Mk. 16IQ Troubleshooting

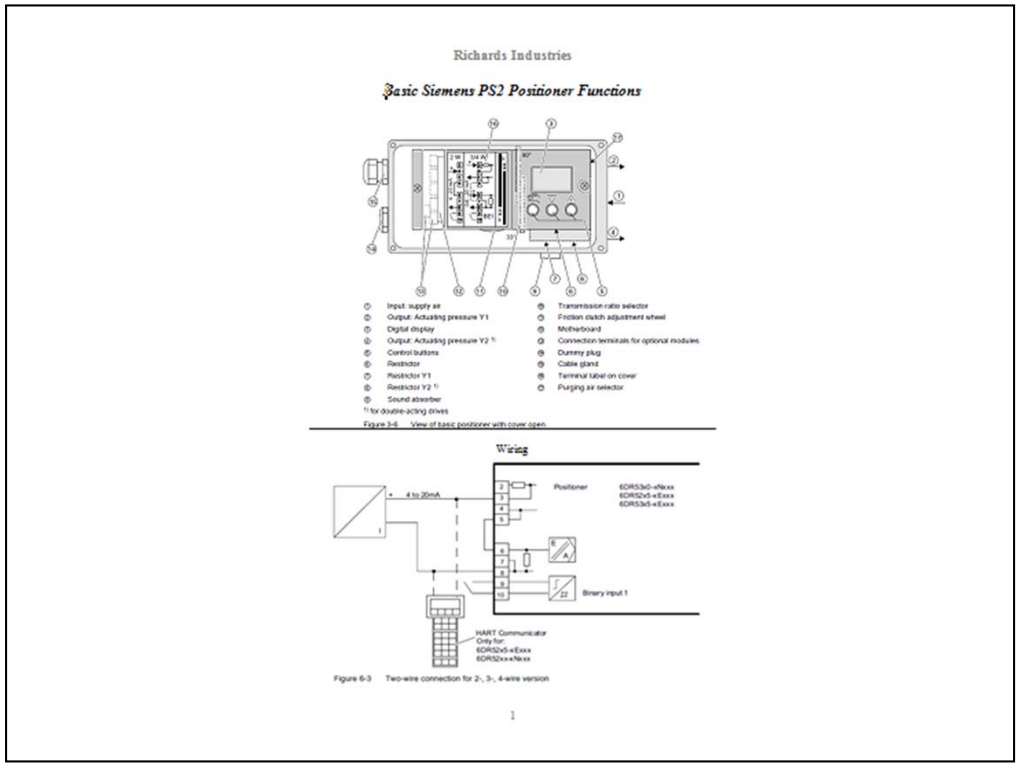
09/27/2013

Troubleshooting

The first thing you need is information ... Try to find out what is wrong and why. Getting a serial number (found on the valve tag (see above)) and application parameters are always helpful in dealing with field problems.

The problem could just be something the customer considers odd. For example, on all sliding gate control valves, we ‘zero’ the overlap of the seats out when we calibrate the positioner. Therefore, the % signal reading will not match the % position reading. There is nothing wrong with the positioner ... though sometimes the customer thinks the positioner is not set up properly because of this.

Another common problem is over pressurization of the actuator. Jordan actuators are limited to between 20-40psi pressure and are supplied with the above clearly marked tags from the factory. If the actuator has seen greater than the allowed pressure, more than likely the internal components of the actuator will need to be replaced. It is strongly recommended to allow the factory to do this repair.



