Building Connections That Last™

ASC Engineered Solutions

Series EC

Electric Actuator Manual

ABZ VALVE
An ASC Engineered Solution

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1. Caution

Electrical Shock Hazard

To avoid serious personal injury, property damage or death, turn off all power to the actuator before removing the cover.

Before installation or use, verify the nameplate information to insure the correct model number, torque, voltage and enclosure type.

Be sure to completely review the actuator manual prior to operation.

Final limit switch adjustment must be done after mounting the actuator to the valve. Incorrect adjustment may cause actuator or valve failure.

Actuator MUST be properly grounded. Use the grounding lugs provided on the inside or outside of the actuator body.

To minimize the possible damage caused by condensation, be sure to energize the heater and seal the inside of the conduit entries after wires are run.

Explosion-proof products must be used when the actuator installation is located in a hazardous area.

2. Storage

The actuator must be stored in a clean, dry, temperature controlled location, off the floor and covered.

The actuator shall be stored with the cover installed and all conduit openings sealed.

Care must be taken to protect the actuator from condensation in extreme temperature variations.

Heaters should be energized as soon as actuators are installed.

Improper storage of the actuator will VOID WARRANTY.

Storage Location	Indoor
Storage Temperaure	13°C ~ 18°C (55°F ~ 65°F)

3. Actuator Specification

Note: Types L, S and X

3–1 The Series EC Actuator has been designed for the automation of 90° rotating equipment. The actuator is well suited for ball valves and butterfly valves as well as dampers.

3–2 Environment and Temperature

Temperature	20°C ~70°C
	4°F to 158°F (L,S) and 131°F (X)
Enclosure	L, S and X -Type 4/4x - IP67

The Series EC enclosure is manufactured using an anodized aluminum alloy material and is coated with a dry powder epoxy paint to protect from oxidation.

3–3 Manual Overide

Power off, manual operation is available using the provided Z-wrench handle.

3–4 Self Locking

The self-locking worm gear prevents the valve from drifting and back driving the actuator gears.

3–5 Heater

The 5-watt internal heater helps to minimize condensation due to temperature and humidity changes.

3–6 Limit Switch

The mechanical, cam actuated limit switches are included to accurately calibrate the valve position.

3–7 Motor

The actuator motor is protected with an embedded 120°C (248°F) thermal protector designed to protect the motor from overheating.

3–8 Indicator

The visual indicator is directly connected to the actuator output shaft and is designed for visual indication from a distance.

3–9 Adaptation

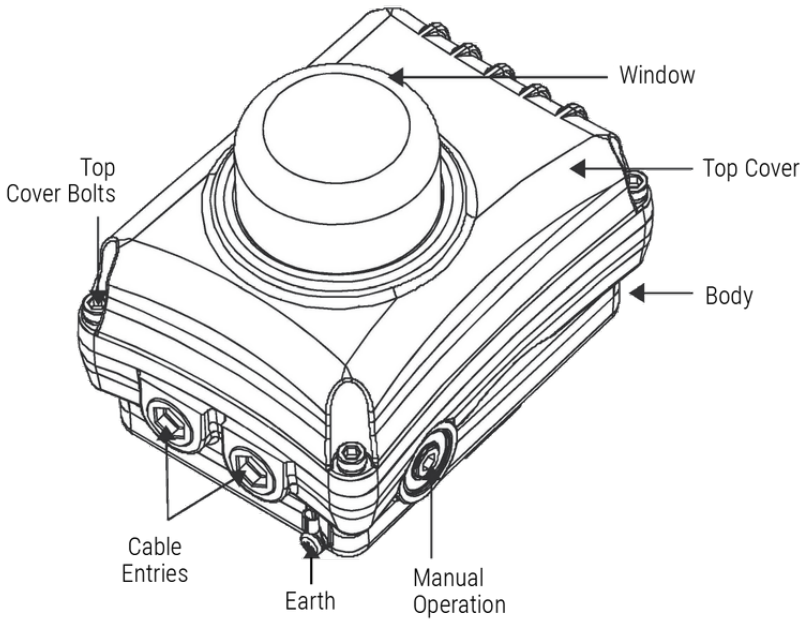
Mounting is standardized to the ISO5211 mounting specification.

4. Performance

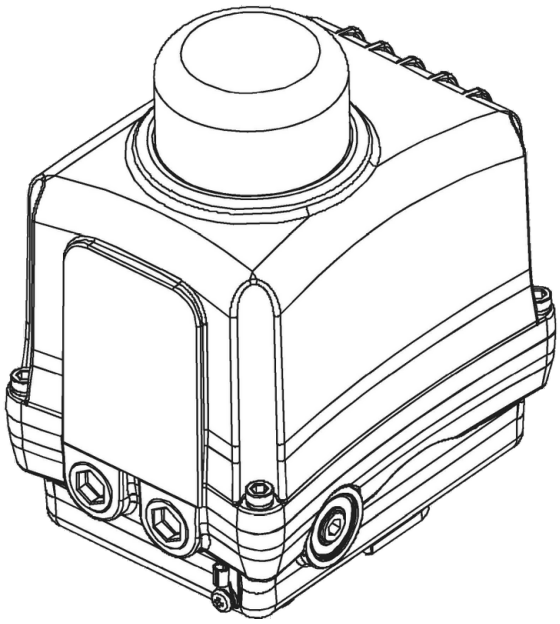
Model	EC005 (L, S, X)	EC009 (L, S, X)
Enclosure	IP67	IP67
Torque Output	430-inch pounds	780-inch pounds
Operating Time		
AC 60Hz	14-seconds	26-seconds
AC 50Hz	17-seconds	32-seconds
12Vdc	11-seconds	25-seconds
24Vdc	10-seconds	22-seconds
Motor Voltage / Watts	**Rated / Locked Rotor AMP**	**Rated / Locked Rotor AMP**
120Vac 60Hz	0.35A / 0.65A	0.35A / 0.65A
220Vac 50Hz	0.23A / 0.35A	0.25A / 0.40A
12Vdc	3.2A / 13.9A	3.4A / 13.9A
24V	1.8A / 7.9A	2.1A / 7.9A
Duty Cycle	S2-15min / S4-50%	S2-15min / S4-30%
Mounting Base	F03, F05, F07	F03, F05, F07
Bore	14mm-Star	14mm-Star
Handle Turns	6-Turns	4.5-Turns
Type Weight		
Tall Cover (L,FL)	7.1 lbs	7.1 lbs
Short Cover (S,FS)	6.2 lbs	6.2 lbs
Explosion Proof (X)	11.0 lbs	11.0 lbs

