



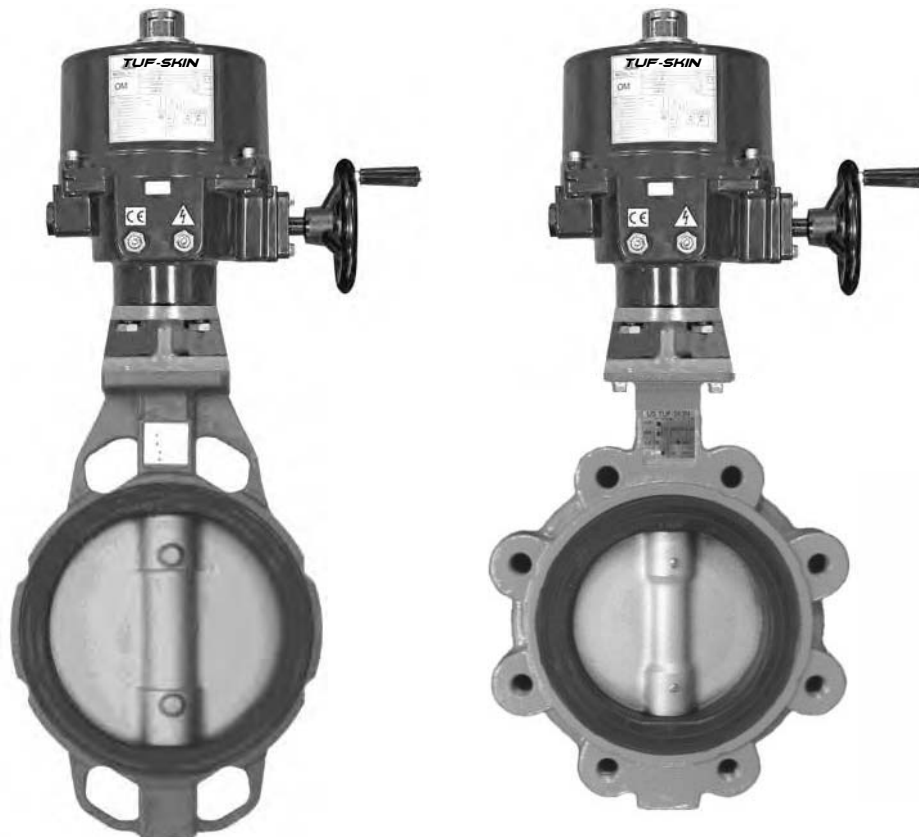
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## Operation Manual OM series Quarter Turn Electrical Actuator

This is a condensed version for 120VAC only.  
For other types consult the full manual.  
(This version includes pages 2, 25, & 48-52.)



2015-09-01

## IMPORTANT NOTICES



OM series are based on a self-locking worm drive design, which provides for a smooth running, dependable, and robust drive system. All models are ISO5211 compliant, have a visual position indicator on top of the cover, and a manual override. The manual operation is a non-clutch design that can be operated without any lever, clutch, or brake upon power outage.

1. Check for correct voltage prior to wiring.
2. Turn power off before servicing or for maintenance purpose.
3. Use sealant to seal conduit connections after wiring to prevent dusting or water contamination.
4. The angle of electrical actuator installation must be between 0~180 degree. Do not install upside down or below the horizontal. The conduit entries can not face up.
5. When more than one electric actuator needed to operate simultaneously, please connect with the individual cables or install the coupling board.
6. Not intended for vacuum spaces and avoid installing near explosive atmospheres.
7. Actuators should be placed at clean and dry place for storage, and protected with outer carton from being affected by great temperature difference or serious vibration.
8. To avoid functional failure caused by statics, do not touch any components on the PCB with metal tools or bare hands.
9. Please connect the ground wire to PE inside the electric actuator.
10. The warranty period of our products is one year.

### Duty Cycle – compliance to IEC standard

"Duty cycle" means the starting frequency.

