

Valvcon™ electric actuator for special applications, oil field Q6.2.1 & Q6.2.3

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 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.

NOTE: THE ACTUATOR IS DESIGNED FOR USE IN HAZARDOUS LOCATIONS. AFTER THE ACTUATOR HAS BEEN INSTALLED, IT MUST NOT BE OPERATED WITH THE COVER OFF OR WITH LESS THAN ALL EIGHT COVER BOLTS SECURELY FASTENED. ACTUATOR SHOULD BE PROPERLY GROUNDED IN ACCORDANCE WITH LOCAL ELECTRICAL CODE.

1.2 DESCRIPTION

The Q6.2.1 and Q6.2.3 are 600 in•lb, 12 VDC electric actuators with 80% duty cycle. Installation is simplified and reliability is improved. They are controlled by two 12 VDC internal relays.

This Instruction Manual pertains only to the Q6.2.1 & Q6.2.3 actuators.

2. INSTALLATION

2.1 TOOLS REQUIRED

- 1/16 inch hex wrench (setting cams)
- small flat blade screw driver
- 3/16 inch hex wrench (cover screws)

2.2 TEMPERATURE LIMITS

Low ambient temperatures

The minimum recommended ambient temperature is approximately 30°F (-1°C). With the optional heater and thermostat installed, the recommended minimum ambient temperature can be lowered to -40°F (-40°C).

High ambient temperatures

The maximum recommended ambient temperature is 160°F (71.1°C). With electronic options installed, the maximum recommended ambient temperature is 150°F (65.5°C) with the actuator shaded from direct sunlight.

High media temperatures

For media temperatures between 200°F and 300°F (93°C and 149°C), a shielding plate (about one inch larger than the actuator in each dimension and at least 1/16" thick) should be placed between the actuator and the mounting bracket. Additionally, 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 (149°C), a valve with an extended shaft mounting arrangement should be used.

2.3 ACTUATOR MOUNTING

The actuator may be mounted in any position.

Verify that the output torque of the actuator is appropriate for the torque requirements of the valve. The Q6.2.1 & Q6.2.3 actuators are furnished with a female drive output 0.75" square by 0.90" deep. Two I.S.O. bolt patterns (ISO 5211) are provided for ease of actuator mounting. See (Figure 2) on the following page for dimensions required for sizing and mounting purposes.

It is mandatory that the actuator be firmly secured to a sturdy mounting bracket. A minimum of four bolts with lockwashers should be used to secure the actuator to the bracket. Flexibility in the bracket is not allowed, and backlash, or "play", in the coupling should be minimized. The actuator output shaft must be in line (centered) with the valve shaft to avoid side-loading the shaft.

3. MAINTENANCE

3.1 WIRING

The identification label on each actuator specifies the voltage and current requirements for the actuator, and a wiring diagram is provided on the terminal board of each actuator. (Figure 1) shows the standard power and control wiring connections for the actuator.

For clockwise (CW), switch the power negative to terminal 5. For counter-clockwise (CCW) control, switch the power negative to terminal 4. Open and closed limit indication is provided at terminals 9 through 12 with a dry contact closure between terminals 12 and 11 at the full CCW position, and a dry contact closure between terminals 10 and 9 at the full CW position. If power is properly connected, the power indicator light above terminals 1 and 2 will be turned on.

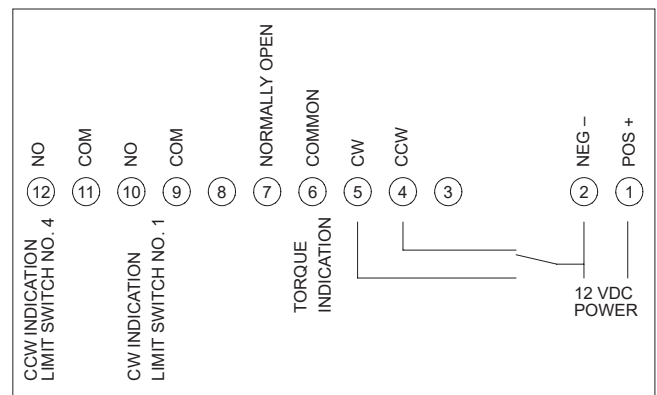


Figure 1.

