

ECON SPRING RETURN ELECTRIC ACTUATOR

Fig. 7917, type ELSA50 - 260



Installation and Operation Manual for actuator type: ELSA50, 130, 200 & 260

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1. General Information

 **Failure to follow safety instructions may cause serious injury, equipment damage, or voided warranty.**

1.1 Safety Instructions

- Installation, maintenance and repair works must be performed by trained personnel and the safety and warning instruction contained in this manual must be followed.
- The user should read and follow instructions contained in this operation manual included with the product. Failure to do this may result in damages and void warranty. ERIKS will not be liable for damages caused by operator negligence or misuse.
- Local health and safety legislation shall be complied with.
- In a few cases, the surface temperature may exceed 60°C (140°F). Please check the surface temperature before operation, using an appropriate thermometer and wearing protective gloves before operation.

1.2 Installation Notices

 **Operating by handwheel: Do not use any tools to increase force on the handwheel for operating, as this can damage the actuator or valve.**

- The spring return actuator is shipped in spring return position (spring unloaded). Standard actuators will be supplied with a clockwise spring return action for closing the valve in case power outage occurs. However actuators can optionally be supplied with a counter-clockwise spring return action for opening the valve.
- Please read the operation manual and wiring diagram carefully before installation.
- Verify that the supply voltage is in accordance with the data on nameplate to prevent a short circuit or damage to the electrical/electronic parts caused by incorrect power input.
- Turn the power off before wiring or maintenance.
- Connect the ground wire to PE point inside the electric actuator.
- To avoid functional failure caused by a static load, do not touch any components on the PCB with metal tools or bare hands.
- Do not parallel wire multiple actuators together without using an extra relay.
- Use proper cable glands in order to seal the conduit entries correctly. Don't mount the actuator with conduit entries in upright position in order to prevent water ingress.
- After manual operation, the actuator shall be returned to its unloaded position by the handwheel before electrical operation of the actuator.
- The actuator should be installed in an upright or horizontal position. Do not mount

the actuator upside down or below the horizontal position.

- These units are not designed to operate in vacuum spaces or where an explosive atmosphere exists.
- Periodically inspect the actuator enclosure to prevent dust from accumulating.

1.3 Inspection, Storage, Transport

1.3.1 Receiving / Inspection

- Carefully inspect the package for any damages resulting from shipping and report all damages to the freight carrier and supplier.
- After unpacking the product, please keep the cartons and any packing materials in case of product return or replacement. Verify that the items listed on the packing slip or bill of lading are the same as what was ordered. If there is any discrepancy, please contact your supplier.
- Verify that the technical data on the nameplate is in accordance with your purchase order.

1.3.2 Storage

- The actuator should be stored in a dry area with relative humidity of less than 90% ($20 \pm 5^{\circ}\text{C}$) and at temperatures between -20°C to $+40^{\circ}\text{C}$ (-4°F to $+104^{\circ}\text{F}$).
- The product shall be stored with suitable protection from corrosive substances, which could damage the metal and insulating parts.
- The red conduit plug for temporary protection should not be removed until the actuator is ready to be cabled. Use suitable cable glands to ensure IP rated protection when installing.

1.3.3 Transport

- Attach ropes or hooks for the purpose of lifting or hoisting only to the housing and not to the handwheel.
- Actuators packaged in cartons can stand up to land, sea, or air transportation.
- Packaged actuators shall be safeguarded from violent impact and strong vibrations and be protected from rain or snow.

1.3.4 Lubrication

- The gear train has been sufficiently lubricated at the factory. No additional lubrication is required.

2. Product Overview

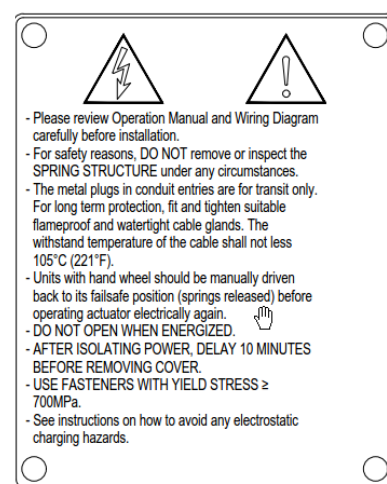
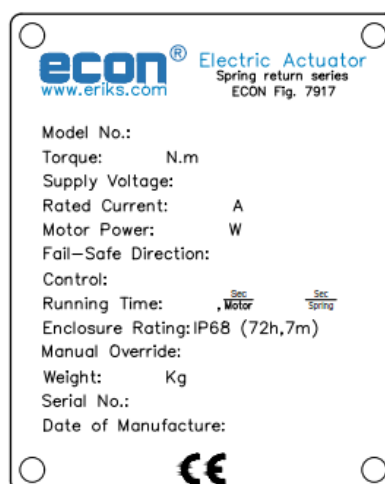
ECON Fig. 7917 ELSA series spring return fail-safe electric actuators offer torque ranges from 50 Nm up to 260 Nm (445 in-lb to 2300 in-lb) and are designed for fail-safe positioning of quarter-turn valves or dampers upon loss of supply voltage, which include On/Off control, floating control and modulating control. A rack and pinion spring mechanism is used to position the controlled device to either fully OPEN or fully CLOSED position without any external power source. For On/Off types, a mechanical BUFFER is used at the end of the spring stroke to reduce the “water hammer” effects in pipes. A clutch-less manual override is provided for manual positioning of the controlled device. Actuators without a manual override can be ordered as an option.

2.1 Features

- Controls: On/Off, floating (optional), modulating (optional).
- Clutch-less manual override.
- Without Clutch-less manual override (optional).
- IP 68 enclosure (7m/72hours)
- ISO 5211 mounting flange.
- Domed visual position indicator.
- Built-in motor thermal protection.

