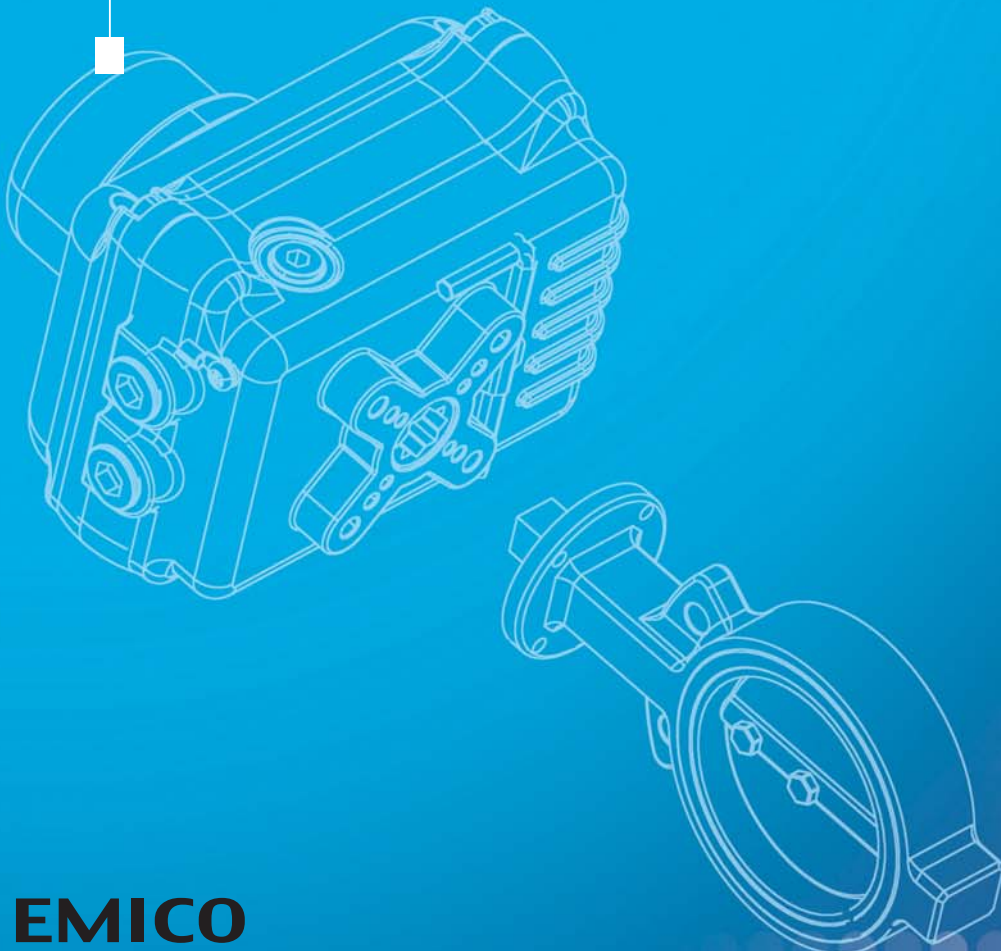




NOAH ACTUATOR SA-SERIES MANUAL

<http://www.emico.co.kr>



EMICO

EUNHA MACHINERY INDUSTRIAL CO.,LTD

SA

Table of Contents

1. Caution	2
2. Storage	3
3. Actuator Specification	4
4. Standard Specification	5
5. Optional Specification	5
6. Performance	5
7. Exterior Parts Identification	6
8. Interior Parts Identification	7
9. Actuator Nameplate information	8
10. Actuator Mounting Flange	8
11. Actuator and Valve Assembly	9
12. Actuator Installation	14
13. Limit Switch Setting	14
14. Indicator Setting	15
15. Wire Connection	15
16. Electric Wiring	16
17. Maintenance	17
18. Warranty Information	17
19. Troubleshooting	17
20. Dimension	18

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, verify the nameplate information to insure the correct model number and voltage of the ACTUATOR.



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 failure.



The ACTUATOR **MUST** be properly grounded. Use the grounding lugs provided on the inside or outside of the ACTUATOR body.



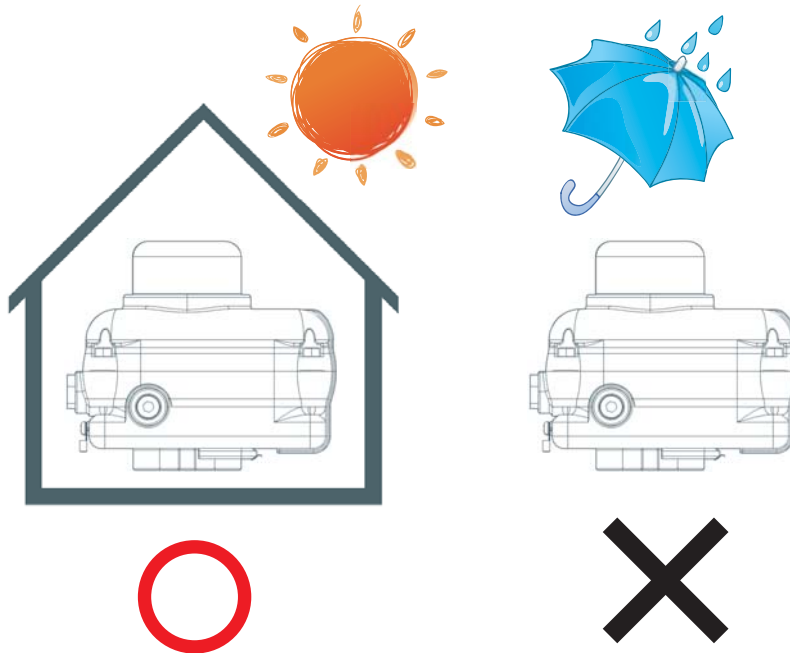
To minimize the possible damage caused by condensation, be sure to energize the heater.

2. Storage

The ACTUATOR MUST be stored in a clean, dry and temperature controlled area. The ACTUATOR shall be stored with the cover installed and with the conduit openings sealed. Storage must be off the floor. Care must be taken to guard the ACTUATOR from condensation during extreme temperature variation. The heater should be energized as soon as the ACTUATOR is installed.