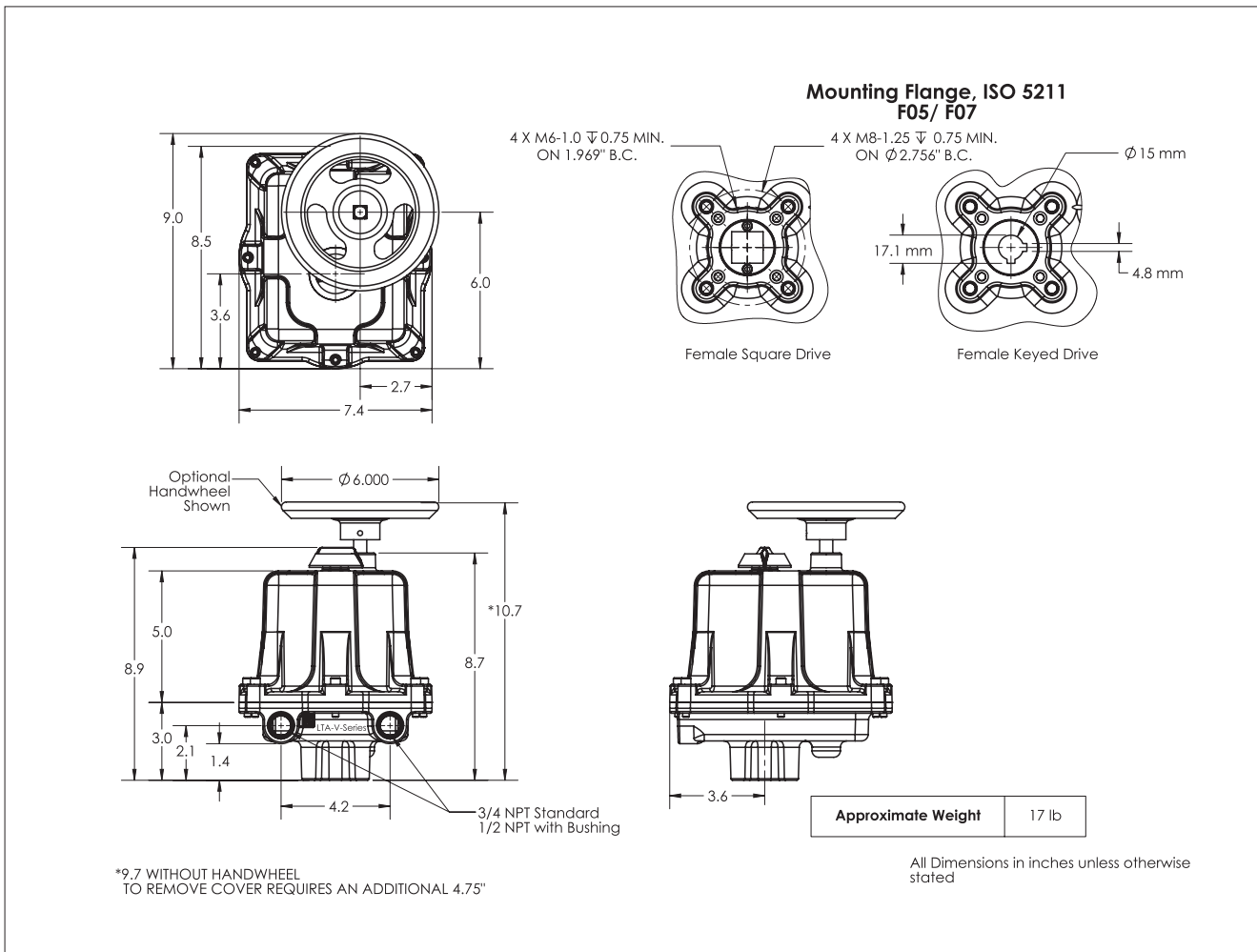


Figure 2.

3.2 TORQUE LIMIT ADJUSTMENT

The Q6.2.1 and Q6.2.3 actuator has as a standard feature Neles torque limiter option. Upon reaching 110% of the rated torque, the actuator's motor will be disabled. There is a two second delay in the torque circuit to allow the start up current of the motor to be ignored. If a torque condition does occur, there will be a contact closure between terminals 6 and 7. To reset actuator, all control power must be removed briefly, (from terminals 4 and 5) power may remain at terminals 1 and 2. Turning pot clockwise increases the torque output and turning counter-clockwise decrease the torque output.

