Bear BA Linear Actuator

Solar Ready & Power Fail Safe

www.calscan.net

Calscan's Bear BA series of linear actuators are designed for the 21st century zero-emission well site by replacing fuel gas powered pneumatic actuators with electric ones. Advanced electronics and a high efficiency brushless DC motor gives low active and standby energy consumption ideally suited for remote non-grid power sites, such as solar, TEG or methanol fuel cell. When combined with the Bear Fail Safe Controller (FSC) up to 9 standard DC powered electric actuators can be made power fail safe.

Easily installed on standard control valves such as standard ET and D-body valves, BA linear actuators can be used in processes for throttling or on-off control. When throttling the actuator gives improved PID loop performance versus pneumatic actuators because of the precise mechanical gearing system.

Features:

- Explosion Proof Class I Zone 1 Certified
- Power and RTU fail safe operation when used with the Bear FSC and Bear UPS
- Fail on Loss of Signal (Open or Closed)
- Actuating Current @ 24DC < 4.2A
- Low quiescent current for solar powered operation <50mA
- Wide 20 to 35VDC or 90 to 264VAC operating range
- Brushless DC Motor with cut-motor protection
- 4-20mA, 0(1)-10 Volt Modulating, or 24DC Digital On/Off Control
- Single Handed Manual Override
- Blockage Detection, Soft Seating, Split Range Operation
- Suitable on 1" and up to 4" Control Valves

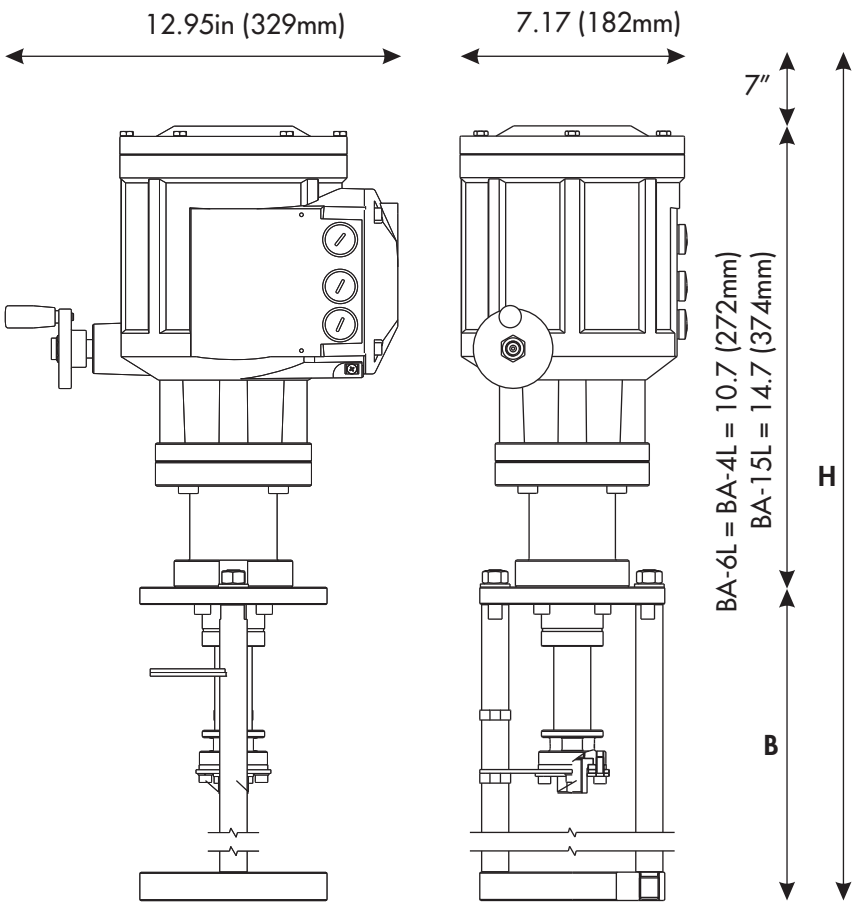
Mechanical Ratings

Thrust and Speed

Model	Max Continuous Modulating Thrust kN (lbf) - S9 Class D	Max On/Off Seating Thrust kN (lbf) - S2 Class A	Max Speed mm/sec	Min Speed mm/sec	Max Stroke mm
BA-15L	10 (2250)	15 (3300)	1.5	0.3	85
BA-6L	4.0 (900)	6.0 (1350)	2.0	0.4	55
BA-4L	2.5 (560)	4.0 (900)	5.0	1.2	55