Storage Location	Indoor
Storage Temperature	18°C±5°C

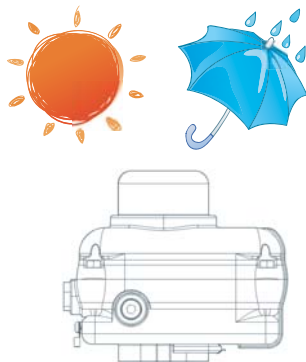


Improper storage of the ACTUATOR will VOID the warranty.

3. Actuator Specification

3-1 The SA-SERIES ACTUATOR has been designed for the automation of 90-degree rotating equipment. The ACTUATOR is well suited applications requiring a torque of less than 5-kgm(Nm). Typical applications are ball valves, butterfly valves and dampers.

3-2 Environment and Temperature



Temperature	20°C ~ + 70°C
Water-Proof(Sealing)	IP68(0.5bar 72h)

The ACTUATOR enclosure is made from an anodized aluminum alloy which is also dry powder epoxy painted to help protect against oxidation.

3-3 Heater

The 2-watt internal heater helps to minimize condensation due to temperature and humidity changes.

3-4 Limit Switch

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

3-5 Motor

The ACTUATOR motor is protected with an embedded, 120 degree C, thermal protector designed to protect the motor from overheating.

3-6 Indicator

The visual indicator is connected directly to the ACTUATOR output shaft. The LED lights illuminate and give visible indication of the valve position over a far greater distance.

4. Standard Specification

Enclosure	Weatherproof Enclosure IP68 Nema 4 and 6
Ambient Temperature	-20°C to +70°C 120°C / 1hr
Power Supply	DC12V, DC24V, AC24V AC110 / 230V 50/60Hz
Limit Switches	Open / Close + Dry Contact Open / Close
Stall Protection	Thermal Protection (Open 120°C)
Travel Angel	90 ° ± 5 ° (Extention : Upto 270 °)
Indicator	Dome Type (LED Light Inside)
Manual Operation	By L-Wrench (6mm Hexagon)
Self Locking	Provided by means of Worm Gearing
Space Heater	2W (110 / 230VAC, 24VDC)
Conduit Entries	Two PF 1/2" Option : M20 Pitch1.5, NPT 1/2"
Lubrication	Grease (Shell Gadus S2 V220 2)
Materials	Aluminium Alloy
Surface Treatment	Anodizing
External Coating	Polyester (TGIC-Free)

5. Optional Specification

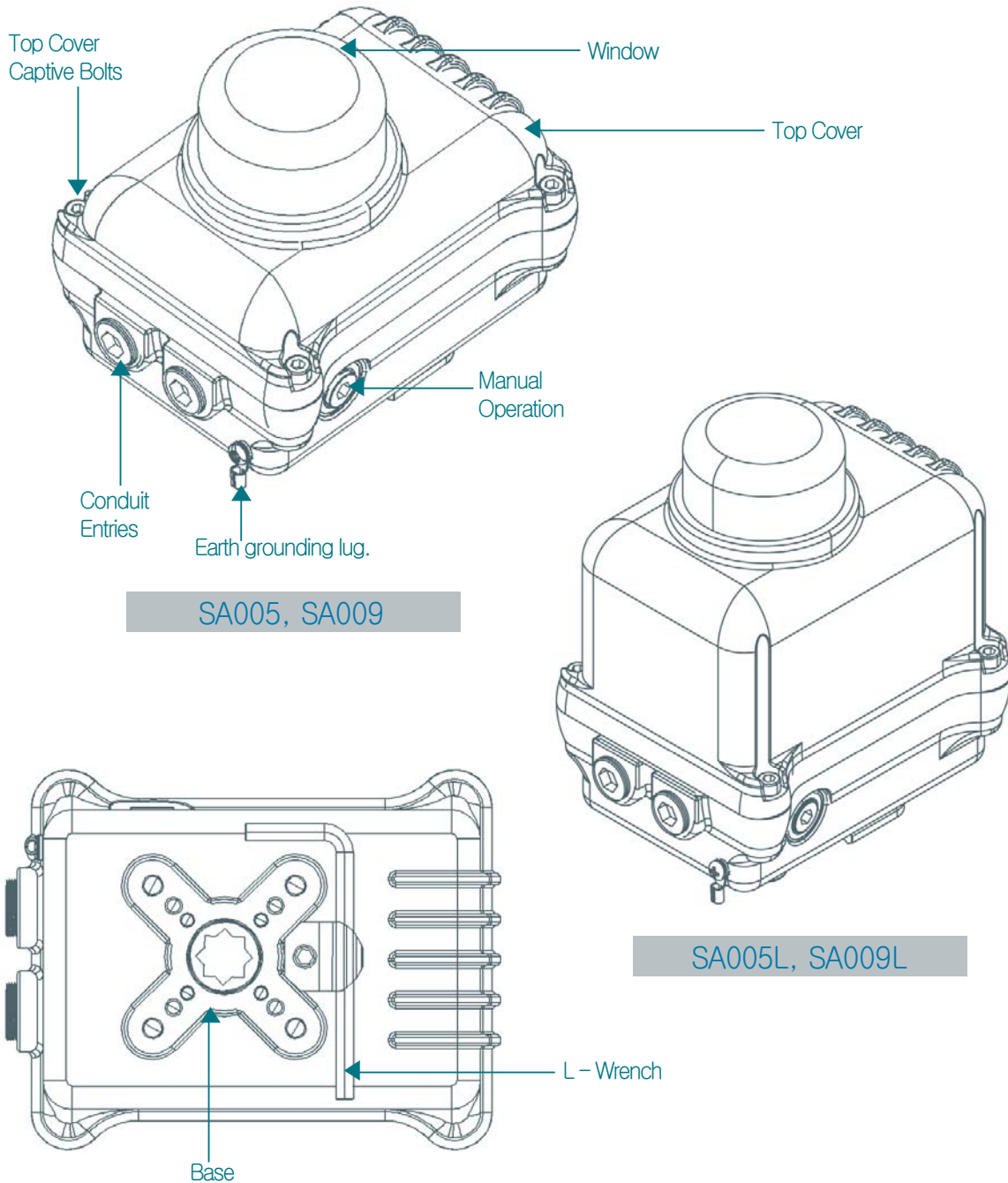
P I U	Potentiometer 1K Ohm	SA005L / SA009L
C P T	Current Position Transmitter Output : DC 4-20mA	SA005L / SA009L
P C U	Proportional Control Unit Input : DC 4-20mA, DC1-5V, DC2-10V Output : DC 4-20mA	SA005L / SA009L
L C U	Local Control Unit	SA005L / SA009L