NOTE:

the maximum torque output is 600 lb in (50 lb•ft/68 N•m)

3.3 MANUAL CONTROL

To ease the initial setup, the actuator provides two push buttons that operate the actuator CW and CCW. The UPPER button drives the actuator CCW. The LOWER button drives the actuator CW.

3.4 MANUAL OVERRIDE

NOTE: THE MANUAL OVERRIDE TURNS THE OPPOSITE DIRECTION AS THE OUTPUT DRIVE. THEREFORE, TURN THE MANUAL OVERRIDE CW TO DRIVE THE VALVE IN THE CCW DIRECTION.

To use the manual override function, push the override shaft down to disengage the motor from the gear train. While holding the shaft down in the disengaged position, turn the override shaft with a wrench until the desired position is reached. Be careful not to drive the actuator past the limit switch settings; it is possible to damage the actuator.

The manual override shaft must be returned to its fully upward position before operating the actuator.

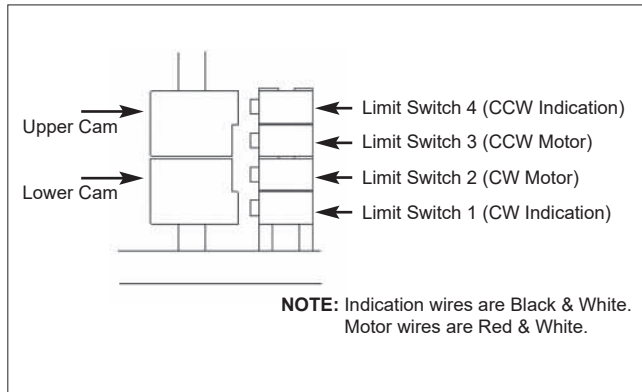


Figure 3.

3.5 LIMIT SWITCHES

Two limit switches operated by cams on the output shaft determine the exact positions where the actuator will stop at the end of each cycle. Limit switch #2 determines the full CW position. Limit switch #3 determines the full CCW position. (Figure 3) shows the limit switch and cam configuration.

3.6 ADJUSTMENT OF LIMIT SWITCHES

If adjustment of the clockwise or counter-clockwise position is required, proceed as follows:

A. Remove Actuator Cover

Remove the actuator cover by removing the screws securing the cover to the base.

B. Adjust the CW limit switch cam

1. Using the manual override, rotate the actuator until you can access the set screw on the lower cam from the side of the actuator opposite the limit switch wires
2. Using a 1/16 inch hex wrench, loosen the set screw in the lower cam.
3. Using the manual override, rotate the actuator to the full CW position.
4. Rotate the cam clockwise toward the limit switch arm until you hear both limit switch #1 and #2 "click" closed. **NOTE:** The indication limit switch "clicks" closed one degree ahead of the motor switch. Make sure both switches click closed.
5. Re-tighten the set screw on the limit switch cam.

C. Adjust the CCW limit switch cam

1. Using the manual override, rotate the actuator until you can access the set screw on the upper cam from the side of the actuator opposite the limit switch wires.
2. Using a 1/16 inch hex wrench, loosen the set screw in the upper cam.
3. Using the manual override, rotate the actuator to the full CCW position.
4. Rotate the cam counterclockwise toward the limit switch arm until both limit switch #3 and #4 "click" closed. **NOTE:** The indication limit switch "clicks" closed one degree ahead of the motor switch. Make sure both switches click closed.
5. Re-tighten the set screw on the limit switch cam.

3.7 TROUBLESHOOTING

If the actuator fails to operate:

Check that the proper voltages are present at the actuator's terminal connections. Check all the plug-in connections to be sure they are properly installed (see Figure 4).

Wires to top of motor Red to terminal w/Red dot and Black to other terminal

Limit switch wires "Seated" on switch terminals

If the actuator is stalling:

Check that the limit switches are properly set.

Check that the actuator has enough torque for the application.

