

**VALUE**ISO 9002  
3M4Y009~00

## **TECHNICAL BULLETIN**

### **SETTING OF “ZERO” & “SPAN” FOR EOM SERIES ELECTRIC ACTUATORS FOR 4ma TO 20ma INPUT OPERATION**

Connect power to terminals per wiring diagram and leave power off.

Connect signal generator or signal power to terminals per the wiring diagram (- TERMINAL 6 and + TERMINAL 7) and leave signal generator power off.

Connect ma meter for reading ma output per the wiring diagram (-TERMINAL 11 and + TERMINAL 12).

Set dipswitches for proper input control signal of 4-20 ma as follows: SWITCH 1 ON, SWITCH 2 OFF, SWITCH 3 OFF, SWITCH 4 ON, SWITCH 5 OFF, SWITCH 6 OFF, SWITCH 7 OFF, SWITCH 8 ON, for initial setup. (See Operation Manual for additional information)

IF VR1 has Phillips type screw adjustment, set VR1 (Span) pot full counter-clockwise. Otherwise skip this step.

IF VR2 has Phillips type screw adjustment, set VR2 (Zero) pot full clockwise. Otherwise skip this step.

Loosen the right mechanical stop locking nut and turn the mechanical stop stud counter-clockwise several turns. Using the actuator hand wheel, turn it clockwise to position the valve to the full closed position. Then turn the hand wheel an additional 1 and ¼ turns clockwise and adjust the right mechanical stop stud to snugly engage the gear train and then tighten the locking nut.

Check the fan shaped gear, such that it is at it's end of travel in the counter-clockwise position looking down from the top of the actuator and it has not hit the motor casing. Adjust as needed by loosening the setscrew on fan gear, loosening the two long Phillip screws holding the valve position pot, disengage the valve position pot, and then adjust position of fan gear as necessary. Reengage valve position pot and make sure its gear is turned fully clockwise. Re-tighten all connections.

Again using the actuator hand wheel, turn it counter-clockwise to position the valve back to the full closed position, usually about two turns.

Set the closed limit switch, 2<sup>nd</sup> from bottom, such that the limit switch has fallen off the cam, thus opening the motor close circuit and stopping the valve closing. Verify proper setting with a meter, light or by limit switch clicking sound.

Loosen the left mechanical stop locking nut and turn the mechanical stop stud counter-clockwise several turns. Using the actuator hand wheel, turn it counter clockwise to position the valve to the full open position. Then turn the hand wheel an additional 1 and ¼ turns clockwise and adjust the left mechanical stop stud to snugly engage the gear train and then tighten the locking nut.

Set the open limit switch, 1<sup>st</sup> from bottom, such that the limit switch has fallen off the cam, thus opening the motor open circuit and stopping the valve opening. Verify proper setting with a meter, light or by limit switch clicking sound.

Apply actuator power. The valve will go to the closed position.

Adjust VR52 to read 4-ma on the ma meter or as close as possible to 4-ma.

Remove the actuator power.

Set DIP SWITCH 7 to ON and DIP SWITCH 8 OFF.  
(See Operation Manual for additional information)

Apply actuator power. The valve will go to the open position.

Adjust VR51 to read 20-ma on the ma meter or as close as possible to 20-ma.

Apply signal power and give a full closed command, such as 4-ma. The valve should move to the closed position.

IF VR2 has Phillips type screw adjustment, and the red zero light is off, slowly adjust the VR2 (ZERO) pot counter-clockwise until the red zero light comes on and then immediately stop turning the VR2 (ZERO) pot. After actuator stops moving and the red zero light goes off, again slowly adjust the VR2 (ZERO) pot counter-clockwise until the red zero light comes on and stays on. The actuator position ZERO is now set.

IF VR2 does not have a Phillips type screw adjustment, and the red zero light is off, slowly adjust the VR2 (ZERO) pot counter-clockwise until the red zero light comes on and stays on. The actuator position ZERO is now set.