The formula:  $\text{Running Time} \div (\text{Running time} + \text{Rest Time}) \times 100\% = \text{duty cycle}$

$\text{Rest Time} = \text{Running Time} \times (1 - \text{duty cycle}) \div \text{duty cycle}$

For example : The running time for OM-2 is 15 sec.

30% duty cycle  $15 \times [(1 - 30\%) / 30\%] = 35 \rightarrow$  The rest time will be 35 sec.

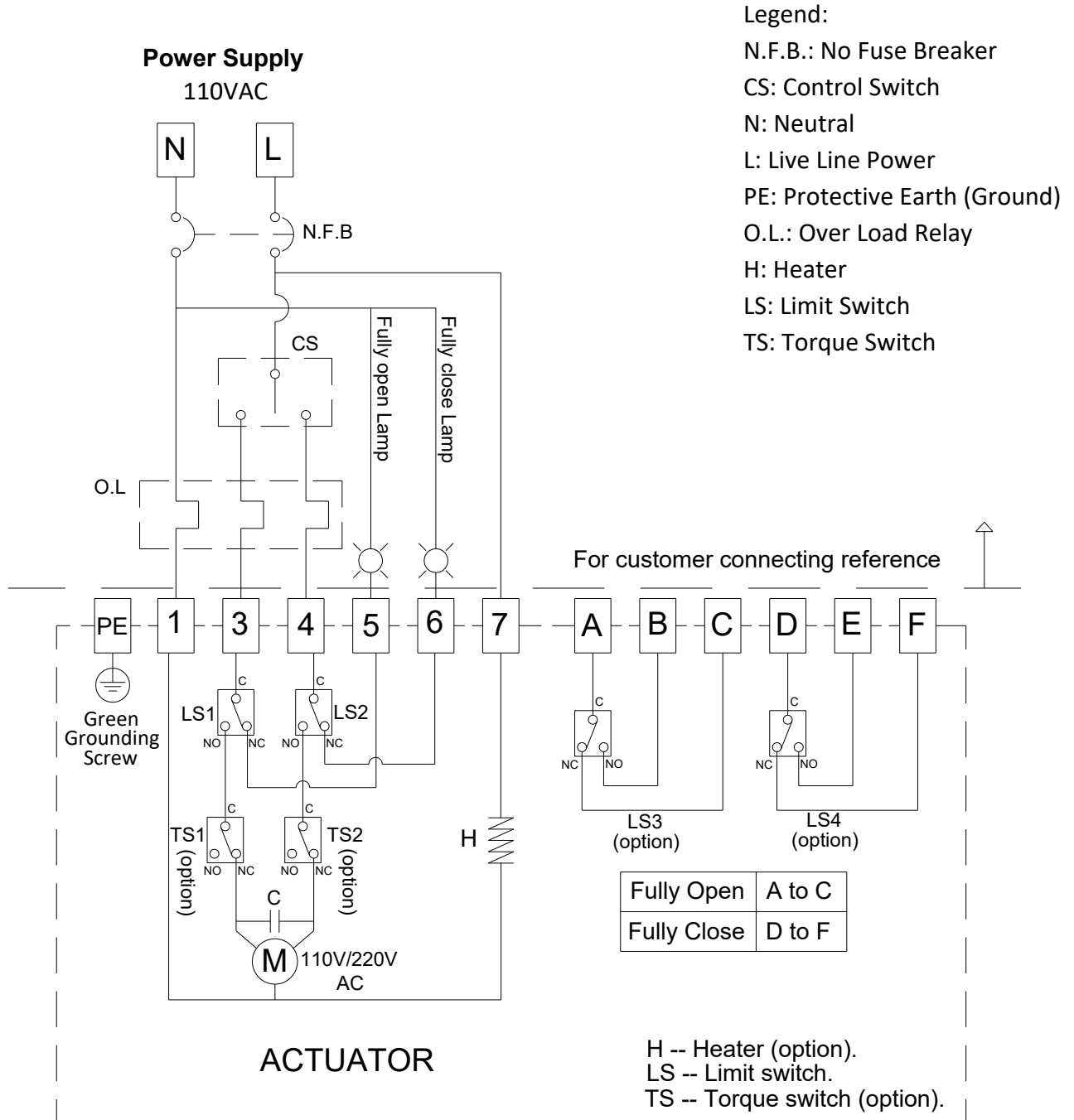
75% duty cycle  $15 \times [(1 - 75\%) / 75\%] = 5 \rightarrow$  The rest time will be 5 sec.

