

Building connections that last™



ABZ B Series

Electric Actuator Datasheet



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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.

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 actuators. 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 when the actuator installation is located in a hazardous area.

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 variations.

Heaters should be energized as soon as actuators are installed.

Improper storage of the actuator will VOID WARRANTY.

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

3. Actuator Specification

3-1 The ABZ, B-Series 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 ~ 158°F
Enclosure Type	Type 4, 4X / IP66

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

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 prevents the valve from drifting and back driving the actuator gears.

3-5 **Heater**

The 20 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 **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 available in the ABZ006 and ABZ009.

3-8 **Motor**

The actuator motor is protected with an embedded 150°C (300°F) 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 override or in the event of a limit switch failure.

3-11 **Adaptation**

Mounting is standardized to the ABZ inch based mounting specification as well as ISO5211 and the removable drive bushing can be machined to match the valve stem.

4. Standard Specification

Enclosure	Standard: IP66, NEMA 4, 4x CSA Certified Type 4, 4x (ABZ006-ABZ050) 120VAC
Ambient Temperature	Standard: -20°C to +70°C (-4°F to 158°F) Optional: -40°C to +70°C (-40°F to 158°F) Optional: -60°C to +70°C (-76°F to 158°F)
Ambient Humidity	90% RH Max (Non Condensing)
Power Supply	Standard: 120vac or 220vac 1-phase Optional: 380vac or 440vac 3-phase Optional: 24vdc or 24vac (ABZ006 thru ABZ028)
Torque Switches	Open and Close Torque Switches (ABZ015 thru ABZ350)
Motor Limit Switches	Open / Close Position Limit Switches
Auxiliary Switches	Open and Close Indication Switches (dry contact)
Stall Protection	Internal Thermal Protection Open: 150° C / 300° F, Close: 97° C / 207° F
Travel Angle	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 (Not available with EXT option)
Space Heater	20W
Conduit Entries	Two ¾" NPT
Lubrication	Shell Gadus S2 V220 2
Enclosure Material	Aluminum
Surface Treatment	Anodizing
External Coating	Polyester
Dielectric Strength	AC 1800V / 1min
Insulation	DC500V greater than 100M ohm
Anti-Vibration	X, Y, Z 10Hz-57Hz 0.15mm 30-min

5. Options

EXP	Flameproof Enclosure Ex dIIB T4 Gb (ATEX, NEPSI, GOST and KTL)
WTE	Enclosure IP68 (A-Series Only) 1 bar (24 inches) 72hrs (KTL)
ALS	Auxiliary open, close limit switches (dry contact)
ATS	Auxiliary Dry Contact indication over-torque switches (ABZ015 to ABZ350)
EXT	Extended Travel Angle (to 270°) (ABZ006 to ABZ100)
PIU	Potentiometer 1K Ohm
CPT	Current Position Transmitter Output: DC 4-20mA
DCT	VDC Position Feedback Transmitter 1-5VDC, 0-5VDC, and 0-10VDC
PCU	Proportional Control Unit Input: 4-20mA; 1-5v; 2-10v
LCU	Local Control Unit (see LCU literature) Material: Aluminum
IMS	Integral Motor Starter for 3-phase actuator
24V	24V (ABZ006 thru ABZ028) -- 24 AC / DC
CLC	Cycle Length Control

6. Performance

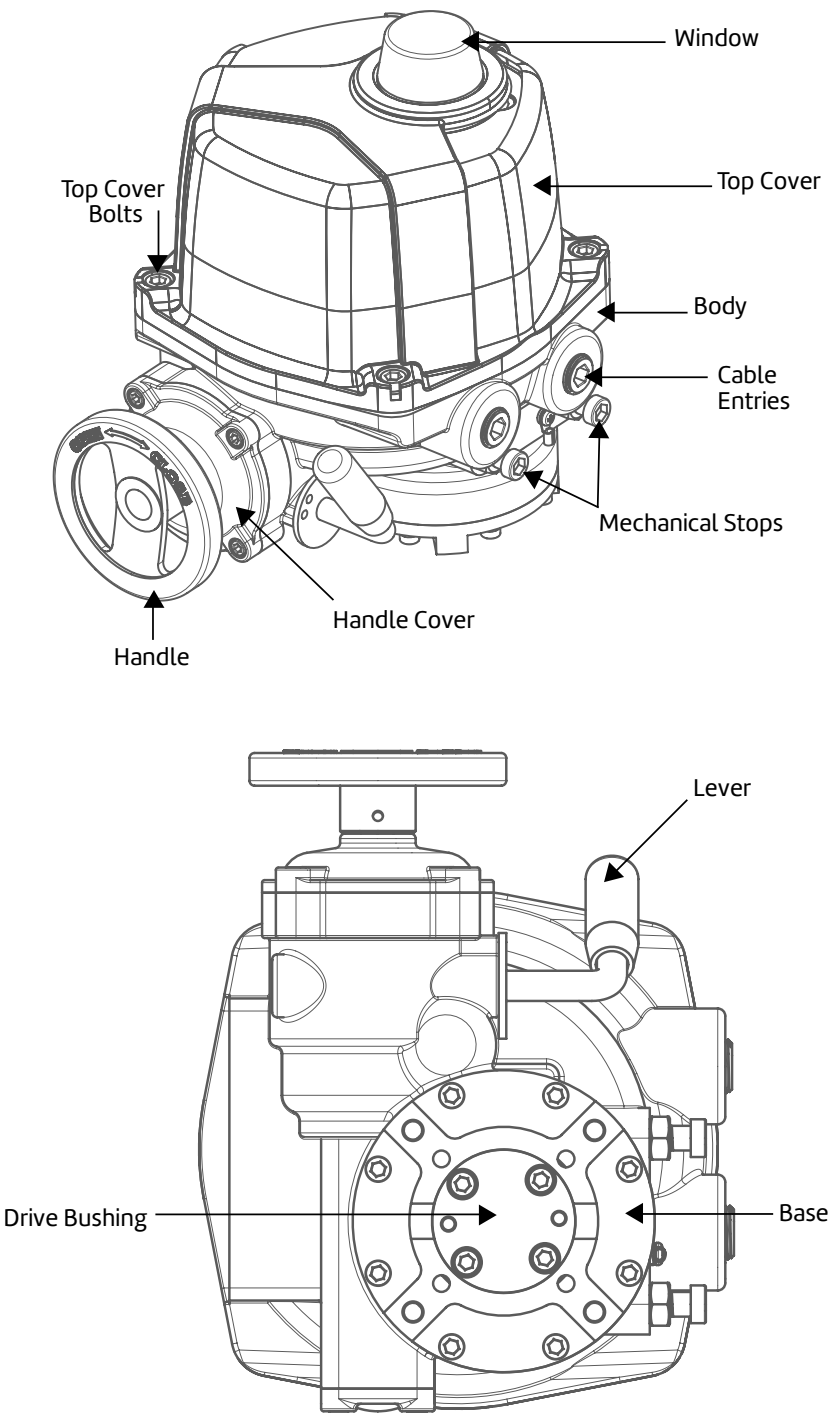
Type		ABZ 006	ABZ 009	ABZ 015	ABZ 019	ABZ 028	ABZ 038	ABZ 050	ABZ 060	ABZ 080	ABZ 100	ABZ 150	ABZ 200	ABZ 250	ABZ 300	ABZ 350
Max Output Torque	in-lbs	520	780	1301	1649	2430	3298	4340	5208	6944	8680	13020	17360	21700	26040	30300
	Nm	60	90	150	190	280	380	500	600	800	1000	1500	2000	2500	3000	3500
Operating Time (90 / sec)	50Hz	17	17	20	20	24	24	24	29	29	29	87	87	87	116	116
	60Hz	14	14	17	17	20	20	20	24	24	24	72	72	72	96	96
Standard Enclosure	STD	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66	IP66
Motor	W	15	25	40	40	60	90	90	180	180	90	180	180	180	180	180
	Class	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Duty Cycle	S4 (%)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Max Stem Dia (mm)	Bore	22	22	22	22	32	32	32	42	42	42	75	75	75	75	75
	Square	20	20	20	20	26	26	26	34	34	34	65	65	65	65	65
Mounting Base	ISO 5211	F07	F07	F07 / F10	F07 / F10	F10 / F12	F10 / F12	F10 / F12	F12 / F14	F10 / F12	F10 / F12	F16	F16	F16	F16	F16
	ABZ STD	3.25"	3.25"	3.25" / 5.00"	3.25" / 5.00"	5.00"	5.00"	5.00"	5.00"	5.00"	5.00"	6.50"	6.50"	6.50"	6.50"	6.50"
Handle Turns	STD	8.5	8.5	10	10	12.5	12.5	12.5	14.5	14.5	14.5	43.5	43.5	43.5	58	58
Weight	kg	11	11	14	14	17	17	17	24	25	25	64	65	65	65	65
	lbs	25	25	31	31	38	38	38	53	55	55	141	143	143	143	143

