

Valvcon™ LCR-series reversing electric actuators

Installation, maintenance and
operating instructions



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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

1.1 DESCRIPTION

Valvcon LCR-Series Electric Actuators are designed to provide reliable and efficient operation of 1/4-turn valves. The supported torque range for actuation is between 150 and 600 inch pounds. LCR-Series actuators are available in AC models with a 25% duty cycle and DC models with an 80% duty cycle.

1.2 PARTS IDENTIFICATION

- 1 - Limit Switches
- 2 - Cams
- 3 - O-Ring

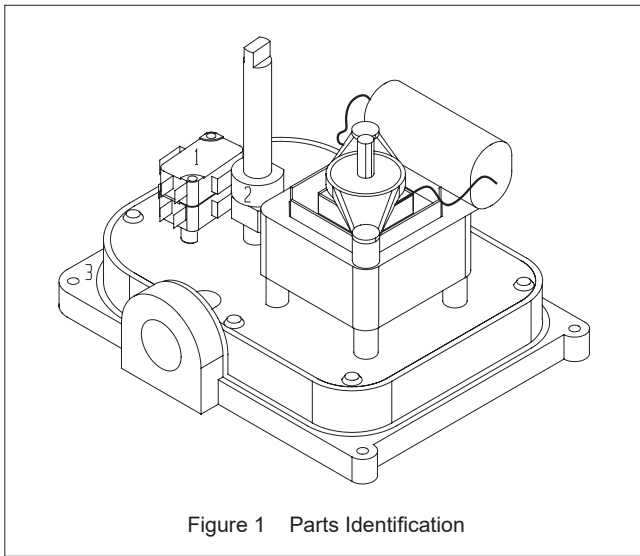


Figure 1 Parts Identification

1.3 GENERAL TECHNICAL INFORMATION

WARNING

DANGEROUS VOLTAGES ARE PRESENT INSIDE THE ACTUATOR COVER UNLESS THE POWER SUPPLY TO THE ACTUATOR HAS BEEN SHUT OFF OR DISCONNECTED. USE EXTREME CAUTION WHENEVER WORKING ON THE ACTUATOR WITH THE COVER REMOVED.

WARNING

BEWARE OF MOVEMENT OF THE FINAL DRIVE ELEMENT AND ANY LINKAGE BETWEEN IT AND THE ACTUATOR!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE WAY OF MOVING PARTS. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

LCR-Series AC voltage actuators use a split phase motor, which internally steps up the applied AC voltage and feeds it back to the off terminal. For example, when 115 VAC power is applied at terminals 1 and 4, 230 volts will be fed back to terminal 3. This can create a problem for controllers with solid state outputs rated for less than 230 VAC and it is suggested that relay outputs be used. Additionally, due to this feed back, multiple actuators cannot be wired in parallel, and individual leads (isolated contacts) must be run to each actuator.

It is important to verify that the output torque of the actuator is appropriate for the torque requirements of the valve and that the actuator duty cycle is appropriate for the intended application.

LCR-Series DC voltage actuators have a brushed DC motor.

2. TEMPERATURE LIMITS

2.1 LOW AMBIENT TEMPERATURES

The minimum recommended ambient temperature is -40°F/C.