Richards Industries

Basic Siemens PS2 Positioner Functions

Figure 3-6 View of basic positioner with cover open

Wiring

Figure 6-3 Two-wire connection for 2-, 3-, 4-wire version

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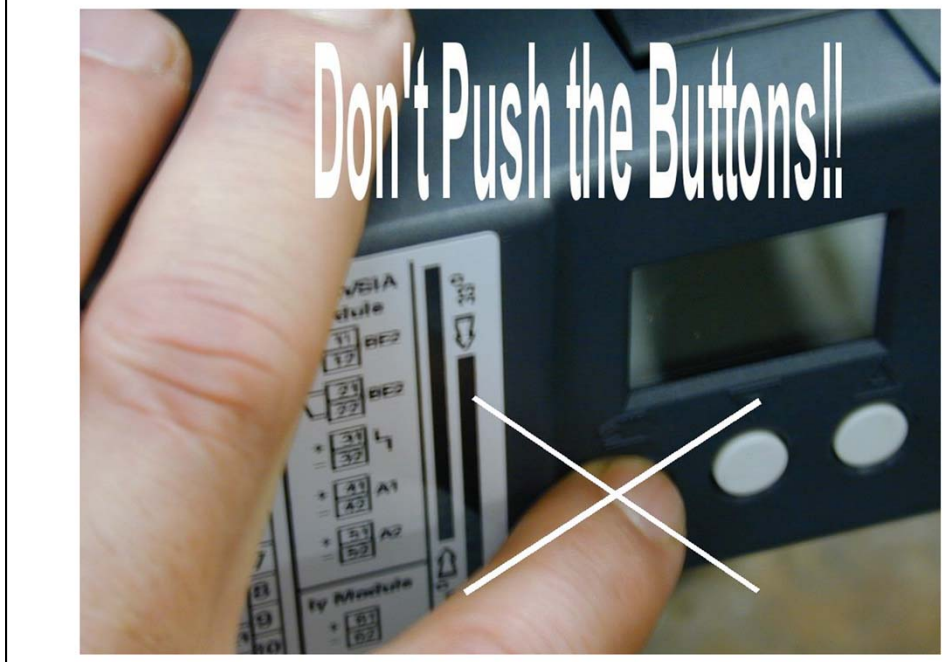
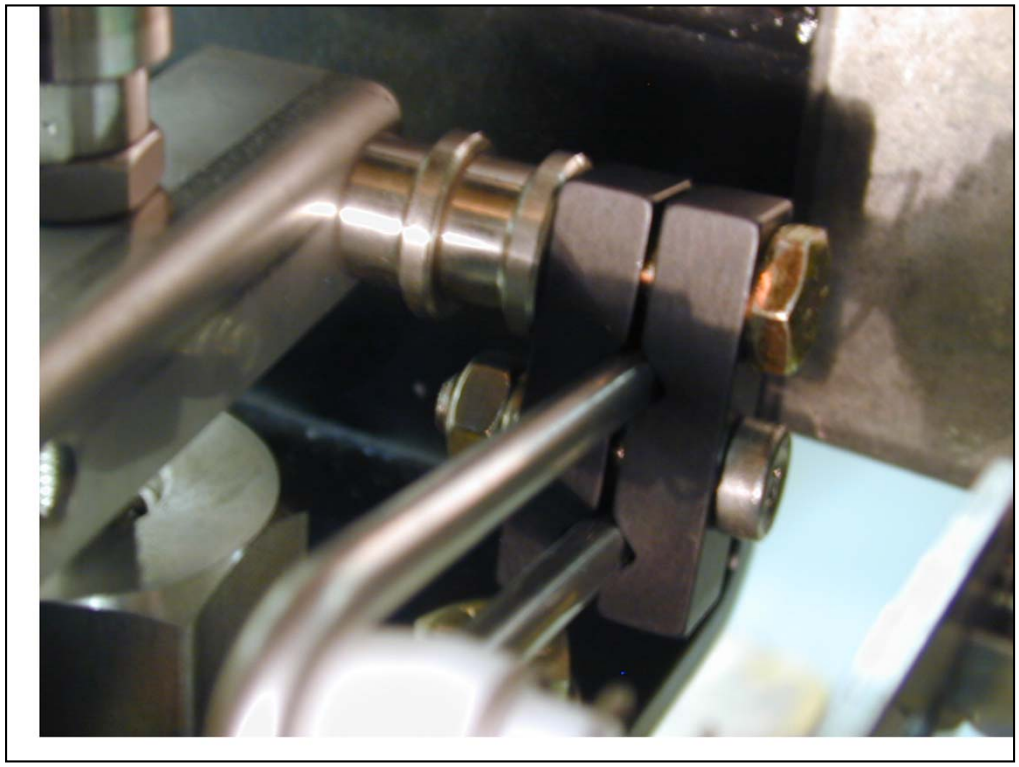
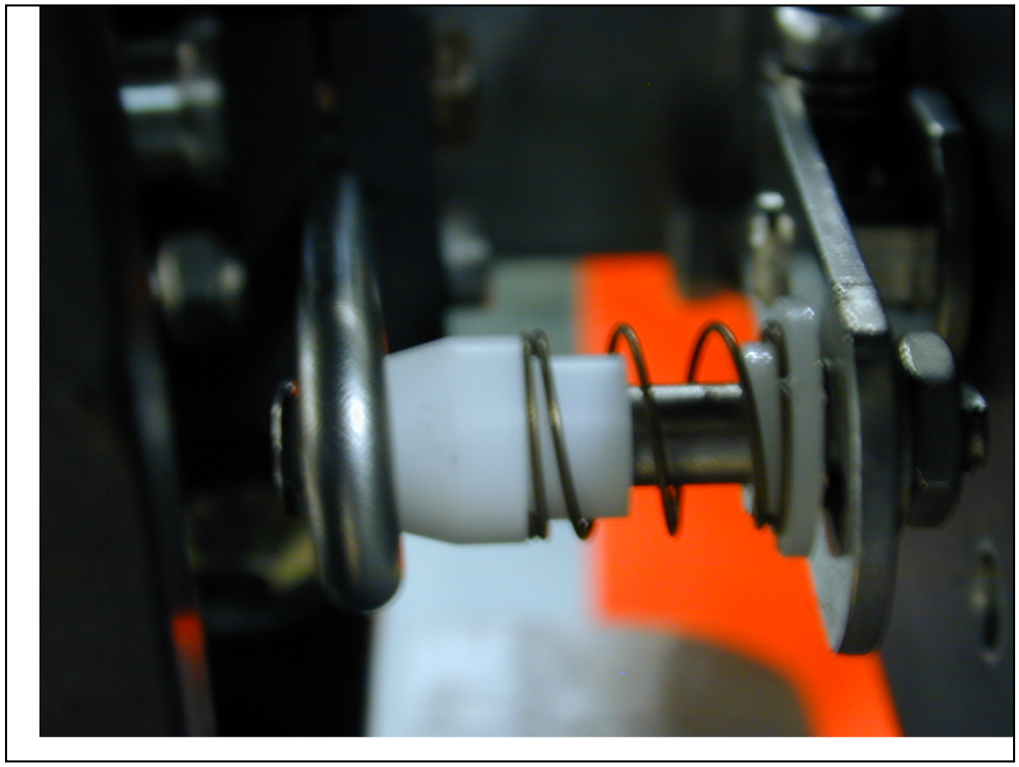
All of the control valves that we install the Mk. 16IQ positioner on are factory calibrated for proper operation prior to shipment. We ship the above Positioner Programming Guide with all positioners that show what the factory settings are for each style of valve. The Positioner Programming Guide is available at http://www.jordanvalve.com/products/control-valves/positioners/84/mark-16iq-series--smart-valve.