Check the "Torque Limit Adjustment" setting. (See section 3.2)

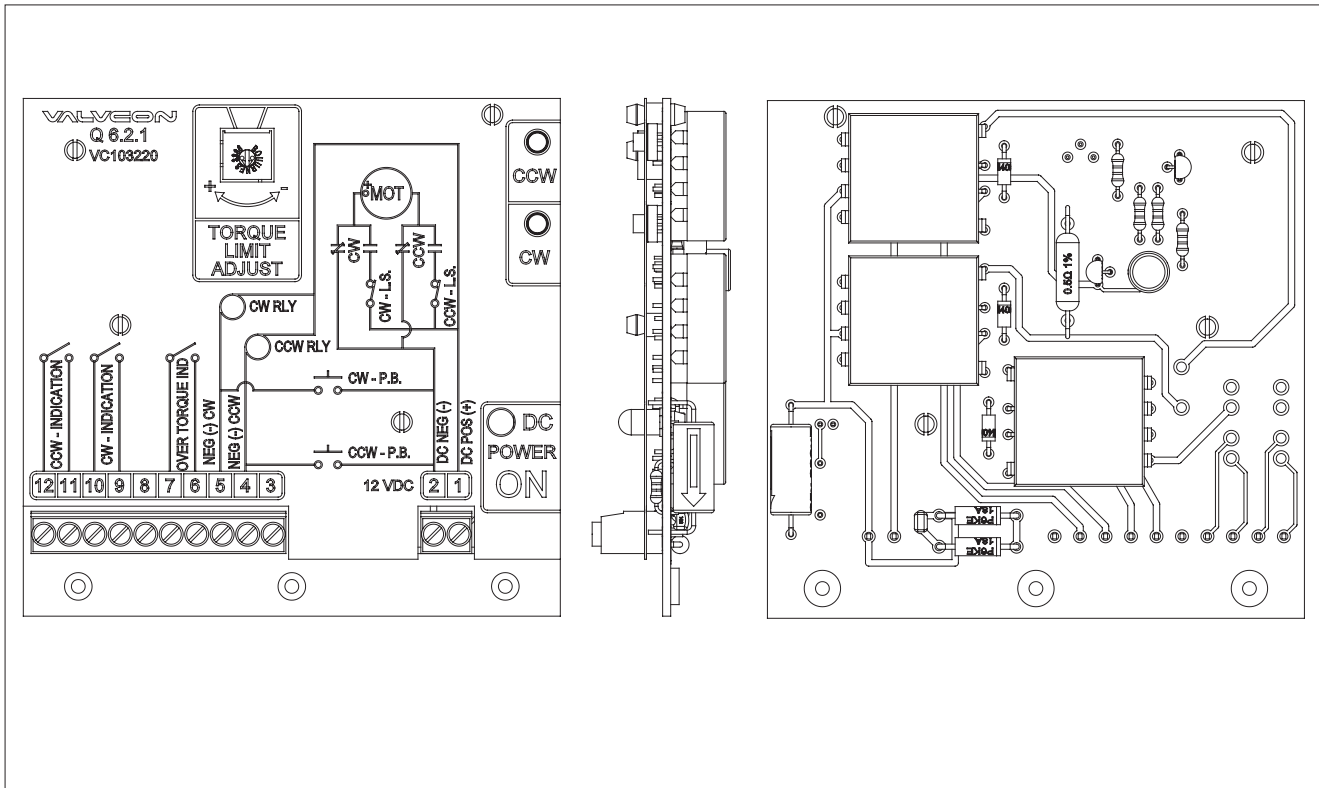
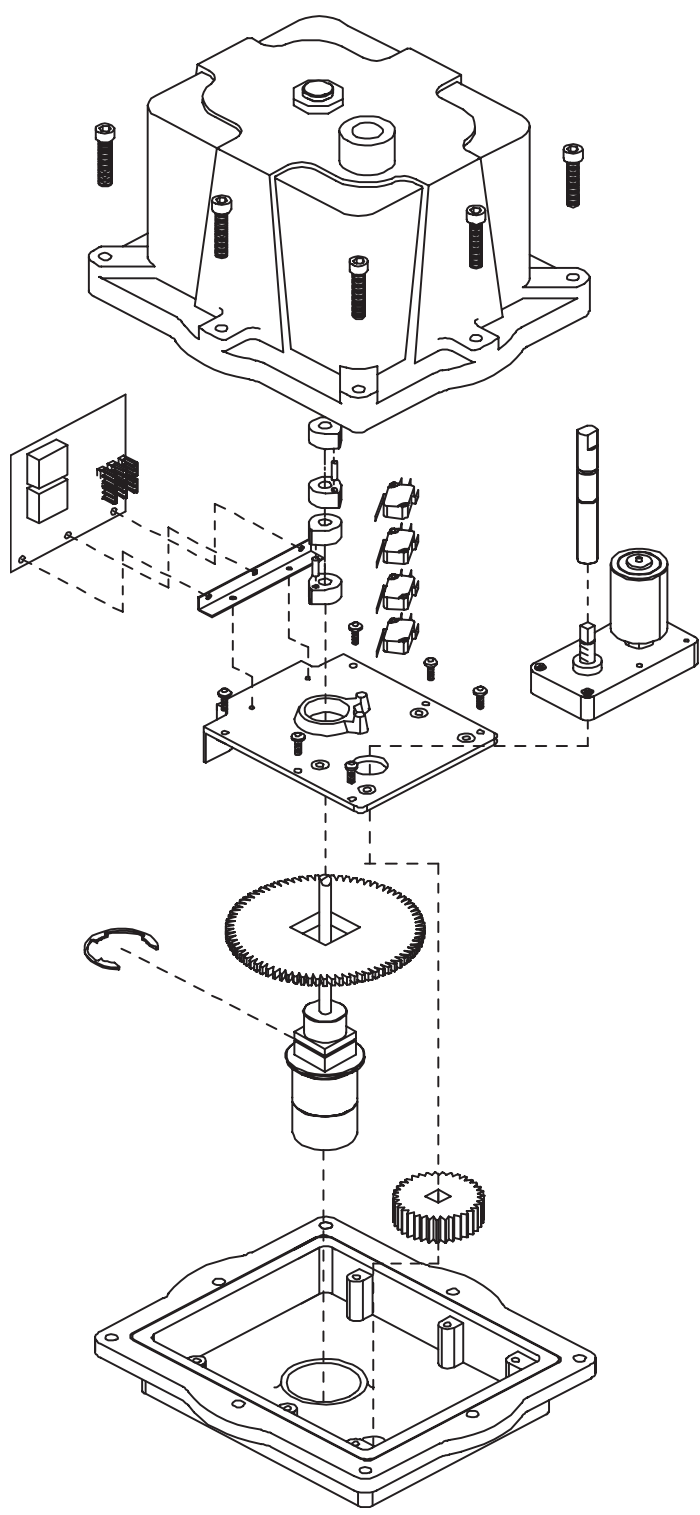