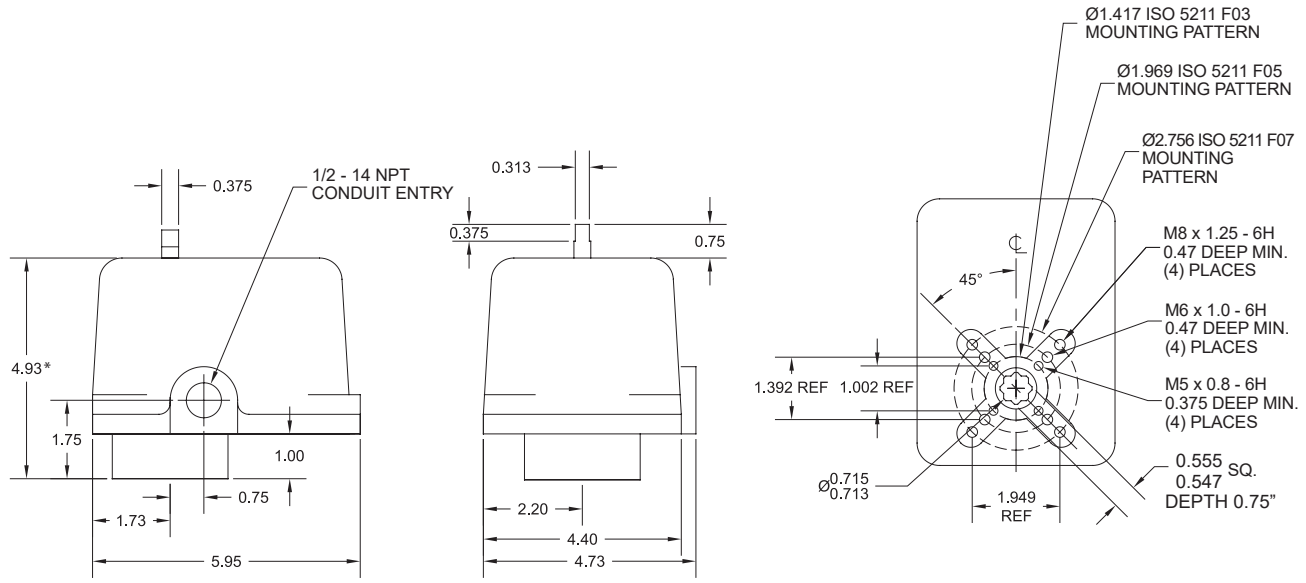
2.2 HIGH AMBIENT TEMPERATURES:

The maximum recommended ambient temperature is 150°F (66°C).

2.3 HIGH MEDIA TEMPERATURES

For media temperatures up to 200°F, additional precautions are not typically required. For media temperatures between 200°F and 300°F, a shielding plate about one inch larger than the actuator in each dimension should be placed between the actuator and the mounting bracket. In addition, the actuator should be mounted at the 3 o'clock or 9 o'clock position relative to the pipe. For media temperatures above 300°F, a valve with an extended shaft mounting arrangement should be used.

All dimensions are shown in inches



* Requires an additional 4.375" to remove cover.

Approximate Weight	7 lb
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Figure 2 Dimensions, Female output (standard)