5. Exterior Parts Identification

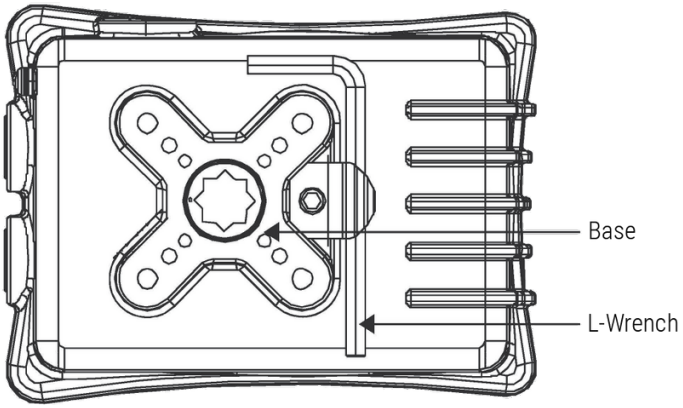
5–1 C005S, C005L / C009S, C009L



C005S, C009S

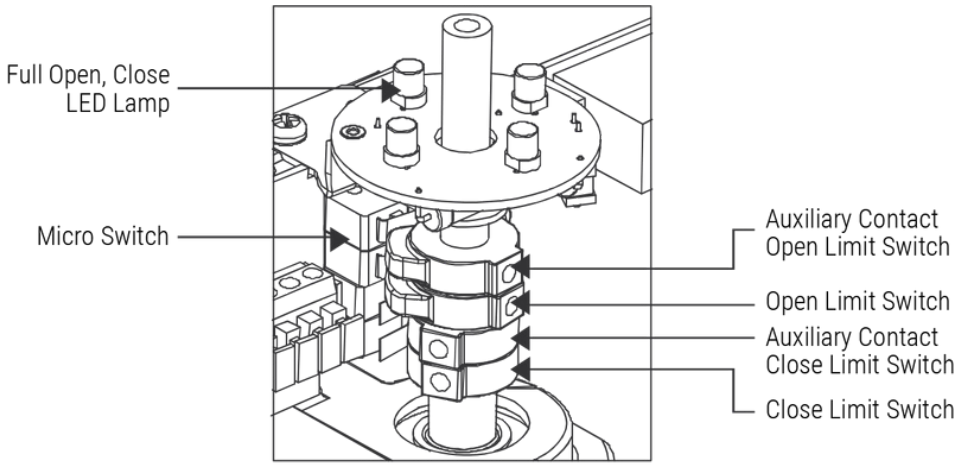


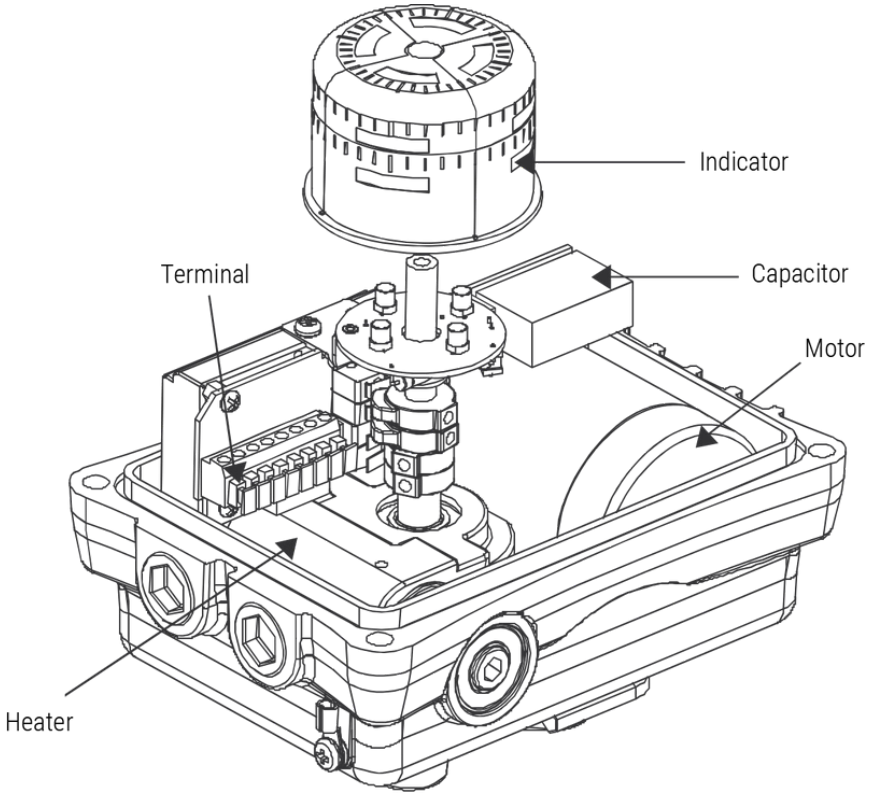
C005L, C009L



6. Interior Parts Identification

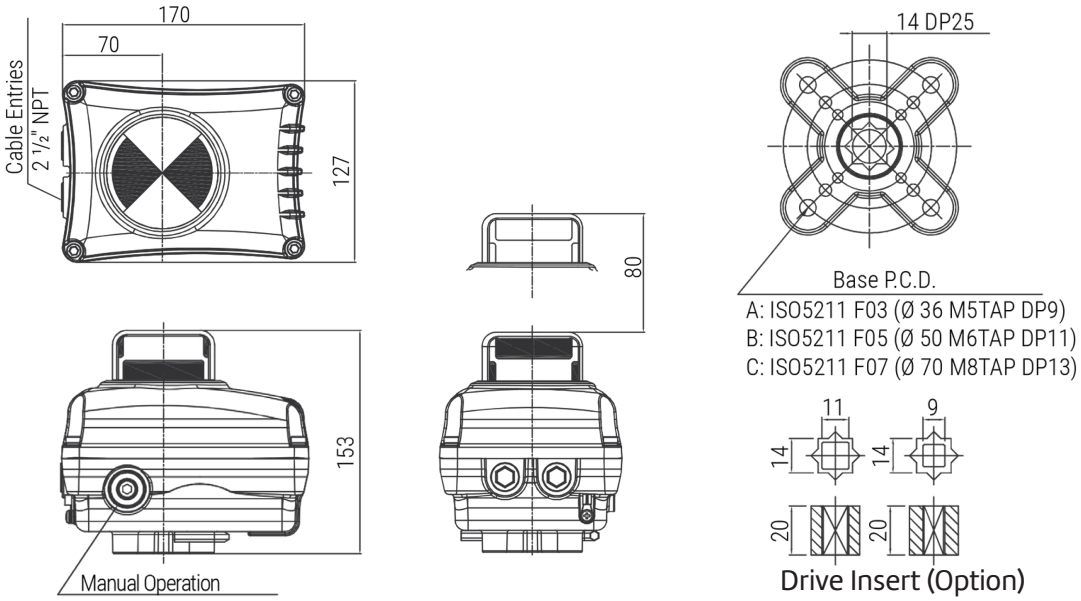
6–1 C005S, C005L / C009S, C009L



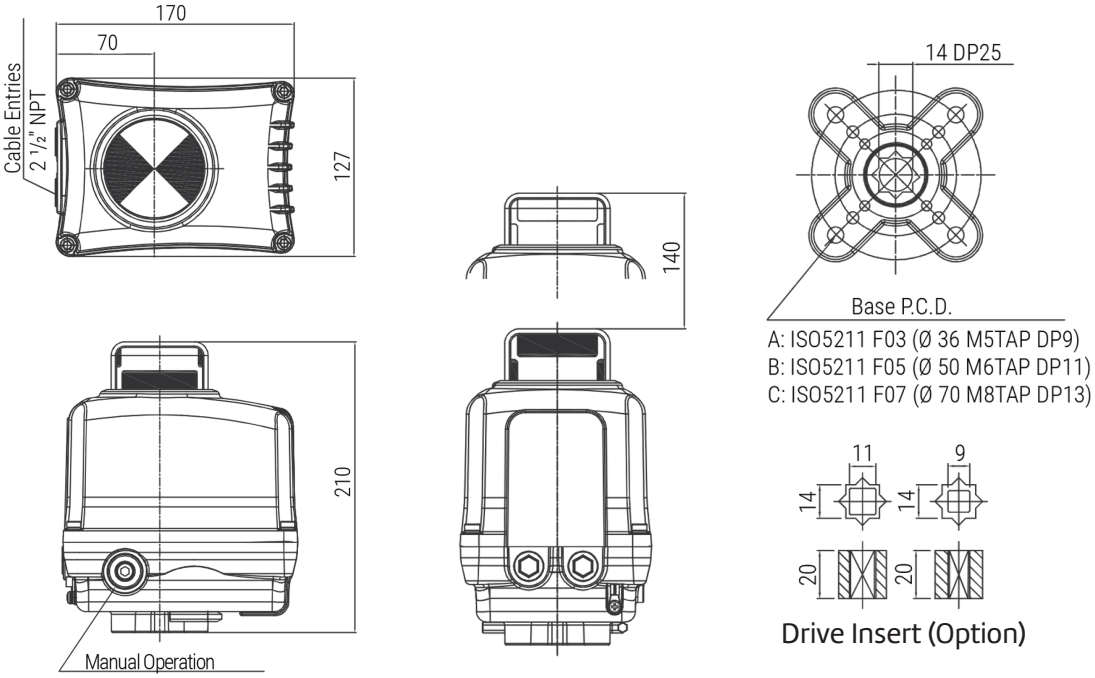


7. Dimension

7–1 C005S, C009S



7–2 C005L, C009L



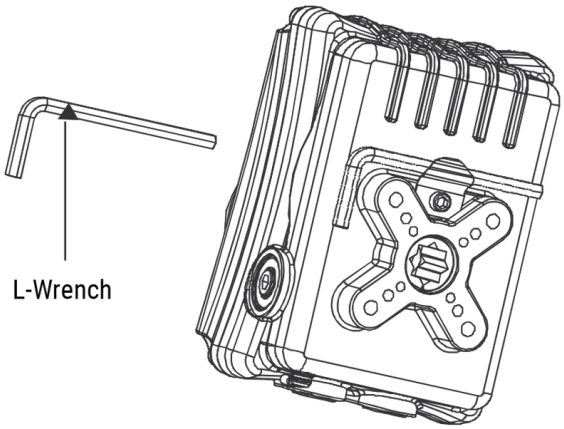
8. Actuator and Valve Assembly

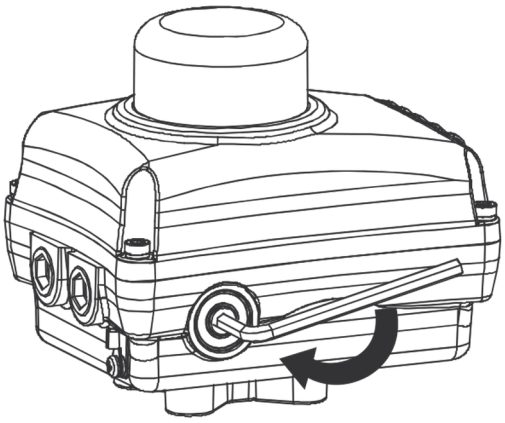
8–1 Butterfly Valve Assembly

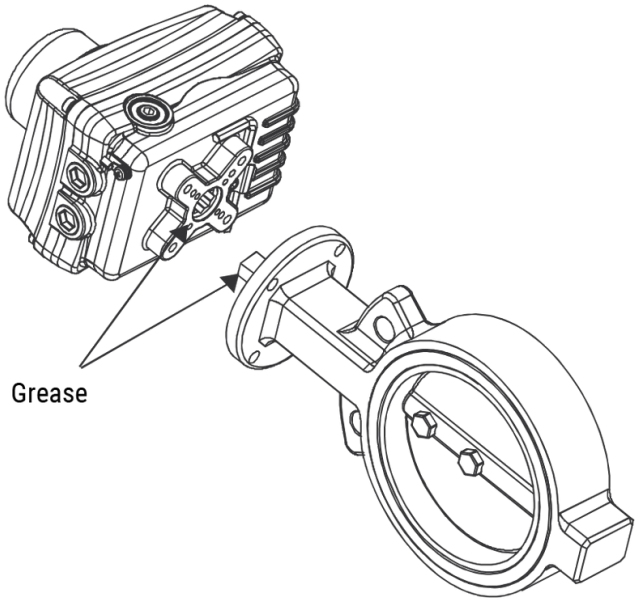
