

# Bear DC Quarter Turn Actuators

## Solar Ready & Power Fail Safe

Calscan's Bear Quarter Turn Actuators are designed for the zero-emission well site by replacing fuel gas powered pneumatic actuators with electric.

No need to replace your valve, Bear actuators can be adapted to be used on most quarter turn valves requiring up to 3840 in-lbs torque.

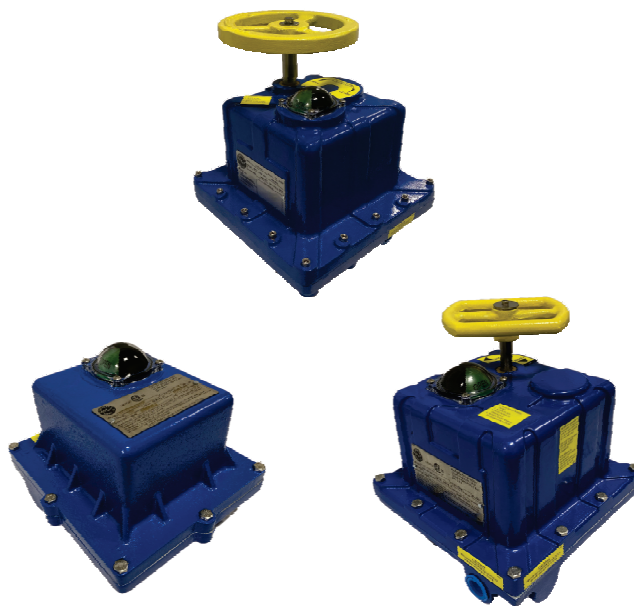
Low active and standby energy consumption ideally suited for remote non-grid power sites, such as solar or TEG. When combined with the Bear Fail Safe Controller (FSC) up to 9 standard DC powered electric actuators can be made power fail safe.

### Features:

- Explosion Proof Class I Div1 /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)
- Low quiescent current for solar powered operation <85mA
- 12VDC or 24VDC. 120/240VAC voltage models available
- 4-20mA Modulating or Digital On/Off Control
- Optional Single Handed Manual Override



[www.calscan.net](http://www.calscan.net)



Bear 1/4 Turn Actuators

## Mechanical Ratings

### Torque and Speed

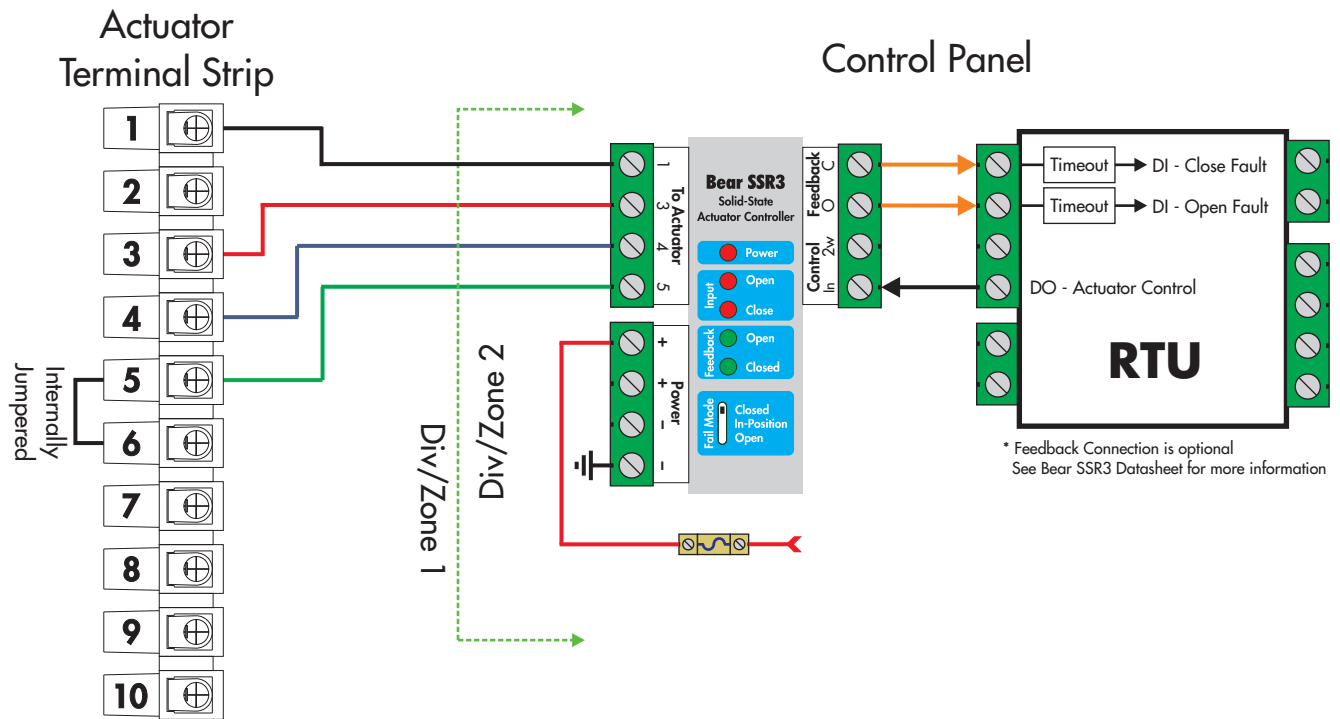
Model	Output Torque In-Lbs	Cycle Time sec/90°	Duty Cycle %	Current 24VDC		Current 12VDC	
				Full Load Amps	Locked Rotor Amps	Full Load Amps	Locked Rotor Amps
SX7	300	5	25	0.70	3.2	1.3	4.2
ML7	1000	15	25	1.1	3.2	2.2	4.2
LA7-*-5	700	5	100	3.7	25	6.9	48
LA7-*-12	2000	12	100	3.7	25	6.9	48
LX7-*-5	1200	5	100	5.0	25	10	48
LX7-*-12	3840	14	100	5.0	25	10	48