6. Performance

Model	Output Torque		Operating Time (90°)				Motor Class(E)	Rated Current (A)				Duty Cycle	Number of Handle Turns	Weight	
			1 Phase(AC)		DC			1 Phase(AC)			DC				
	Kg.m	N.m	60Hz	50Hz	12V	24V	W	24V	110V	220V	12V	24V	S2 (%)	Kg	
SA005	5	50	14	17	12	14	6	1.8	0.35	0.23	3.2	1.8	75	6	2.8
SA005L	5	50	14	17	12	14	6	1.8	0.35	0.23	3.2	1.8	75	6	3.2
SA009	9	90	30	36	-	22	6	1.8	0.19	0.19	-	1.8	30	6	2.8
SA009L	9	90	30	36	-	22	6	1.8	0.19	0.19	-	1.8	30	6	3.2

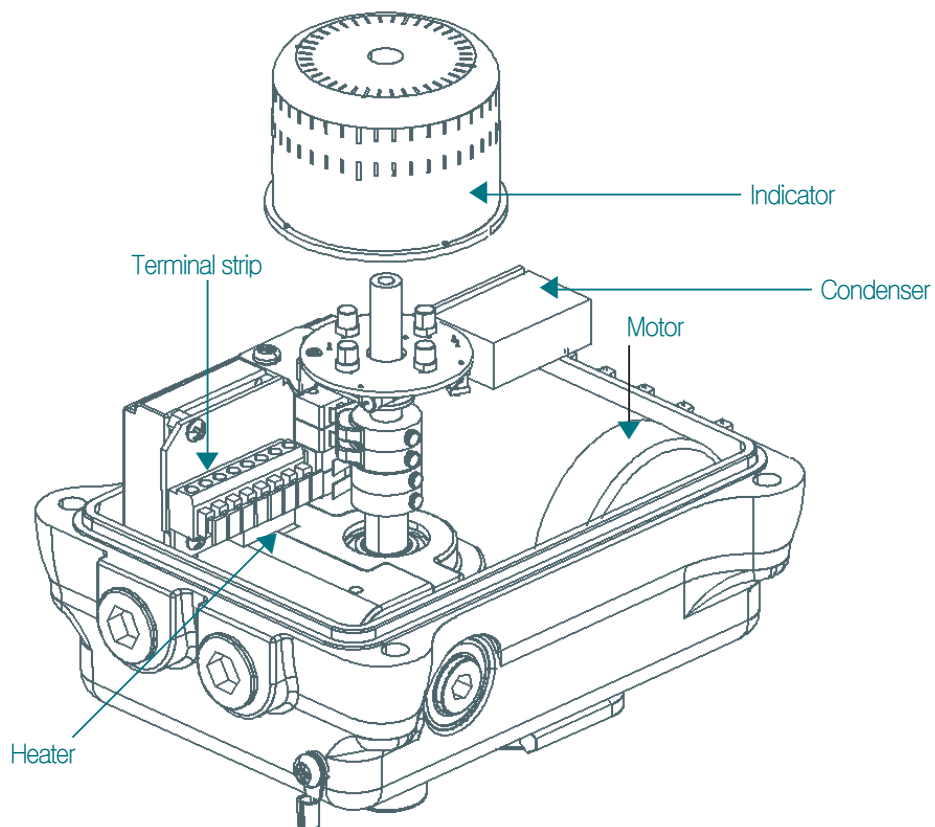
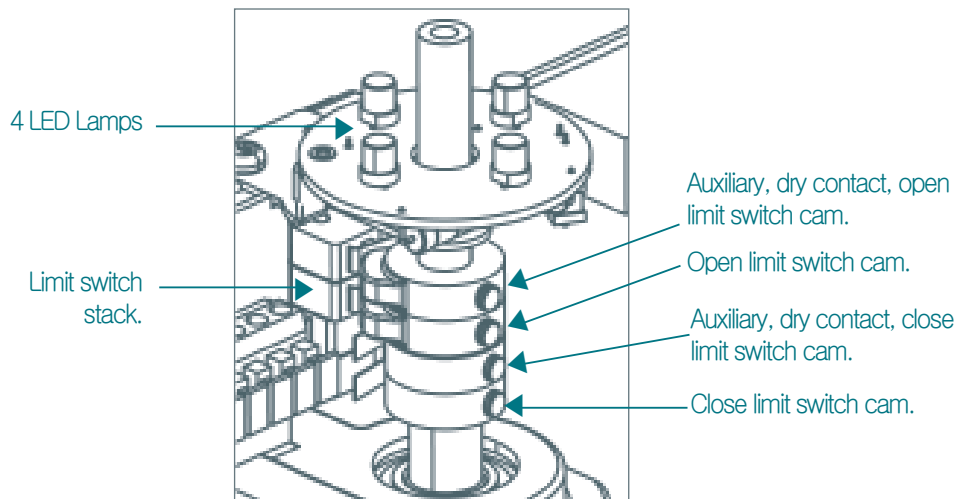
7. Exterior Parts Identification

7-1 SA005, SA005L / SA009, SA009L



8. Interior Parts Identification

8-1 SA005, SA005L / SA009, SA009L



9. Actuator Nameplate Information.

BEFORE Installation or use, verify the nameplate information to insure that you have the correct model number, voltage and options.

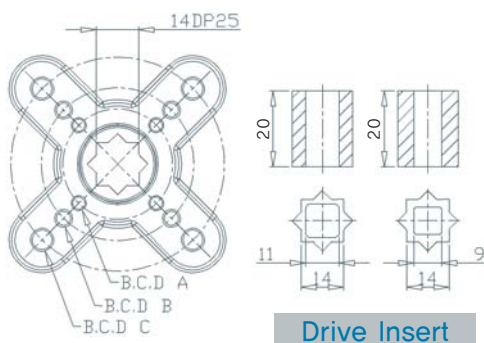
Type	Torque	Motor	Supply
S.N.		OP	
Manufacturer and Contact Info			

- 9-1 Type**
 Model Number
- 9-2 Torque**
 Torque output.
- 9-3 Motor**
 Motor wattage
- 9-4 Supply**
 Main power supply voltage for the motor.
- 9-5 S.N.**
 A unique serial number is issued for each ACTUATOR.
- 9-6 OP**
 Options installed will be listed here. For a complete listing of options refer to section 5 Optional Specifications.

