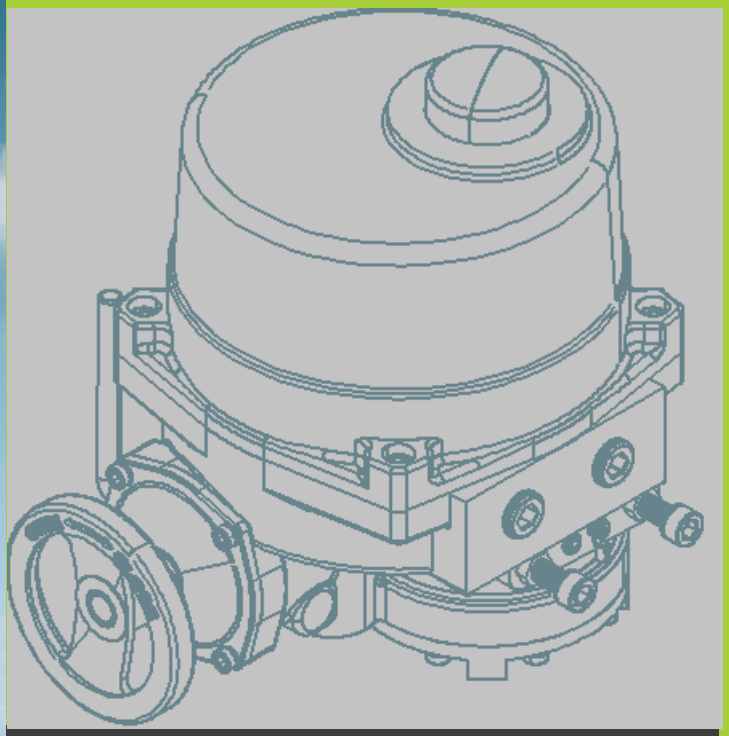
CLORIUSCONTROLS.COM



99.4.11.08-B
GB

Actuator CAR-series

- Installation
- Commissioning
- Operation

Clorius CONTROLS

RELIABLE FLOW CONTROLS SINCE 1902

CAR

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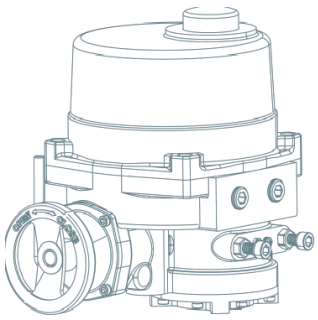


1. Caution

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 failure.

Over torque switches are factory set. Tampering with the over torque switch settings may damage the Actuator and VOID the Warranty.

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.

Care should be taken when wiring 3-phase Aactuators. Confirm proper rotation and limit switch shutoff function during the initial operation. If the Actuator rotates in the reverse direction, then the phasing needs to be corrected by switching two of the 3-phase wires on the terminal block.

Explosion-proof products must be used under the temperature and environment appropriate for the product spec.

Flameproof Enclosure Level and Environment of Actuator
Ex IIB T4 −20℃ ~ +55℃

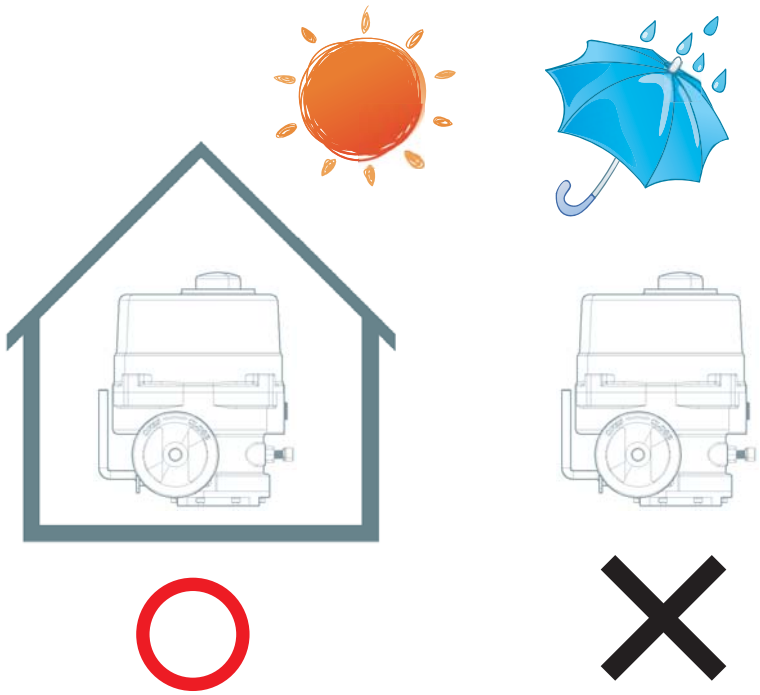
Explosion proof Actuators and wiring must be properly sealed prior to operation. Improper installation may cause a hazardous condition and failure of the explosion proof enclosure. The manufacture is not responsible for any losses or damages caused by incorrect installation.

1. Certified cable entries rated for at least 90℃ must be used when installed.
2. If conduit is used for cable entry, a seal fitting with setting compound must be installed as close as possible, within 450mm, to the actuator.

2. Storage

The Actuator must be stored in a clean, dry, temperature controlled area. The unit 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 in extreme temperature varia-tions. Heaters should be energized as soon as actuators are installed.

Storage Location	Indoor
Storage Temperature	18℃±5℃



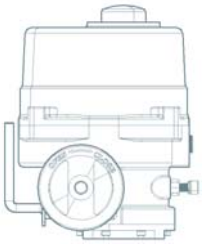
Improper storage of the Actuator will VOID WARRANTY.

3. Actuator Specification

3-1

The CAR-SERIES Actuator has been designed for the automation of 90-degree rotating equipment. The Actuator is available in 13 different sizes with torque outputs from 6kgm to 250kgm. The Actuator is suitable for Clorius Controls rotary valves.

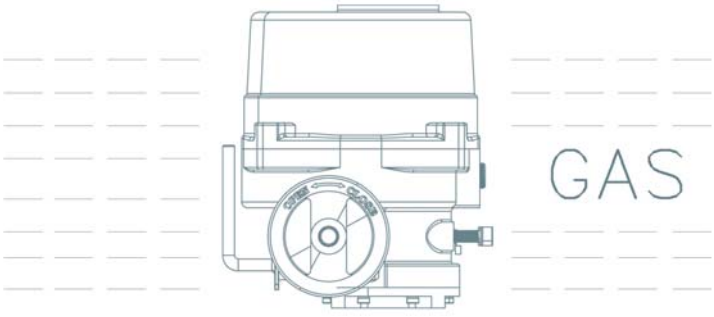
3-2 Environment and Temperature



Temperature	20℃ ~ + 70℃
Enclosure type	IP67 (IP68 : OPTION)

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

Flameproof Enclosure



Explosion Proof	Ex IIB T4	
Ex IIB T4	-20℃ ~ 55℃	
Certification Body	CSA (Canada /USA) ATEX (Europe) NEPSI (China)	GOST (Russia) KTL (South Korea) KOSHA (South Korea)

3–3 Manual Override

Hand/Auto declutch type with motor priority, the hand lever engages the manual override and will automatically reset when the motor is energized.

3–4 Self Locking

The self-locking worm gear system prevents any valve back drive from occurring.

3–5 Heater

The 20watt 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 Torque Switch

The torque switches are cam actuated and factory set to provide over torque protection for the valve as well as the Actuator. Torque switches are not included in the 006 and 009.

3–8 Motor

The Actuator motor is protected with an embedded 150-degree C thermal protector designed to protect the motor from overheating.

3–9 Indicator

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

3–10 Mechanical Limit Stops

Mechanical limit stops are designed to protect against the over-travel of quarter turn applications while using the manual over ride or in the event of a limit switch failure.

3–11 Adaption

Mounting is standardized to the ISO-5211 specification and the removable drive bushing can be machined to match valve stem.