### Enclosure

Type	
Enclosure Protection	Nema 7
Cable Entry	M & SX: 1/2in NPT    LA & LX: 3/4in NPT

## Technical Data: Digital On/Off with SSR3

### Electrical Wiring Diagram

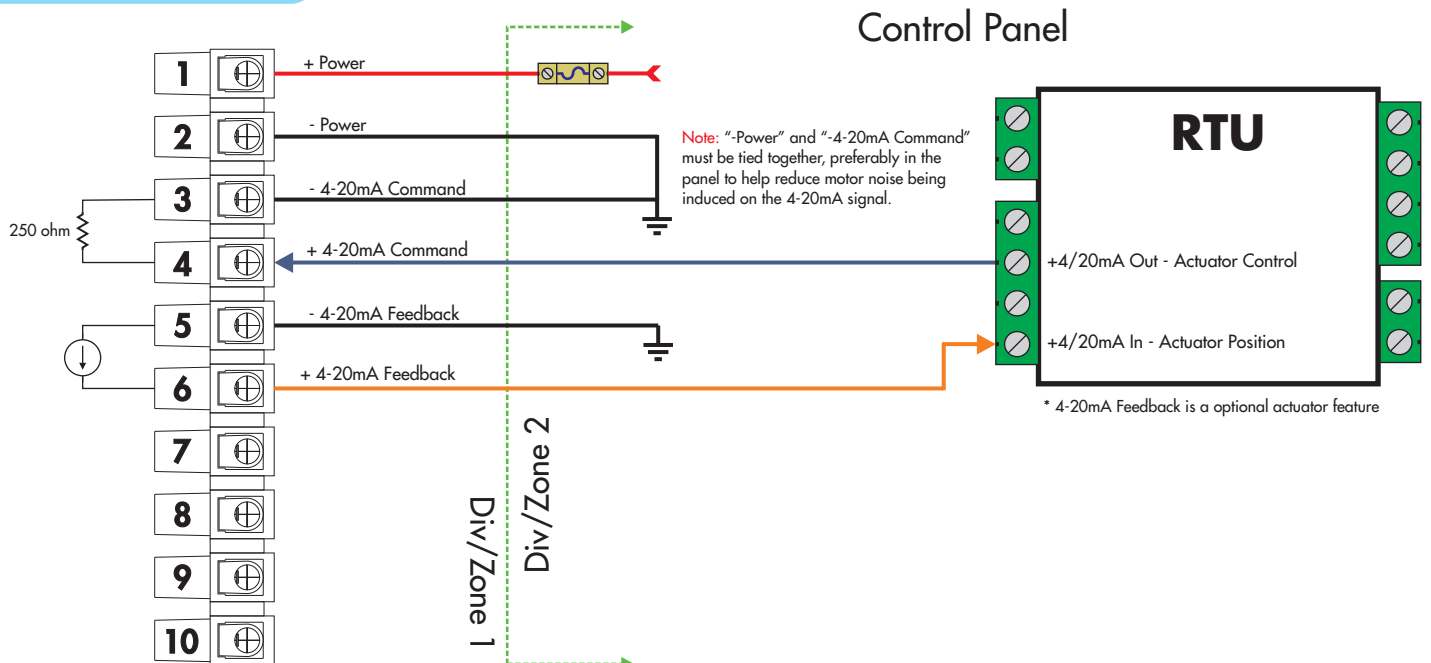


### Electrical Ratings

Electrical ratings are specified in the Bear SSR3 datasheet

## Technical Data: 4-20mA Modulating Control

### Electrical Wiring Diagram



## 4-20mA Actuator Control Board Configuration

Inside the actuator is the 4-20mA control board. The command control signal can be configured via DIP switches and 3 potentiometers.

### Command Signal Configuration



Open LED   Span Adjustment

Close LED   Zero Adjustment

 Deadband

### Indicator and Fault Conditions

The Red and Green LED on the 4-20mA control board are used for visual feedback on the state of the actuator.