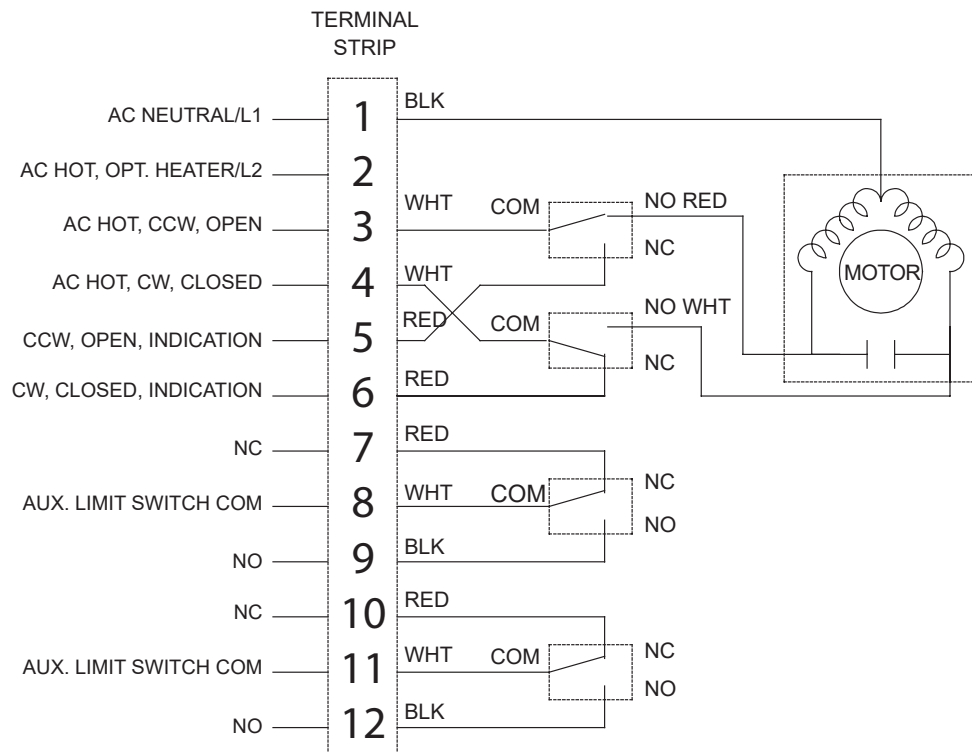


Figure 3A LCR Series AC Wiring

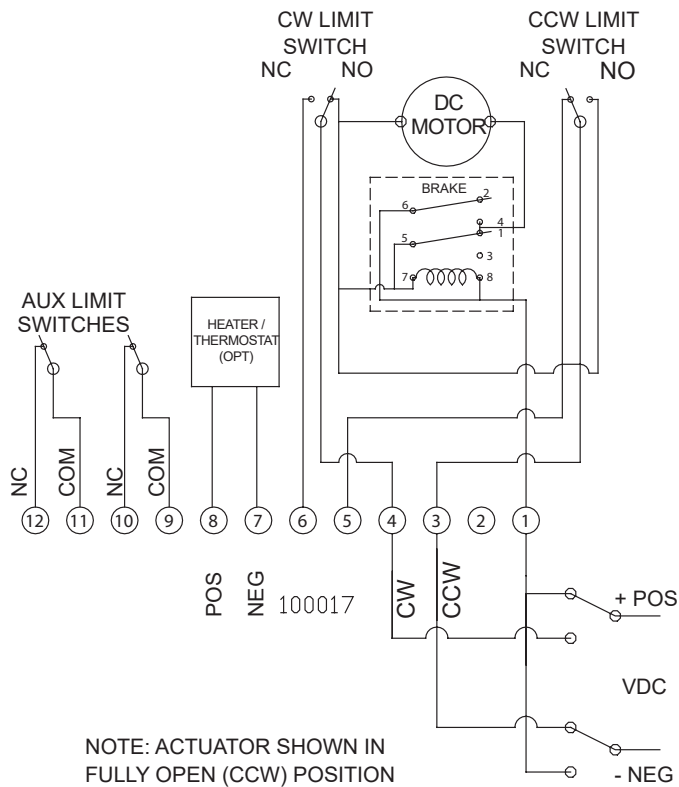


Figure 3B LCR Series DC Wiring

3. MOUNTING THE ACTUATOR

First verify that the output torque of the actuator is appropriate for the torque requirements of the valve and that the actuator duty cycle is appropriate for the intended application.

3.1 ACTUATOR DRIVE OUTPUT REQUIREMENTS:

Valvcon's LCR-Series actuators have a female square output drive. ISO 5211 bolt circle configurations are provided (see **Figure 2**).

3.2 BRACKET REQUIREMENTS:

It is mandatory that the actuator be firmly secured to a sturdy mounting bracket. A minimum of four bolts with lockwashers must be used to secure the actuator to the bracket. There can be no flexibility in the bracket, and backlash ("play") in the coupling should be minimized. In addition, the actuator output shaft must be in line (centered) with the valve shaft. This avoids side-loading the shafts (crossed-slot couplings are more tolerant of misalignment).

4. MANUAL OVERRIDE

WARNING

MANUAL OVERRIDE OF THE ACTUATOR IS INTENDED FOR USE WHEN POWER IS NOT AVAILABLE.

USING THE OVERRIDE WHEN POWER IS STILL PRESENT AT THE ACTUATOR COULD RESULT IN DAMAGE OR PERSONAL INJURY!

4.1 FEMALE OUTPUT:

To operate the actuator manually, push the override shaft down approximately 1/4", and use a wrench on the flats of the shaft to rotate the actuator. The override shaft can also be used to provide visual identification of the valve's position.

5. WIRING

NOTE: Be sure to follow local wiring codes.

The identification label on each actuator specifies the voltage and current requirements for the actuator. **Figure 3** shows the standard power and control wiring connections for AC and DC actuators. To operate the LCR-Series actuator, the user supplies power to the actuator's motor through two limit switches. The limit switches control the actuator's mechanical travel limits and are factory set at 90 degrees.

5.1 AC

To drive the actuator counterclockwise (CCW), apply power to terminals 1 and 3. To drive the actuator clockwise (CW), apply power to terminals 1 and 4. The actuator can be driven fully open (CCW) or closed (CW) by maintaining power to the motor until the actuator trips the internal limit switches. Power can also be disconnected at any point during the travel to position the actuator (see **Figure 3A**).

5.2 DC

DC voltage actuators require a reversing of the power polarity. To drive the actuator CW, apply power so that terminal 1 is negative and terminal 4 is positive. To drive the actuator CCW, apply power so that terminal 1 is positive and terminal 3 is negative (see **Figure 3B**).