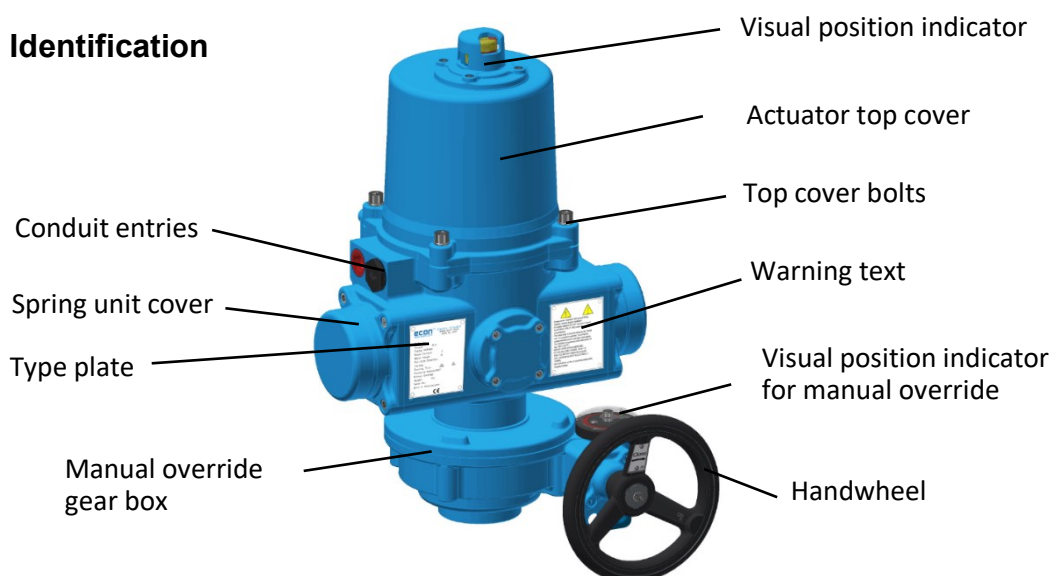
2.2 Actuator markings

- ECON logo (trade mark)
- Model number
- Output torque
- Electrical power supply
- Rated current
- Motor power
- Fail-safe direction
- Control
- Running time
- Enclosure (IP)-rating
- Manual override
- Weight
- Serial Number
- Manufacturing date



3. Product Mechanical Data

3.1 Parts Identification

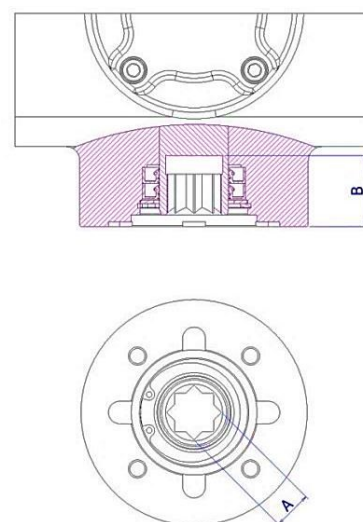


3.2 Technical Information

Model	Torque		Motor Power	Weight			
				Without manual override		With manual override	
	Nm	In-lb	Watt	kg	lb	kg	lb
ELSA50	50	445	50	27	60	37	82
ELSA130	130	1150	130	57,5	127	74,5	164
ELSA200	200	1770	130	95	209	135	297
ELSA260	260	2300	130	95	209	135	297

3.3 Mounting Base Details

Model	Mounting Flange	Shaft (A)		Depth of Shaft (B)	
	ISO 5211	mm	inch	mm	inch
ELSA50	F07	17	0.669	30	1.181
ELSA130	F10	22	0.866	41	1.614
ELSA200	F12	27	1.063	45	1.772
ELSA260	F12	27	1.063	45	1.772



3.4 Sizing

⚠ For safety reasons, do not remove or inspect the SPRING UNIT. Proper tools must be used or serious injury will occur.

The actuator shall be sized to ensure that its torque output meets the operating torque of the valve and its ability to overcome the required duty cycle of the application (A safety factor of minimal 30% on top of the required valve torque is recommended).

If the maximum torque of a valve is 80 Nm → $80 \times 1.3 = 104$ Nm
104 Nm < 130 N.m (ELSA130) → OK!
104 Nm > 50 Nm (ELSA50) → NOT OK!

3.5 Duty Cycle – IEC

- The duty cycle is the relationship between the running time and resting time. It is calculated as below:

$$\text{Duty Cycle} = \frac{\text{Running Time (s)}}{\text{Running Time (s)} + \text{Rest Time (s)}} \times 100 \%$$

➔
$$\text{Rest Time (s)} = \frac{\text{Running Time (s)} \times (1 - \text{Duty Cycle})}{\text{Duty Cycle}}$$

- **If the motor running time is 10 s, the spring return time is 5 s and the duty cycle is 50%, the rest (off) time shall be calculated as below:**
 - ✓ Motor running time $10 \text{ s} \times (1 - 50\%) / 50\% = 10$, rest time is 10 s.
 - ✓ Spring return time $5 \text{ s} \times (1 - 50\%) / 50\% = 5$, rest time is 5 s.

⚠ One cycle is equal to: open-rest-close-rest.

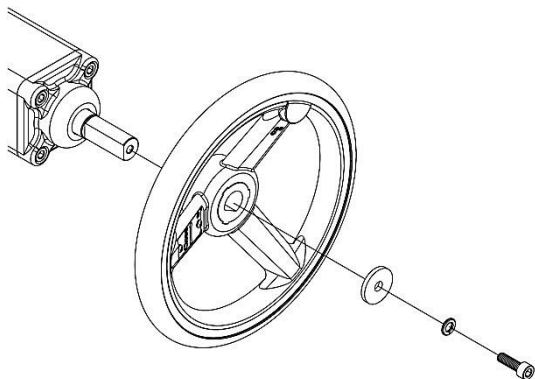
⚠ A rest time is required after spring return action because the gear train and motor are driven during spring release.

4. Mounting and Setup

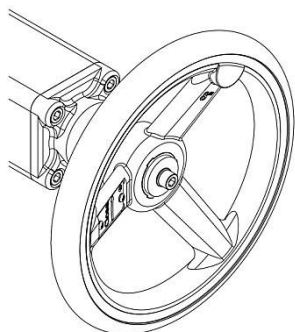
4.1 Handwheel Installation

- a. Slide the fixing bolt through the washers and handwheel and secure them to the override shaft as shown in the figure below.

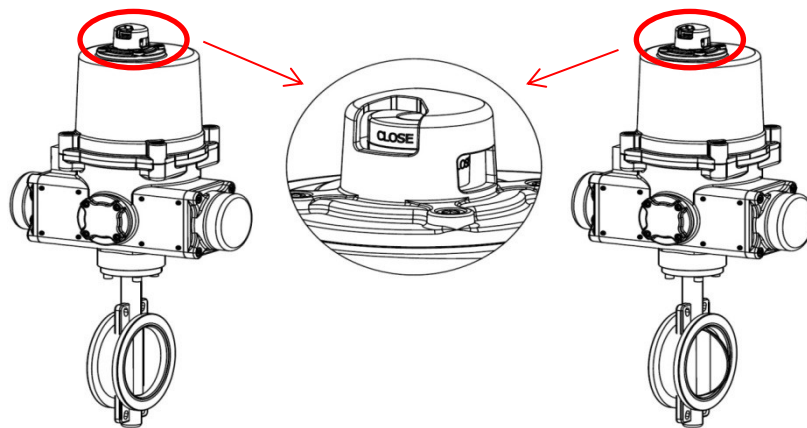
⚠ Turn off the power supply when installing handwheel.