10. Actuator Mounting Flange

SA-Series Base is manufactured to the ISO 5211 standard.

If the ACTUATOR does not fit directly to the valve, drive inserts are available or complete mounting kits can be manufactured.



Mounting Base B.C.D.	
A	ISO 5211 F03 (Ø36 M5TAP DP8)
B	ISO 5211 F05 (Ø50 M6TAP DP10)
C	ISO 5211 F07 (Ø70 M8TAP DP13)
OPTIONAL	※ ISO 5211 F04(Ø42 M5TAP)

11. Actuator and Valve Assembly

※ If the Valve is supplied by the user, the delivery is available after Emico mounts the ACTUATOR to the valve and calibrates the limit switch settings.

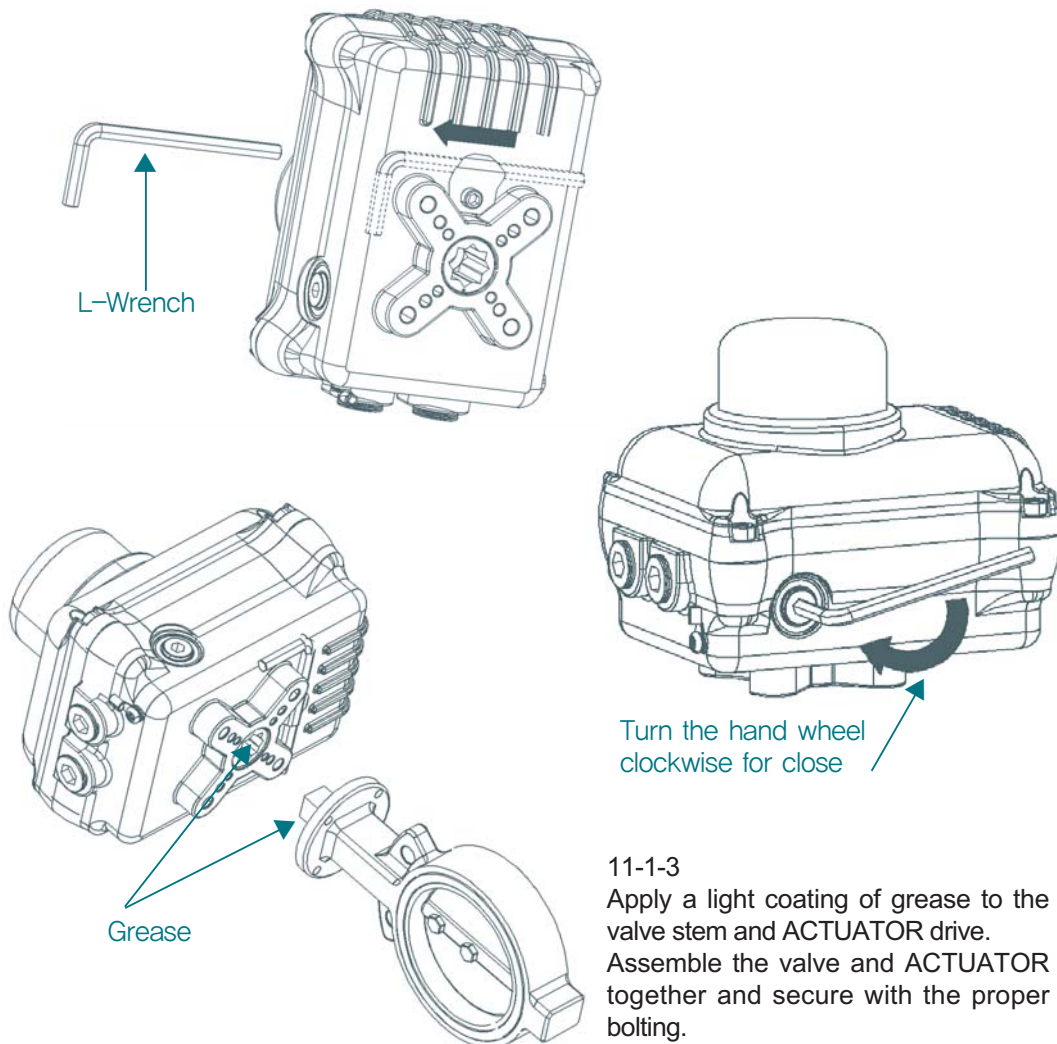
11-1 Butterfly Valve Assembly

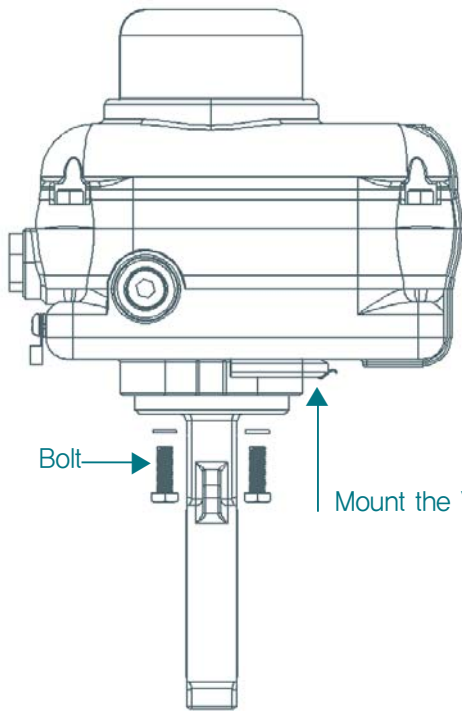
11-1-1

Confirm that the valve mounting dimensions match the ACTUATOR ISO mounting. Refer to section 10 for more detail.

11-1-2

Remove the manual over ride lever provided on the ACTUATOR base, and with power off, close the ACTUATOR clockwise. Also, close the valve that is to be mounted.