If the duty cycle is higher, the rest time will be shortened. It means the starting frequency will be higher.

# WIRING DIAGRAM – Quarter Turn Actuator

BM-2 , OM-2~OM-13 , OM-F , OM-G 110VAC 1-Phase

On-Off Controller



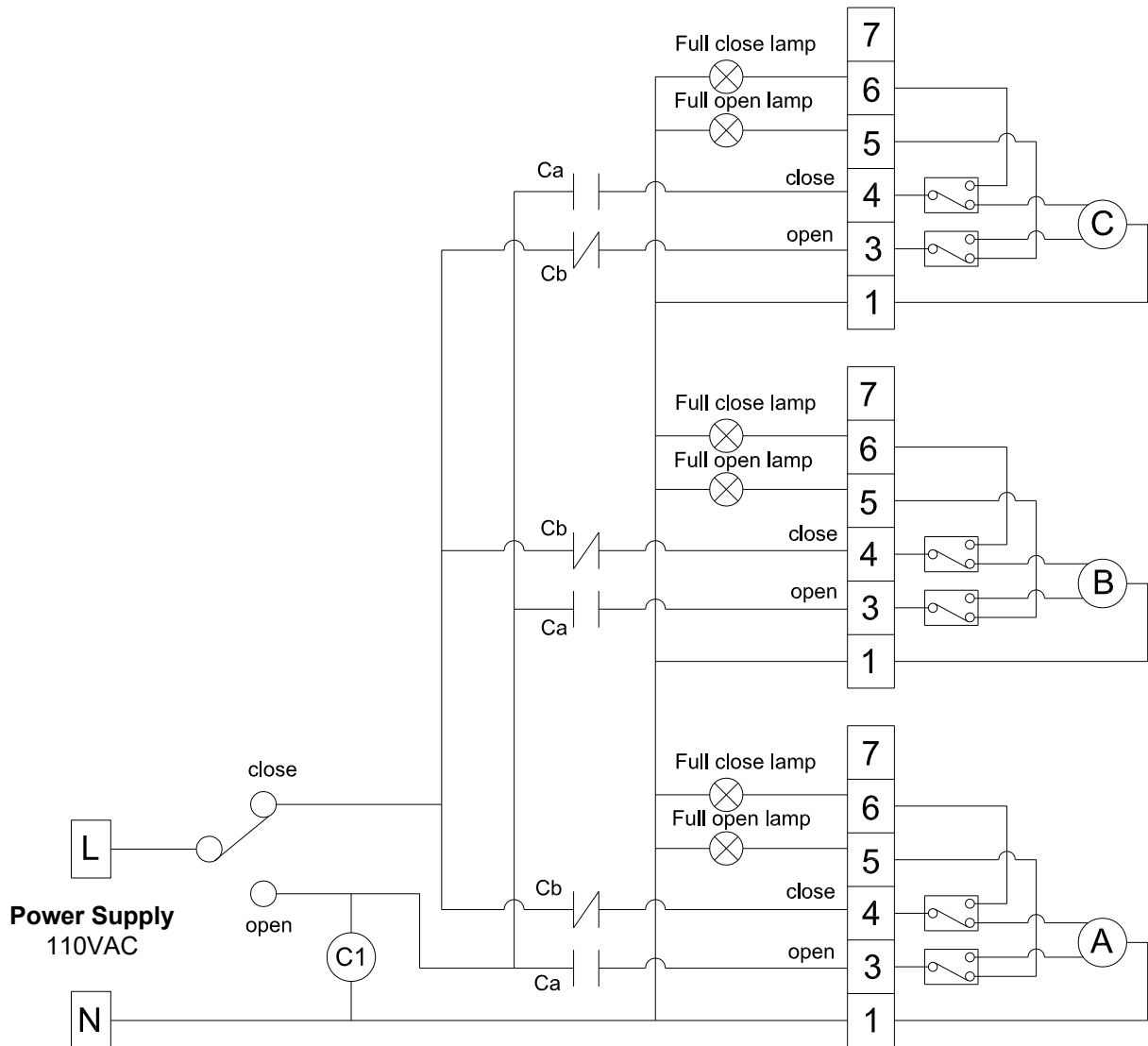
**NOTE :**

1. "N" connects to #1, "L" connects to #7.
2. "L" connects to #3 for "OPEN", "L" connects to #4 for "CLOSE".
3. Using less than 5A current for "A, B, C, D, E, F".
4. BM-2 could not install torque switches.

## WIRING DIAGRAM – Quarter Turn Actuator

**BM-2, OM-A, OM-A-M, OM-1~OM-13, OM-F, OM-G 110VAC 1-Phase**

**Same Switch Coupling Wiring**



**NOTE :**

1. The wiring is based on 3 sets of actuators for one switch – 1 set is open and 2 sets are close. (If more sets, the rest can be done by this logic.)
2. When a set of control wire or switch needs to control two or more actuators at the same time, please refer to the wiring diagram.
3. Add one contactor for separation to prevent the interference of compression coupling.
4. C1=3a3b contactor

## ADJUSTMENT – Travel Cam & Limit Switches

### NOTE:

If LS3 & LS4 are fitted, they should be set to trip prior to LS1 & LS2 to avoid over-travel.