Max Continuous and On/Off thrust is at max speed

Dimensions



Brackets

BA-15L

Bracket Part #	Valve Type	Height in Inches	
		H	B
E	E Body Style	36.7	15
D	D Body Style	34.2	12.5

3/4in and 1/2in Stem only

BA-6L and BA-4L

Bracket Part #	Valve Type	Height in Inches	
		H	B
D2	D2 Fisher / Norriseal 2275	26.5	8.8
D3	D3 Fisher	26.8	9.1
D4	D4 Fisher	27.2	9.5

1/2in and 3/8in Stem only

Flamepath Integrity

With explosion proof enclosures, it is critical that the flamepath is not damaged. When opening the actuator enclosure the technician must be careful not to inadvertently damage the flanges on the lid or on the inside of the actuator.

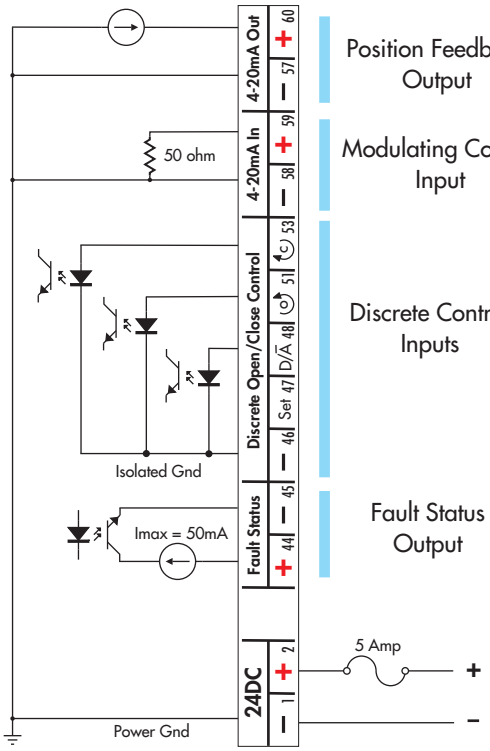
Once damaged there is no guarantee the flamepath will properly cool the flame to prevent an explosion.

Holes, gouges or scratches on the flamepath means the actuator is no longer explosion proof

Technical Data

Type		
Enclosure Protection		IP 67
Cable Entries		Three M20x1.5 shipped with adapters to 1/2in NPT
Electrical Connection		Spring Terminal Board in Separate Terminal Box: 4mm^2 (12AWG)
Valve Attachment		DIN 3358, F10
Positioning Accuracy		< 0.5 %
End Position Stop		Electronically adjustable torque or limit in both directions
Approximate Weight	BA-4L & BA-6L BA-15L	30.8 (14) lbs (kg) 33.1 (15)

Electrical Connections



Position Feedback Output

Position Feedback and Modulating Control signals can be configured for 0(4) to 20mA or 0(1) to 10 Volts

Modulating Control Input

The 4-20mA ground connections (pin 57 and 58) are not ground isolated and connected internally to the Power Gnd (pin 1). Only attach 4-20mA ground connection if the associated equipments 4-20mA connection is galvanically isolated.

Discrete Control Inputs

Discrete Control lines all use positive logic

Energize the D/A input for Discrete Open/Close actuation or ground/leave unconnected for Analog (4-20mA) Modulating actuation

For fail close discrete operation configure the 4/20mA to Failsafe 0% and connect the actuation control line to Open (pin 51) and bridge signal to D/A (pin 48) input

For fail open discrete operation configure the 4/20mA to Failsafe 100% and connect the actuation control line to Close (pin 53) and bridge signal to D/A (pin 48) input