Performance – Rated / Starting Current

Type		ABZ 006	ABZ 009	ABZ 015	ABZ 019	ABZ 028	ABZ 038	ABZ 050	ABZ 060	ABZ 080	ABZ 100	ABZ 150	ABZ 200	ABZ 250	ABZ 300	ABZ 350
110V 50Hz	Rated Current (A)	0.7	1.1	1.6	1.6	1.6	2.3	3.5	3.5	3.8	4.0	3.5	3.8	4.0	4.0	4.0
	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	7.45	7.45
120V 60Hz	Rated Current (A)	0.7	1.1	1.7	1.7	1.8	2.8	3.7	3.7	4.7	4.7	3.7	4.7	4.7	4.7	4.7
	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	7.5	7.5
220V 50Hz	Rated Current (A)	0.38	0.51	0.75	0.75	0.75	1.1	1.2	1.2	1.8	2.0	1.2	1.8	2.0	2.0	2.0
	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	3.4	3.4
220V 60Hz	Rated Current (A)	0.42	0.52	0.9	0.9	0.9	1.2	1.5	1.5	1.8	2.0	1.5	1.8	2.0	2.0	2.0
	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	3.4	3.4
230V 50Hz	Rated Current (A)	0.38	0.56	0.75	0.75	0.75	1.06	1.2	1.2	1.8	2.0	1.2	1.8	2.0	2.0	2.0
	Starting Current (A)	0.6	0.8	1.05	1.05	1.3	1.8	2.3	2.3	3.3	3.3	2.25	3.3	3.3	3.3	3.3
380V 50Hz	Rated Current (A)	0.15	0.18	0.3	0.3	0.32	0.34	0.47	0.47	0.75	0.85	0.47	0.75	0.85	0.85	0.85
	Starting Current (A)	0.32	0.36	0.59	0.59	0.74	0.78	1.23	1.23	1.68	1.68	0.78	1.68	1.68	1.68	1.68
380V 60Hz	Rated Current (A)	0.15	0.18	0.3	0.3	0.32	0.37	0.56	0.56	0.85	0.9	0.56	0.85	0.9	0.9	0.9
	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	1.68	1.68
440V 50Hz	Rated Current (A)	0.15	0.18	0.3	0.3	0.32	0.34	0.47	0.47	0.75	0.85	0.47	0.75	0.85	0.85	0.85
	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	1.68	1.68
440V 60Hz	Rated Current (A)	0.15	0.18	0.3	0.3	0.3	0.32	0.46	0.46	0.75	0.9	0.46	0.75	0.9	0.9	0.9
	Starting Current (A)	0.32	0.46	0.59	0.59	0.74	0.78	1.24	1.24	1.68	1.68	0.78	1.68	1.68	1.68	1.68
DC 24V	Rated Current (A)	2.5	3.5	5.0	5.0	6.5	-	-	-	-	-	-	-	-	-	-
	Starting Current (A)	8.00	9.00	13.00	13.00	15.00	-	-	-	-	-	-	-	-	-	-

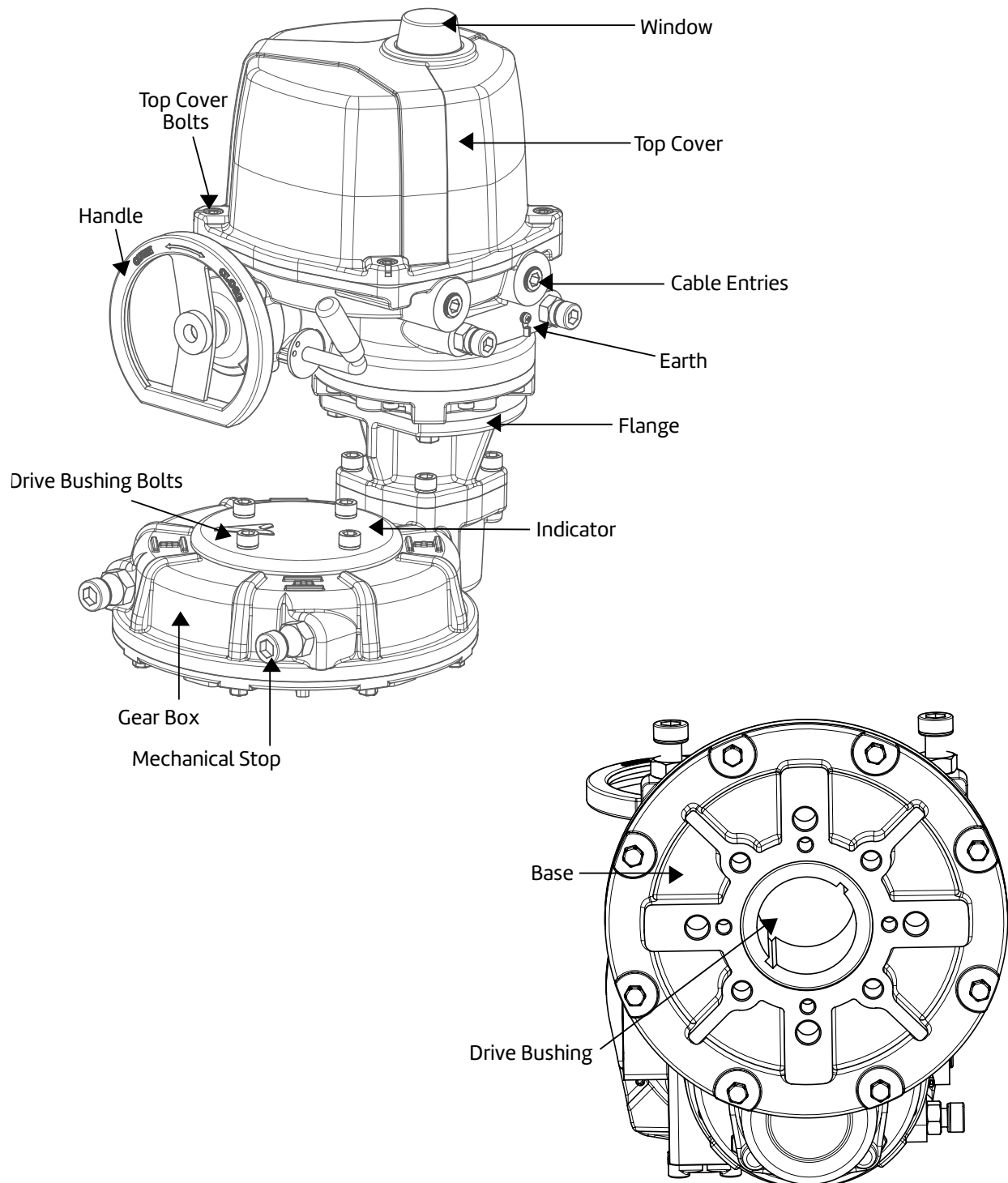
7. Exterior Parts Identification

7-1A ABZ006B thru ABZ100B



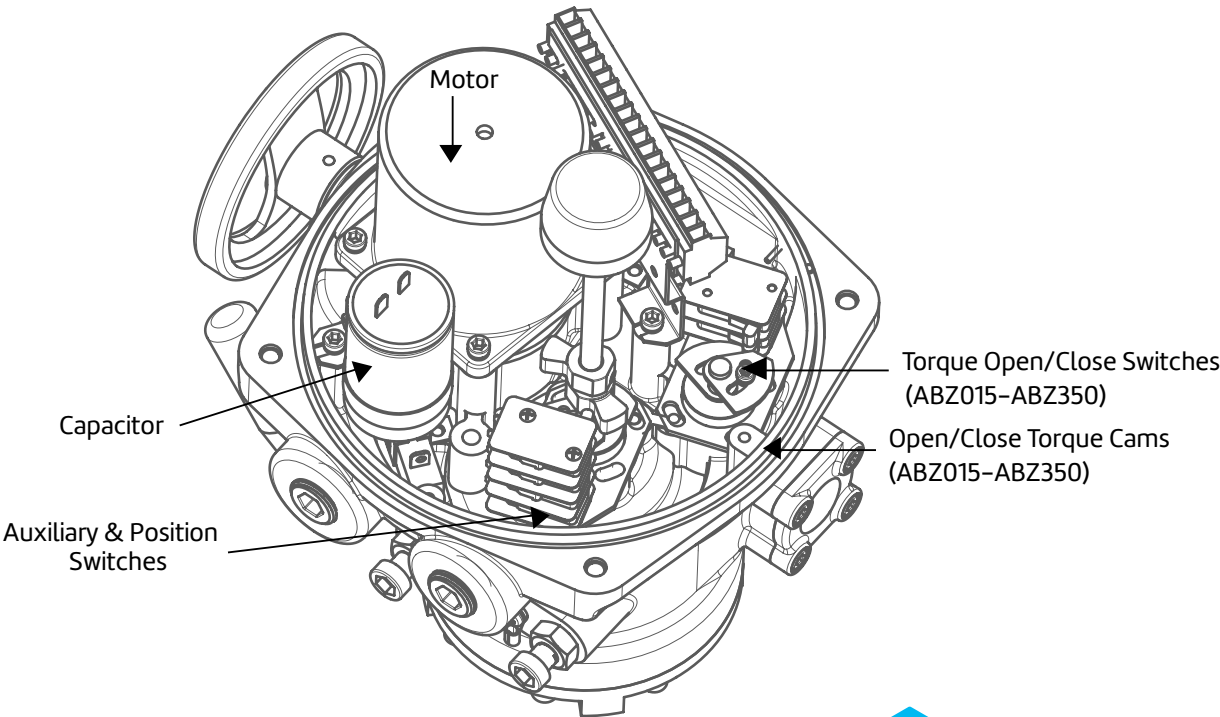
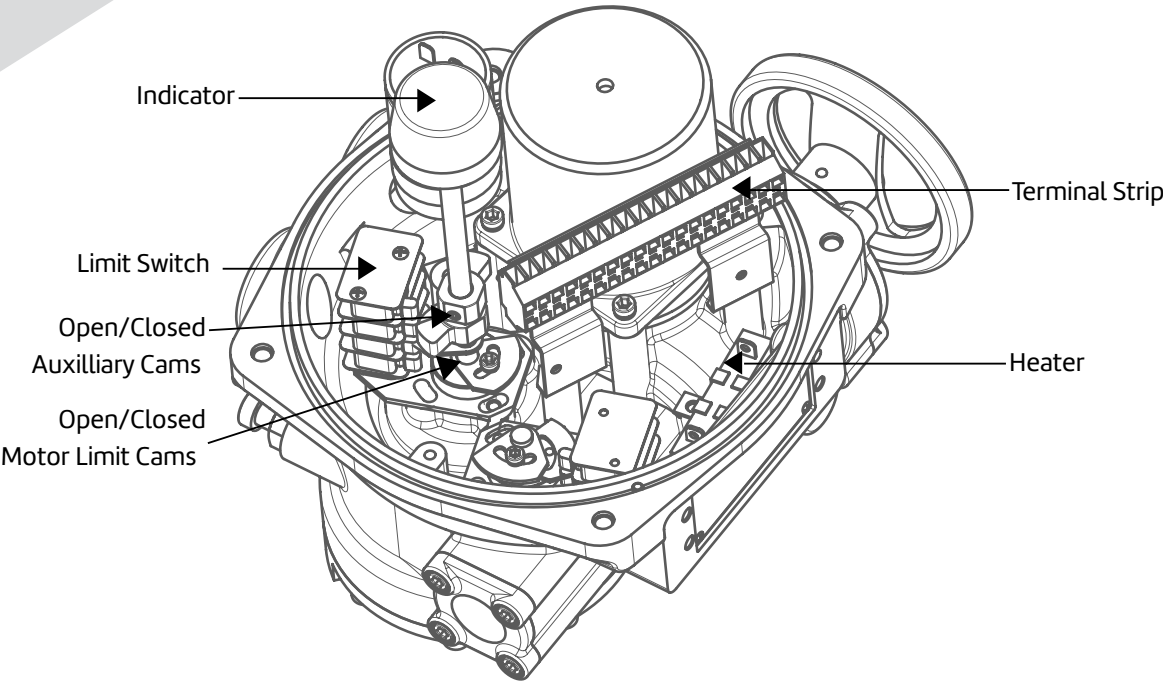
Exterior Parts Identification