8-1-1 Confirm that the valve mounting dimensions match the actuator ISO mounting.

A proper mounting kit will be required for valves where ISO direct mount is not possible.

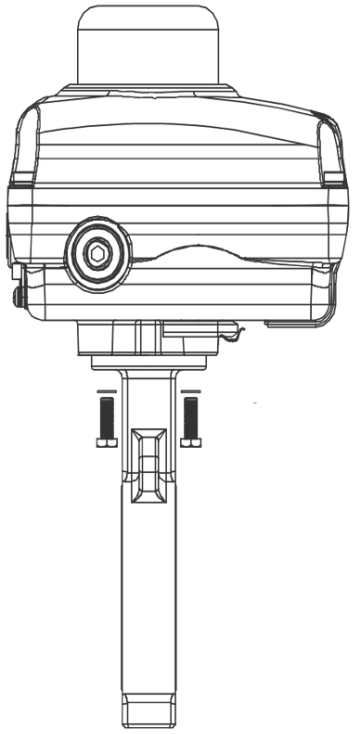
8-1-2 Remove the manual override lever provided on the actuator base, and with the power off, close the actuator clockwise. Also, close the valve that is to be mounted.



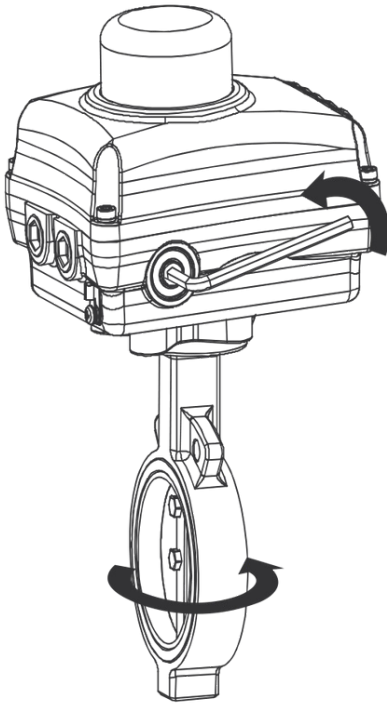




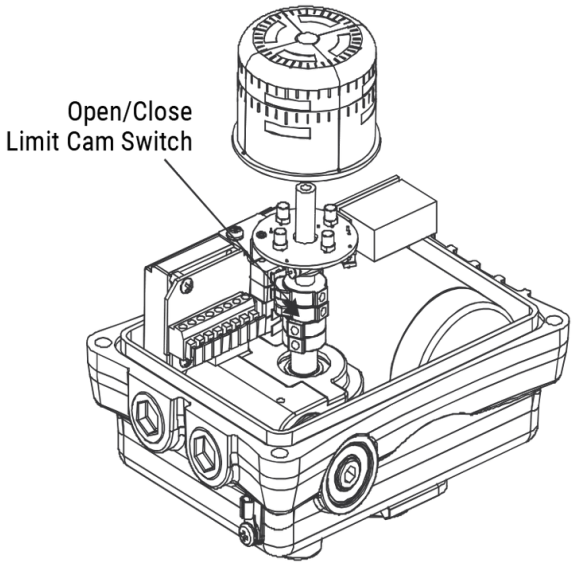
8-1-3 Apply a light coating of grease to the valve stem and actuator dirve. Assemble the valve and actuator together and secure with the proper bolting.