- b. Assembly completed as shown in the figure below.



4.2 Valve Mounting Instructions



- a. The spring return actuator is shipped in spring return position (spring unloaded).
Standard actuators will be supplied with a clockwise spring return action for closing the valve in case power outage occurs. However actuators can optionally be supplied with a counter-clockwise spring return action for opening the valve.
- b. Make sure the valve is in the correct FAIL POSITION before mounting the actuator to it. Refer to illustration above.
- c. Remove all of the valve manual operation parts, such as the mechanical open/close stoppers in order to prevent interference with the electric operation.
⚠ Do not remove the packing gland or other parts necessary for safe operation of the valve.
- d. Check again if the valve and actuator are in the same position (fully-open or fully-closed).
- e. Once mounted together, either directly or with a mounting kit, ensure that they are properly secured together by fastening all fasteners by using correct tools.
- f. Remove the conduit entry plug to relieve the pressure inside the actuator for the ease of the top cover removal and gently remove the cover.
⚠ The power supply must be switched off before removing the cover.
- g. A label with the wiring diagram is inside the cover of the actuator.
- h. Supply power to the actuator.
⚠ Care must be taken at all times as there are live circuits present which may cause an electrical shock.
- i. Re-calibration may be required for the end positions, refer to section 4.4 for further instructions.
- j. Assemble the cover and secure the cover bolts firmly after setting.
⚠ Please ensure that the O-ring seal is in good condition prior to cover installation.

4.3 Wiring Instructions

- ⚠ Turn the power off before making the electrical connection!**
- Connect the ground wire to PE point placed on middle metal plate inside the electric actuator (a green bolt).
 - Each actuator is attached with a black water-proof plug and a temporary red dust plug to conduit entries.
⚠ Use correct size of fittings in order not to damage the threads.
 - Verify if the power supply is in accordance with the data on the nameplate to prevent a short circuit and an electrical shock.

⚠ Do not apply power to actuator before wiring, otherwise it can cause an electrical shock or damage components of the actuator.

- Use proper sealant to seal the conduit connection after wiring procedure to prevent dust or water from entering the actuator.

⚠ The red plastic dust plug is not meant for long-term use. Replace with suitable water-proof connector to ensure the enclosure protection rating.

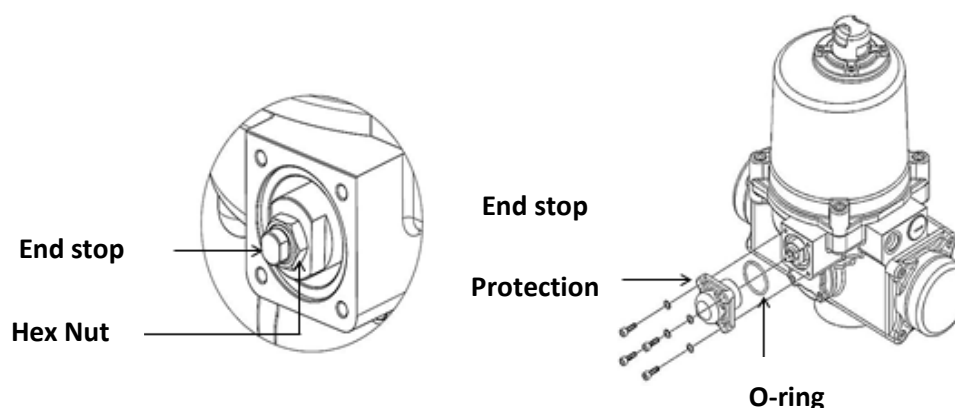
4.4 Actuator Set-up

⚠ If the actuator is equipped with a manual override, rotate the handwheel to return the actuator to its fully unloaded spring position before the power is supplied.

⚠ Securely tighten the conduit fittings to ensure the enclosure protection rating.

The spring return actuator provides fail-safe positioning and the end stop position of the spring return action is determined by either a buffer or mechanical stop (On/Off by the buffer, floating or modulating limited by mechanical stop). When the actuator is motorized, the end position is determined by limit switches.

The actuator has been set and calibrated at the factory. Most products will not require recalibration of these settings. However these are general settings. After the valve and actuator are bolted together, apply power to drive the actuator to its fully-open (spring compressed for a spring to close actuator). Then remove power to let the rack and pinion spring mechanism drive back to its fully-closed position. If the OPEN or CLOSE stop point are not aligned with the valve or damper position correctly, the end positions must be adjusted. Please follow steps below:

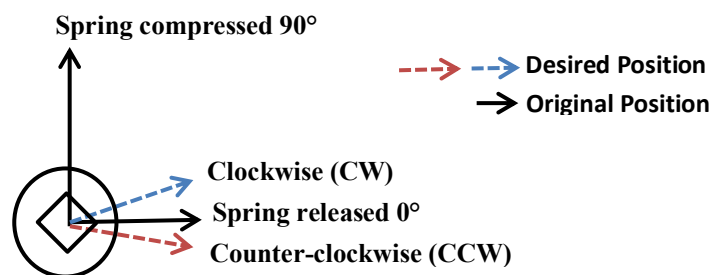


⚠ For modulating units, ensure to loosen the sector gear of the potentiometer first, before adjusting the following settings.

4.4.1 Adjustment procedure for spring-return actuator in the fail-closed position upon loss of supply voltage.

Adjust FULLY-CLOSED (spring released) stop point. Follow the steps below:

- Turn the power off and loosen the end stop protection cover using a 5mm hex key.
- Loosen the hex locknut of the End Stop using a 17mm hex wrench. Hold the locknut and turn the End Stop using a 10mm hex wrench to adjust the end position
- Turn the buffer or End Stop in order to adjust the fully-closed stop point.

