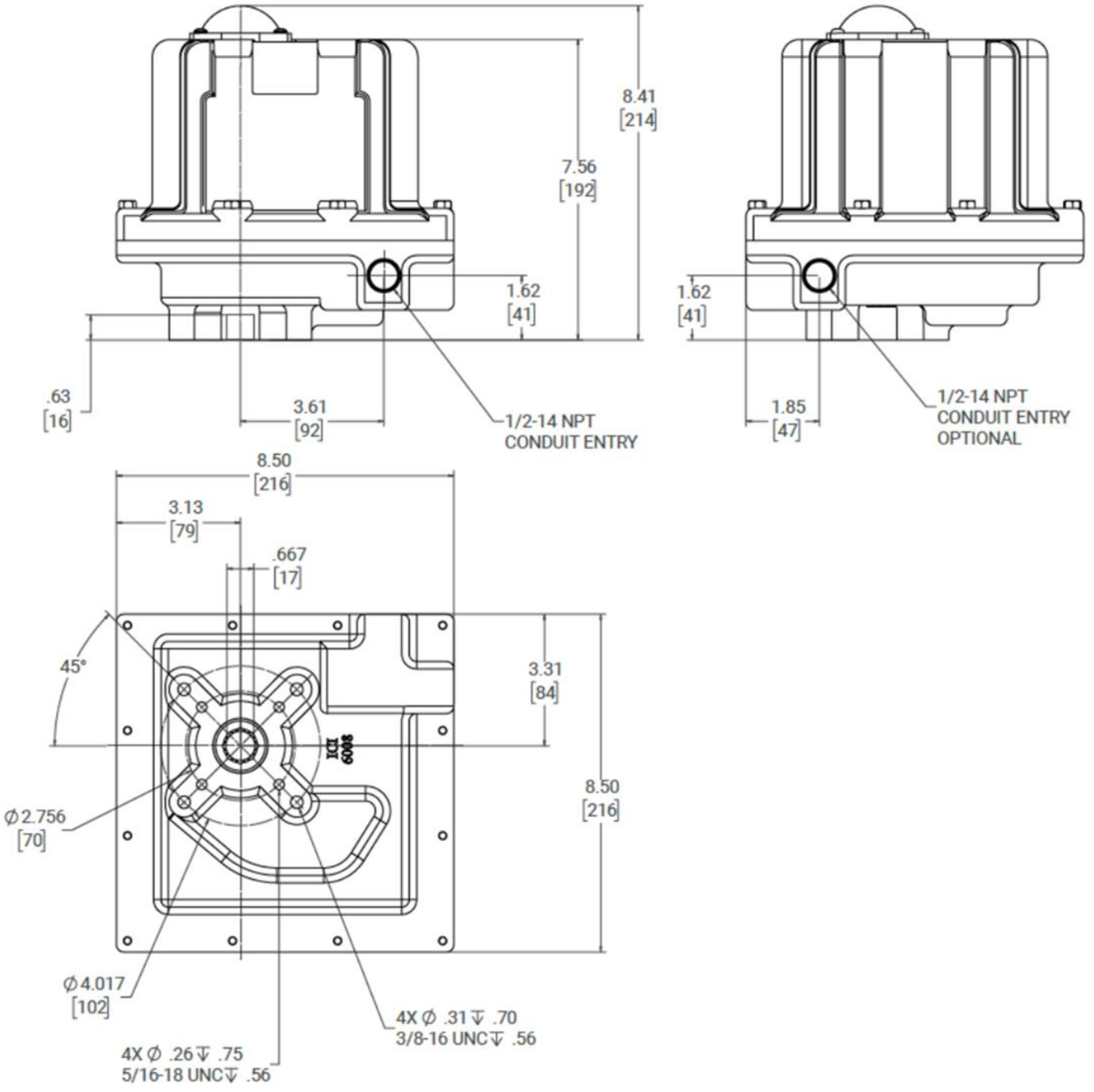
CAUTION: IF THE MECHANICAL STOP COMES IN CONTACT WITH THE ADJUSTMENT SCREW DURING NORMAL POWERED OPERATION IT WILL CAUSE DAMAGE AND PREMATURE FAILURE OF THE ACTUATOR.

WIRING DIAGRAM:



EXTERNAL DIMENSIONS – ALL NEMA 4 / 4X / 7 ENCLOSURE TYPES

ALLOW 4'' CLEARANCE FOR COVER REMOVAL



MAINTENANCE:

After your ICI spring return electric actuator has been properly installed there is little or no maintenance ever required. The gear train has been permanently lubricated at the factory and requires no routine maintenance. In the event it becomes necessary to perform maintenance on the actuator upon reassembling, we recommend using Shell Darina #2 grease.

TO SET BRAKE:

If it ever becomes necessary to set the brake

1. Using a small flat head screw driver rotate the motor shaft via the top of the motor using the flat on the motor shaft until you can see the first of two, motor hub set screws through the access window located on the side of the brake.
2. Use a 1/16'' Allen wrench to loosen the first set screw.
3. Repeat step #1 & #2 to locate and loosen the second set screw.
4. Using a .011'' (.279mm) feeler gauge, set the brake gap.
5. Securely re-tighten the 2 set screws on the brake hub, making sure one of them is aligned with the flat on the motor shaft.