4. Standard Specification

Enclosure	Watertight Ingress Protection 67 Nema 4 and 6 Option : IP68
Ambient Temperature	-20℃ to +70℃ 150℃/1hr Option : -40℃ to +70℃
Ambient Humidity	90% RH Max (Non Condensing)
Power Supply	DC24V 110 / 230V, 50/60Hz 380 / 440V, 50/60Hz Option : AC24V
Torque Switches	Open / Close Torque Switch (Except NA006, NA009)
Limit Switches	Open / Close Limit Switch
Stall Protection	Thermal Protection (Open 150℃)
Travel Angel	90±5℃
Indicator	Continuous Position Indicator
Manual Override	Hand / Auto Declutching Mechanism
Self Locking	Provided by Means of Worm Gearing
Mechanical Stops	External Adjustable Screws
Space Heater	20-watt
Conduit Entries	Two PF 3/4" Option : Two M20 Pitch 1.5 , Two NPT 3/4″
Lubrication	Shell ALVIDA EP2
Material	Aluminium
Surface Treafment	Anodizing
External Coating	POLYESTER
Dielectric Strength	AC1800V / 1min
Insulation	DC500V more Than 100M Ohm
Anti Vibration	X, Y, Z log, 10Hz~57Hz 0.15mm 30min

5. Optional Specification

EXP	Flameproof Enclosure Exd IIB T4 CSA, ATEX, NEPSI, GOST, KOSHA, KTL
IP68	Watertight Enclosure IP68 1 bar 72h (KTL)
ALS	Auxiliary Open, Close Limit Switches (Dry Contact)
ATS	Auxiliary Open, Close Over Torque Switches (Dry Contact)
EXT	Travel Angle (120 ° , 135 ° , 180 ° , 270 °)
PIU	Potentiometer 1K Ohm
CPT	Current Position Transmiter Output : DC 4-20mA
PCU	Proportional Control Unit Input DC 4-20mA, DC1~5V, DC2~10V Output : DC 4-20mA
LCU 1	Local Control Unit Material : Plastic (IP66)
LCU 2	Local Control Unit Material : Aluminium (IP67~68)
IMS	Integral Motor Starter (On-Off Action)
NAC	Continuous Modulating (Duty 100%) With Speed Controls
RBP	Rechargeble Battery Pack

6. Performance

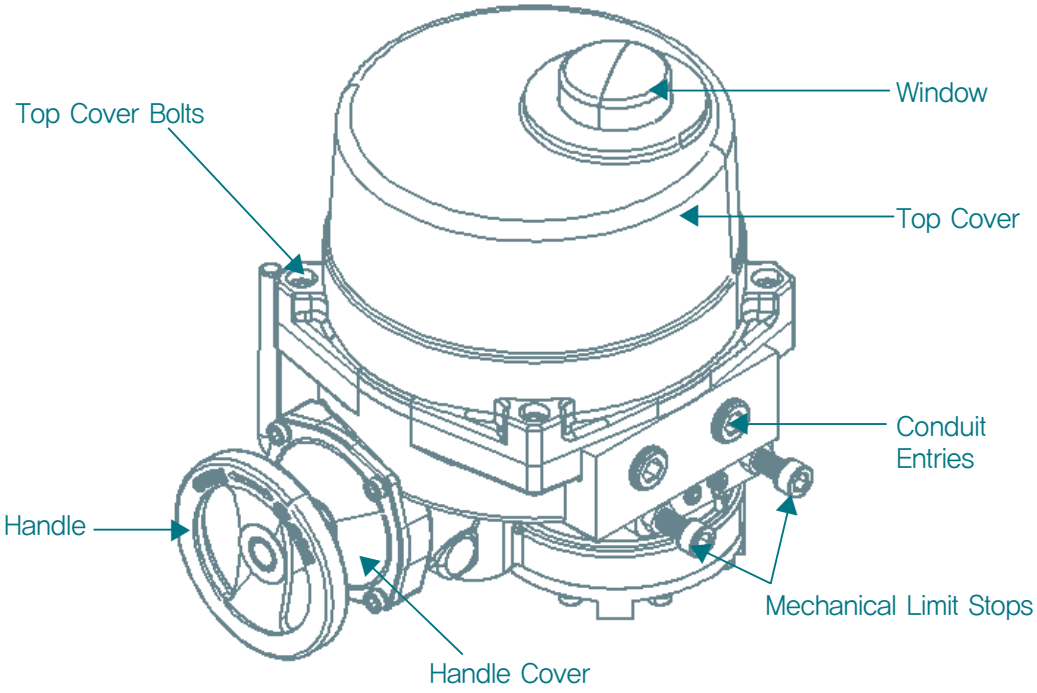
CAR type		006	009	015	019	028	038	050	060	080	100	150	200	250
Max Output Torque	kgm	6	9	15	19	28	38	50	60	80	100	150	200	250
	Nm	60	90	150	190	280	380	500	600	800	1000	1500	2000	2500
Operating Time (90/sec)	50Hz	17	17	20	20	24	24	24	29	29	29	87	87	87
	60Hz	14	14	17	17	20	20	20	24	24	24	72	72	72
Optional Enclosure	IP	67/68	67/68	67/68	67/68	67/68	67/68	67/68	67/68	67/68	67/68	67/68	67/68	67/68
Optional Flameproof	Ex	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4	IIB T4
Motor	W	15	25	40	40	40	60	90	90	180	180	90	180	180
	Class	F	F	F	F	F	F	F	F	F	F	F	F	F
Duty Cycle (CSA)	S4 (%)	50	50	50	50	50	30	25	25	25	25	25	25	25
Max Stem Dia(mm)	Key	22	22	22	22	32	32	32	42	42	42	75	75	75
	Squ-are	20	20	20	20	26	26	26	34	34	34	65	65	65
Mounting Base	ISO 5211	F07	F07	F07 /F10	F07 /F10	F10 /F12	F10 /F12	F10 /F12	F12 /F14	F12 /F14	F12 /F14	F16	F16	F16
Handle Tuns		8.5	8.5	10	10	12.5	12.5	12.5	14.5	14.5	14.5	43.5	43.5	43.5
Weight	kg	11	11	13	13	17	18	19	22	25	25	68	70	70

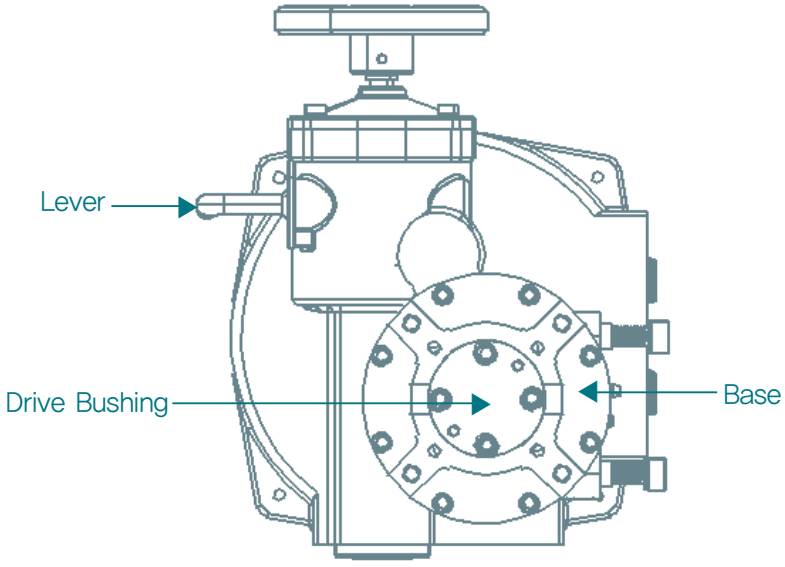
6-1 Rated / Starting Current

TYPE		006	009	015	019	028	038	050	060	080	100	150	200	250
110V 50Hz	Rated current(A)	0.75	1.2	1.6	1.6	1.8	2.3	3.9	3.9	4.7	4.7	3.9	4.7	4.7
	starting current(A)	1.35	2.1	2.1	2.1	2.9	3.7	4.9	4.9	7.45	7.45	4.9	7.45	7.45
110V 60Hz	Rated current(A)	0.75	1.1	1.52	1.52	17.3	2.2	3.85	3.85	4.58	4.58	3.85	4.58	4.58
	starting current(A)	1.36	2.1	2.13	2.13	2.96	3.72	4.9	4.9	7.5	7.5	4.9	7.5	7.5
220V 50Hz	Rated current(A)	0.45	0.58	0.95	0.95	0.95	1.3	1.5	1.5	2.15	2.15	1.5	2.15	2.15
	starting current(A)	0.63	0.89	1.12	1.12	1.37	1.85	2.34	2.34	3.4	3.4	2.34	3.4	3.4
220V 60Hz	Rated current(A)	0.45	0.58	0.95	0.95	0.95	1.3	1.5	1.5	2.15	2.15	1.5	2.15	2.15
	starting current(A)	0.63	0.89	1.12	1.12	1.37	1.85	2.34	2.34	3.4	3.4	2.34	3.4	3.4
380V 50Hz	Rated current(A)	0.13	0.18	0.3	0.3	0.3	0.33	0.52	0.52	0.73	0.73	0.52	0.73	0.73
	starting current(A)	0.32	0.36	0.59	0.59	0.74	0.78	1.24	1.24	1.68	1.68	0.78	1.68	1.68
380V 60Hz	Rated current(A)	0.13	0.17	0.3	0.3	0.33	0.36	0.56	0.56	0.84	0.84	0.56	0.84	0.84
	starting current(A)	0.32	0.36	0.59	0.59	0.74	0.78	1.24	1.24	1.68	1.68	0.78	1.68	1.68
440V 50Hz	Rated current(A)	0.13	0.2	0.35	0.35	0.36	0.36	0.55	0.55	0.75	0.79	0.55	0.79	0.79
	starting current(A)	0.32	0.36	0.59	0.59	0.74	0.78	1.24	1.24	1.68	1.68	0.78	1.68	1.68
440V 60Hz	Rated current(A)	0.12	0.16	0.3	0.3	0.34	0.34	0.57	0.57	0.78	0.78	0.57	0.78	0.78
	starting current(A)	0.32	0.36	0.59	0.59	0.74	0.78	1.24	1.24	1.68	1.68	0.78	1.68	1.68
DC 24V	Rated current(A)	2.2	3.5	4.5	5	6.5								
	starting current(A)	4.1	4.1	6.6	9.8	13.8								