7-2 ABZ150B thru ABZ350B






8. Interior Parts Identification

8-1 ABZ006B thru ABZ350B



9. Actuator Information

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

 ABZ VALVE <small>An ASC Engineered Solution</small>		855-803-6786 www.asc-es.com		 	
MODEL	ABZ	ENCLOSURE TYPE 4, 4X			
TORQUE	lbf-in	SUPPLY	1Ph	120 V	
SERIAL		AMP		A	
DUTY	%	EXTERNAL LOAD	15 A		
113 W. Main, Madison, KS 66860					

9-1 Model

Model Number

9-2 Torque

9-3 Serial Number

A unique serial number is issued for each actuator

9-4 Supply

Main Power supply voltage

9-5 Wiring Diagram

Electrical diagram for actuator as built, can be located inside top cover.
Contact supplier for additional information.

9-6 Options

Installed options will be shown in wiring diagram.

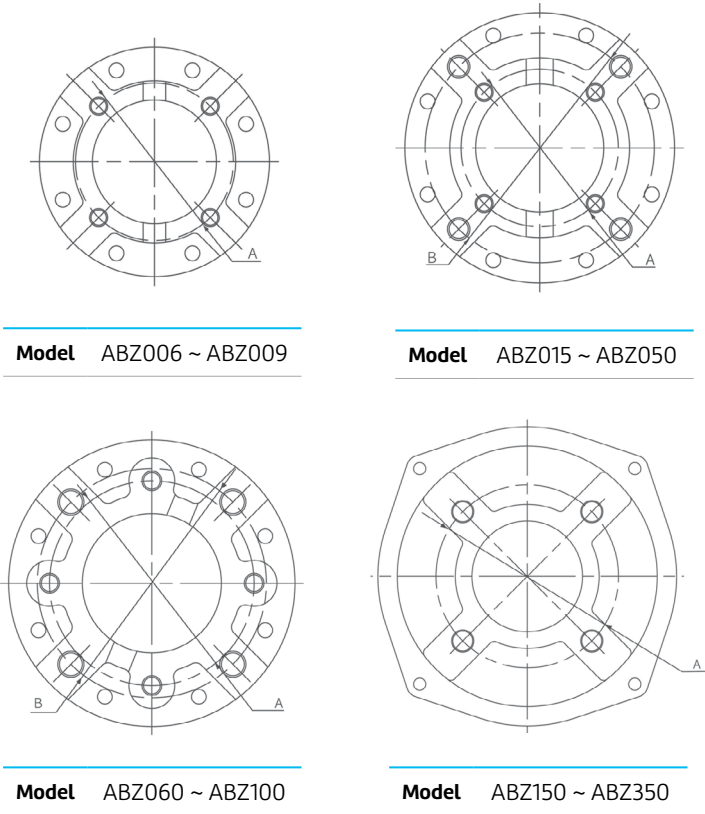
9-7 Flameproof / Explosion Proof Actuator Enclosure



ABZ B-Series Electric Actuators are type 4, 4x ONLY
See ABZ Series A for Explosion proof design.

10. Actuator Mounting Flange

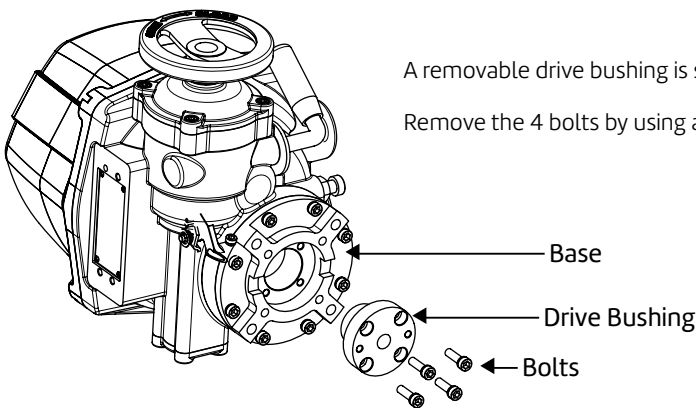
The ABZ-Series mounting flange is manufactured to both ABZ and ISO5211 standards.
If the actuator does not mount directly to the valve, then a mounting kit will need to be manufactured.



ABZ Model	006~009	015~019	028~050	060~100	150~350
ABZ FLANGE	3.25"	3.25" 5.00"	5.00"	5.00"	5.00" 6.50"
ABZ TAP	3/8"-16 (.47 dp)	3/8"-16 (.47 dp) 1/2"-13 (.59 dp)	1/2"-13 (.59 dp)	1/2"-13(. 59 dp)	1/2"-13 / 0.98 deep 3/4"-10 / 1.18 deep
ISO FLANGE	F07 / 2.76"	F07 / 2.76" F10 / 4.02"	F10 / 4.02" F12 / 4.92"	F10 / 4.02" F14 / 5.51"	F14 / 5.51" F16 / 6.50"
ISO TAP Metric	M8-1.25 (12 dp)	M8-1.25 (12 dp) M10-1.50 (15 dp)	M10-1.50 (15 dp) M12-1.75 (22 dp)	M10-1.50 (15 dp) M16-2.00 (22 dp)	M16-2.00 (30 dp) 3/4"-10 1.18 deep

11. Actuator Drive Bushing

11-1 Drive Bushings

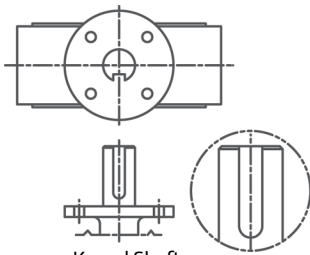
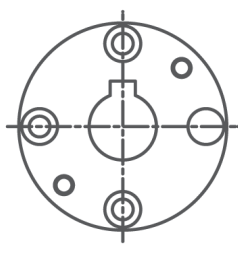
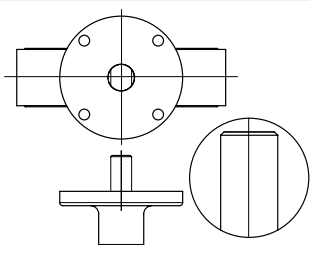
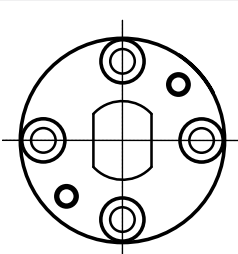


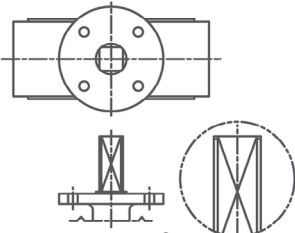
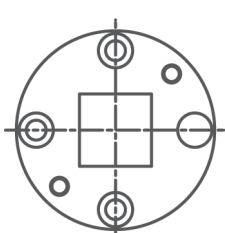
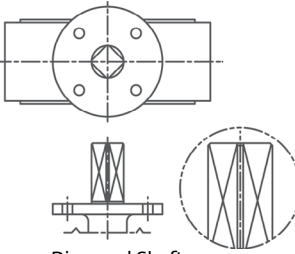
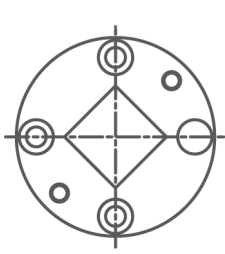
A removable drive bushing is supplied with each actuator that is machined to match the valve stem.
Remove the 4 bolts by using a metric allen-wrench and separate the drive bushing from the actuator.

11-2 Drive Bushing Adaptations

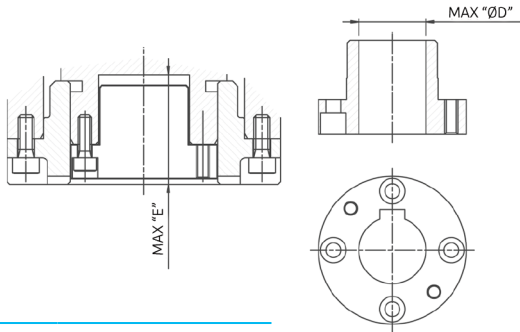


The drive bushing should be machined to match the valve stem dimensions when the valve is in the full open or full closed position. The actuator bushing can be provided machined and ready to mount to the valve if the valve drawing is provided to ABZ.