Figure 4.

4. EXPLODED VIEW



PARTS LIST		
Special Application Actuator Q6.2.1 & Q6.2.3		
Item No.	Description	Qty.
1	Cover	1
2	Cover Screws	8
3	Terminal Board	1
4	Board Bracket	1
5	Cams	2
6	Limit Switches	4
7	Override Shaft	1
8	Motor	1
9	Base Plate	1
10	Base Plate Screws	6
11	Cam/Output Shaft	1
12	Bull Gear	1
13	Pinion Gear	1
14	Base	1
15	Visual Position Indicator (not shown)	1

Figure 5.

ADDITIONAL ACTUATOR PRODUCTS AND ACCESSORIES FROM NELES

V-Series

- Up to 3000 inch pounds for On/Off, Modulating or Automatic Cycling applications
- 75% Duty Cycle
- 115VAC and 230VAC voltages
- NEMA 4/4X and NEMA 4/4X/7&9 enclosures
- CSA Certified (Canadian & U.S. Standards)
- Options include Modulating Control Board, Speed Control/TimerBoard, Iso/Readback Board, extra limit switches, heater/thermostats, motor brake, feedback potentiometer and handwheel override

I-Series Network Capable

- Modbus®
- AS-Interface
- DeviceNet™
- Foundation Fieldbus
- Other fieldbus protocols (consult factory)

QX-Series

- Up to 3000 inch pounds for On/Off applications
- Economical NEMA 4/4X/7&9 solution
- 12VDC & 24VDC voltages
- 80% Duty Cycle
- CSA (C US) Certification

ADC-Series

- Up to 3000 inch pounds for On/Off or Modulating applications
- Optional Internal Battery Back-Up
- Continuous Duty Cycle
- 115VAC, 230VAC, 24VAC, 12VDC and 24VDC voltages
- Options include extra limit switches, heater/thermostats and handwheel override

LC Series

- Up to 600 inch pounds
- Economical actuators for Reversing or Unidirectional applications
- 25% duty cycle
- NEMA 4/4X enclosures
- 115VAC, 230VAC, 24VAC, 12 VDC and 24VDC voltages
- Options include extra limit switches and heater/thermostats
- Male output (standard) or female output (optional)

ESR-Series

- Up to 600 inch pounds for True "Two-Wire" On/Off applications
- 80% Duty Cycle
- 115VAC and 230VAC voltages
- Options include extra limit switches and heater/thermostats

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