7. Exterior Parts Identification

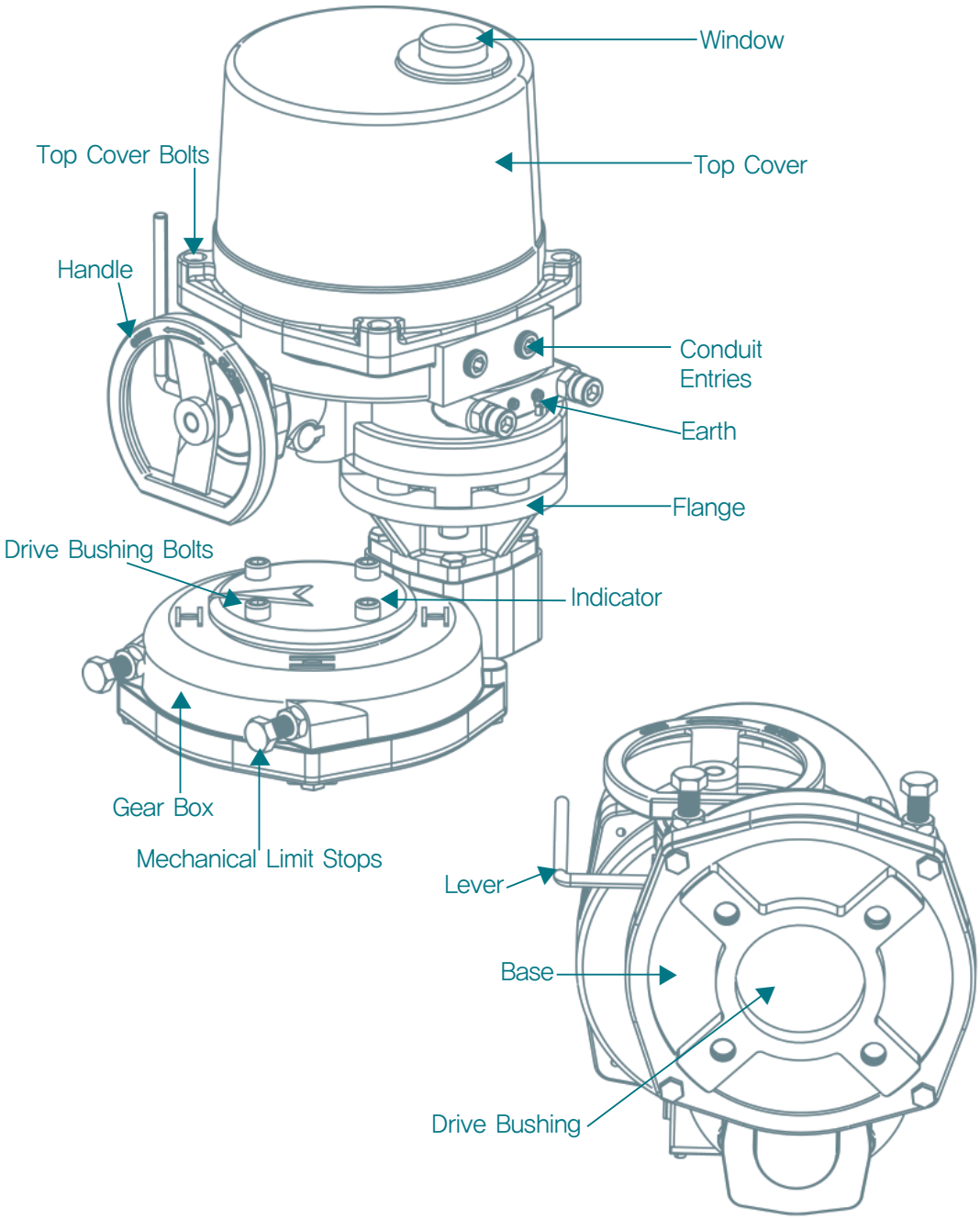
7–1 006, 009, 015, 019, 028, 038
050, 060, 080, 100





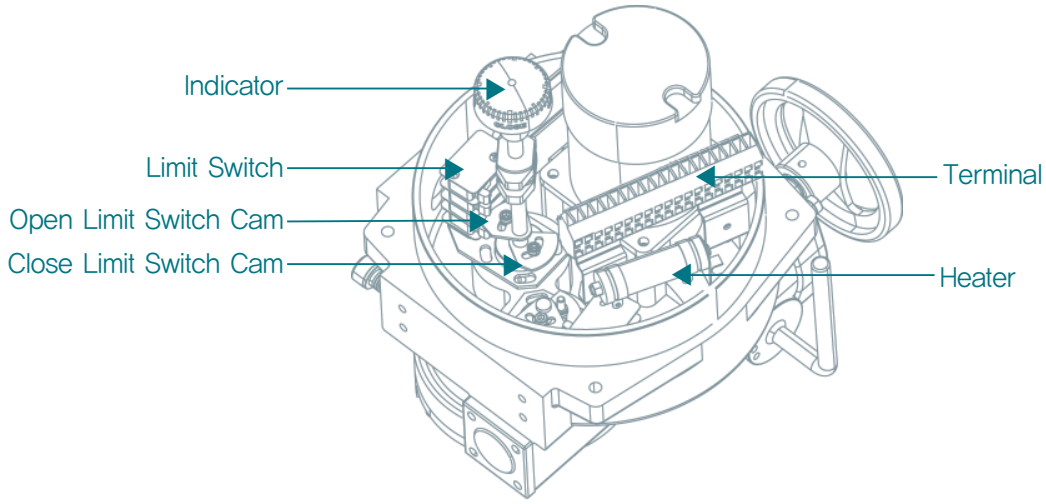
7. Exterior Parts Identification

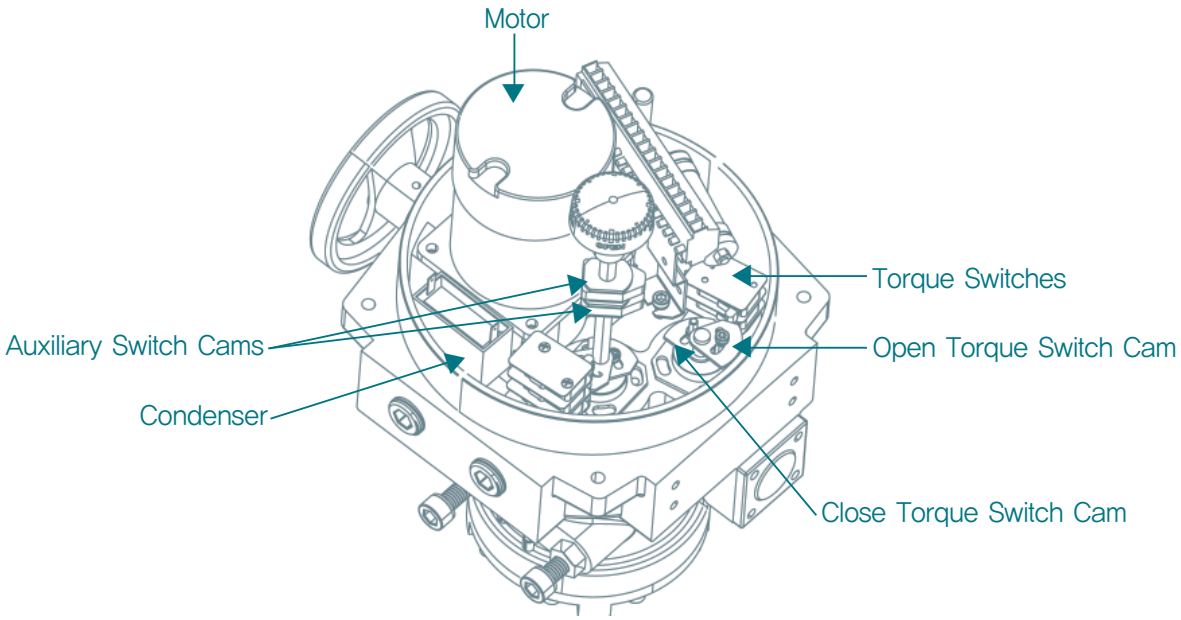
7–2 150, 200, 250



8. Interior Parts Identification

8–1 006, 009, 015, 019, 028, 038, 050 060, 080, 100, 150, 200, 250





9. Actuator Nameplate Information

BEFORE installation or use, verify the nameplate information to insure that you have the correct model number, torque, voltage and enclosure type.