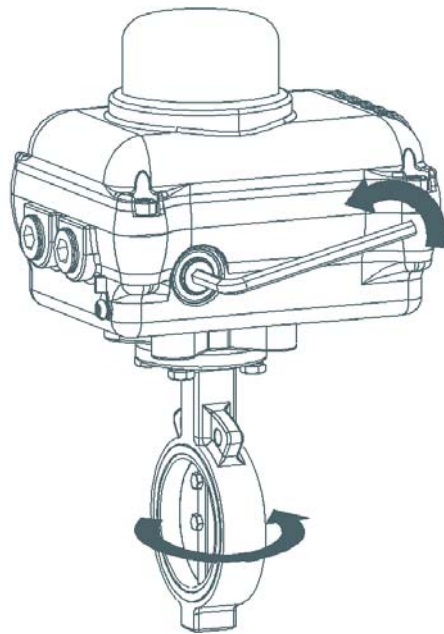


11-1-4

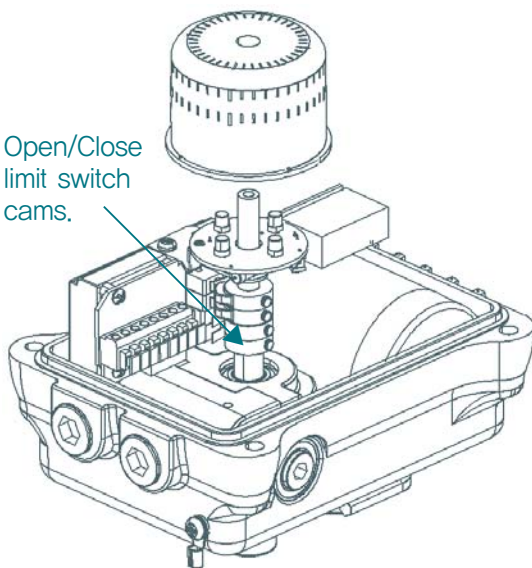
Secure the ACTUATOR and valve together using stud bolts and nuts or hex bolts. Firmly tighten the assembly and confirm that there is no gap between the ACTUATOR and valve. Overtightening the bolts to close the gap may damage the assembly. Confirm that the valve stem and mounting bolts are not too long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

11-1-5

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.



Open/Close
limit switch
cams.

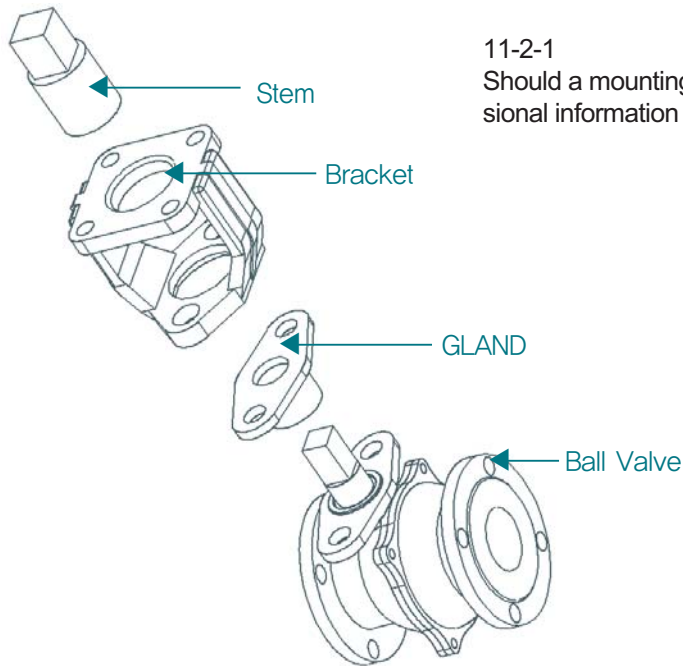


11-1-6

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 13 for more detail.

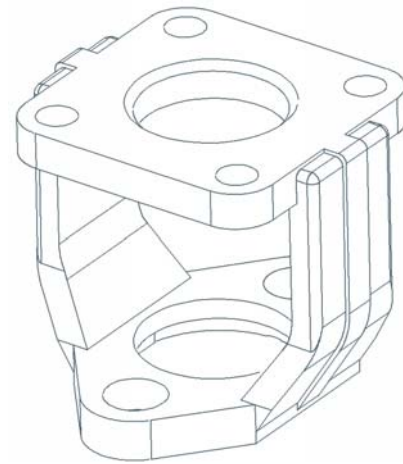
11-2 Ball Valve Assembly

※ If the Valve is supplied by the user, the delivery is available after Emico mounts the ACTUATOR to the valve and calibrates the limit switch settings. Emico can also provide a complete valve mounting kit if required.