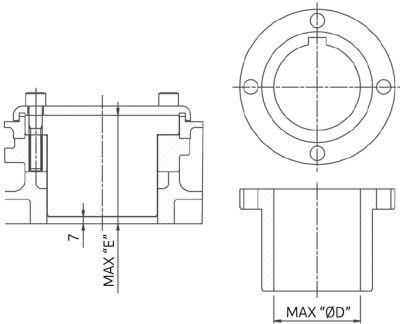
Shaft Orientation when Butterfly Valve is in Full Open	Machined Drive Bushing Orientation and Type
 <p>Keyed Shaft</p>	
 <p>Double "D" Shaft</p>	

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

11-3 Drive Bushing Information



Model ABZ006 ~ ABZ100



Model ABZ150 ~ ABZ350

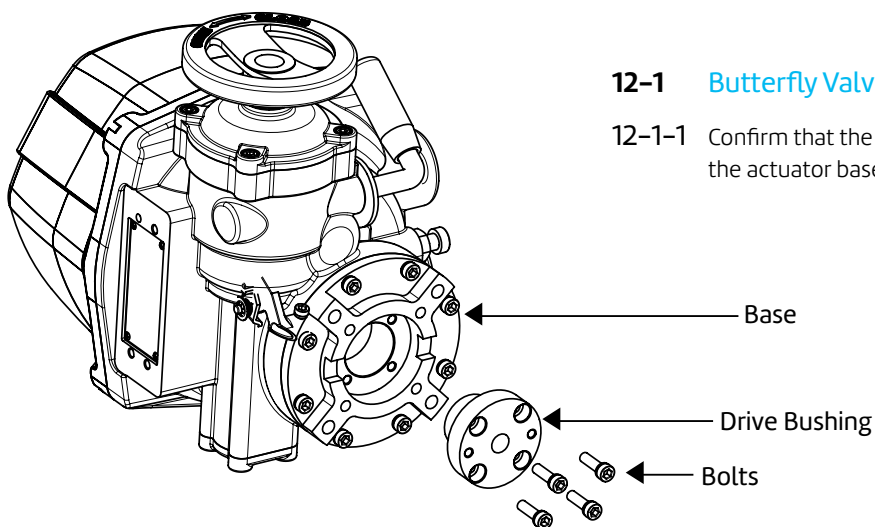
Model	Max "ØD"	Max Square	Max Depth "E"	Standard Bore*
	mm	mm	mm	in
ABZ006 ~ 009	Ø22	20	43	¾" x ½" Double D
ABZ015 ~ 019	Ø22	20	43	¾" x ½" Double D
ABZ028 ~ 050	Ø32	26	52	1-⅞" with ¼" key
ABZ060 ~ 080	Ø42	34	59	1-⅞" with ¼" key
ABZ100	Ø42	34	59	1-⅞" with ⅝" key

Model	Max "ØD"	Max "Square"	Max Depth "E"
	mm	mm	mm
ABZ150~350	Ø75	75	100

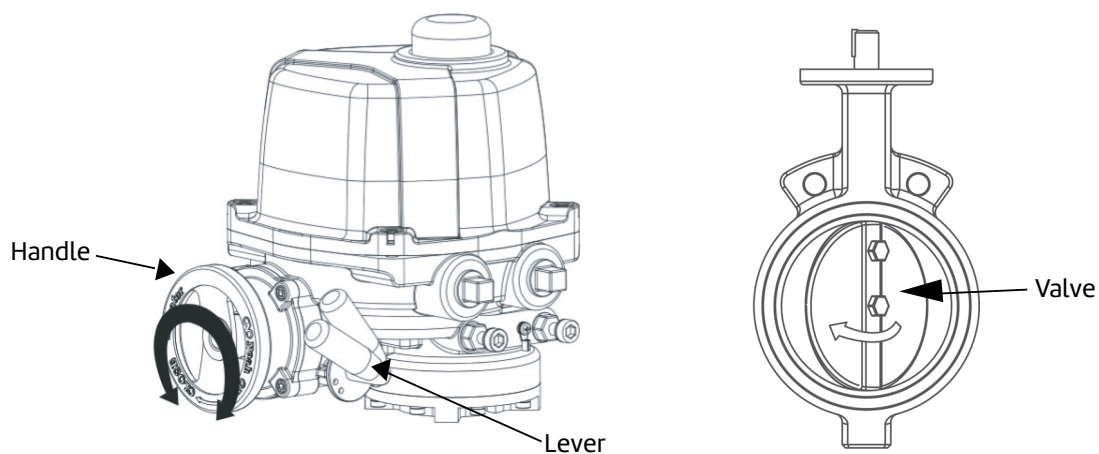
*Standard actuator bore is supplied with unmounted actuators. If an alternate bore is required, please contact customer service.

12. Actuator and Valve Assembly

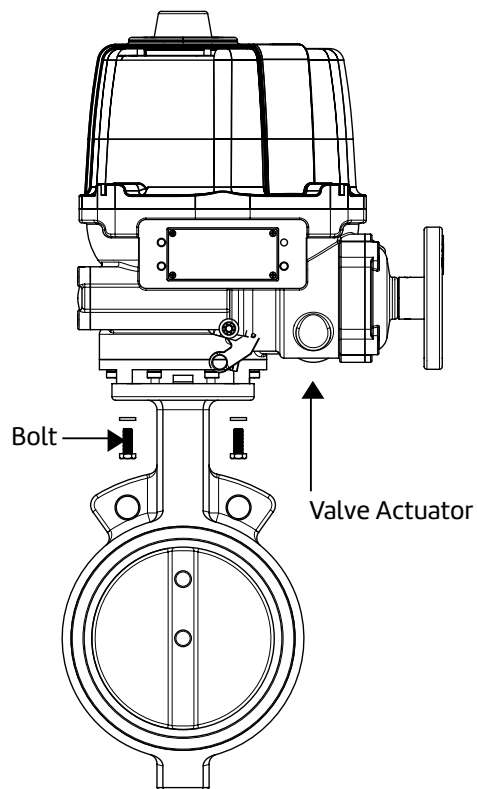
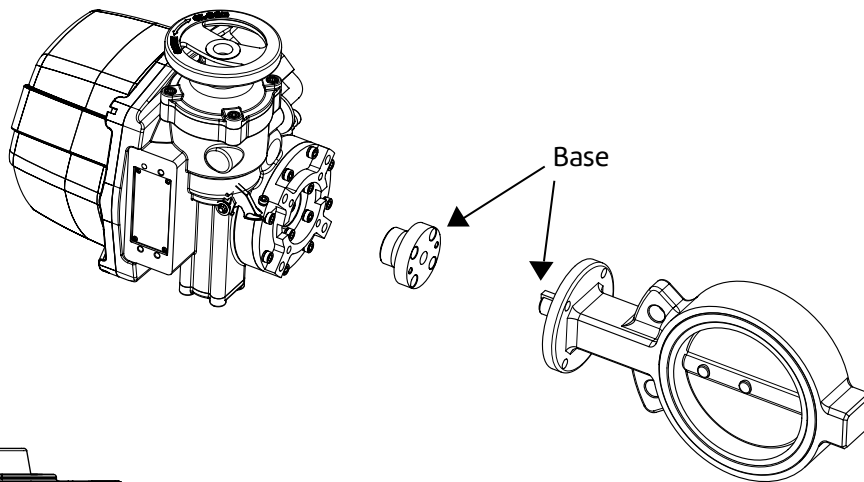
ABZ mounts and cycles each valve assembly, calibrating and setting switches as required.



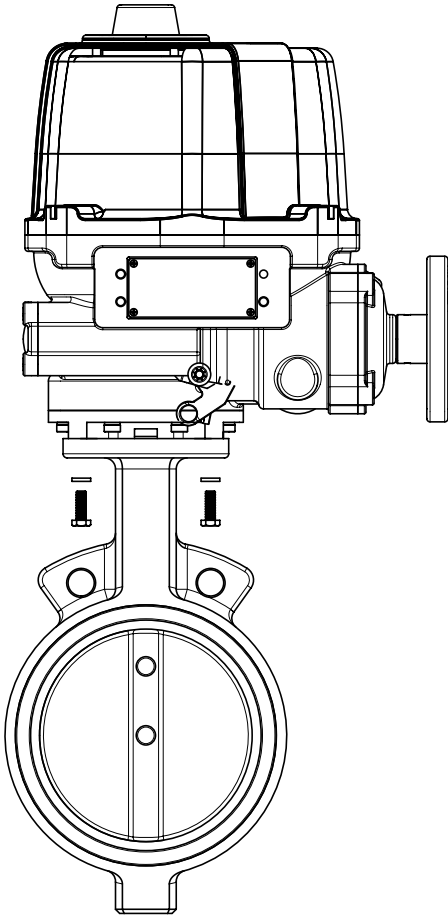
12-1-2 Pull lever to engage the handwheel, then rotate the actuator to the full clockwise / closed position and turn the valve shaft to the full closed position.