Type		Motor	
Ser.No.		Supply	
Wir.No.		Option	

Clorius Controls Contact Info

9–1 Type

Model Number

9–2 Motor

Motor Wattage

9–3 Ser. No.

A unique serial number is issued for each Actuator.

9–4 Supply

Main power supply voltage for motor

9–5 Wir. No.

Electrical diagram for Actuator as built. The circuit diagram can be located inside top cover. Contact your supplier if you cannot locate the diagram or it is different than the one listed on the nameplate.

9–6 Option

Options installed will be listed here. For complete listing of options and descriptions please refer to Section 5 Optional Specification.

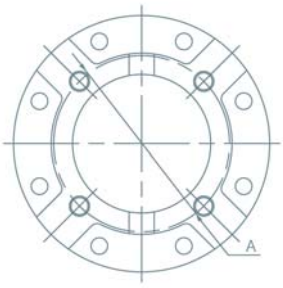
9–7 FLAMEPROOF/EXPLOSION PROOF ACTUATOR ENCLOSURE

If the application requires an explosion proof Actuator, you MUST confirm that the nameplate lists the explosion proof symbol or the certification body number. If no symbol or certification is located on the nameplate, immediately contact the supplier as the Actuator is not manufactured for explosion proof service.

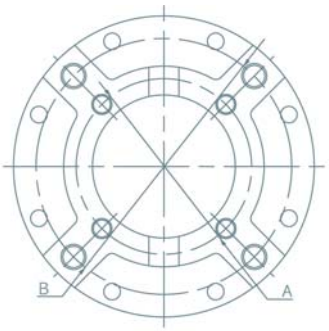
※ Flameproof Enclosure Symbol: In the case of ATEX
"CE 0470 Ex II 2G EEx d IIB T4 Nemko 03ATEX1342X"

10. Actuator Mounting Flange

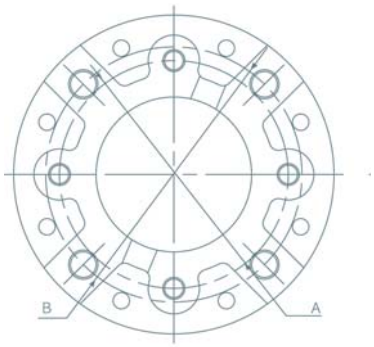
The CAR-Series mounting flange is manufactured to ISO5211 standards. If the Actuator does not mount directly to the valve, then a mounting kit will need to be manufactured.



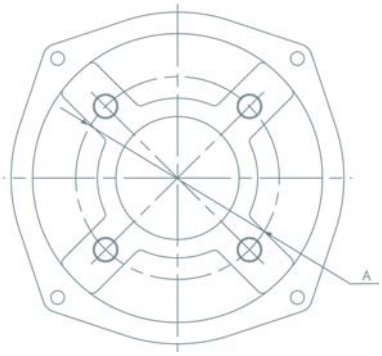
Model 006, 009



Model 015~050



Model 060~100



Model 50~250

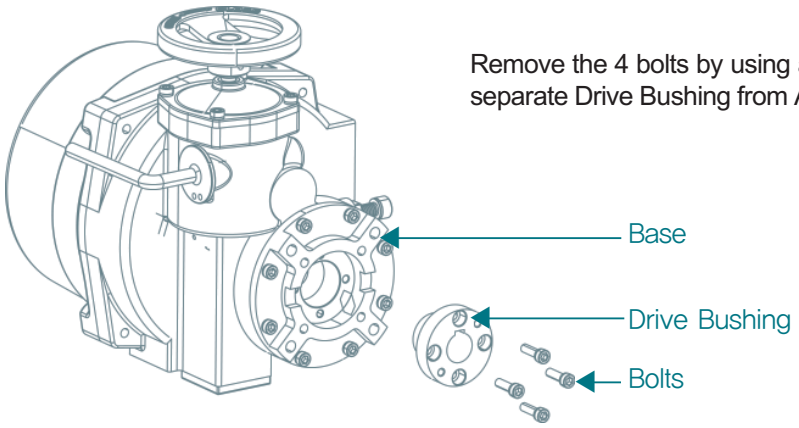
(mm)

Size \ Model		006 ~009	015 ~019	028 ~050	060 ~100	150 ~250
A	B.C.D	Ø70	Ø70	Ø102	Ø125	Ø165
	TAP	4-M8 DP12	4-M8 DP12	4-M10 DP15	4-M12 DP22	4-M20 DP22
	ISO 5211	F07	F07	F10	F12	F16
B	B.C.D	–	Ø102	Ø125	Ø140	–
	TAP	–	4-M10 DP15	4-M12 DP22	4-M16 DP22	–
	ISO 5211	–	F10	F12	F14	–
Option	B.C.D	Ø82	Ø82	–	Ø102	Ø140
	TAP	4-M8 DP12	4-M8 DP12	– –	4-M10 DP15	4-M16 DP22
	ISO 5211	–	–	–	F10	F10

11. Actuator Drive Bushing

A removable blank drive bushing is supplied with each Actuator that can be machined to adapt to the valve stem.

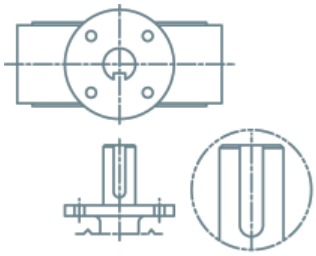
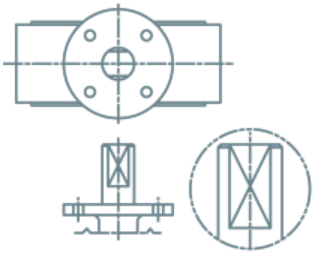
11–1 Drive Bushing Separation

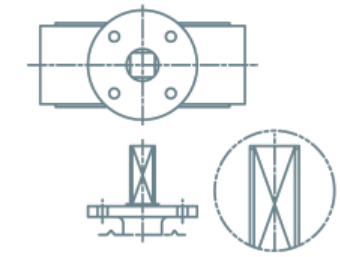
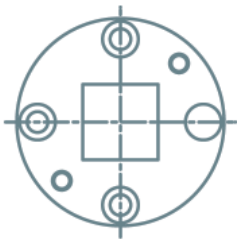
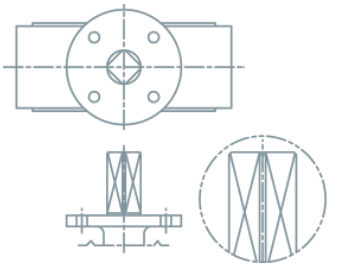


Remove the 4 bolts by using an L-wrench and the separate Drive Bushing from Actuator.

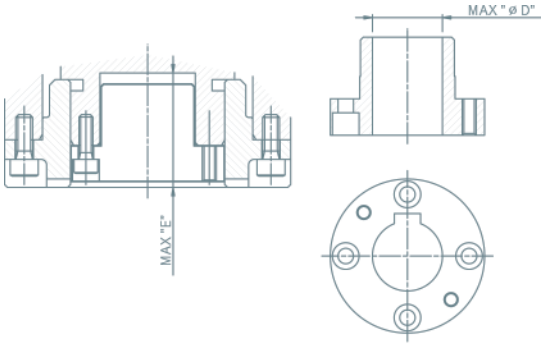
11–2 Drive Bushing Adaption

The drive bushing should be Machined to match the valve stem dimensions when the valve is in the full open or full closed position. The actuator bushings can be provided machined and ready to mount to the valve if the valve drawings are provided to the manufacture.