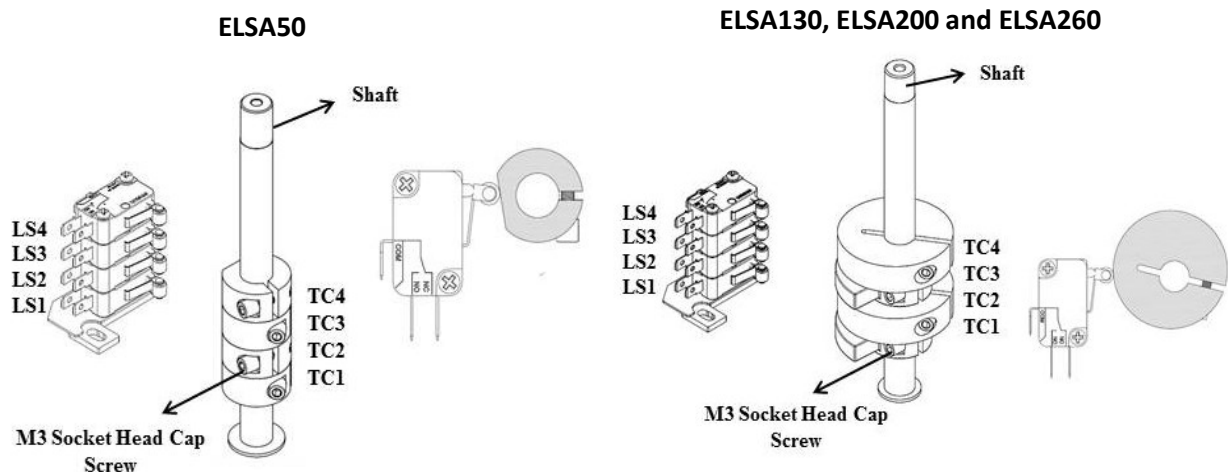


- ELSA50 : One turn = 2.3 degrees
- ELSA130 to ELSA260 : One turn = 1.4 degrees

d. Once completed, tighten the hex nut, replace the cover and tighten the bolts.

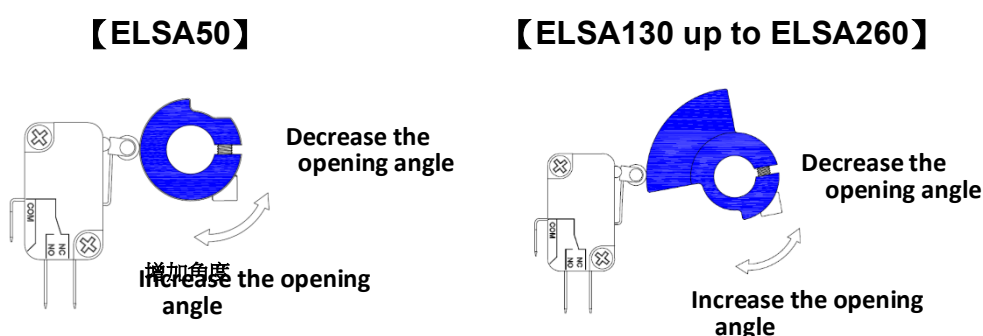
⚠ If the buffer or End Stop is adjusted, TC2 must be reset in accordance with the buffer or the End Stop

- Loosen the M3 cap bolt of the cam TC2 with a 2.5mm hex key.
- Rotate the cam TC2 counter-clockwise until a light click is heard and then slowly rotate the cam TC2 **clockwise** until a light click is heard.
- Tighten the cap bolt of cam TC2.



Adjust FULLY-OPEN (spring compressed) stop point. Follow the steps below:

- Apply power to drive the actuator to its fully-open (spring compressed) position. If the open stop point is not aligned with the valve or damper properly, then it must be adjusted.
- Turn the power off and let the spring unit drive the actuator back to its fully-closed (spring released) position.
- If it is required to adjust, loosen the cap screw of cam TC1 with a 2.5mm hex key.
 - To increase the opening angle, turn the cam clockwise.
 - To decrease the opening angle, turn the cam counter-clockwise.

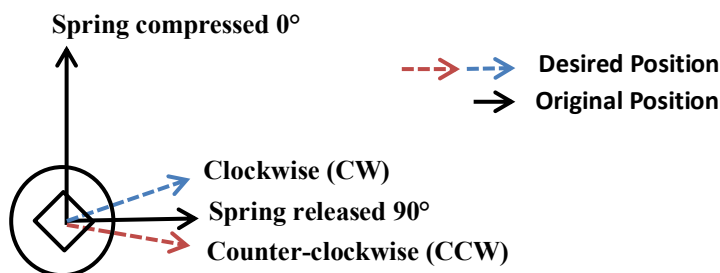


- After adjusting the cam, apply power to drive the actuator to the fully-open position.
- Verify that it is in the correct fully-open position.
 - ✓ If it is in correct position, turn the power supply off and lock the cap bolt of cam TC1
 - ✓ If it is not in the correct position, repeat step **C** until the correct position is reached.
- If auxiliary switches will be used for feedback, cams TC3 and TC4 need to be calibrated.
 - ✓ Adjust cam TC3 so it trips just before cam TC1 does.
 - ✓ Adjust cam TC4 so it trips just before cam TC2 does.

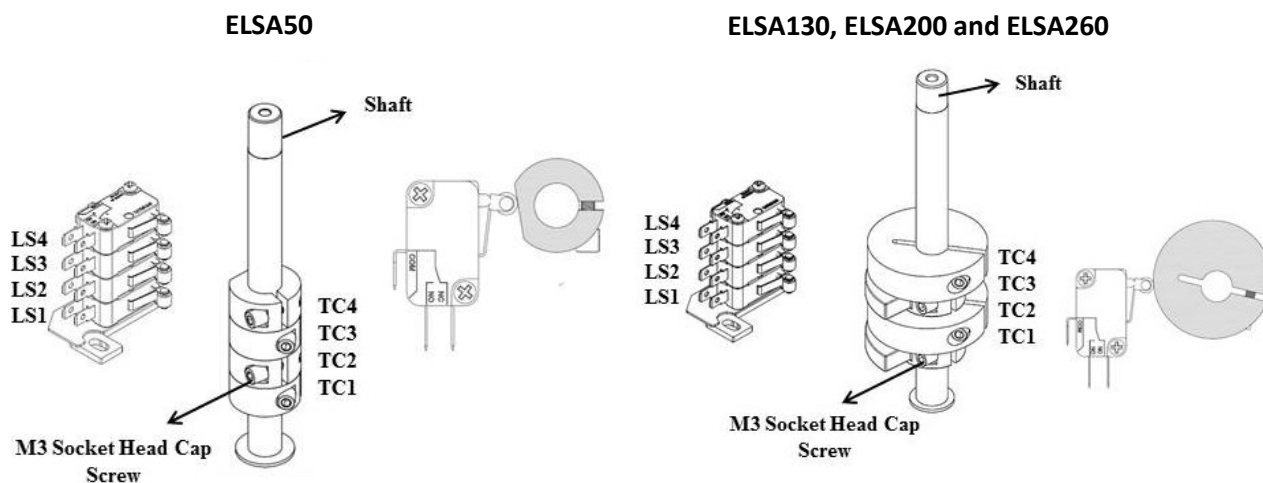
4.4.2 Adjustment procedure for spring-return actuator in the fail-open position upon loss of supply voltage.