8-1-4 Secure the actuator and valve together using stud bolts and nuts or hex bolts.
Firmly tighten the assembly and confirm that there is no gap between the actuator and valve. Overtightening the bolts to close the gap may damage the assembly.
Confirm that the valve stem and mounting bolts are not too long and bottoming out inside the ACTUATOR body



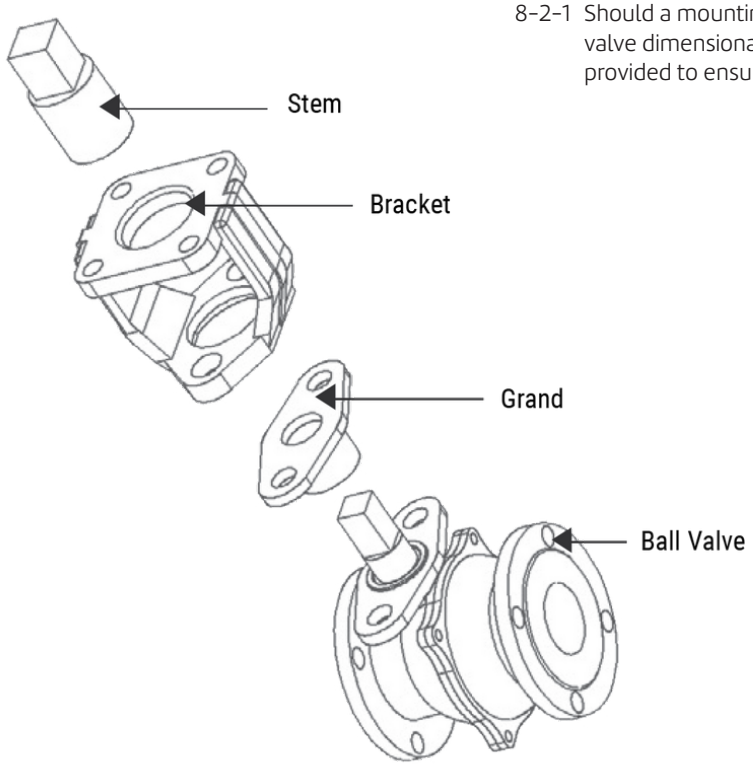
8-1-5 Using the manual over ride, rotate the actuator to the open, counter-clockwise, position and confirm that the valve is rotating in the same direction.