Shaft Orientation when Butterfly Valve is in Full Open	Machined Drive Bushing Orientation and Type
	
	

Shaft Orientation when Butterfly Valve is in Full Open	Machined Drive Bushing Orientation and Type
	
	

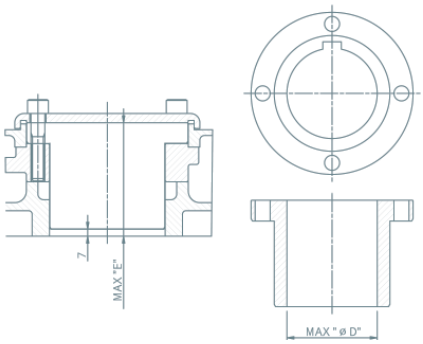
11-3 Drive Bushing MAX Machined Bore Size



Model 006~100

(mm)

	Max "ØD"	MAX "Squre"	E
006~009	Ø22	20	43
015~019	Ø22	20	43
028~050	Ø32	26	52
060~100	Ø42	34	59



Model 150~250

(mm)

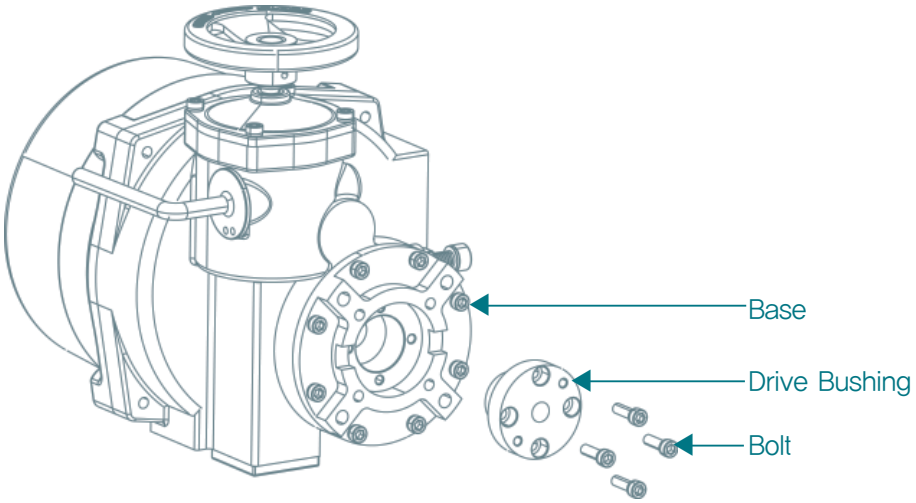
	Max "ØD"	MAX "Squre"	E
150~250	Ø75	65	100

12. Actuator and Valve Assembly

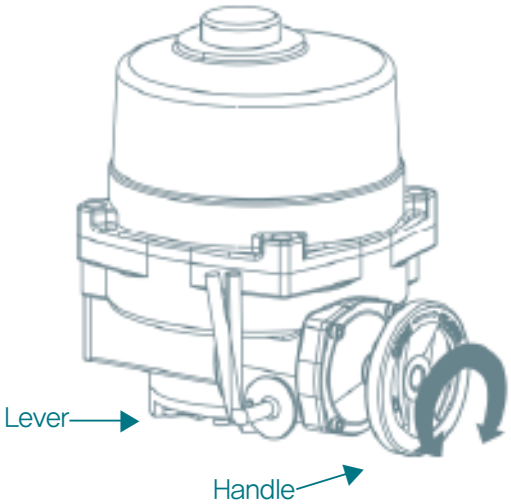
※ CLORIUS CONTROLS mounts and cycles the valve assembly, and then calibrates the limit switch settings.

12–1 Assembly

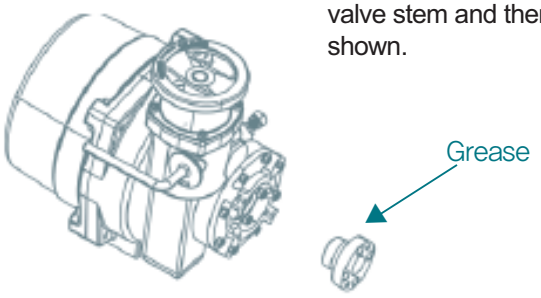
12-1-1
Confirm that the valve mounting dimensions match the Actuator base and machined bushing dimentions.

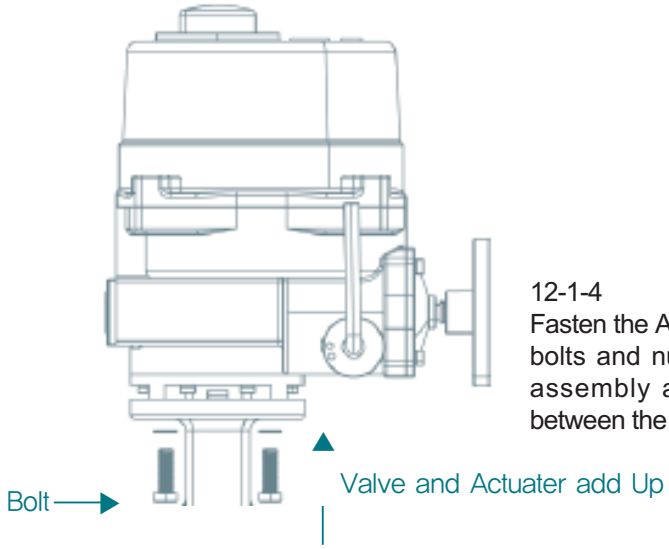


12-1-2
Pull lever to engage the hand wheel, then rotate the Actuator to the full clockwise / closed position turn the valve shaft to the full close position.

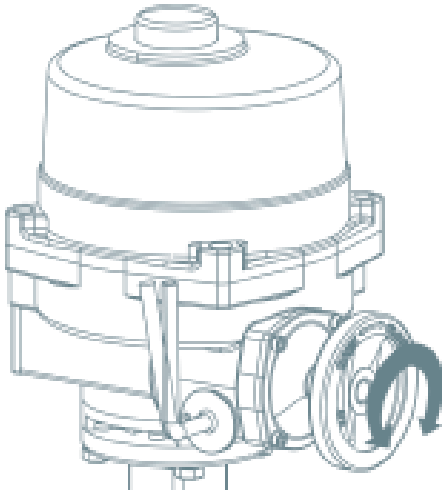


12-1-3
Apply a thin coat of grease to the drive bushing and install in the Actuator. Apply a thin coat of grease to the valve stem and then mount the Actuator to the valve as shown.





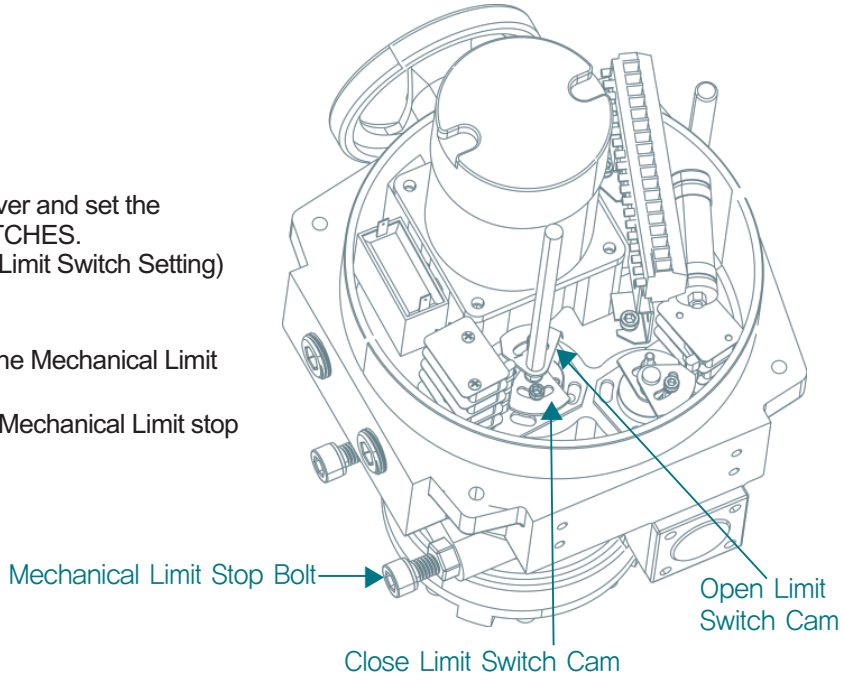
12-1-4
Fasten the Actuator and valve together using Stud bolts and nuts or hex bolts. Firmly tighten the assembly and confirm that there is no gap between the Actuator and valve.



12-1-5
Engage the hand wheel and rotate counter-clockwise(open). Confirm that the valve opens while turning the hand wheel.