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



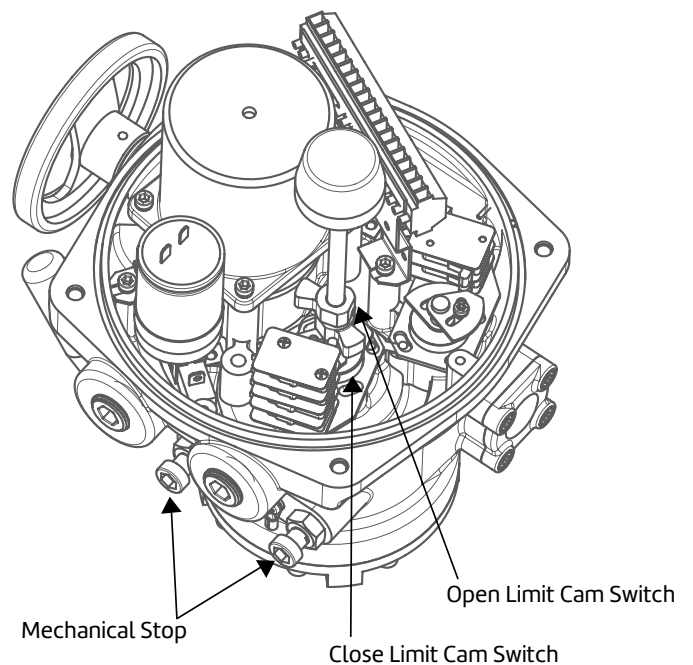
- 12-1-4 Fasten the actuator and valve together using stud bolts and nuts or hex bolts. Firmly tighten the assembly and confirm that there is no gap between the actuator and valve.

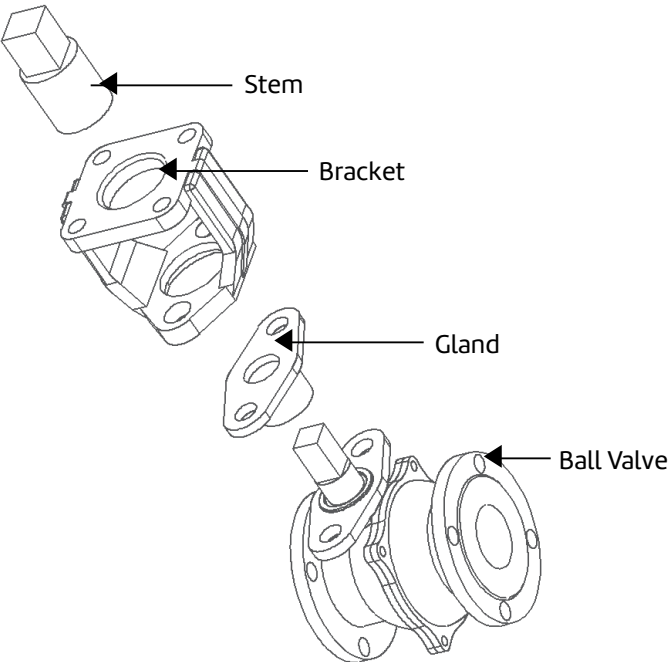


12-1-5 Engage the handwheel and rotate counter-clockwise (open). Confirm that the valve opens while turning the handwheel.

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)

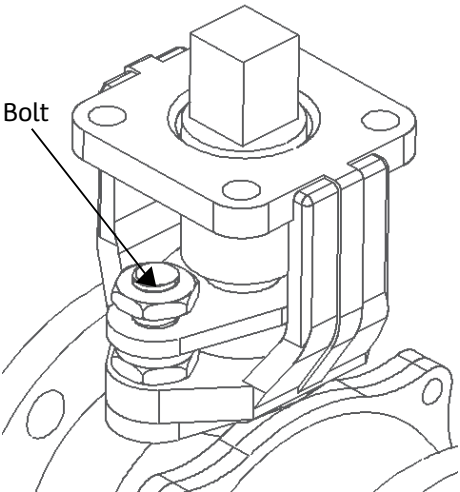
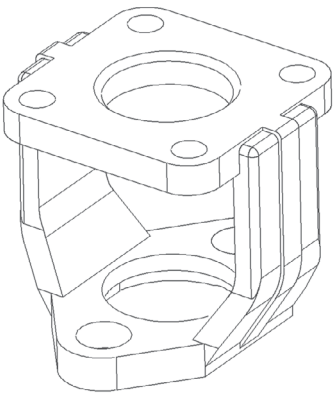




12-2 Ball Valve Assembly

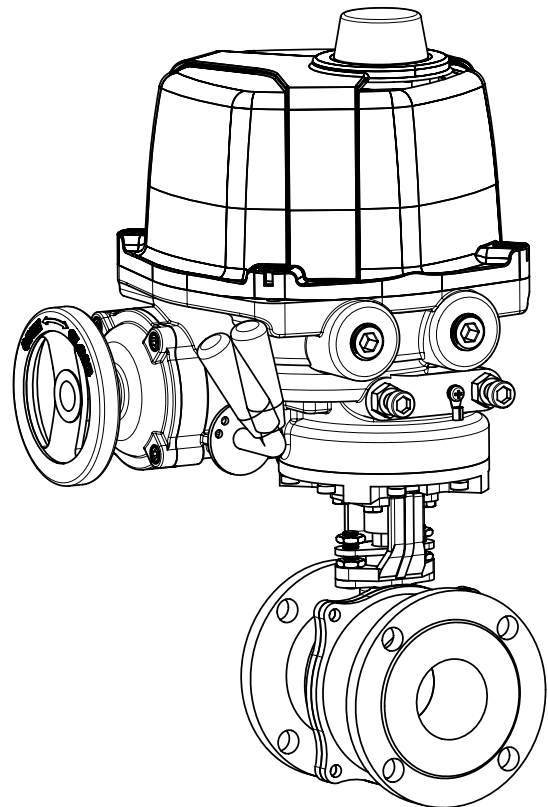
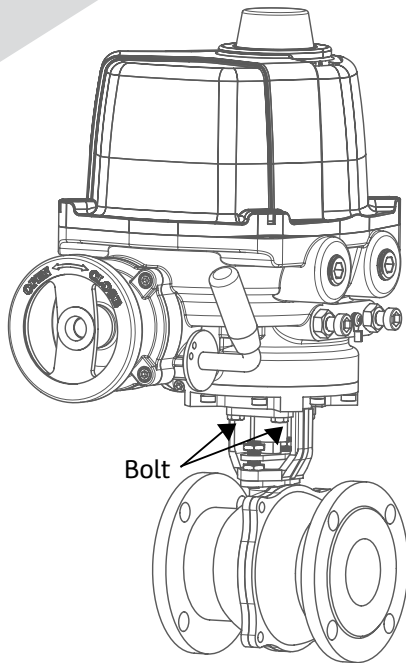
ABZ mounts and cycles the valve assembly, and then calibrates the limit switch settings.

- 12-2-1 To mount the actuator and ball valve, a separate mounting kit may be required. The mounting kit will need to be manufactured based on the actuator and valve mounting dimensions.



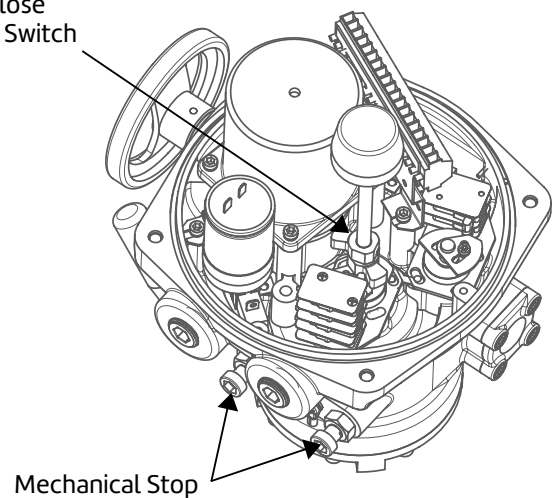
- 12-2-2 In general, when a mounting kit is designed on the ball valve, a gland is installed to prevent valve stem leakage of fluid and an adjustable bolt is installed to tighten the valve packing and stop any leakage.

- 12-2-3 Pull the lever and turn the handwheel counter clockwise to rotate the actuator to the full open position. Also, open the valve at this time.



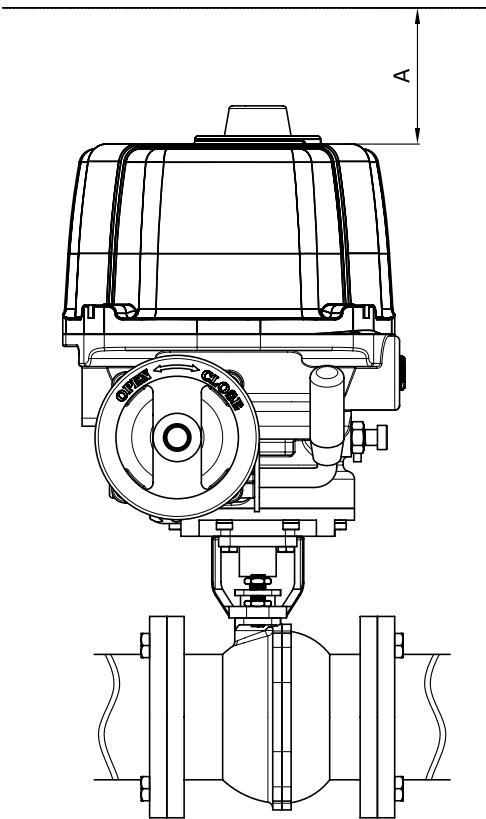
- 12-2-4 Apply a thin coat of grease, as needed, to the drive bushing and install in the actuator. Apply a thin coat of grease, as needed, to the valve stem coupling and then mount the actuator to the valve and mounting kit as shown.
- 12-2-5 Fasten the actuator, valve and mounting kit together using stud bolts and nuts or hex bolts. Firmly tighten the assembly together and confirm that there are no gaps between the components.
- 12-2-6 Confirm that the ball valve rotates open while you manually engage the manual override and rotate the handwheel counter clockwise. (Refer to Section 15. Limit Switch Setting)
- 12-2-7 Adjust the length of the mechanical limit stop. (Refer to Section 17. Mechanical Limit Stop Setting).