Adjust FULLY-OPEN (spring released) stop point. Follow the steps below:

- Turn the power off and loosen the end stop protection cover using a 5mm hex key.
- Loosen the hex locknut of the End Stop using a 17mm hex wrench. Hold the locknut and turn the End Stop using a 10mm hex wrench to adjust the end position.
- Turn the buffer or End Stop to adjust the fully-open stop point.



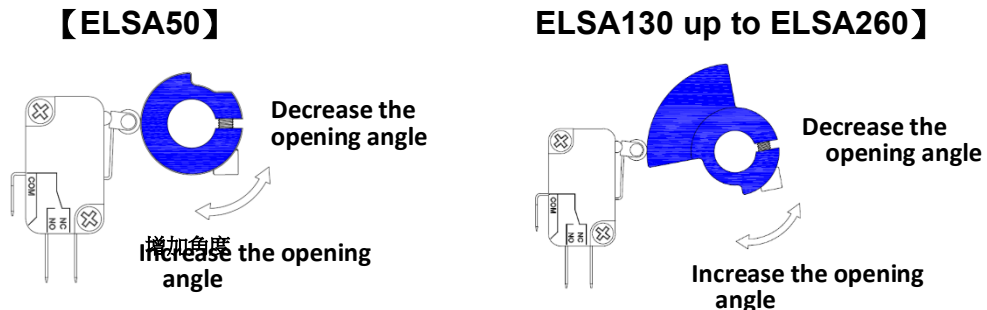
- ELSA50: One turn = 2.3 degrees
 - ELSA130 to ELSA260: One turn = 1.4 degrees
- d. Once completed, tighten the hex nut, replace cover and tighten the bolts.
- ⚠ If the buffer or End Stop is adjusted, TC2 must be reset in accordance with the buffer or the End Stop**
- e. Loosen the M3 cap screw of cam TC2 with a 2.5mm hex key.
- f. Rotate the cam TC2 counter-clockwise until a light click is heard, and then slowly rotate the cam TC2 clockwise until a light click is heard.
- g. Tighten the cap bolt of cam TC2.



Adjust FULLY-CLOSED (spring compressed) stop point. Follow the steps below:

- a. Apply power to drive the actuator to its fully-closed (spring compressed) position. If the close stop point is not aligned with the valve or damper properly, then it must be adjusted.
- b. Turn the power off and let the spring unit drive the actuator back to its fully-open (spring released) position.
- c. If it is required to adjust, loosen the cap bolt of cam TC1 with a 2.5m hex key.

- To increase the opening angle, turn the cam clockwise.
- To decrease the opening angle, turn the cam counter-clockwise.



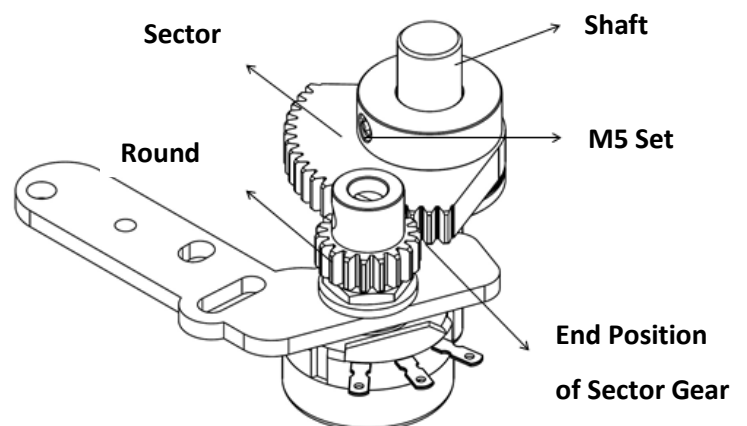
- d. After adjusting the cam, apply power to drive the actuator to the fully-closed position.
- e. Verify that it is in the correct fully-closed position.
 - ✓ If it is in correct position, turn the power supply off and lock the cap bolt of cam TC1.
 - ✓ If it is not in the correct position, repeat step C until the correct position is reached.
- f. If auxiliary switches will be used for feedback, cams TC3 and TC4 need to be calibrated.
 - ✓ Adjust cam TC3 so it trips just before cam TC1 does
 - ✓ Adjust cam TC4 so it trips just before cam TC2 does.

For modulating actuators, after completing the calibration, turn the actuator to the fully-closed position and follow the procedure below:

- a. Loosen M5 set screw.
- b. Rotate the sector gear clockwise to the position shown in the figure below.

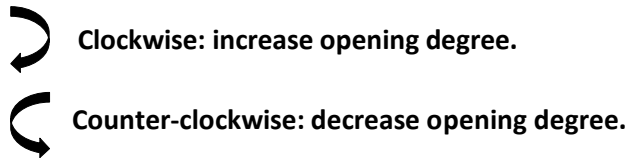
⚠ Ensure that the round gear and sector gear are engaged properly.

- c. Tighten M5 set screw.



TC2 is utilized for sensing fully-closed stop point. Once the spring mechanism has been released when power outage, the actuator will not drive under power again until it has reached its fail stop position and TC2 trips.