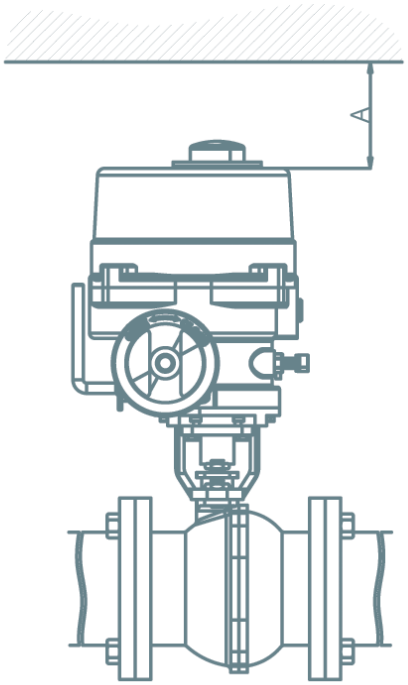
12-1-6
Remove the Top Cover and set the Actuator LIMIT SWITCHES.
(Refer to Section 15 Limit Switch Setting)

12-1-7
Adjust the length of the Mechanical Limit Stops.
(Refer to Section 17 Mechanical Limit stop bolt setting)

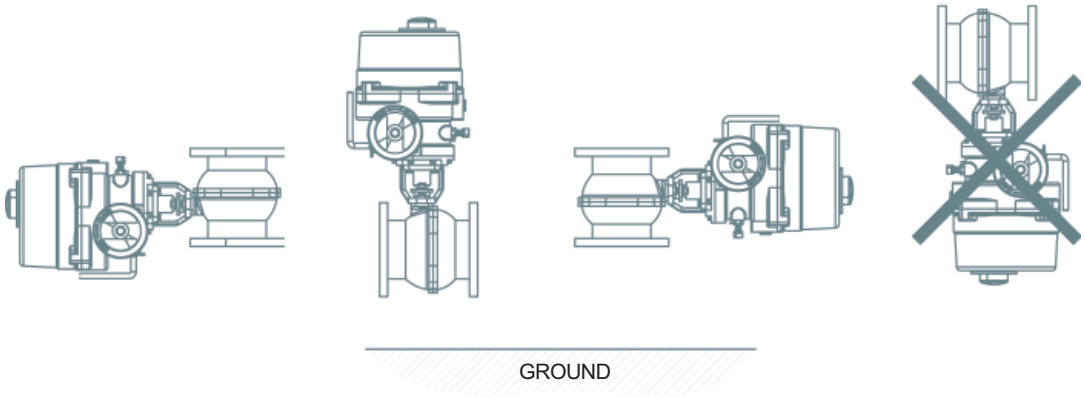


13. Actuator Installation

When installing an Actuator, proper clearence around the Actuator is required to ensure that the cover can be removed to allow for mainteriance.



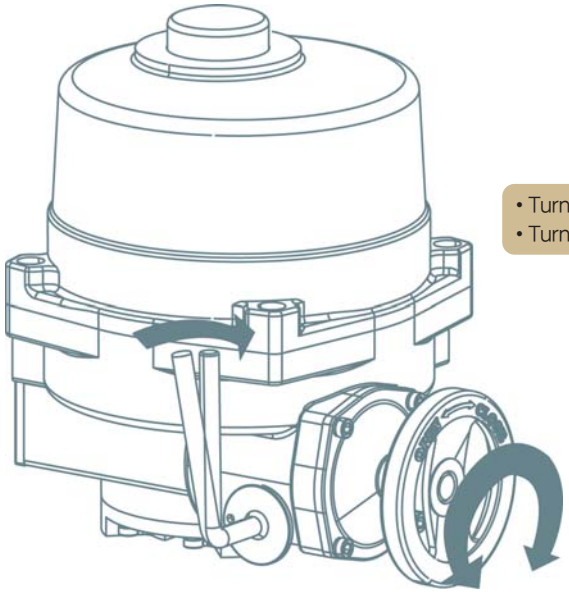
MODEL	A (mm)
006,009	108
015,019	108
028,038,050	130
060,080,100	178
150,200,250	178



14. Manual Operation

14-1
Pull the lever located on the side of the Actuator toward the hand wheel. The lever should “lock” in position. Turn the hand wheel and the Actuator output will rotate.

14-2
If the lever does not “lock” in the upright position, then turn the hand wheel halfway and pull lever to the upright position.



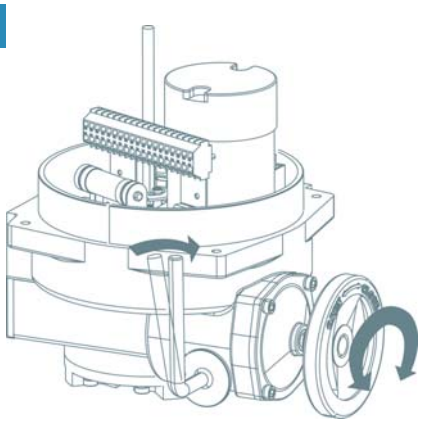
- Turn the hand wheel clockwise for CLOSE
- Turn the hand wheel counter clockwise for OPEN

14-3
After manual operation , leave the lever as is. When power is re-applied to the Actuator, the lever will disengage and declutch the manual override. The Actuator motor will then rotate the valve to the powered position.

14-4
If the Lever does not “lock” in the manual position while trying to manually operate the Actuator, then the Actuator gearing may be jammed and needs to be checked.

15. Limit Switch Setting

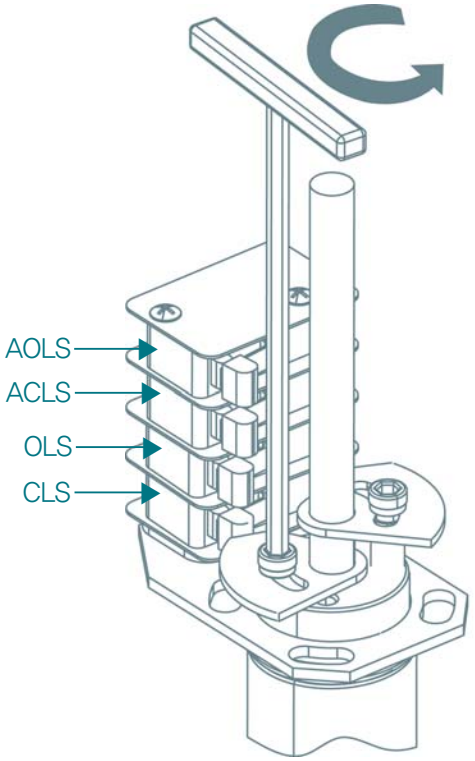
15–1 Close/Open Limit Switch Cam Setting



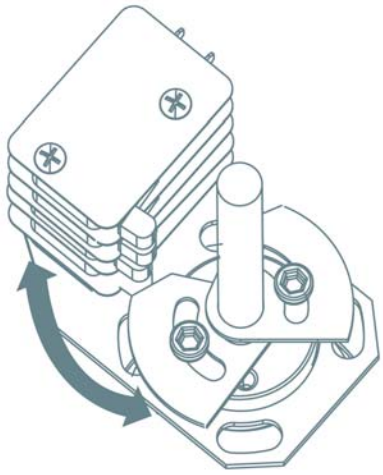
15-1-1
Confirm that the power is off.
Pull lever located on the side of the Actuator to engage the manual override handwheel.
Rotate the handwheel clockwise to fully close the Actuator / valve.

15-1-2
Loosen the Closed Limit Switch cam set screw as shown. Rotate cam in the closed / clockwise direction and engage the switch lever to actuate the switch

If Auxillary limit switches are included in the Actuator, then set the corresponding auxillary switch at this time.



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

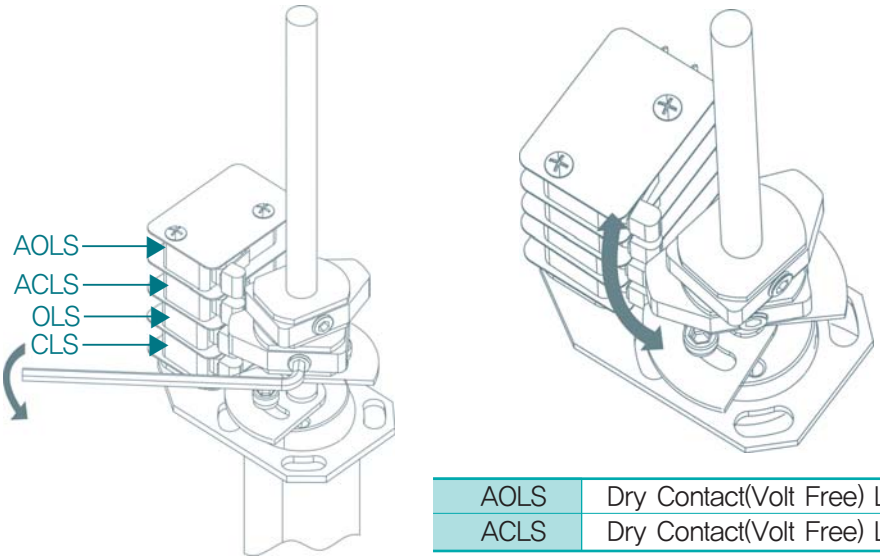


15-1-3
Firmly re-tighted the cam set screw.

15-1-4
To set the open limit switch, follow the same proceedure as above except that the rotation will be counter-clockwise using the open limit switch cam.

15–2 Dry Contact(Volt Free) Close/Open Auxiliary Limit Switch Setting

15–2–1
Using the manual override or power, rotate Actuator to the full clockwise position. Loosen the set screw in the ACLS cam and then rotate the cam in the clockwise rotation to engage the auxillary switch.



AOLS	Dry Contact(Volt Free) Limit Switch
ACLS	Dry Contact(Volt Free) Limit Switch

15-2-3
Firmly re-tighten the cam set screw.