NOTE: LCR series actuators have a 25% duty cycle, which means that for every operating cycle that the actuator is ON (to open or close the valve), the actuator must be OFF for a time equal to three operating cycles. For example, if the operating cycle time is 5 seconds, for every operating cycle that the actuator is ON, it must be OFF for 15 seconds. Exceeding the actuator's duty cycle may cause the thermal overload switch to temporarily shut off power to the motor.

6. ADJUSTMENT OF THE LIMIT SWITCHES

If adjustment of the open or closed position is required, proceed as follows:

6.1 ADJUST THE CCW (TYPICALLY OPEN) LIMIT SWITCH CAM

1. Using a hex wrench, loosen the set screw in the OPEN limit switch cam (the second up from the bottom).
2. Apply power to terminals 1 and 3 (See **Figures 3A and 3B**) to drive the actuator to the open position (counterclockwise rotation).
3. Remove the power from the actuator.
4. Rotate the cam away from the limit switch arm just until the switch clicks open (the cam falls off the switch).
5. Set the vertical cam position so that the bottom of the cam will be in alignment with the limit switch arm. Tighten the Cam set screw to secure the Cam in position. Do not over-tighten the screws (use less than 8 in/lbs of tightening torque). If the cam is not set "high" as described, the cam will become disengaged from the limit switch arm when using the manual override feature.
6. The CCW indication cam is set in the same manner; typically this is set a few degrees before the actual end of travel, to ensure that indication is provided before the motor stops.

6.2 ADJUST THE CW (TYPICALLY CLOSED) LIMIT SWITCH CAM

1. Using a hex wrench, loosen the set screw in the CLOSED limit switch cam (the bottom one).
2. Apply power to terminals 1 and 4 (See **Figures 3A and 3B**) to drive the actuator to the closed position (clockwise rotation).
3. Remove the power from the actuator.
4. Rotate the cam away from the limit switch arm just until the switch clicks open (the cam falls off the switch).
5. Set the vertical cam position so that the bottom of the cam will be in alignment with the limit switch arm. Tighten the Cam set screw to secure the Cam in position. Do not over-tighten the screws (use less than 8 in/lbs of tightening torque). If the cam is not set "high" as described, the cam will become disengaged from the limit switch arm when using the manual override feature.
6. The CW indication cam is set in the same manner; typically this is set a few degrees before the actual end of travel, to ensure that indication is provided before the motor stops.

7. ADDITIONAL ACTUATOR PRODUCTS AND ACCESSORIES FROM VALMET

V-Series

- Up to 3000 inch pounds (250 lb-ft; 339 Nm) for On/Off or Automatic Cycling applications
- 115VAC and 230VAC voltages
- 75% Duty Cycle (55% on 3000 lb-in models)
- NEMA 4/4X and NEMA 4/4X/7&9 enclosures
- CSA (C US) Certified
- CE Compliant
- Certified to ATEX Directive 2014/34/EU: Ex db IIB T6 Gb, and IECEx CSA 14.0057X ("WX" models only)
- Standard Features: motor brake, tropical heater/thermostat, auxiliary limit switches, manual override and visual position indicator
- Available Options: Speed Control/Timer Board, metric and "keyed" female outputs and handwheel override

LCU Series

- Up to 600 inch pounds (50 lb-ft; 68 Nm)
- Economical actuators for Unidirectional applications
- 25% duty cycle (80% on 12VDC or 24VDC models)
- NEMA 4/4X enclosure
- 115VAC, 230VAC, 24VAC, 12 VDC and 24VDC voltages
- Features include auxiliary limit switches and heater/thermostat
- Female output (standard)

ADC-Series

- Universal Control Board for On/Off and Modulating applications
- Up to 3000 inch pounds (250 lb-ft; 339 Nm)
- Optional Internal Battery Back-Up
- Continuous Duty Cycle
- Universal Input Power: 115VAC, 230VAC, 24VAC, 12VDC or 24VDC
- NEMA 4/4X and NEMA 4/4X/7&9 enclosures
- CSA (C US) Certified
- CE Compliant
- Certified to ATEX Directive 2014/34/EU:
- Ex db IIB T6 Gb, and IECEx CSA 14.0057X ("WX" models only)
- Standard Features: auxiliary limit switches, heater/thermostat, manual override and visual position indicator
- Available Options: MODBUS® communications board, metric and "keyed" female outputs, and handwheel override

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