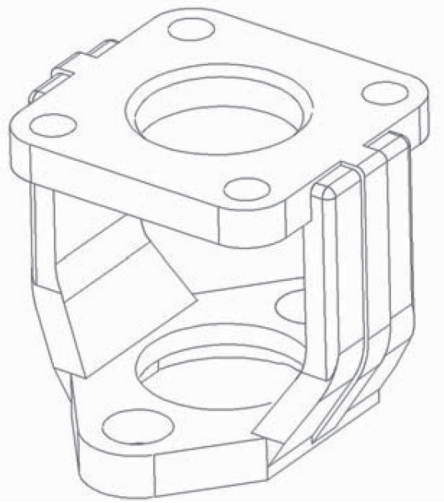


8-1-6 Remove the top cover and properly set the open and close limit switches. The auxiliary switches may be set at this time also.
Refer to section 10 for more detail.

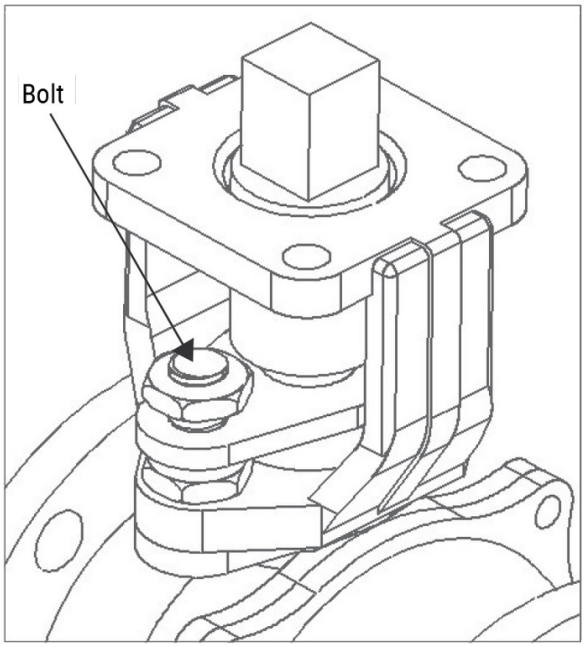
8–2 Ball Valve Assembly

8-2-1 Should a mounting kit be required, proper valve dimensional information must be provided to ensure a proper fit.