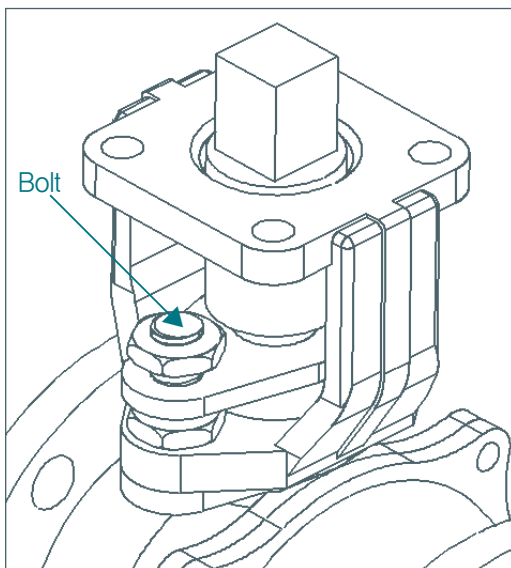


11-2-1

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



Example of a fabricated bracket

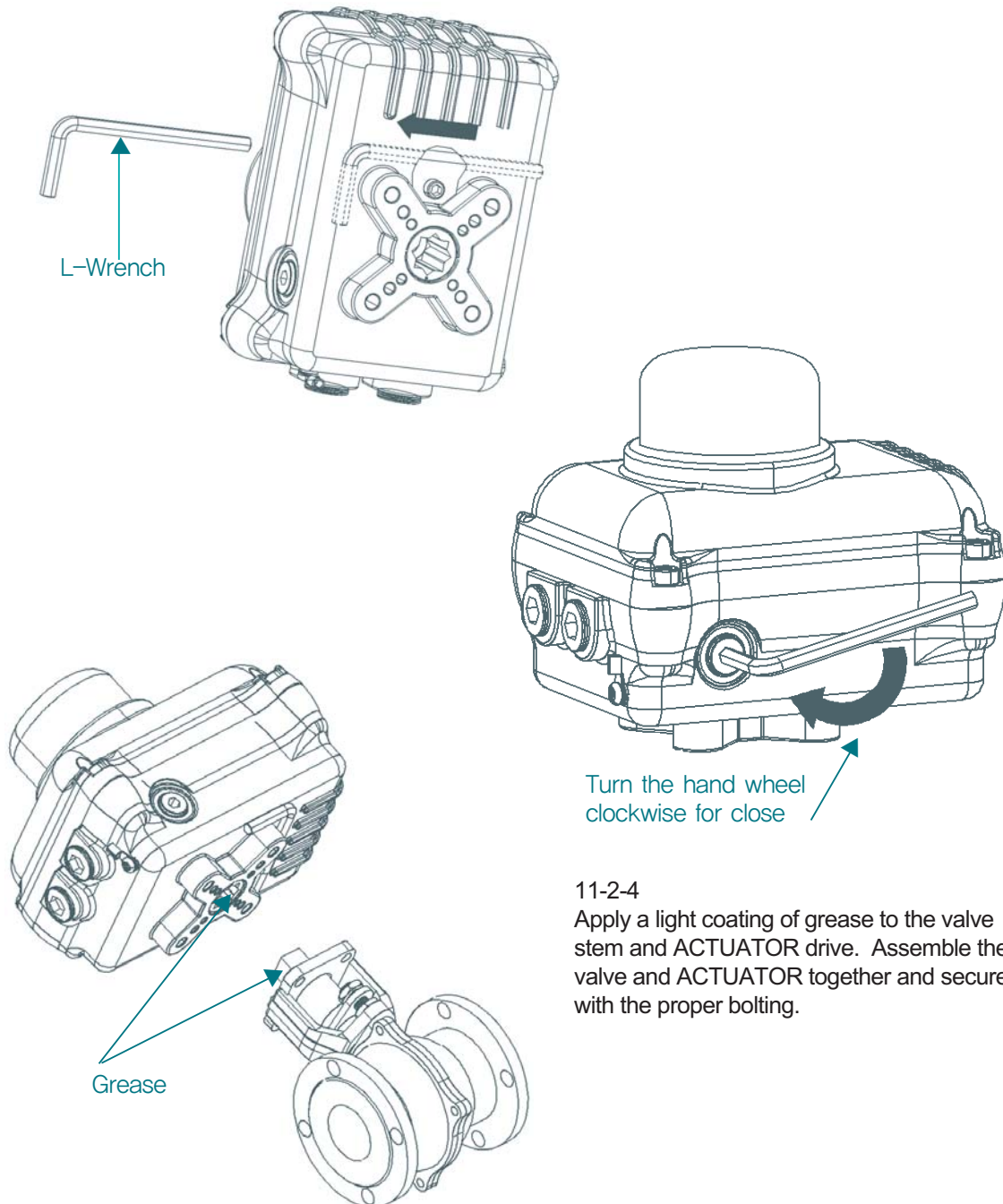


11-2-2

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.

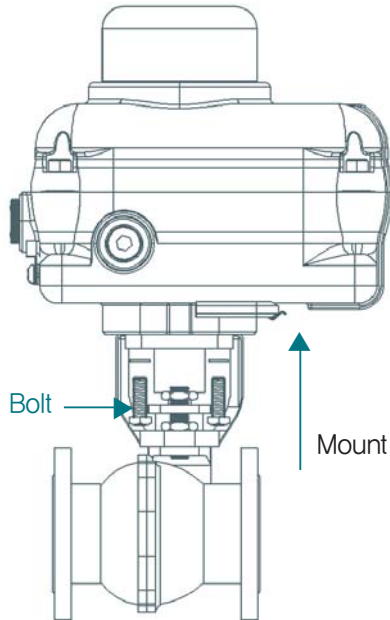
11-2-3

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.



11-2-4

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.



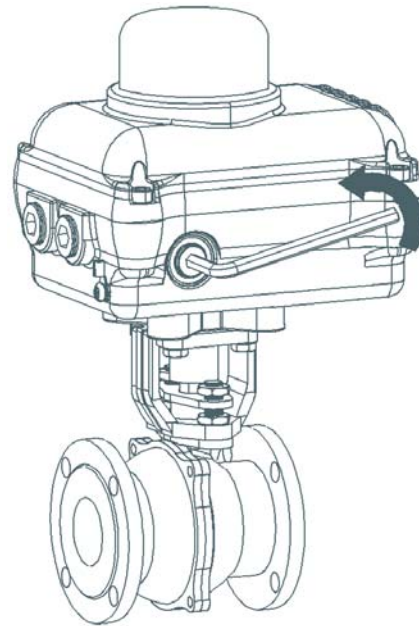
11-2-5

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.

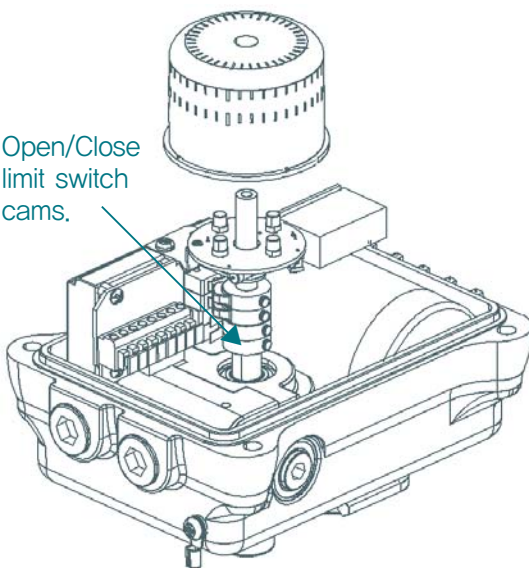
Mount the Valve and the ACTUATOR

11-2-6

Using the manual over ride, rotate the ACTUATOR to the closed, clockwise, position and confirm that the valve is rotating in the same direction.



Open/Close limit switch cams.