15-2-4
To set the open auxillary limit switch, follow the same proceedure as above except that the rotation will be counter-clockwise using the open auxillary limit switch cam.

16. Over Torque Switch Setting

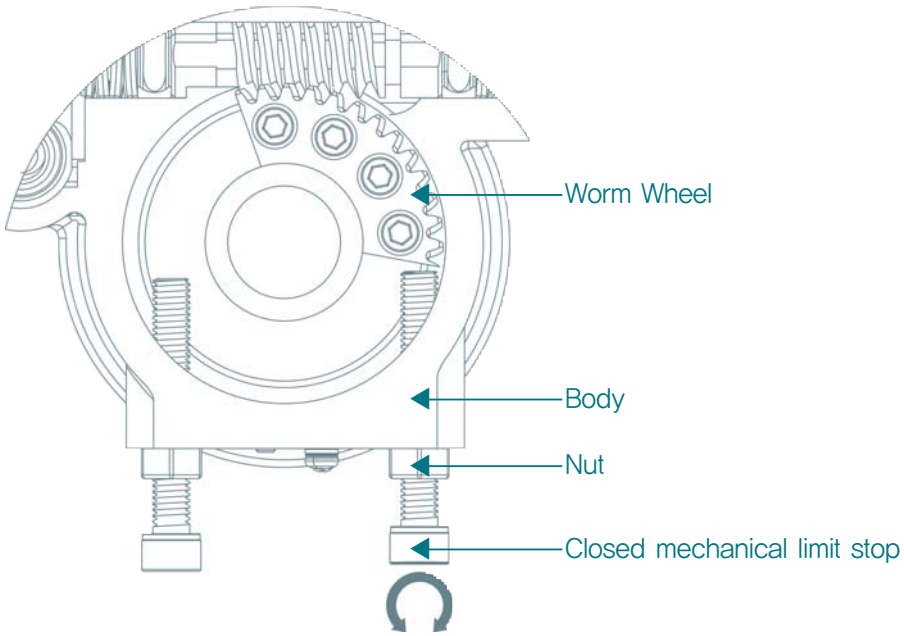
The over torque switches are factory set. Tampering with the over torque switch settings may damage the ACTUATOR and VOID the warranty. For more intormation contact CLORIUS CONTROLS.

17. Mechanical limit stop setting

In the event of a limit switch malfunction, the mechanical limit stops will prevent the Actuator from over traveling and causing damage to the valve. The mechanical limit stops should be reset whenever any adjustment is made to the open and closed limit switches, this will protect the valve in the event of an electrical malfunction.

17-1
Turn the power off to the Actuator. Engage the manual override and fully close the valve clockwise.

17-2
As shown below, turn the mechanical limit stop into the body until contact is made between the limit stop and worm wheel. After contact is made, then turn the limit stop back out two turns and lock it in place with the nut by tightening the nut against the body.

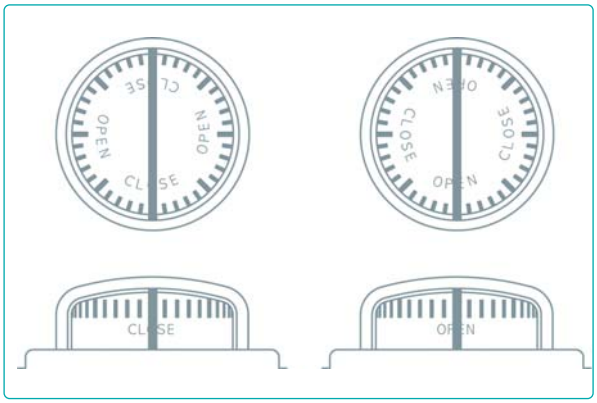


17-3
To set the open limit stop, follow the above instructions except rotate the Actuator in the counter clockwise rotation.

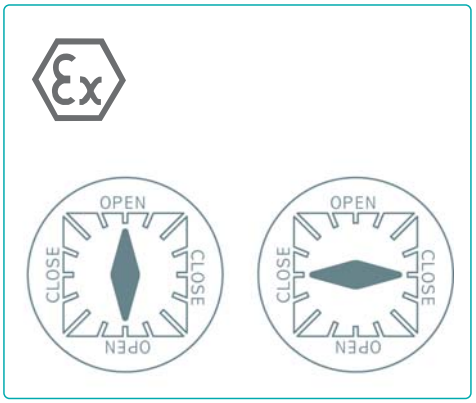
If the mechanical stops are improperly set, motor and gear damage may occur.
After setting the limit stops, check for proper function by operating the Actuator both manually and electricly. Confirm that the end of travel limit switches shut off power to the motor in both the open and closed positions, and that the motor is not stalled or in an over-torque condition.

18. Visual Indicator Setting

The valve position is easily confirmed from a distance by looking at the indicator dome located on the top of the Actuator cover.

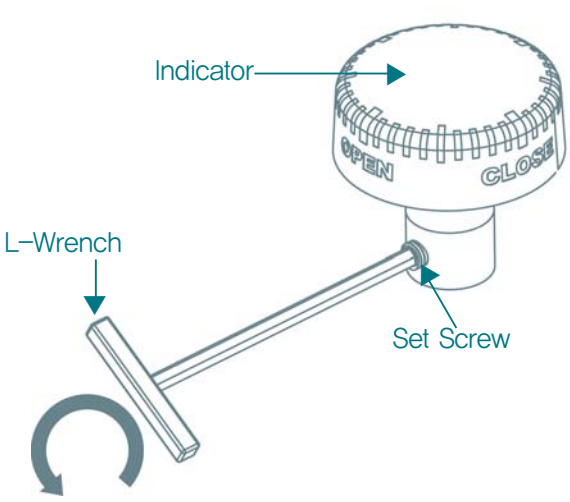


Non explosion proof

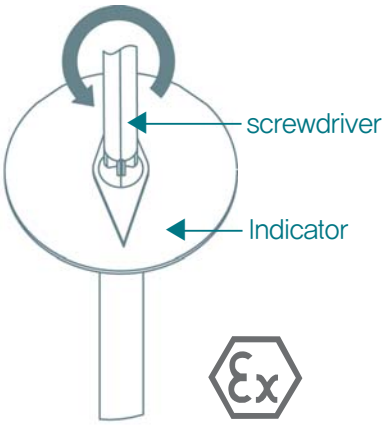


explosion proof

18–1
If the position shown on the indicator is incorrect, simply loosen the set screw and rotate the indicator to the correct position and retighten the set screw.



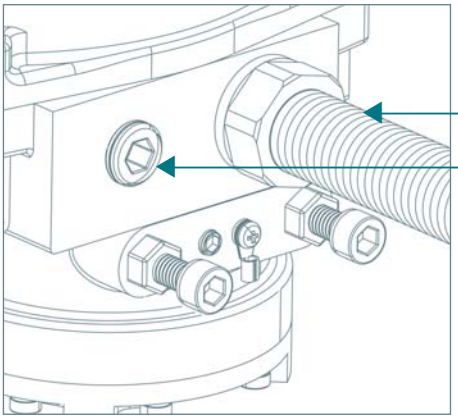
non-explosion proof



explosion proof

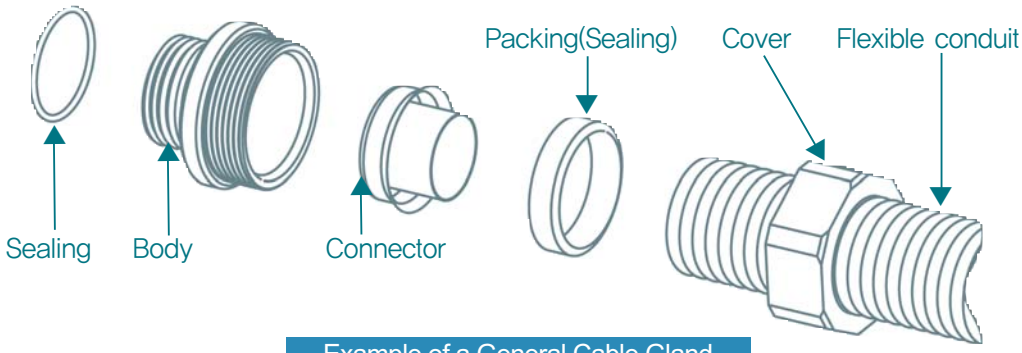
19. Wire Connection

The two conduit entries on the CAR-Series Actuator are basiclly PF3/4 ″. The Actuator is sold worldwide and so there may be some differences as to thread pitch standards. Check with your supplier as to the standard that is supplied in your area.



Conduit entry specification	
Korea, Japan, China	PF 3/4″
Europe/UK/Australia/NZ	M20
US, Canada	NPT 3/4″

19-1
Standard conduit and conduit fittings may be used. It is recommended that a seal fitting be fitted to the Actuator conduit entry and sealed with a resin compound after all wiring has been installed. This will help prevent humidity and water from entering the Actuator enclosure.