Open/Close
Limit Cam Switch

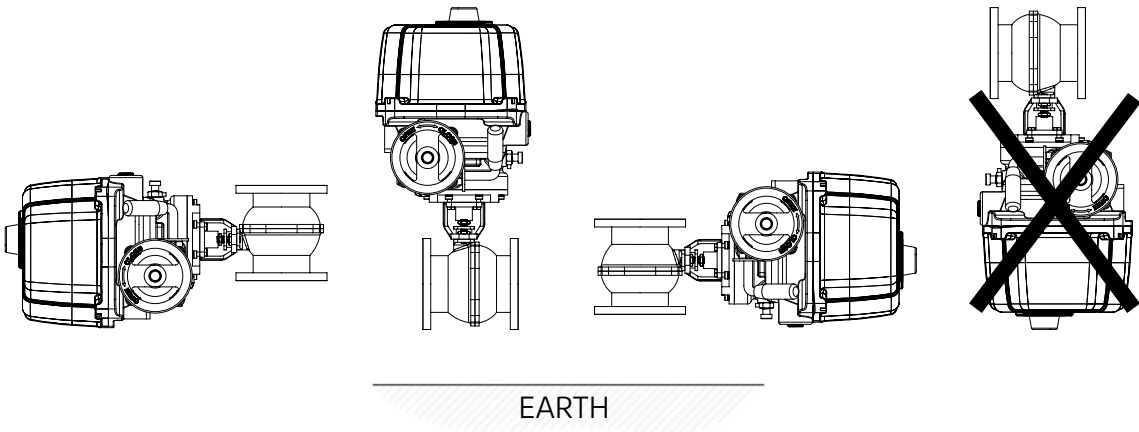


13. Actuator Installation

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

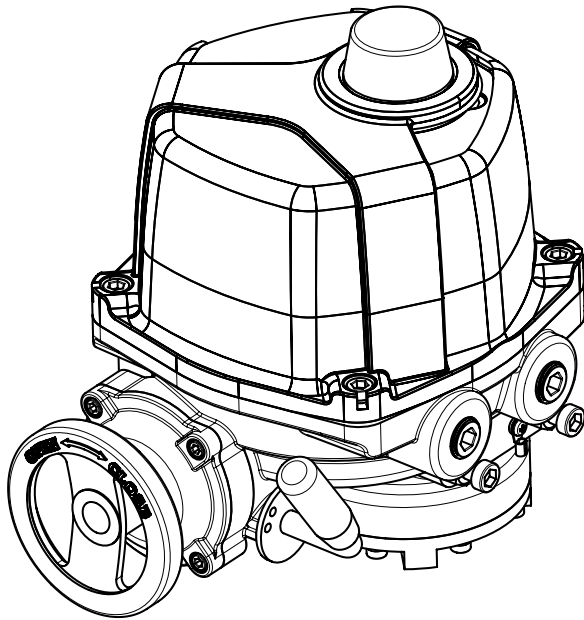


Model	A
ABZ006 ~ 009	108 mm / 4.25 in
ABZ015 ~ 019	108 mm / 4.25 in
ABZ028 thru 050	130 mm / 5.12 in
ABZ060 thru 100	178 mm / 7.01 in
ABZ150 thru 350	178 mm / 7.01 in



14. Manual Operation Upon Power Loss

- 14-1** Upon loss of power, pull the lever located on the side of the actuator toward the handwheel. The lever should "LOCK" in position. Turn the handwheel and the actuator output will rotate.
- 14-2** If the lever does not "LOCK" in the upright position, then turn the handwheel halfway and pull lever to the upright position.



Turn the handwheel clockwise for CLOSE
Turn the handwheel counter clockwise for OPEN

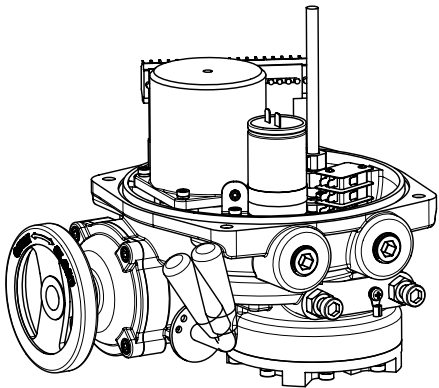
- 14-3** After the manual operation, leave the lever as is. When power is reapplied to the actuator, the lever will disengage and declutch the manual override. The actuator motor will then rotate the valve to the powered position.
- 14-4** If the lever does not "LOCK" in the manual position while trying to manually operate the actuator, then the actuator gearing may be jammed and needs to be checked.

15. Limit Switch Setting

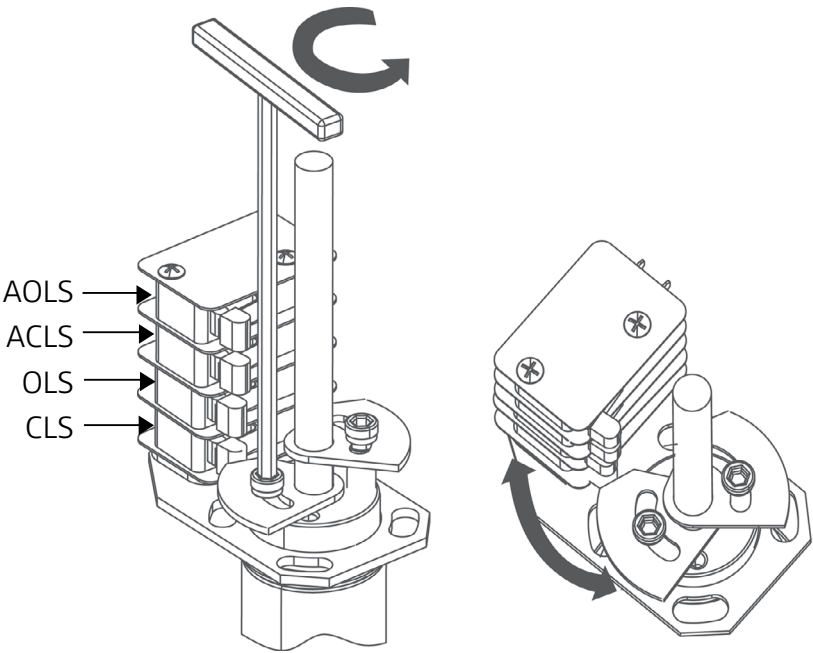
15-1 Close / Open Limit Switch Cam Setting

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 close / clockwise direction and engage the switch lever to actuate the switch. If auxiliary limit switches are included in the actuator, then set the corresponding auxiliary switch at this time.



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

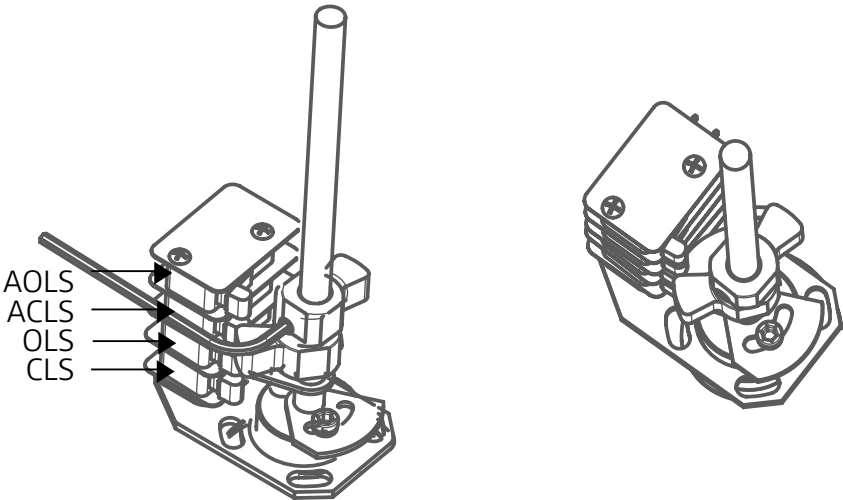


15-1-3 Firmly retighten the cam set screw.

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

15-2 Dry Contact Close / Open 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 auxiliary switch.



15-2-2 Firmly retighten the cam set screw.

15-2-3 To set the open auxiliary limit switch, follow the same procedure as above except that the rotation will be counter clockwise using the open auxiliary limit switch cam.

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

16. Over Torque Switch Setting

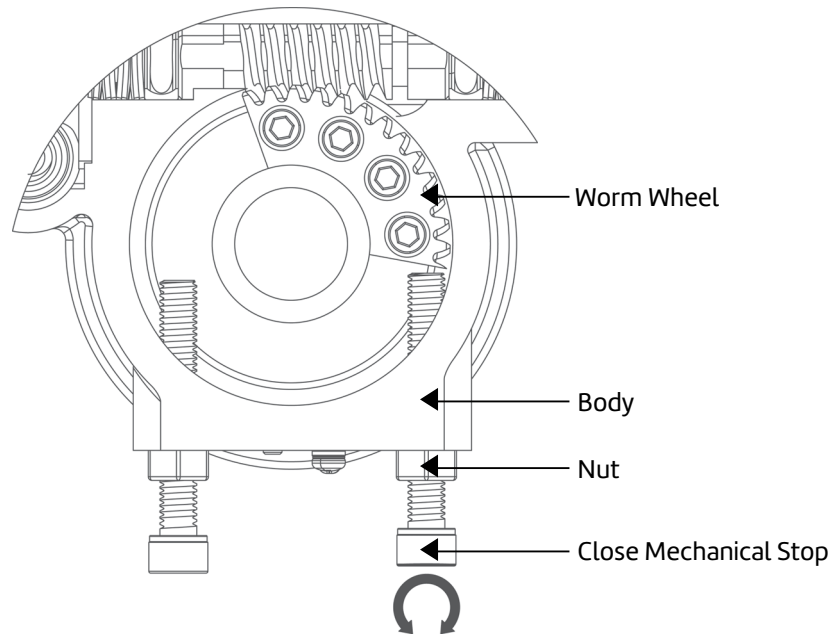


The over torque switches are factory set. Tampering with the over torque switch settings may damage the actuators and VOID the warranty. For more information contact ABZ.