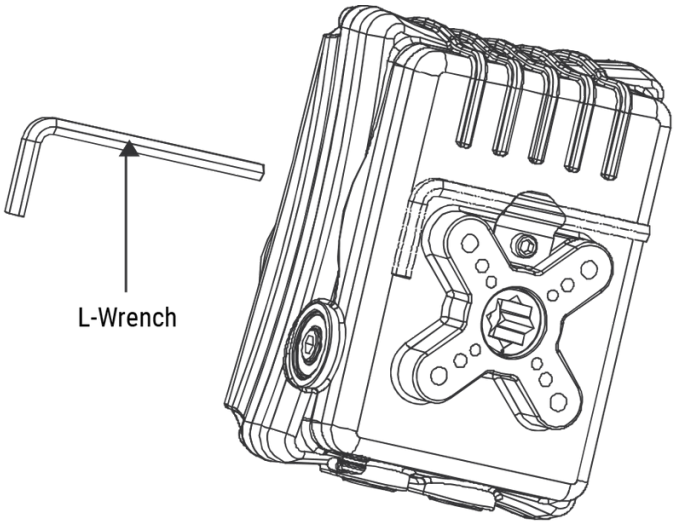


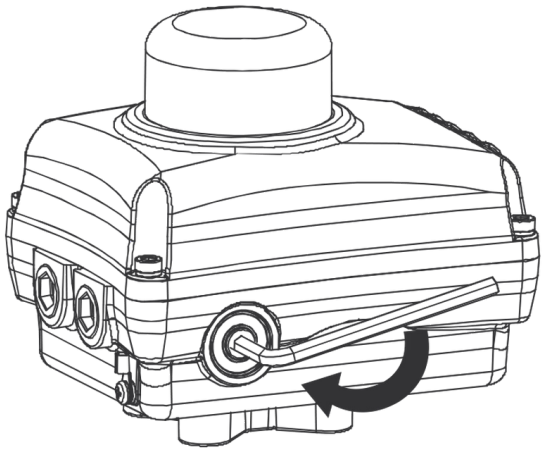
Example of a Fabricated Bracket

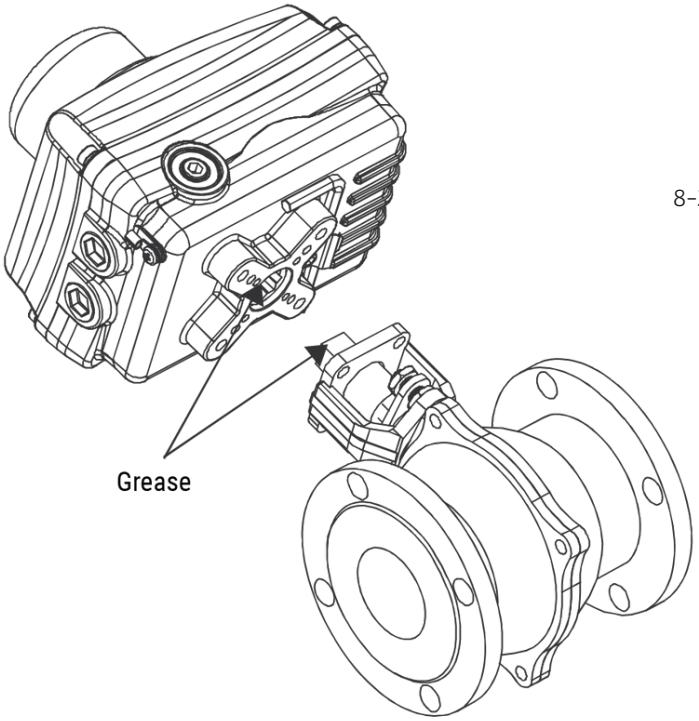


8-2-2 In general, when a Mounting Kit is designed for the Ball Valve, a packing gland is installed to prevent any valve stem leakage and an adjustable bolt and nut assembly is installed to tighten the valve stem packing. This will compress the stem packing and is adjusted as required. Caution, over tightening of the packing gland will increase the torque required to turn the valve and may cause the actuator to stall.

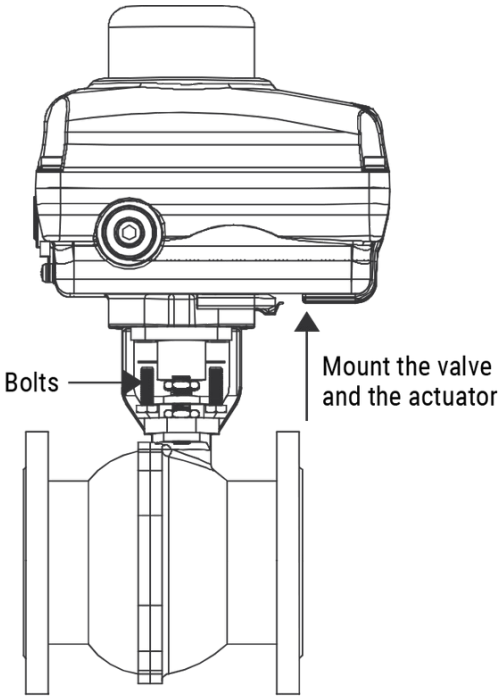
8-2-3 Remove the manual over ride lever provided on the actuator base, and with power off, open the actuator counter-clockwise. Also, open the valve that is to be mounted.



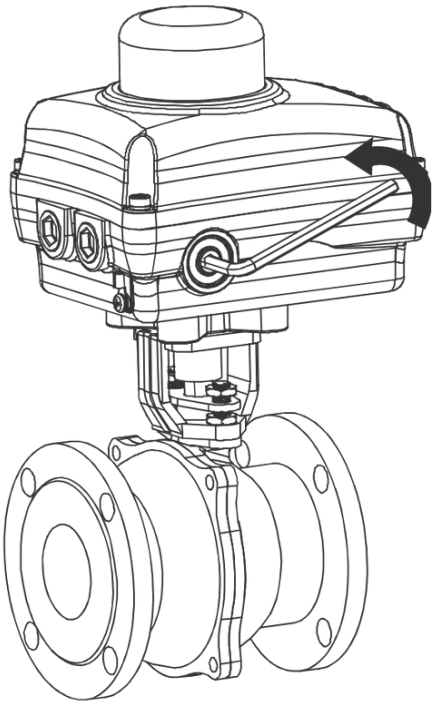




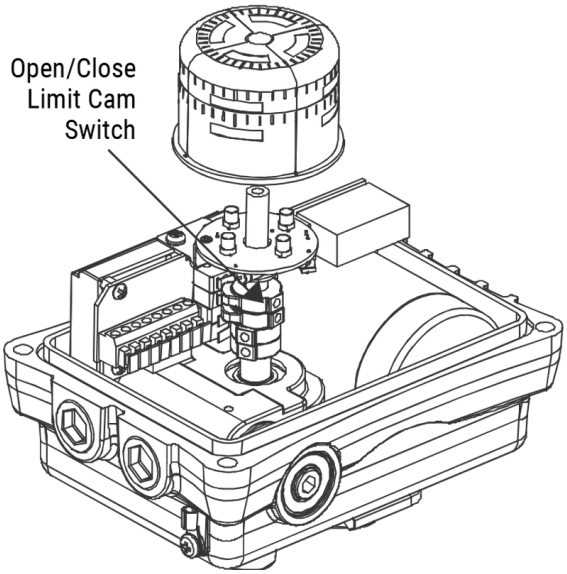
8-2-4 Apply a light coating of grease to the valve stem and actuator drive. assemble the valve and actuator together and secure with the proper bolting.



8-2-5 Secure the actuator and valve together using stud bolts and nuts or hex bolts.
Firmly tighten the assembly and confirm that there is no gap between the actuator and valve. Overtightening the bolts to close the gap may damage the assembly. Confirm that the valve stem and mounting bolts are not too long and bottoming out inside the actuator body.



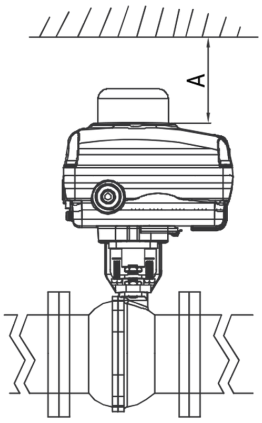
8-2-6 Using the manual over ride, rotate the actuator to the closed, clockwise, position and confirm that the valve is rotating in the same direction.