LED Decode Chart		
Green	Red	Condition
	On	Actuator Opening
On		Actuator Closing
	Flash	Error: Open limit switch reached before fully opened
Flash		Error: Close limit switch reached before fully opened
Blink	Off	Error: Feedback Wiper < 0.25
Off	Blink	Error: Feedback Wiper > 4.75V
Blink	Blink	Error Low Voltage: Power Supply <10V
On	On	Error Overvoltage: Power Supply > 30V

**Errors:** See Operation and Maintenance Manual for detailed resolution steps

## Loop Tuning

If the 4-20mA loop needs to be fine tuned use the zero and span potentiometers on the transmitter board.

Limit Switches and Feedback Position are Factory Calibrated and should not need to be adjusted.

## Deadband

If the actuator is hunting for position, turn the "Deadband" adjustment clockwise until hunting stops. If the actuator is not hunting for position, turn the "Deadband" adjustment counterclockwise until the actuator begins to hunt; then turn the "Deadband" adjustment slightly clockwise until hunting stops.

**WARNING!** Actuator failure may occur if the "Deadband" adjustment is set to allow continuous hunting. This can cause excessive wear of actuator.

## Command Configuration

The Command Signal is configured via DIP Switches in the actuator.

DIP Switch Command Signal Configuration					
Command Type	SW1	SW2	SW3	SW4	Fail Mode
4-20mA	On	On	On	On	In-Position
			On	Off	Fail Closed
			Off	On	Fail Open
1-5V	Off	On	On	On	In-Position
			On	Off	Fail Closed
			Off	On	Fail Open
2-10v	Off	Off	On	On	In-Position
			On	Off	Fail Closed
			Off	On	Fail Open
0-5V	Off	On	Off	Off	
0-10V	Off	Off	Off	Off	

Command Signal Filter	SW5
Normal/Calibrate	Off
Log Rate Filter	On

## Electrical Ratings

Parameter	Min	Max	Unit
DC Supply Voltage	10	30	VDC
Quiscent (Idle) Current		<82	mA
Operating Temperature	General Purpose Ex Div1	-40 60 -20 40	°C

Command Signal	Min	Nominal	Max	Unit
Common Mode Voltage	-13		30	V
Input Impedance	Voltage Command 4-20mA Command	13000 250	252.5	ohms
Loss of Command Signal Threshold	1-5V 2-10V 4-20mA	< 0.75 < 1.50 < 3.0		Volts Volts mA
Deadband adjustable range of feedback signal	6.0 >		< 118	mV

## Certification

Class I Division 1&2 Groups C&D; Class II Division 1&2 Groups E,F&G  
Temperature Code T6, Enclosure Type 4, Ambient Temperature: -20°C to + 40°C.

CSA C3228 02	Valves & Actuators for Hazardous Locations
CSA C3229 82	Valves & Actuators for Hazardous Locations, Certified to US Standards
CSA C22.2 No.139	Electrically Operated Valves
CSA C22.2 No.25	Enclosures for Use in Class II Groups E, F, and G Hazardous Locations
CSA C22.2 No.30	Explosion Proof Equipment
UL 429 5th Edition	Electrically Operated Valves
UL 50 11th Edition	Enclosures for Electrical Equipment

Certification is valid only if the product is installed with a Division 1 Conduit Seal within 18 in of the conduit entries.  
Division 1 installation requirements must be maintained for Division 2 installations.

## 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

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Edmonton, Alberta  
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### Actuator

<b>SX7</b>	<b>Power</b> -D = 12VDC -A = 24VDC	<b>ISO Mount</b> -F05	<b>Speed (Sec/90°)</b> -5	<b>Control</b> -Blank = Digital On/Off using SSR3 -VP = 4-20mA Control -VP-TC = 4-20mA Control & Feedback	<b>Indicator</b> -Blank = none -DI = Dome	<b>Typical Valve</b> AT Controls 88 Series 1in Full Port
<b>ML7</b>	<b>Power</b> -D = 12VDC -A = 24VDC	<b>ISO Mount</b> -F07	<b>Speed (Sec/90°)</b> -15	<b>Control</b> -Blank = Digital On/Off using SSR3 -VP = 4-20mA Control -VP-TC = 4-20mA Control & Feedback	<b>Indicator</b> -Blank = none -DI = Dome	<b>Typical Valve</b> AT Controls 88 Series 2in Full Port
<b>LA7</b>	<b>Power</b> -D = 12VDC -A = 24VDC	<b>ISO Mount</b> -F07 -F10	<b>Speed (Sec/90°)</b> -5 -12	<b>Control</b> -Blank = Digital On/Off using SSR3 -VP = 4-20mA Control -VP-TC = 4-20mA Control & Feedback	<b>Indicator</b> -Blank = none -DI = Dome	<b>LA7 &amp; LX7 Typical Valve</b> Forum BTE Choke Valves CVS BTE Choke Valves CVS Series 9000/9100 3 piece Trunnion CVS Series 8000/8100 Floating
<b>LX7</b>	<b>Power</b> -D = 12VDC -A = 24VDC	<b>ISO Mount</b> -F07 -F10	<b>Speed (Sec/90°)</b> -5 -14	<b>Control</b> -Blank = Digital On/Off using SSR3 -VP = 4-20mA Control -VP-TC = 4-20mA Control & Feedback	<b>Indicator</b> -Blank = none -DI = Dome	