The travel cams are set to control the open and closed position of the valve. The position is set to stop the travel of the actuator when the travel cams activate the limit switch. Standard is two limit switches (LS1 & LS2), one for open, one for closed. LS1 & LS2 limit the maximum range by disabling the electric motor. LS3 & LS4 are optional. They allow external equipment to confirm that the valve has reached the fully open and fully closed positions.

The travel cams can be adjusted with a 2.5mm Allen key. The cams are preset at the factory. When additional adjustments are needed, follow steps described below.

### OM-A, OM-A-M

#### 1. To set the open position:

- a. Turn power off.
- b. Use manual override to turn valve to the fully-open position.
- c. Remove cover and loosen the M5 set screw on the TC1 with a 2.5mm Allen Key.
- d. Rotate cam(TC1) counterclockwise to contact with switch.
- e. Slowly rotate cam(TC1) clockwise until a light click is heard.
- f. Securely tighten the M5 set screw and apply power to check the travel position. If the position is not correct, please repeat steps a ~ f.
- g. After the adjustment is completed, check again the M5 set screw is securely tightened.

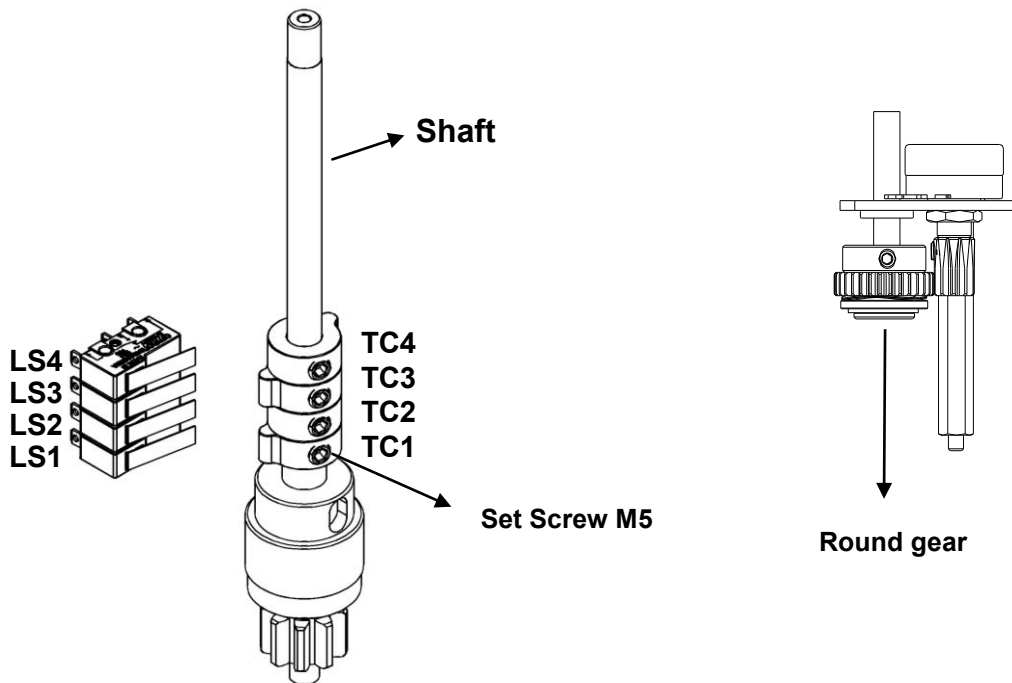
#### 2. To set the close position:

- a. Turn power off.
- b. Use manual override to turn valve to the fully-closed position.
- c. Loosen the M5 set screw on the TC2 with a 2.5mm Allen key.
- d. Rotate cam(TC2) clockwise to contact with switch.
- e. Slowly rotate cam(TC2) counterclockwise until a light click is heard.
- f. Securely tighten the set screw and apply power to check the traveling position. If the position is not correct, please repeat steps a ~ f.
- g. After the adjustment is completed, check again the M5 set screw is securely tightened.

**Modulating type: Loosen M5 set screw on round gear before setting, after completing fully-open and fully-closed calibration, run the actuator to fully-closed position, then rotate round gear counterclockwise to the end and tighten M5 set screw.**

## ADJUSTMENT – Travel Cam & Limit Switches

**【OM-A, OM-A-M】**



- TC 4 Synchronous turn with TC2 (optional).**
- TC 3 Synchronous turn with TC1 (optional).**
- TC 2 “CLOSE”**
  - Clockwise: increase closing degree to fully closed.**
  - Counterclockwise: decrease closing degree.**
- TC 1 “ OPEN”**
  - Clockwise: decrease opening degree.**
  - Counterclockwise: increase opening degree to fully open.**

### OM-1, BM-2, OM2~13, OM-F, OM-G

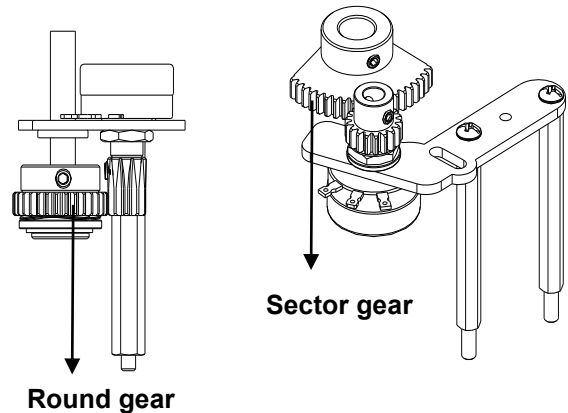
**1. To set the open position:**

- a. Turn power off and loosen both mechanical stops (Please refer to P52 and except OM-A, BM-2, OM-A, OM-A-M).
- b. Use manual override to turn valve to the fully-open position.
- c. Remove cover and loosen the M5 set screw on the TC1 with a 2.5mm Allen key.
- d. Rotate cam(TC1) clockwise to contact with switch.
- e. Slowly rotate cam(TC1) counterclockwise until a light click is heard.
- f. Securely tighten the set screw and apply power to check the travel position. If the position is not correct, please repeat steps a ~ f.
- g. After the adjustment is completed, check again the M5 set screw is securely tightened.