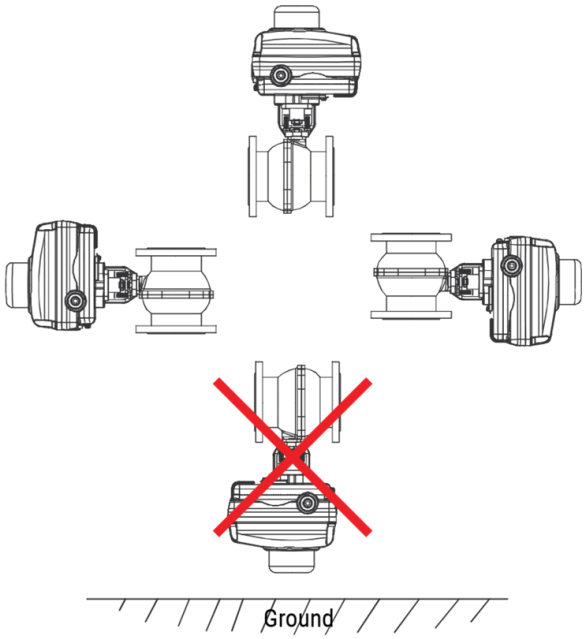


8-2-7 Remove the top cover and properly set the open and close limit switches. The auxiliary switches may be set at this time also.
Refer to section 10 for more detail.

9. Actuator Installation

When installing an actuator, proper clearance around the actuator is required to ensure that the cover can be removed to allow for maintenance.





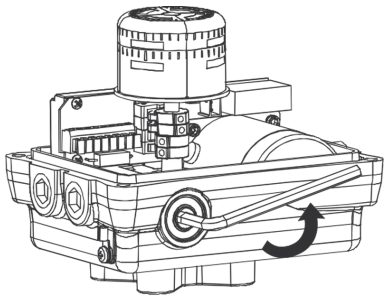
Model	A
C005S	3.25" (80mm)
C005L	5.5" (140mm)
C009S	3.25" (80mm)
C009L	5.5" (140mm)

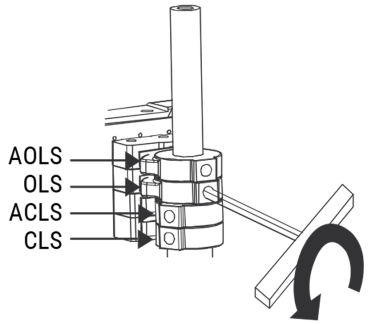
10. Limit Switch Setting

10–1 Switch Cam Callibration

10-1-1 With the power off, remove the cover and manually rotate the ACTUATOR to the closed, clockwise, position.

10-1-2 Loosen the close cam set screw and rotate the cam in a clockwise direction to actuate the close limit switch. Also, the close auxiliary switch can be adjusted at this time, too.





AOLS	Dry Contact Open Limit Switch
OLS	Open Limit Switch
ACLS	Dry Contact Close Limit Switch
CLS	Close Limit Switch

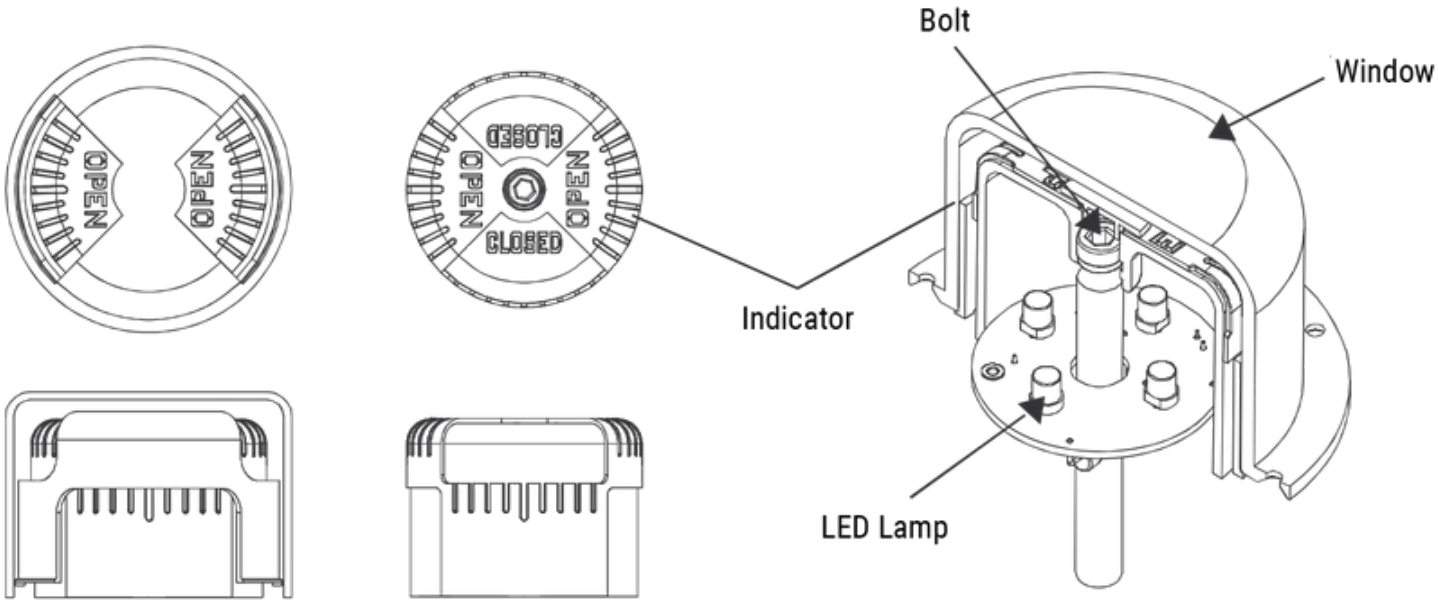
10-1-3 Firmly tighted the cam set screws.

10-1-4 To set the open cam switches, repeat the previous instructions except rotate the actuator to the open, counter-clockwise position and rotate the open cams in the counter-clockwise direction to actuate the open switches.

Note: The aux switches should be set to actuate before the motor switches to ensure the proper signal is sent

11. Visual Indicator Setting

The position of the valve is indicated by the visual dome indicator. (Types L & S)



LED lights illuminate to allow for easy visual confirmation of valve position. (Types L & S)

Note: If the position of the indicator is not aligned correctly, an adjustment can be made by simply loosening the bolt and manually turning the indicator to the proper location, then re-tightening the bolt.