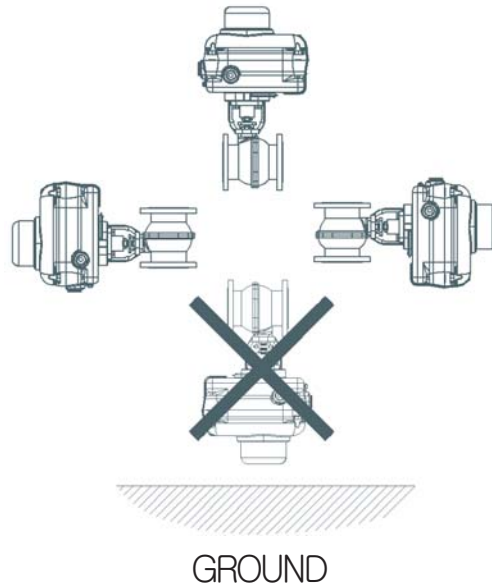
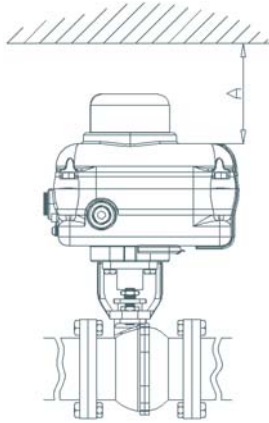


11-2-7

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 13 for more detail.

12. 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.



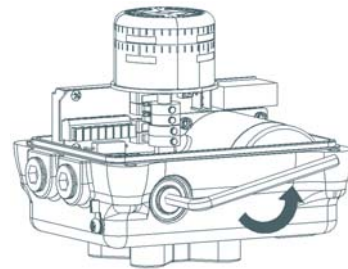
MODEL	A(mm)
SA005	80
SA005L	140
SA009	80
SA009L	140

13. Limit Switch Setting

13-1 Switch cam calibration

13-1-1

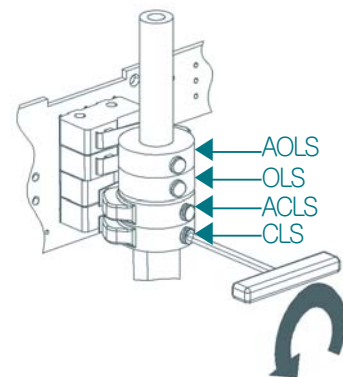
With the power off, remove the cover and manually rotate the ACTUATOR to the closed, clockwise, position.



13-1-2

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 cam 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



13-1-3

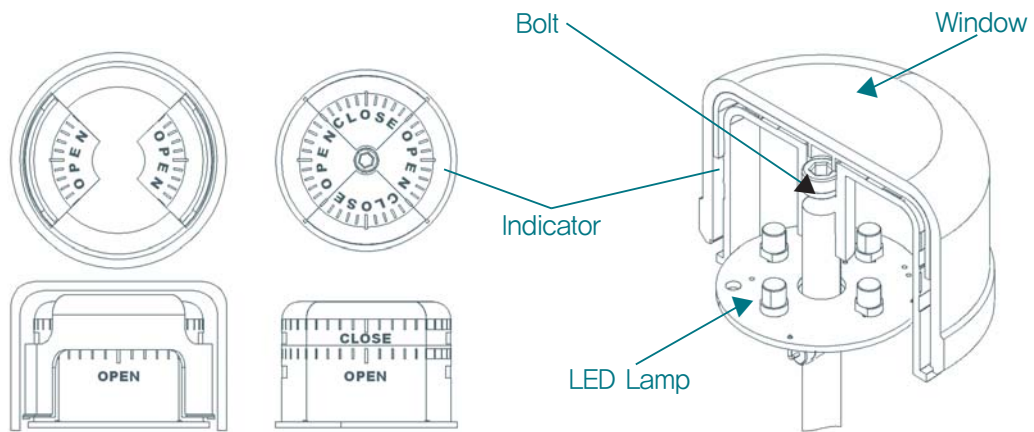
Firmly tighten the cam set screws.

13-1-4

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.

14. Indicator Setting

The position of the valve is indicated by the visual DOME indicator.



LED lights illuminate to allow for easy visual confirmation of valve position.

- ※ 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.

15. Wire Connection

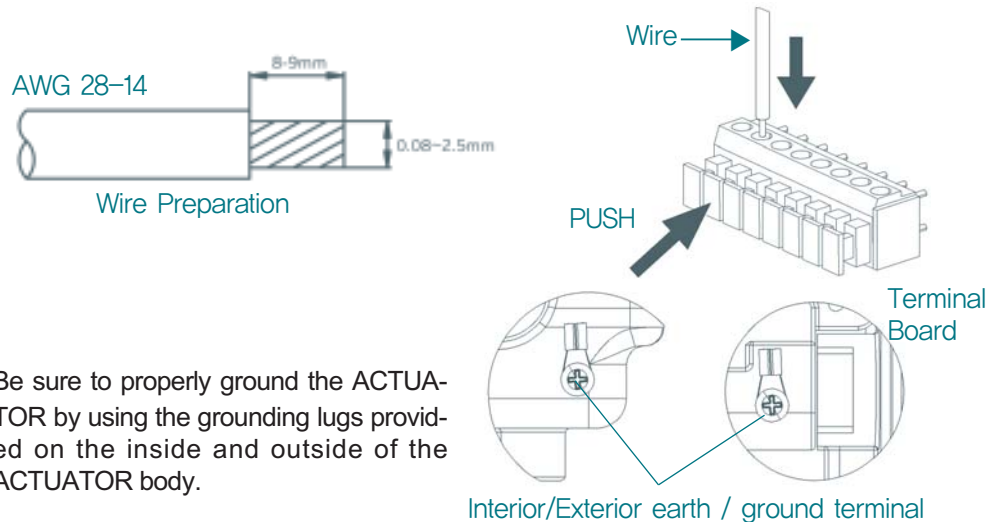
The two conduit entries on the SA-Series ACTUATOR are PF1/2". The ACTUATOR is sold worldwide, so there may be some differences as to the thread and pitch standards. Check with your supplier to confirm which standard is supplied in your area.

Conduit Entry Specifications	
Korea, Japan, China	PF 1/2"
Europe, UK, Australia, NZ	M20
US, Canada	NPT 1/2"

- 15-1 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 conduit entry. After all the conduit and wiring has been completed, then the seal fitting can be sealed with packing and or a potting material.
- 15-2 Any unused conduit entry must remain plugged with the pipe plug provided with the ACTUATOR. Do not remove the remaining plug as it is already sealed.