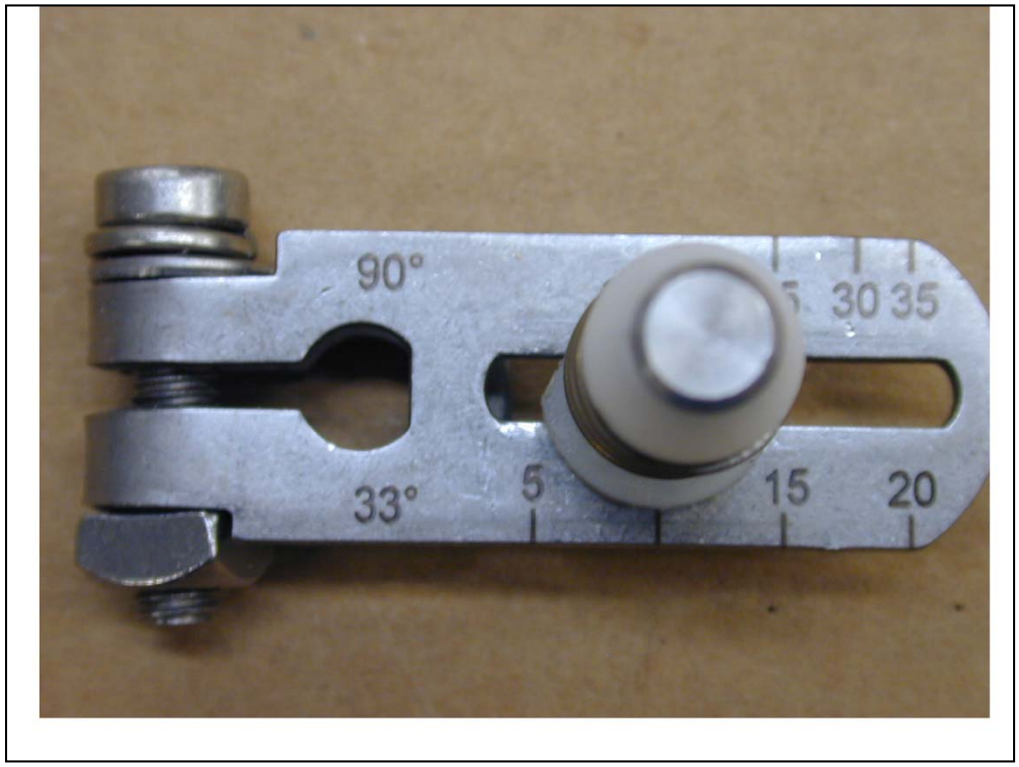
People just can’t resist pushing those three little buttons inside the positioner. No matter what has been changed, you can always get the positioner back to where it should be.