TC1 "OPEN "



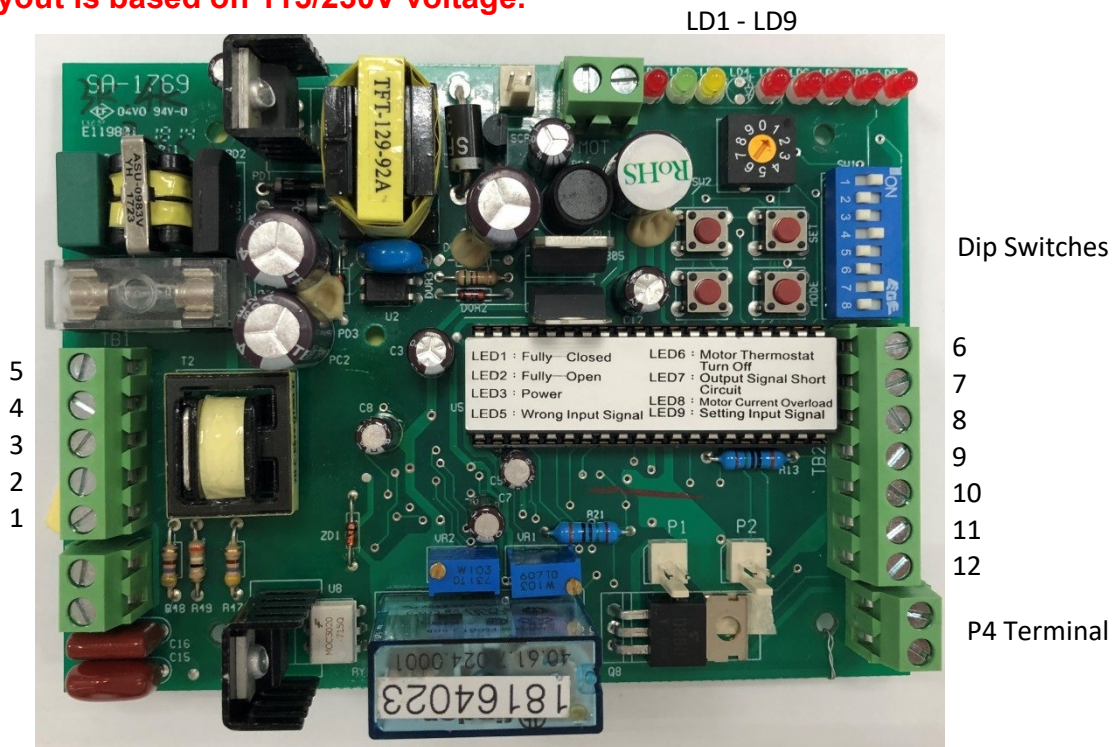
Note:

- LS2 shall trip while TC2 reaches the end stop point.
- TC3 & TC4 are optional, refer to section 4.4.1 and 4.4.2 for calibration.

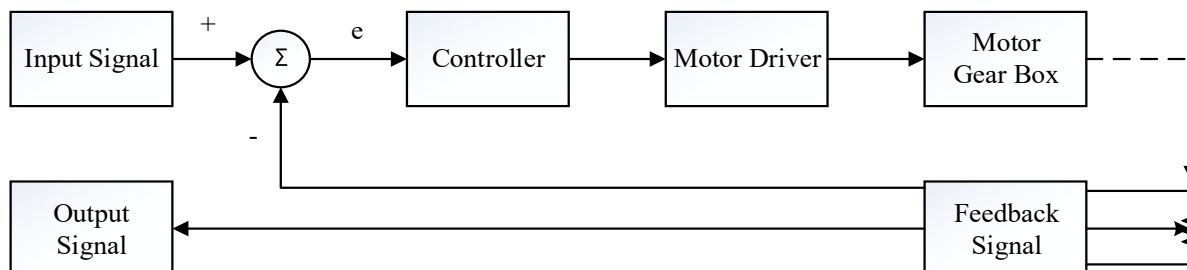
5. Modulating Control Board Adjustment

5.1 Modulating Control Board Surface

The layout is based on 115/230V voltage.

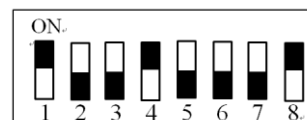


5.2 Programming



5.3 Dip Switch Setting (SW1)

The Dip Switch SW1 is a combination of 8 switches and equally divided in two rows. It is utilized to select the input signal type as well as the output type and fail positioning type, when the signal input fails. The sliders can be placed at either ON (upper) or OFF (lower) state position. Factory settings are switches 1, 4, 8 at ON state and switches 2, 3, 5, 6, 7 at OFF state.



ⓘ **Please follow the steps below if an adjustment of these settings are required. Please restart the actuator after adjusting.**

	1	2	3	4	5	6	7	8
Factory Setting	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
4 - 20 mA input	ON	OFF						
1 - 5V input	OFF	OFF						
2 - 10V input	OFF	ON						
4 - 20 mA output			OFF	ON	OFF			
2 - 10V output			ON	OFF	ON			
Input 20 mA / 5V / 10V to operate valve to fully-open position						OFF		
Input 20 mA / 5V / 10V to operate valve to fully-closed position						ON		
When signal input failed, driving valve to fully-open (when S6 sets at "ON").							OFF	ON
When signal input failed, driving valve to fully-closed (when S6 sets at "ON").							ON	OFF
When signal input failed, driving valve to fully-closed (when S6 sets at "OFF").							OFF	ON
When signal input failed, driving valve to fully-open (when S6 sets at "OFF").							ON	OFF
When signal input failed, valve stays at the last position.							ON	ON

a. Input Signal Setting (switches 1 - 2)



Input Signal	State of Switches
4 - 20 mA	1 at ON, 2 at OFF
1 - 5V	1 at OFF, 2 at OFF
2 - 10V	1 at OFF, 2 at ON

b. Output Signal Setting (switches 3 - 5)

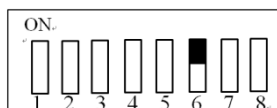


Output Signal	State of Switches
4 - 20 mA	3 at OFF, 4 at ON, 5 at OFF
2 - 10V	3 at ON, 4 at OFF, 5 at ON

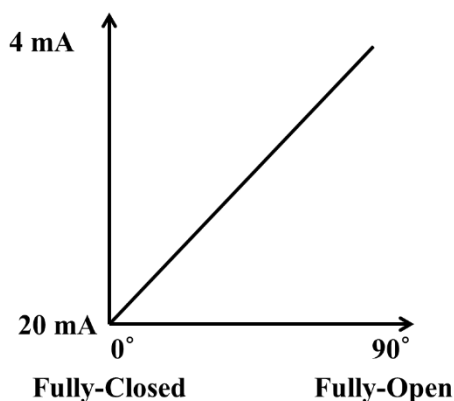
c. Setting of the fail position, when the signal input failed (Switches 6 - 8).

⚠ The input signal type is set by switches 1 and 2. And switch 6 is used to set the corresponding relationship between value of signal input and operation direction of actuator.