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 an 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.



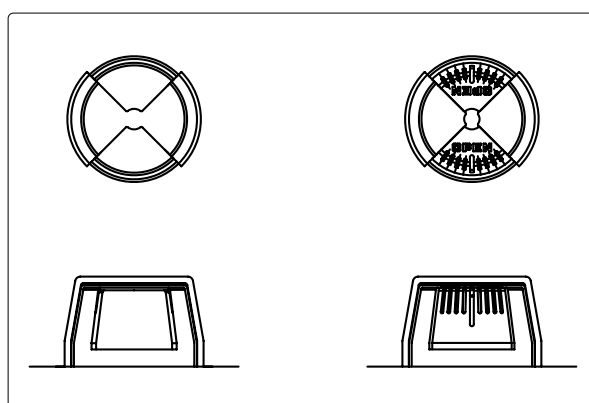
- 17-3** To set open limit stop, follow the above instructions except rotate the actuator in the counter clockwise rotation. back out two turns and lock it in place with the nut by tightening the nut against the body.



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 electrically. 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.

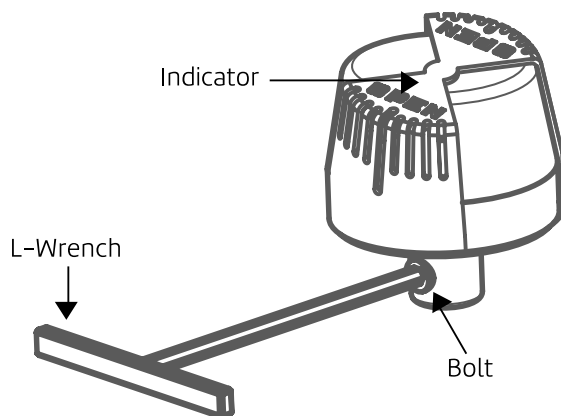
18. Visual Indicator Setting

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



Visual Indicator

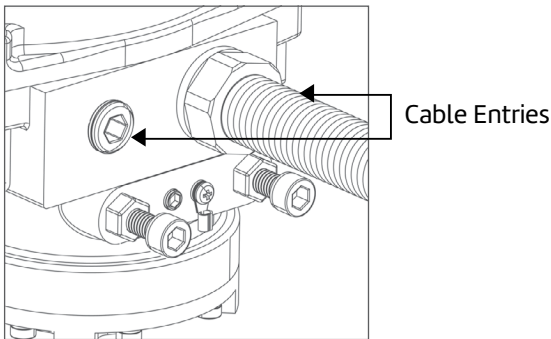
- 18-1** If the position shown on the indicator is incorrect, simply loosen the set screw and rotate the indicator to the correct position and retighten the set screw.



Indicator Adjustment

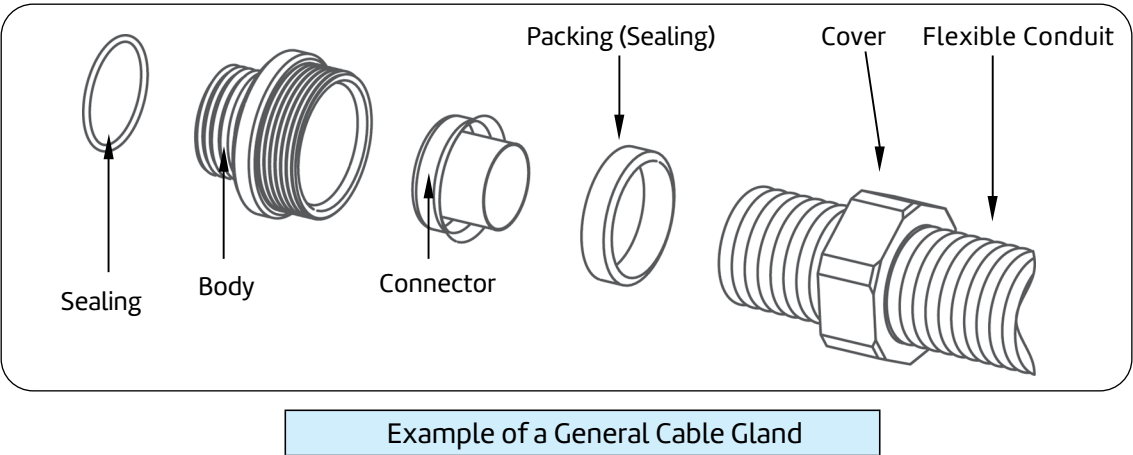
19. Wire Connection

19-1 Any unused conduit entry must remain plugged with the pipe plug supplied in the actuator.
Do not remove as the unit is already sealed.



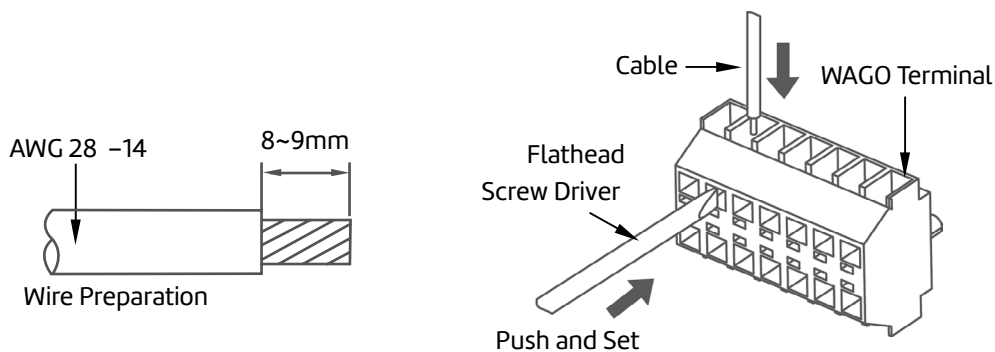
Cable Gland Spec.
(STD) 2-NPT 3/4"
2-PF 3/4"
2-M20

19-2 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 as this will help minimize humidity and water from entering the actuator enclosure. Also, adding a desiccant bag and a VCI (volatile corrosion inhibitor) sponge under the cover is also recommended for additional protection.

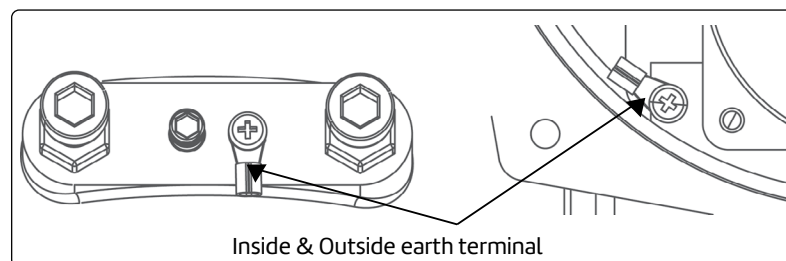


20. Electrical Wiring

- 20-1** Separate the cover of the actuator by loosening the four cover bolts.
- 20-2** Confirm the proper wiring diagram number.
- 20-3** Confirm that the main power and power supply described on the name plate of actuator match with each other.
- 20-4** ABZ Series uses a WAGO brand terminal strip to allow for easy wiring and to protect against vibration. Use the wire thickness within the standard size of AWG 28~14.

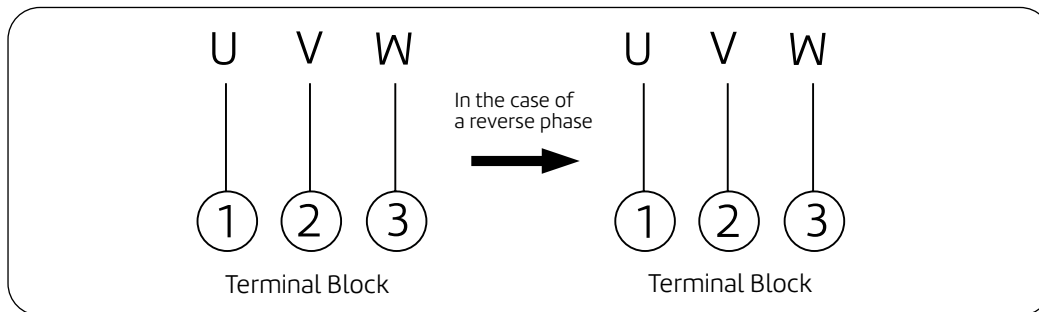


- 20-5** Insert a small flathead screwdriver as shown to open the terminal point, then insert the wire.
- 20-6** Be sure to properly ground the actuator wiring to the grounding terminals provided on the inside and outside of the actuator body.
The internal grounding wire gauge shall be at least the same as the conductor used.
The external grounding wire gauge shall be at least 14 gauge.



- 20-7** Be sure to wire and energize the heater that is provided.
- 20-8** Each actuator must be powered by their own individual relays to prevent voltage feedback and actuator damage.

- 20-9** With a 3 Phase (380, 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 miswire has occurred.
- 20-9-1** With power disconnected, manually operate the actuator to a mid position.
- 20-9-2** Apply power / signal to rotate the actuator open or closed and confirm the rotation is correct.
- 20-9-3** If the rotation is incorrect, then shut off the actuator and rewire two of the three wires as shown.



- 20-10** 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, and remove any loose debris.
- 20-11** When all the work is completed, replace the top cover and secure it using the four cover screws.
- 20-12** Apply the power and do a final check to confirm proper operation.



Main power must only be applied when the top cover is reinstalled on the actuator body. If the main power is on while wiring the actuator stop working 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 40°C (104°F) or the humidity is less than 15%, periodic regreasing is recommended. The recommended grease used in the ABZ Series actuator is SHELL Gadus S2 V220 2.