16. Electric Wiring

- 16-1 Remove the ACTUATOR cover by loosening the four captive cover bolts.
- 16-2 Confirm that the wiring diagram located in the ACTUATOR and the wiring number on the nameplate match with each other.
- 16-3 Confirm that the main power and supply described on the nameplate of the ACTUATOR match with each other.
- 16-4 Connect the wire to the terminal strip according to the wiring diagram provided. The SA-Series 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.



- 16-5 Be sure to properly ground the ACTUATOR by using the grounding lugs provided on the inside and outside of the ACTUATOR body.
- 16-6 Be sure to wire and energize the heater as shown in the wiring diagram.
- 16-7 Each ACTUATOR must be powered by their own individual relays to prevent voltage feedback and ACTUATOR damage.
- 16-8 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.
- 16-9 When all the work is completed, replace the top cover and secure it using the four cover screws.
- 16-10 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.

17. 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 conduit entries to be sealed at the ACTUATOR and that the heater is energized.

18. 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 conduit 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.

19. Troubleshooting

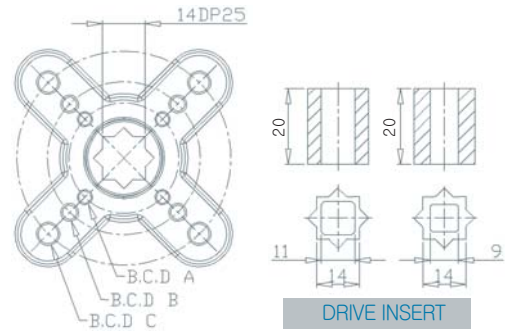
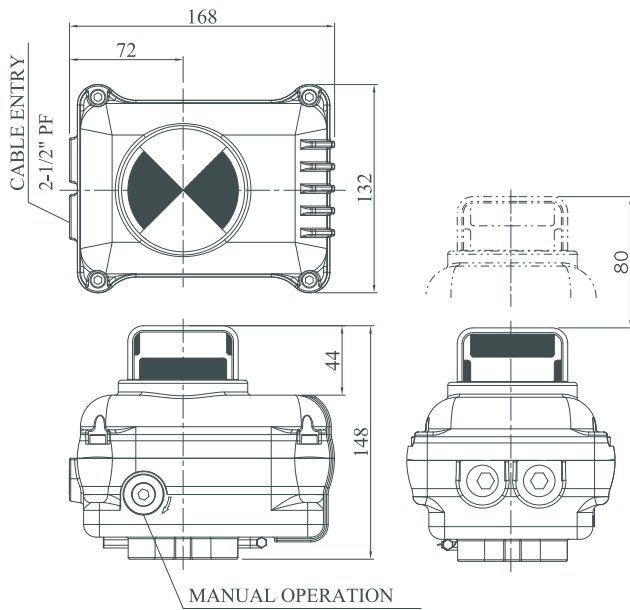
If the ACTUATOR fails to function correctly, first check for any mechanical / alignment problems, then check for any electrical problems. See chart below for more information.

PROBLEM	CAUSE	SOLUTION
Manual over ride not functioning	Gear Failure	Disassemble the ACTUATOR and replace the GEAR
	Main Power Failure	Main Power Check
	Motor/condenser damage	Replace Motor/condenser
	Motor over Heated and Thermal Protector Disengaged	Check Frequency of Operation or JAMMED GEARS.
	Wiring failure	Confirm Unit is Properly Wired Per Wiring Diagram
LED lights not operating	LED Board failure	Replace LED Board
	Main Board failure	Replace Main Board
Actuator continues to move even after the cam has tripped the limit switch.	Main Board failure	Replace Main 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 Emico for consultation. For faster service, please have all of the nameplate information available when calling the factory

20. Dimension

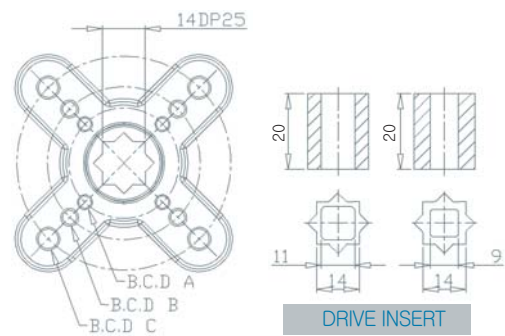
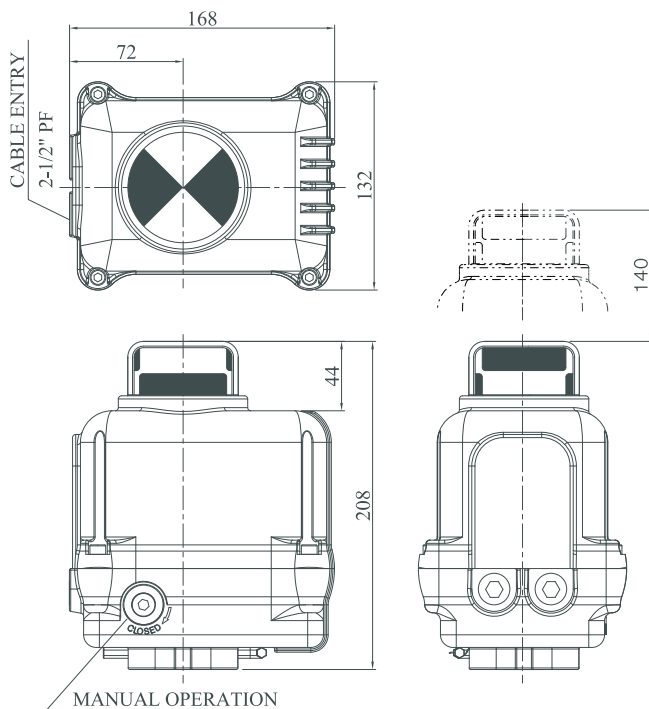
SA005, SA009



BASE B.C.D

- A : ISO 5211 F03 (Ø36 M5TAP DP8)
- B : ISO 5211 F05 (Ø50 M6TAP DP10)
- C : ISO 5211 F07 (Ø70 M8TAP DP13)

SA005L, SA009L



BASE B.C.D

- A : ISO 5211 F03 (Ø36 M5TAP DP8)
- B : ISO 5211 F05 (Ø50 M6TAP DP10)
- C : ISO 5211 F07 (Ø70 M8TAP DP13)