12. Conduit Connection

The two conduit entries on the Series EC actuator are ½" NPT.

12-1 Standard conduit and conduit seal fittings may be used when installing and wiring the actuator. To prevent moisture and humidity from entering the actuator, it is highly recommended that a seal fitting be installed in the actuator cable entry.
After all the conduit and wiring has been completed, then the seal fitting can be sealed with packing and or a potting material.

12-2 Any unused cable entry must remain plugged with the pipe plug provided with the actuator.
Do not remove the remaining pipe plug as it is already sealed.

Note: Explosion-proof products must be used under the designed temperature range and environment appropriate for the product spec. Flameproof Enclosure Level and Environment of Actuator: **Ex IIB T4 –20°C~ 55°C**

Explosion-proof actuators and wiring must be properly sealed prior to operation.
Improper installation may cause a hazardous condition and failure of the explosion proof enclosure.
The manufacture is not responsible for any losses or damages caused by incorrect installation.

1. Certified cable entries must be used when installed.
   Use separately certified cable entries, conduit entries or pipe plugs so that the flameproof properties of the enclosure are maintained.
2. If conduit is used for cable entry, a seal fitting with setting compound must be installed as close as possible, within 18-inches to the actuator.

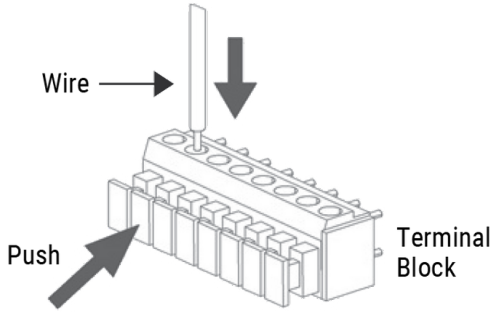
13. Electric Wiring

13-1 Remove the actuator cover by loosening the four captive cover bolts.

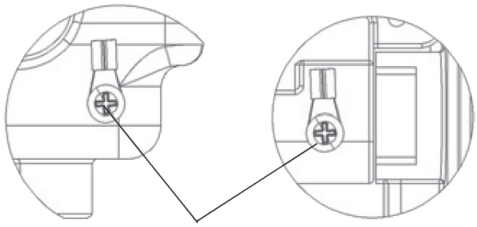
13-2 Confirm that the wiring diagram located in the actuator and the wiring number on the namplate match with each other.

13-3 Confirm that the main power and supply described on the nameplate of the actuator match with each other.

13-4 Connect the wire to the terminal strip according to the wiring diagram provided. The Series EC actuator uses the push type WAGO brand terminal strip. The push type strip makes wiring connections easy and also helps to protect against pipeline vibration.



13-5 Be sure to properly ground the actuator by using the grouding lugs provided on the inside and outside of the actuator body.



Interior/Exterior Earth/Ground Terminal

13-6 Be sure to wire and energize the heater as shown in the wiring diagram.

13-7 Each actuator must be powered by their own individual relays to prevent voltage feedback and actuator damage.

13-8 After the wiring is completed in the actuator, use wire ties to group the wires together and clean up their appearance. Be certain that the wires are secure and away from any moving parts. Remove any loose debris before replacing the cover.

13-9 When all the work is completed, replace the top cover and secure it using the four cover screws.

13-10 Apply power and do a final check to confirm proper operation.

Main power must only be applied when the top cover is re-installed on the actuator body. If the main power is on while wiring the actuator, stop work immediately and turn the power off, only then is it safe to proceed.

14. Maintenance

It is recommended that the actuator be cycled every two weeks after purchase.
To minimize the effects of condensation in the actuator, it is recommended that the cable entries to be sealed at the actuator and that the heater is energized.

15. Warranty Information

The warranty will be void under the following conditions:

18-1 Failure or damage caused by misuse or abuse.

18-2 Failure or damage caused by unauthorized modifications or repairs done to the actuator.

18-3 Failure caused by the unauthorized modification/ change or the wiring.

18-4 Failure caused by water entering the actuator due to improper sealing of the cable entries

18-5 Failure caused by improperly set limit switches.

18-6 Failure caused by fire, flood damage or other "Acts of God".

18-7 Failure occurring more than one year after shipment date.

16. Troubleshooting

If the actuator fails to function correctly, first check for any mechanical / alignment problems, then check for any electrical problems. See chart below for more information.

Problem	Cause	Solution
Manual override not functioning	Gear Failure	Disassemble the actuator and replace the gear
Actuator will not function when given power to cycle, however when using the manual override feature it functions properly.	Main power failure	Main power check
	Motor/capacitor damage	Replace motor/capacitor
	Motor over heated and thermal protector disengaged	Check frequency of operation or jammed gears.
	Wiring failure	Confirm unit is properly wired per wiring diagram
	Terminal board failure	Replace terminal board
LED lights not operating	LED Board failure	Replace LED Board
	Terminal board failure	Replace terminal board
Actuator continues to move even after the cam has tripped the limit switch	Terminal board failure	Replace terminal board

In addition to the above described mechanical / electrical failures, other causes may be the reason for a failure based on the site conditions. For more information please contact ASC for consultation. For faster service, please have all of the nameplate information available when calling the factory.

About ASC Engineered Solutions

ASC Engineered Solutions connects high-quality products with advanced technology, service, and support. With nearly 2,000 employees, the company's extensive portfolio of precision-engineered piping support, valves and connections provides products to professionals across industries, such as commercial and residential construction, industrial, fire protection, and oil and gas. Its portfolio of leading brands includes ABZ Valve®, AFCON®, Anvil®, Anvil EPS, Basic-PSA, Beck®, Catawissa, Cooplet®, FlexHead®, FPPI®, Gruvlok®, J.B. Smith, Merit®, NAP®, Quadrant®, SCI®, Sharpe®, SPF®, SprinkFLEX®, Trenton Pipe, VEP, and WARDFlex®. With headquarters in Oak Brook, IL, ASC also has ISO 9001:2015 certified production facilities in PA, TN, IL, TX, AL, KS, and RI.

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