Example of a General Cable Gland

19-2
Cable Glands used in explosion proof applications must be certified for the proper explosion proof application class and properly sealed. Failure to use the correct components may result in the failure of the Actuator enclosure. CLORIUS CONTROLS is not responsible the improper installation of these ACTUATORS.

19-3
Any unused conduit entry must remain plugged with the pipe plug supplied in the ACTUATOR. Do not remove as the unit is already sealed.

19-4
Certified cable entries rated for at least 90℃ must be used when installed.

19-5
If conduit is used for cable entry, a seal fitting with setting compound must be provided close to the entry.

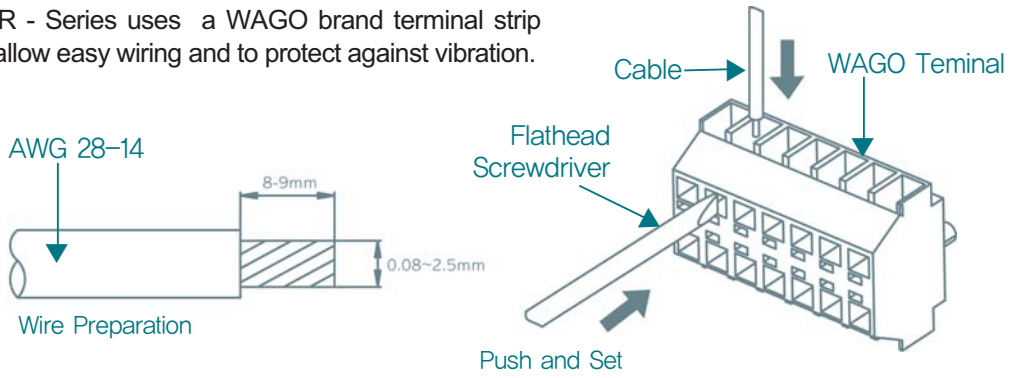
20. Electrical Wiring

20-1
Separate the cover of the Actuator by loosening the four cover bolts.

20-2
Confirm that the wiring diagram located in the Actuator and Wiring No. on the name plate match with each other.

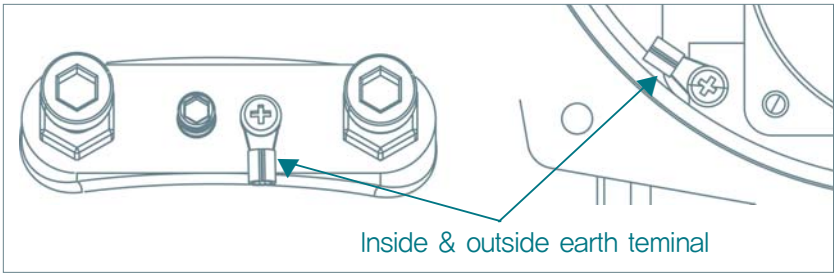
20-3
Confirm that the main power and power supply described on the name plate of Actuator match with each other.

20–4
CAR - Series uses a WAGO brand terminal strip to allow easy wiring and to protect against vibration.



Insert a small flathead screwdriver as shown to open the terminal point, then insert the wire

20-5
Be sure to properly ground the Actuator wiring to the grounding terminals provided on the inside and outside of the Actuator body.



20-6
Be sure to wire and energize the heater that is provided.

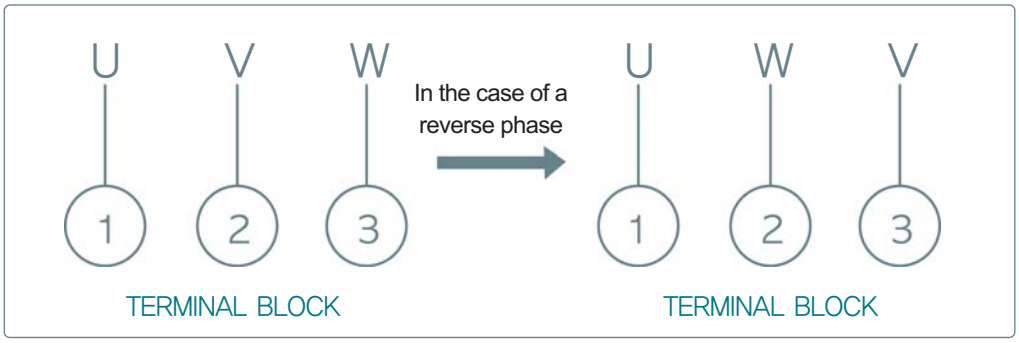
20-7
Each ACTUATOR must be powered by their own individual relays to prevent voltage feedback and ACTUATOR damage.

20-8
With a 3-phase (380V, 440V) powered Actuator, care must be taken to confirm the proper motor rotation when the power and signal are applied. If the Actuator rotates in the reverse direction than what is expected, the limit switches will not function correctly and a mis-wire has occured. Corrective action needs to be taken.

20-8-1
With power disconnected, manually operate the Actuator to a mid position.

20-8-2
Apply power / signal to rotate the Actuator open or closed and confirm the rotation is correct.

20-8-3
If the rotaion is incorrect, then shut off the Actuator and re-wire two of the three wires as shown.



20-9
After the wiring is completed in the Actuator, use wire ties to clean up the Actuator and group wires together, and be certain that the wires are secured away from any moving parts, remove any loose debris.

20-10
When all the work is completed, replace the top cover and secure it using the four cover screws.

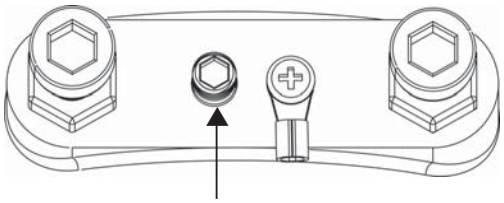
20-11
Apply the power and do a final check to confirm proper operation.

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.

21. Maintenance

21-1 Lubrication

Under normal conditions, no additional grease needs to be added to the Actuator. However if the ambient temperature is greater than 40c of the humidity is less than 15%, periodic re-greasing is recommended. The Recomended grease used in the CAR-Series Actuator is SHELL ALVIDA EP2.



Grease hole PT 3/8″ PLUG

21-2 Regular Checkup

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 are sealed at the Actuator and that the heater is energized.

22. Warranty Information

The warranty will be void under the following conditions.

22-1 Failure or damage caused by misuse or abuse.

22-2 Failure or damage caused by unauthorized modifications or repairs done to the ACTUATOR.

22-3 Failure caused by the unauthorized modification / change of the wiring.

22-4 Failure caused by a reverse phase mis-wire when using three phase power.

22-5 Failure caused by water leakage due to the improper sealing of the ACTUATOR conduit entries or by failure to install the cover properly.

22-6 Failure caused by improperly set limit switches.

22-7 Failure caused by fire, flood damage or other “acts of god”

22-8 Failure occuring 1 year after the shipment date.

23. 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 will not move		The worm wheel and mechanical limit stop is jammed	Loosen the mechanical limit stop and the valve mounting blots. Correct the mechanical stop position and then secure the mounting bolts and limit stop.
Level will not hold position when pulled toward the hand wheel		The worm wheel and mechanical limit stop is jammed	
The hand wheel is engaged and rotated, but the output drive bushing will not move.		Worm Wheel and Gear Separation and Failure	Disassemble the Actuator and replace damaged gear.
In manual operation, the Actuator will not cycle full open or full close		Mechanical limit stop is not set correctly	Reset the mechanical limit stop
Normal Operation by Remote location	Actuator will not cycle to full open or full close	Limit Switch malfunction and / or Mechanical limit stop set incorrectly	Reset the limit switch cam and reset the mechanical limit stop
	Actuator suddenly stops during operation	The over Torque Switch has tripped	Valves torque has increased. Valve needs to be checked / repaired or replaced, or the over torque switch has failed and needs to be reset
	Actuator will not function from remote location	Main Power Failure	Main Power Check
		Wire Disconnect or a Short circuit	Replace defective wire
		Motor or condenser is Damage	Replace Motor or condenser
		Motor has over heated	Do not over cycle the motor
		Wiring failure	Check the circuit diagram and wiring status
		Gears are JAMMED	Release JAMMED Gears
When 3-phase operation rotates ACTUATOR in the oppsit direction than the signal that is applied		Phase reversal	Switch two of the 3-phase wires
When ACTUATOR continues to rotate even after the cam strikes the limit switch		Limit Switch Failure, disconnect or short curcuit	Replace defective switch and reconnect loose wire
		Phase reversal	Switch two of the 3-phase wires

※ In addition to the above described mechanical / electric failures, other causes may be the reason for a failure based on the site conditions. For more information please contact CLORIUS CONTROLS for consulation. For faster service, please have all of the nameplate information avalible calling the factory.