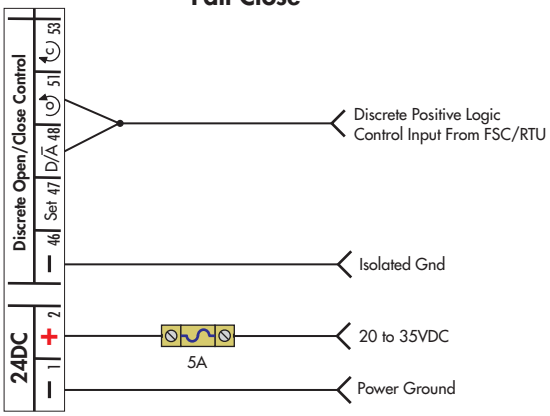
Fault Status Output

24VDC Max 50mA Galvanically Isolated

Power Connection nominal 24VDC
Protect with 5 Amp Slow Blow Fuse

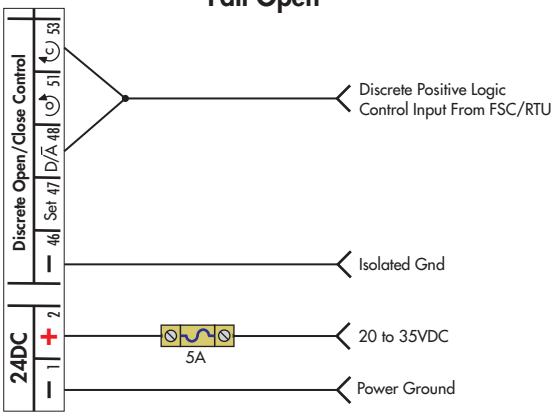
Example Actuator Wiring Diagrams

Discrete Open/Close Control Fail Close



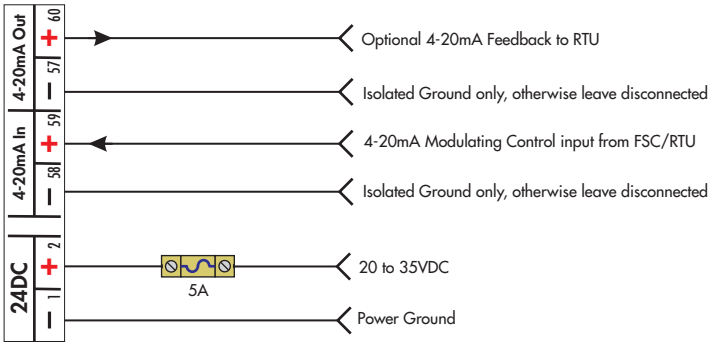
In program mode set the 4-20mA Failsafe Parameter to Fail Close

Discrete Open/Close Control Fail Open



In program mode set the 4-20mA Failsafe Parameter to Fail Open

4-20mA Modulating Control



In program mode set the 4-20mA Failsafe Parameter to either Fail Open or Close

Nominal Electrical Ratings

Parameter		Min	Max	Unit
DC Supply Voltage		20	35	VDC
AC Supply (47 to 63Hz)		90	264	VAC
Quiscent (Idle) Current			<50	mA
24DC Operating Current (Fused to 5 Amps)		0.5	<4.5	A
230VAC Operating Current	BA-15L BA-6L & BA-4L		0.60 0.30	A
Operating Temperature	General Purpose Ex Div1	-40 -20	60 60	°C

Outputs: Fault Status	Min	Max	Unit
Voltage Range (On)	17	35	V
Sinking or Sourcing Current	0	50	mA

Actuator Control Lines	Min	Max	Unit
Voltage Range	0	35	V

Certification

Class I, Zone 1 AEx db eb IIB T4 Gb
Ambient Temperature: -20°C < Ta < +50°C
IP67
Certified to CAN/CSA Std. 61010-1
Conforms to UL Std. 61010-1
Canadian Certificate #ETL22CA104927928X

Intertek
5019396

Ordering Information

Bear Actuators are typically shipped with a bracket to match your valve. Calscan has a selection of standard brackets and can make custom brackets to work with almost any valve. For assistance matching your valve please contact our sales department.

Calscan Solutions
4188 93 St NW
Edmonton, Alberta
Canada
T6E 5P5
Ph:780-944-1377
www.calscan.net

Actuator

BA – **Actuator Model** – **Power** – **Control** – **Feedback** – **Stem**

Actuator Model	Power	Control	Feedback	Stem
-15L **-6L** **-4L**	**-DC** = 24 VDC **-AC** = 90 to 264 VAC	**-D** = Digital Logic **-C4** = 4-20mA **-C0** = 0-20mA **-V1** = 1-10V **-V0** = 0-10V	**-N** = None **-C4** = 4-20mA **-C0** = 0-20mA **-V1** = 1-10V **-V0** = 0-10V	**-3** = 3/4in **-2** = 1/2in **-1** = 3/8in