IF VR2 does not have a Phillips type screw adjustment, and the red zero light is on, slowly adjust the VR2 (ZERO) clockwise until the red zero light is off. Now slowly adjust the VR2 (ZERO) pot counter-clockwise until the red zero light comes on and stays on. The actuator position ZERO is now set.

Proper ZERO setup is achieved when a 4-ma signal is applied, the valve is in the fully closed position, the actuator closed limit switch has removed motor close power, and the red zero light can be turned off and on.

**PLEASE NOTE THAT THE ABOVE STATEMENT MUST BE TRUE AND THE RED ZERO LIGHT MUST BE LEFT ON BEFORE ADJUSTING THE SPAN SETTING.**

Power the actuator utilizing the open signal, such as 6-ma, 8-ma, 10-ma, ETC., until the signal reaches 20-ma and the valve is full open.

You may not have to adjust the VR1 (SPAN) pot.

But, if the valve reaches the full open position before the signal reaches 20-ma, then give the valve a 4-ma signal to close the valve.

Now give the valve a 2-ma signal. Slowly adjust the VR1 (SPAN) pot clockwise until the green span light comes on and then immediately stop turning the VR1 (SPAN) pot. The actuator should move toward the open position and stop.

After the valve stops moving and the green light goes off, apply 2 additional ma signal and again slowly adjust the VR1 (SPAN) pot clockwise until the green light comes on and then immediately stop turning the VR1 (SPAN) pot. The actuator should move toward the open position and stop.

Continue the above VR1 setup procedure, two ma at a time until the signal reaches 20-ma and the valve has reached the full open position and the valve open limit switch has removed motor open power.

If at 20-ma, the green span light cannot be turned off and on, the span setup is not complete.

Give the valve a 19.9-ma signal and see if the green span light goes off.

If the green span light is off, slowly adjust the VR1 (SPAN) pot clockwise until the green light comes on and then immediately stop turning the VR1 (SPAN) pot. The actuator should move toward the open position and stop. The actuator span setting is complete.

If at 19.9-ma, the green span light cannot be turned off and on, the span setup is not complete.

Give the valve a 19.8-ma signal and see if the green span light goes off. If the green span light is off, slowly adjust the VR1 (SPAN) pot clockwise until the green light comes on and then immediately stop turning the VR1 (SPAN) pot. The actuator should move toward the open position and stop.

If at 19.8-ma, the green span light cannot be turned off and on, the span setup is not complete.

Follow the above procedure, decreasing the open signal by .1-ma until the green span light will turn off and on. Do not go below 19.5-ma for the span adjustment.

**Please consult the factory for additional help.**

Proper SPAN setup is achieved when a 19.5-ma to 20-ma signal is applied, the valve is in the fully closed position, the actuator closed limit switch has removed motor open power, and the green span light can be turned off and on.

**PLEASE NOTE THAT THE ABOVE STATEMENT MUST BE TRUE AND THE GREEN SPAN LIGHT MUST BE LEFT ON BEFORE THE SPAN SETTING IS CONSIDERED COMPLETE**

Give the actuator a full closed command and verify valve is fully closed and the red zero is on.

Give the valve a 6-ma signal and verify the valve reaches this position.

Give the valve an 8-ma signal and verify valve movement, then give a 12-ma signal and verify valve movement, then give a 19-ma signal and verify valve movement.

At 19 ma the valve should be nearly full open and the green span light should be off.

Then give a 20-ma signal and verify valve movement to the full open position and the open limit switch is off its cam and the green span light is on.

Stroke valve 2 to 3 times using various signal inputs to check for proper valve movement and position.

**Set signal sensitivity pot (black square pot with 0 to 9 numbers) to setting 9.**

**Set Dip Switch 7 to ON and Dip Switch 8 to ON.**

**Leave valve in a slightly open position (disk not in contact with seat) when finished if valve is not installed in a line.**

**PLEASE NOTE FOR PROPER ACTUATOR OPERATION:**

**At each end of the actuator's travel, the appropriate open or closed limit switch should be off it's cam, the valve should be fully open or closed, power to the motor should be off and the appropriate red zero or green span light should be on.**