DUTY CYCLE:

ICI actuators rated 100 LB-IN up to 1500 LB-IN output torque are rated for 25% duty cycle at 100% ambient temperature at rated torque (75% duty cycle motors are available upon request). Actuators rated for 2000 LB-IN output torque and greater are rated for continuous duty. All direct current (dc) motors are rated for 75% duty cycle.

THERMAL OVER LOAD:

All alternating current (AC) motors are equipped with thermal over load protection to guard the motor against damage from overheating.

MECHANICAL OVER LOAD:

STALL LOAD All ICI actuators are designed to with stand stall conditions. It is not recommended to subject the unit to repeated stall conditions, as the gears will eventually fail.

SHOCK LOAD Shock loads shorten gear life dramatically. To prevent premature gear failure the actuator must be powered to the open and close position, allowing the spring to take over only in the event of a power failure.

ORDERING PARTS:

When ordering parts please specify:

- Actuator Model Number
- Actuator Serial Number
- Part Number
- Part Description

RECOMMENDED SPARE PARTS:

- Set of Cams and Switches
- Motor Brake

NEMA 7 ENCLOSURE, GENERAL:

In general, operation and maintenance of a NEMA 7 electric actuator is no different than that of a NEMA 4 electric actuator. However, there are some precautions that must be followed.

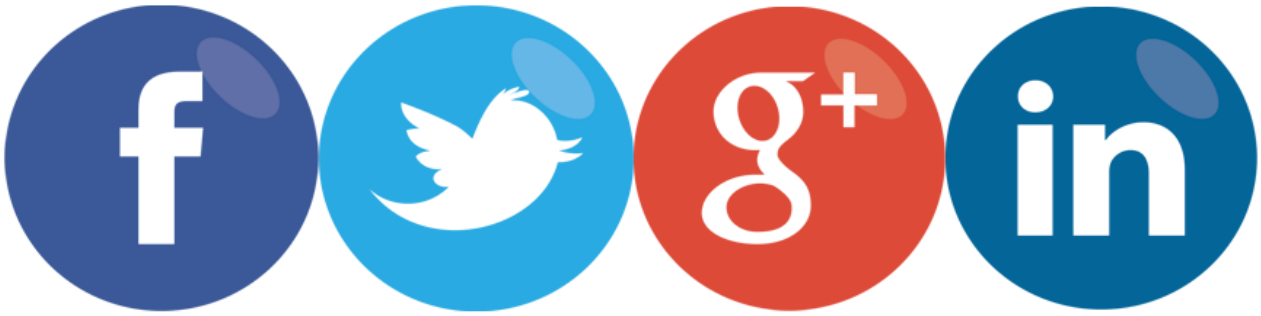
1. **DO NOT** install in ambient temperatures that exceed 140 degrees F.
2. **DO NOT** under any circumstances remove the actuator cover while in a hazardous location when the contacts are still live, this could cause ignition of hazardous atmospheres.
3. **DO NOT** under any circumstances use a NEMA 7 electric actuator in a hazardous location that does not meet the specifications for which the actuator was designed. The actuator is clearly tagged with the NEMA classification it was designed for.
4. Mount, test and calibrate actuator on valve in non-hazardous location.
5. When removing the cover care must be taken not to scratch, scar or deform the flame path of the cover or base of the actuator, this will negate the NEMA 7 rating of the enclosure.
6. When replacing the cover on actuators rated NEMA 4 and 7 take care that the gasket is in place to assure the proper clearance after the cover is secured. After securing the cover screws check the clearance between the cover and the base, a .002" thick by 1/2" wide feeler gauge may not enter between the two mating faces more than .125".
7. All electrical connections must be to state and local codes and in accordance with the specifications for which the unit is being used.

- After proper installation the actuator will require little or no maintenance.
- In the event maintenance is required, remove the actuator from the hazardous location before attempting to work on it.
- If the actuator is in a critical application and down time is not permitted, it is advisable to have a spare actuator in stock.

TROUBLESHOOTING - FREQUENTLY ASKED QUESTIONS

SYMPTOM	PROBLEM	SOLUTION
ACTUATOR DOES NOT RESPOND TO CONTROL SIGNAL.	Power not on	Turn on power
	Actuator wired wrong	Check wiring diagram & rewire
	Wrong voltage	Check power supply & make appropriate changes
	Thermal overload activated	Allow motor to cool, actuator will automatically reset
	Actuator and valve in opposite positions when actuator was mounted.	Remove actuator and rotate 90 degrees & remount
	Torque trip point set too low	Increase trip point
	Torque trip delay set too short	Increase delay time
ACTUATOR WILL NOT OPEN OR CLOSE COMPLETELY.	Travel limits set wrong	Reset cams.
	Valve torque too high for actuator	Install correct size actuator.
	Mechanical stops not removed	Remove stops, CAUTION: Do not remove any part required for proper operation
	Torque trip point set too low	Increase trip point
	Torque trip delay set too short	Increase delay time
VALVE OSCILLATES.	Valve torque too high for actuator	Install correct size actuator.
	Actuator without brake installed on butterfly valve	Install brake
	Motor brake out of adjustment.	Adjust brake
	Set screw loose in brake disc	Adjust brake and tighten set-screw
MOTOR RUNS BUT OUTPUT SHAFT DOES NOT ROTATE.	Gear damage or sheared pin	Contact ICI or nearest distributor

NOTES



Contact Information

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