When S6 is set to ON



- The program defines 20 mA or 5 V or 10 V as a command for fully-closed positioning. The line graph below shows the signal level and the corresponding position of the actuator



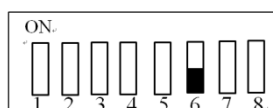
- When a low signal value is received, the actuator operates towards the fully-open position and when a high signal value is received, the actuator operates towards the fully-closed position.

Input Signal	Fully-Open (90°)	Fully-Closed (0°)
4 - 20 mA	4 mA	20 mA
1 - 5V	1 V	5 V
2 - 10V	2 V	10 V

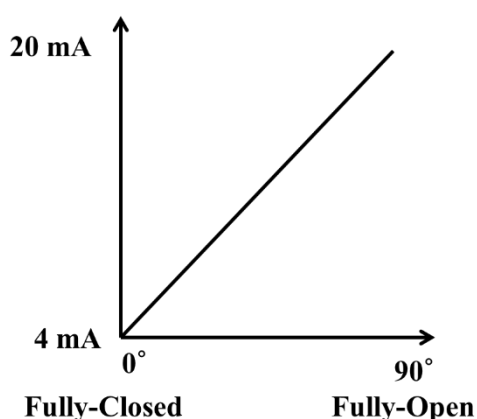
- The selection of the fail position while the input signal failed, please follow the table below:

Fail Position	State of Switch
Fully-Open (90°)	7 at OFF, 8 at ON
Fully-Closed (0°)	7 at ON, 8 at OFF
The Last Position	7 at ON, 8 at ON.

When S6 is set to **OFF**



- The program defines 20 mA / 5 V / 10 V as a command for fully-open positioning. The line graph below shows the signal level and the corresponding position of the actuator.



- When a high signal value is received, the actuator operates towards the fully-open position and when a low signal value is received, the actuator operates towards the fully-closed position.

Input Signal	Fully-Open (90°)	Fully-Closed (0°)
4 - 20 mA	20 mA	4 mA
1 - 5 V	5 V	1 V
2 - 10 V	10 V	2 V

- The selection of the fail position, when the input signal fails. Please follow table below:

Fail Position	State of Switch
Fully-Open (90°)	7 at ON, 8 at OFF
Fully-Closed (0°)	7 at OFF, 8 at ON.
The Last Position	7 at ON, 8 at ON.

5.4 P4 Terminal

P4 is a contact for alarm conduction. If the microprocessor detects that the actuator has not reached the preset end of the travel the stop within 15 seconds, then the microprocessor conducts P4. It can be connected with an alarm or similar devices for warning.

5.5 Sensitivity Switch Setting (SW2)

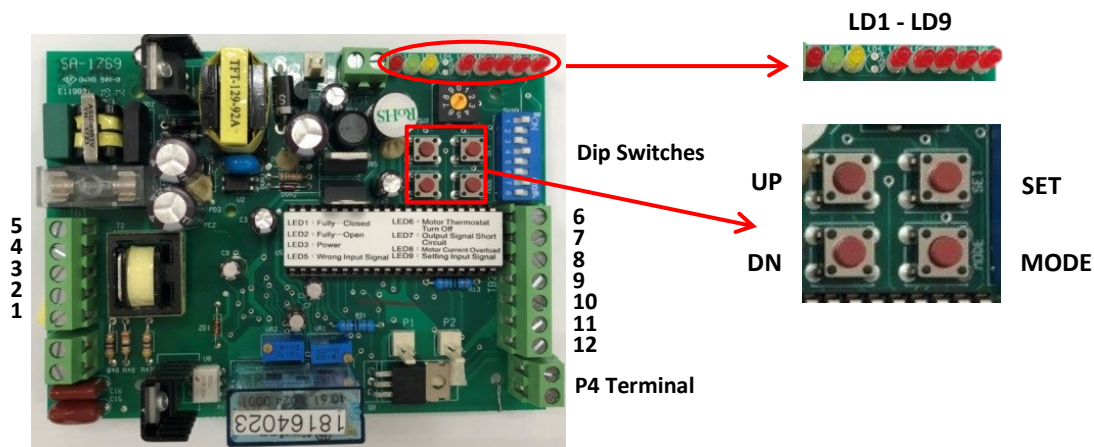
Original factory setting is "3".



- When switched to " 1 " : The Highest Sensitivity level is activated and the 0 - 90 degree travel is divided up to around 80 movements.
- When switched to " 0 " : The Lowest Sensitivity level is activated and the 0 - 90 degree travel is divided up to around 17 time's movements.

5.6 Settings for open and close

⚠ These settings are set and calibrated at the factory. Mostly, they do not need to be recalibrated. Please follow steps below to set when required.



LD1	Fully-closed	LD6	Motor thermal protector started
LD2	Fully-open	LD7	Output signal short circuit
LD3	Power	LD8	Overcurrent in motor
LD5	Wrong input signal	LD9	Local setting mode

Press and hold the "SET" switch for 2 seconds until LD 9 lights up to enter local setting mode.

- **Fully-OPEN Setting**

- Press and hold the "UP" switch to operate the actuator to open until it has reached the fully-open position and LD2 lights up. Then put in signal of 5 V or 10 V or 20 mA.
- Press the "MODE" switch to complete the setting of the fully-open position.

- **Fully-CLOSED Setting**

- Press and hold the "DOWN" switch to operate the actuator to close until it has reached fully-closed position and LD1 lights, and then input a signal 1V or 2V or 4 mA
- Press the "MODE" switch once. The fully-closed setting is completed.

After completing the the above settings, press the "SET" switch to quit local setting.

5.7 Troubleshooting of modulating controller

⚠ In case LD3 does not light or any of LD 5 to LD9 lights when the actuator is motorized, please refer to steps below for basic troubleshooting.