## ADJUSTMENT – Travel Cam & Limit Switches

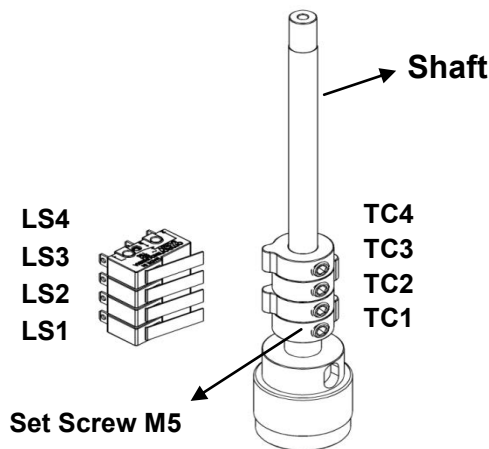
### 2. To set the close position:

- a. Turn power off.
- b. Use manual override to turn valve to the fully closed position.
- c. Loosen the M5 set screw on the TC2 with a 2.5mm Allen key.
- d. Rotate cam(TC2) counterclockwise to contact with switch.
- e. Slowly rotate cam(TC2) clockwise until a light click is heard.
- f. Securely tighten the set screw and apply power to check the travel position. If the position is not correct, please repeat steps a ~ f.
- g. After the adjustment is completed, check again the M5 set screw is securely tightened.
- h. Tighten both mechanical stops and per P52.

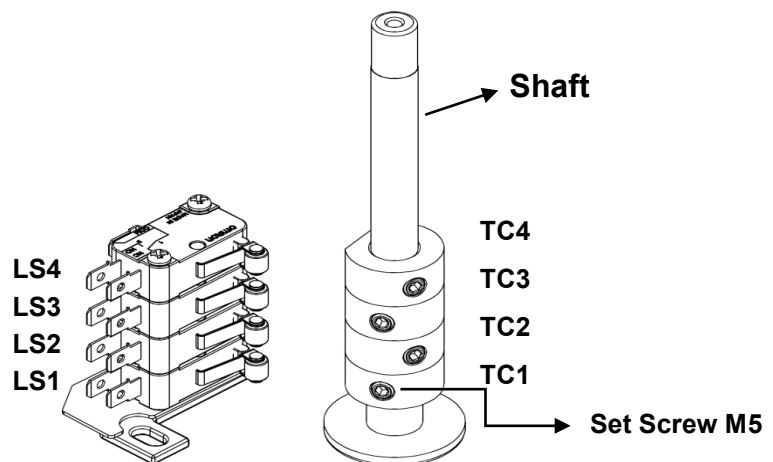


**Modulating type: Loosen M5 set screw on sector gear (Round gear) before setting, after completing fully-open and fully-closed calibration, run the actuator to fully-closed position, then rotate sector gear (Round gear) clockwise to the end and tighten M5 set screw.**

#### 【OM-1】



#### 【BM-2, OM-2~13, OM-F, OM-G】



- TC 4 Synchronous turn with TC2 (optional).
- TC 3 Synchronous turn with TC1 (optional).
- TC 2 “CLOSE”
  - ↻ Clockwise: decrease closing degree.
  - ↺ Counterclockwise: increase closing degree to fully-closed.
- TC 1 “OPEN”
  - ↻ Clockwise: increase opening degree to fully-open.
  - ↺ Counterclockwise: decrease opening degree.

## ADJUSTMENT – Mechanical Stops



### CAUTION !

Mechanical stops should only be reached during manual operation.

The Mechanical stops are factory set, though in some cases adjustment may be required once a valve is fitted.

#### 1. For Electric Operation

Please refer to “Adjustment – Travel Cam & Limit Switches”.

#### 2. For Manual Operation

- a. Turn power off.
- b. Loosen locknut and unwind it a few turns.
- c. For modulating type, loosen the set screw on the sector gear first.
- d. Use manual override to turn the actuator to desire limit position.
- e. For modulating type, rotate sector gear clockwise to the end. Then tighten set screw.
- f. Tighten the mechanical stop screw until it reaches the shaft, then reverse one cycle.
- g. Tighten locknut.
- h. Check that the electrical limit switches can still be reached.