21-2 Regular Check Up

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 miswire 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 damaged, or other "acts of God."

22-8 Failure occurring 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 bolts. Correct the mechanical stop position and then secure the mounting bolts and limit stop
Level will not hold position when pulled toward the handwheel		
The handwheel 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 operations, the actuator will not cycle full open or full close	Mechanical limit stop is not set correctly	Reset the mechanical limit stop
Actuator will not cycle to full open or full close	Limit switch 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
Normal operation by remote location	Main power failure	Main power check
	Wire disconnect or short circuit	Replace defective wire
	Motor or capacitor is damaged	Replace motor or capacitor
	Actuator will not function from remote location	Motor has overheated
	Wiring failure	Check the circuit diagram
	Gears are jammed	Release jammed gears
When 3 phase operation rotates actuator in the opposite direction than the signal that is applied	Phase reversal	Switch two of the phase 3 wires
When actuator continues to rotate even after the cam strikes the limit switch	Limit switch failure, disconnect or short circuit	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 an actuator failure, i.e... site conditions. For more information please contact ABZ for consultation. For faster service, please have all of the nameplate information available when calling the factory.

Electric Actuator ABZ B Series



Example: E-015B-A1A

A size 015 actuator (1301 lbf-in), with IP67 enclosure, 120 Vac / 1 PH power supply, for standard On-Off service, with two limit switches.

How to Order B Series & A Series

E	-	015	B	-	A	1A	-	A1						
		1 Size	2 Type		3 Voltage	4 Service		5 ALS	6 Feedback	7 RCT	8 Temp	9 LCU	10 Suffix	

1	Model / Size	Model / Size
Code	lbf-in	Code
006	520	080
009	780	100
015	1301	150
019	1649	200
028	2430	250
038	3298	300
050	4340	350
060	5208	

2	Type
Code	
B	IP67, Dust-tight, weather-tight, Type 4 / 4x
X	Explosion Proof
W	IP68, Dust-tight, water-tight, Type 4 / 4X / 6

3	Voltage
Code	
A	120 Vac / 1PH
B	220 Vac / 1PH
C	24 Vac / 1PH (006 - 028)
D	24 Vdc (006 - 028)
E	380 Vac / 3PH
F	440 Vac / 3PH
G	24 AC / DC (006 - 028) (on / off)

4	Service & Control Type (Card)
Code	
4N	NOTE: If selecting Full Featured Local Control Unit, USE THIS CODE [See Local Control / Local Override, codes N1 to N3M]

Open / Close (On-Off):	
Standard	
1A	On / Off, 2-Position Control (All Voltages)
With Motor Interface	
1B	AC Motor Interface with speed control [120 Vac]
1C	AC Motor Interface with speed control [220 Vac]
1D	AC Motor Interface with speed control [24 Vac]
1K	AC Motor Interface with speed control [3-phase]
With Motor Starter	
1E	Integral Motor Starter (IMS), Latching [3-phase]
1M	Integral Motor Starter (IMS), Non-Latching [3-phase]

Modulating:	
Digital Controller	
2A	Digital High-Resolution Controller, Vdc or mA signal [120 Vac]
2B	Digital High-Resolution Controller, Vdc or mA signal [220 Vac]
2C	Digital High-Resolution Controller, Vdc or mA signal [24 Vac]
2D	Digital High-Resolution Controller, Vdc or mA signal [3 phase]
2E	Digital High-Resolution Controller, Vdc or mA signal [24 Vdc]
3A	Digital High-Resolution Controller, 0-135 Ohm slidewire signal [120 Vac]
3B	Digital High-Resolution Controller, 0-135 Ohm slidewire signal [220 Vac]
3C	Digital High-Resolution Controller, 0-135 Ohm slidewire signal [24 Vac]
3D	Digital High-Resolution Controller, 0-135 Ohm slidewire signal [3-phase]
3E	Digital High-Resolution Controller, 0-135 Ohm slidewire signal [24 Vdc]

Log Rate Controller - Analog	
2F	Analog, Log Rate Controller, Vdc or mA signal [120 Vac]
2G	Analog, Log Rate Controller, Vdc or mA signal [220 Vac]
3F	Analog, Log Rate Controller, 0-135 Ohm slidewire signal [120 Vac]
3G	Analog, Log Rate Controller, 0-135 Ohm slidewire signal [220 Vac]

Motor Controller - Analog	
2H	Analog AC Motor Controller, Vdc or mA signal [120 Vac] (Max size 028)
2J	Analog AC Motor Controller, Vdc or mA signal [220 Vac] (Max size 038)
3H	Analog AC Motor Controller, 0-135 Ohm slidewire signal [120 Vac] (Max size 028)
3J	Analog AC Motor Controller, 0-135 Ohm slidewire signal [220 Vac] (Max size 038)
2K	Analog DC Motor Controller, 4-20 mA signal [24 Vdc]
3K	Analog DC Motor Controller, 0-135 Ohm slidewire signal [24 Vdc]

How to Order B Series & A Series (cont.)

5 Auxiliary Limit Switches (ALS)	
Code	Standard: 2 switches (one set) [Note-1]
A1	NOTE: If selecting Full Featured Local Control Unit, USE THIS CODE [See Local Control / Local Override, codes N1 to N3M]
A0	No Auxiliary Limit Switches
A2	4 switches (Two sets) [Note-2]
A5	5 switches – "1A" Service Code Only
Note-1: If Size 006 to 019 actuator and Type "X" or "W", use "A0" (no switches). EXCEPTION: If Service Code = "1A", "1E", or "1M". Note-2: If Size 006 to 019 actuator, "A2" only available with Service Codes = "1A", "1E", or "1M".	

6 Position Feedback	
Code	Standard: 2 switches (one set) [Note-1]
<blank>	None
NOTE: If selecting Full Featured Local Control Unit, USE THIS CODE [See Local Control / Local Override, codes N1 to N3M]	
Potentiometer – Feedback Digital Controller	
B	Potentiometer Feedback, 1000 Ohm (on / off only)
Transmitter – Position Feedback	
All Configurations EXCEPT Digital Controllers	
C	Position Feedback Transmitter, 4–20mA
E	Position Feedback Transmitter, 2-wire Loop Powered (on / off only)
All Configurations EXCEPT Digital Controllers (2A to 2E, 3A to 3E), and Analog DC Motor Controllers (2K & 3K)	
D	Position Feedback Transmitter, 0–5 or 0–10 Vdc
Modulating, Digital Controller	
G	Position Feedback Transmitter, 4–20 mA / 0–10 Vdc [for Vac Digital Controllers only]
H	Position Feedback Transmitter, 4–20 mA [for all Digital Controllers]
J	Position Feedback Transmitter with Relays, 4–20 mA / 0–10 Vdc [for Vac Digital Controllers only]
K	Position Feedback Transmitter with Relays, 4–20 mA [for all Digital Controllers]

Modbus

Modulating, Digital Controller	
L	Modbus Option Module [all voltages]

7 Repeat Cycle Timer	
Code	None
<blank>	NOTE: If selecting Full Featured Local Control Unit, USE THIS CODE [See Local Control / Local Override, codes N1 to N3M]
K	Repeat Cycle Timer (On / Off Service ... code 1A Only); 120 & 220V 1-Phase

8 Temperature	
Code	
<blank>	Standard: Low Temp (–20° C)
L4	Low Temp (–40° C)
L6	Low Temp (–60° C)

9 Local Control Unit / Local Override – Mounted to Actuator	
Code	
<blank>	None
Standard – IP67	
M1	<ul style="list-style-type: none"> • Vac only (except 24 Vac) • If modulating, Digital Controller required. Enter modulating service code. [see "SERVICE & CONTROL TYPE (Card)"]

Full Featured Local Control Units

▷	LCD Display
▷	Cycle counter
▷	Auto-calibration, including limits
▷	Phase Protection / Detection

Open-Close / On-Off IP67

N1	• Vac only (except 24 Vac)
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Explosion Proof

N2	<ul style="list-style-type: none"> • Explosion Proof • Vac only (except 24 Vac)
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IP68

N3	• Vac only (except 24 Vac)
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Modulating IP67

N1M	<ul style="list-style-type: none"> • Vac only (except 24 Vac) • Includes modulation package, including feedback NOTE: "SERVICE & CONTROL TYPE" = code N4
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Explosion Proof

N2M	<ul style="list-style-type: none"> • Explosion Proof • Vac only (except 24 Vac) • Includes modulation package, including feedback NOTE: "SERVICE & CONTROL TYPE" = code N4
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IP68

N3M	<ul style="list-style-type: none"> • Explosion Proof • Vac only (except 24 Vac) NOTE: "SERVICE & CONTROL TYPE" = code N4
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10 Suffix	
Code	
<blank>	None

About ASC Engineered Solutions

ASC Engineered Solutions is defined by quality—in its products, services and support. With nearly 2,000 employees, the company's portfolio of precision-engineered piping support, valves and connections provides products to more than 4,000 customers across industries, such as mechanical, industrial, fire protection, oil and gas, and commercial and residential construction. Its portfolio of leading brands includes ABZ Valve®, AFCON®, Anvil®, Anvil EPS, Anvil Services, Basic-PSA, Beck®, Catawissa, Cooplet®, FlexHead®, FPPI®, Gruvlok®, J.B. Smith, Merit®, North Alabama Pipe, Quadrant®, SCI®, Sharpe®, SlideLOK®, SPF®, SprinkFLEX®, Trenton Pipe and VEP. With headquarters in Oak Brook, IL, ASC also has ISO 9001:2015 certified production facilities in PA, TN, IL, TX, AL, LA, KS, and RI.



asc-es.com

Building connections that last™