Status of LEDs	Possible problems	Solution
LD3 does not light up	<ul style="list-style-type: none"> a. No power supplied. b. Incorrect connection of the lines #8, #9 of the potentiometer c. Modulating controller failed. 	<ul style="list-style-type: none"> a. Check the power supply as well as the wires connected to terminals #4 & #5, please refer to section 5. b. Verify the actuator is wired properly as per wiring diagram. c. Send back to the factory for inspection.
LD5 lights up	<ul style="list-style-type: none"> a. An incorrect signal type inputted. For example, preset with 2 - 10 V input but input 4 - 20 mA. Or preset with 4 - 20 mA input but input 2 - 10V signal. In this case, the actuator still works in 2 - 7 V. When the signal is over 7.2 V the LD5 lights. b. Input a voltage exceeding the rated. For example, preset with 2 - 10 V input but input 13.5 V. 	<p>Verify if switch 1 is set in accordance with the type of input signal. Please refer to section 5.3.</p>
LD 6 lights up	Motor thermal protector started.	<ul style="list-style-type: none"> a. The duty cycle exceeded the rated. b. The contact of motor thermal protector (MOT) disconnected.
LD7 lights up	<ul style="list-style-type: none"> a. Signal output short circuit. b. The input signal type 2 - 10 V with reversed polarity. . 	<ul style="list-style-type: none"> a. Verify if the signal output with reversed polarity. The negative pole should be connected to terminal #11 and the positive pole should be connected to terminal 12. b. Verify if the signal input with reversed polarity when applying 2 - 10 V, the negative pole should be connected to terminal #6 and the positive pole should be connected to terminal #7.
LD8 lights up	Motor over-current.	<ul style="list-style-type: none"> a. Duty cycle exceeded the rated. Please refer to section 3.5 and reduce the duty rating. b. Check the load. c. Check if the motor rotor is locked (For example: Valve is stuck by foreign objects).
LD9 lights up	Local setting mode - Setting position for open & close.	After completing setting, press "SET" button to quit.

6. Troubleshooting

Floating Controller

Motor does not operate and overheats.

Possible problems	Solution
<ul style="list-style-type: none"> a. The seating torque of valve increased caused by oxidized seals and has resulted in a torque overload on actuator. b. Jammed pipe or valve seat stuck. c. Motor drive stem bearing damaged. d. The limit switch for fully-closed does not trip (with manual override). e. The limit switch for fully-closed does not trip (without manual override). 	<ul style="list-style-type: none"> a. Manually operate or replace the valve. b. Check if any blockage or obstacle in pipe. c. Replace them. d. Operate the actuator manually to fully-closed position and confirm if the limit switch trips. e. Check if a torque overload caused by the valve.

The actuator functions normally but motor is hot.

Possible problems	Solution
<ul style="list-style-type: none"> a. Actuator operates too frequently and exceeded duty cycle rating. b. A torque overload caused by the valve. c. Supply voltage was too high or too low, out the tolerance of deviation. d. Wrong power supply. 	<ul style="list-style-type: none"> a. Adjust the system bandwidth or reduce the frequency of operation. b. This problem happened frequently after valve operating for a long time. It is suggested to replace the valve. c. Check the supply circuit. d. Check the power supply.

In order to control two or more actuators, sometimes the actuator works abnormally and the motor is getting hot.

Possible problems	Solution
<ul style="list-style-type: none"> a. Parallel connection. 	<ul style="list-style-type: none"> a. Check operating current values and install a relay respectively.

The valve does not operate no matter under either electrical operation or manual operation.

Possible problems	Solution
<ul style="list-style-type: none"> a. The actuator is not properly installed onto the valve. b. The torque of valve is larger than the torque of actuator. c. The cap screw of the cam is loosened. d. The OPEN and CLOSE end stop points of actuator are not aligned with valve. 	<ul style="list-style-type: none"> a. Contact technical department to solve the problem. b. Replace with a new valve or a larger size actuator. c. Readjust the mechanical end stops and limit switches, please refer to section 4.4. d. Separate the actuator from valve and reinstall to ensure the OPEN and CLOSE stop points are aligned properly.

The capacitor has failed.

Possible problems	Solution
a. Worked in an environment out of the withstandable temperature range.	a. Please use the capacitor at temperature between - 30 °C to + 65 °C (- 22 °F to +149 °F).

Modulating Controller

The LED (LD5 - LD9) is flashing after the operating check is completed.

Solution
Refer to section 5.6.

The actuator is running fully open/close but not modulating.

Possible problems	Solution
The signal input with a reversed polarity, it means a signal failure.	Verify if the negative pole of signal input connected to terminal #6 and the positive pole connected to terminal #7.

Cannot operate by modulating controller.

Possible problems	Solution
a. Potentiometer failed. b. The sector gear of potentiometer loosened. c. Input wrong signal type. d. Modulating board failed.	a. Replace with a new potentiometer. b. Remove the input signal wires and operate the actuator to fully-closed. And then recalibrate VR, please refer to section 4.4. c. Check if the input signal is correct, please refer to section 5.. d. Send back to factory for inspection.

7. Actuator Options



Fail clockwise (CW) rotation
 When energized, the driven valve rotates CCW (viewed from the top of the actuator). Meanwhile, the springs are compressed. On loss of power, the spring returns (unloaded) and the driven valve rotates CW.



Fail counter-clockwise (CCW) rotation
 When energized, the driven valve rotates CW (viewed from the top of the actuator). Meanwhile, the springs are compressed. On loss of power, the spring returns (unloaded) and the driven valve rotates CCW.

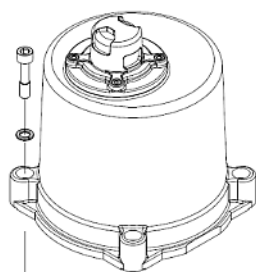
Valve operating direction	Desired fail position upon loss of supply voltage	Actuator Type	Handwheel direction
CW rotation for CLOSE 	Valve at fully-closed	CW	Direct mount per original factory setting.
	Valve at fully-open	CCW	Adjust the tag and position indicator.
CW rotation for OPEN 	Valve at fully-closed	CCW	Direct mount per original factory setting.
	Valve at fully-open	CW	Adjust the tag and position indicator.

Instructions for adjusting the open/close indicator beacon:

1. Loosen the lock screws of top cover (Figure 1).
2. After loosening the lock screws of the position indicator, remove the indicator from the top of the shaft. Rotate the indicator 90 degrees and lock the screws, then re-install the indicator scale (Figure 2).

The tag of **CLOSE** direction with an arrow pointing on the handwheel is printed on both of the sides **A** and **B** as Figure 4. Please adjust its direction in accordance with the configuration.

1. Loosen the screws of tag and adjust the tag to reflect the correct CLOSE direction (Figure 3).
2. Adjust the tag to side **B** (counter-clockwise in the closing direction) and tighten the screws (Figure 4).



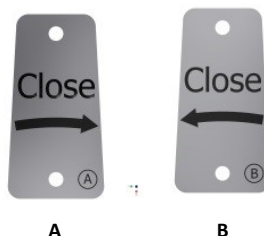
【Figure 1】



【Figure 2】



【Figure 3】



【Figure 4】

If you have questions about this product,
Please contact the nearest ECON distributor.
You can find them on www.eriks.com

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