The first step is to check out the mechanical connections. Check that all parts of the assembly are tightly attached to the valve stem. Each type of valve will be slightly different. The important thing is that these cannot be easily moved. All connections must be tight.

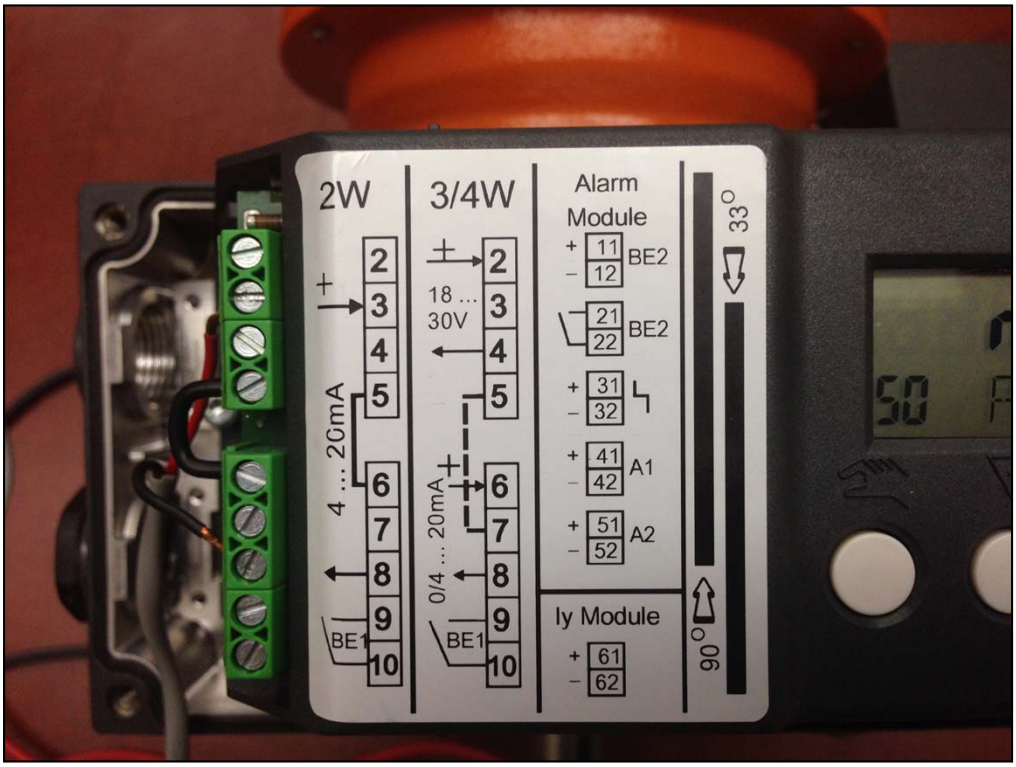


Now check to make sure the linkage is in connected and tight. The spring loaded nylon bushing on the positioner arm pin needs to be engaged in the mating arm. The bushing is spring loaded and must have spring tension holding the cone firmly in the bar.



Verify that the pin is properly set on the positioner arm for the valve in question. You will need to know the stroke length of your valve in millimeters. There are separate scales for 33° and 90° setting, depending on the stroke of your valve.

Make sure the pin cannot be slid back and forth on the positioner arm. A 10mm open end wrench can be used to tighten the back nut if loose.



Wiring

If using a 4-20 mA signal, use the 2 wire connection method (often called loop powered). Make sure the positive lead is connected to terminal #3, and the negative lead is connected to terminal #8.

If using a 0-20 mA signal the 4 wire method is required. The positive signal lead should be connected to terminal #6 and the negative lead should be connected to terminal #8. The auxiliary DC voltage source should be connected with the positive lead to terminal #2 and the negative lead connected to terminal #4. Make sure the jumper wire connected between terminals #5 & #6 is removed for this method of operation.

If everything checks out mechanically, move into testing the positioner. You will need the ability to change the input signal. This can be done through a control system or 4-20mA power source similar to one above.

You must have at least 4mA signal to the positioner for it to power up.

To get into the positioner menu, push and hold the hand key for 5 seconds. The display will change to the menu display.

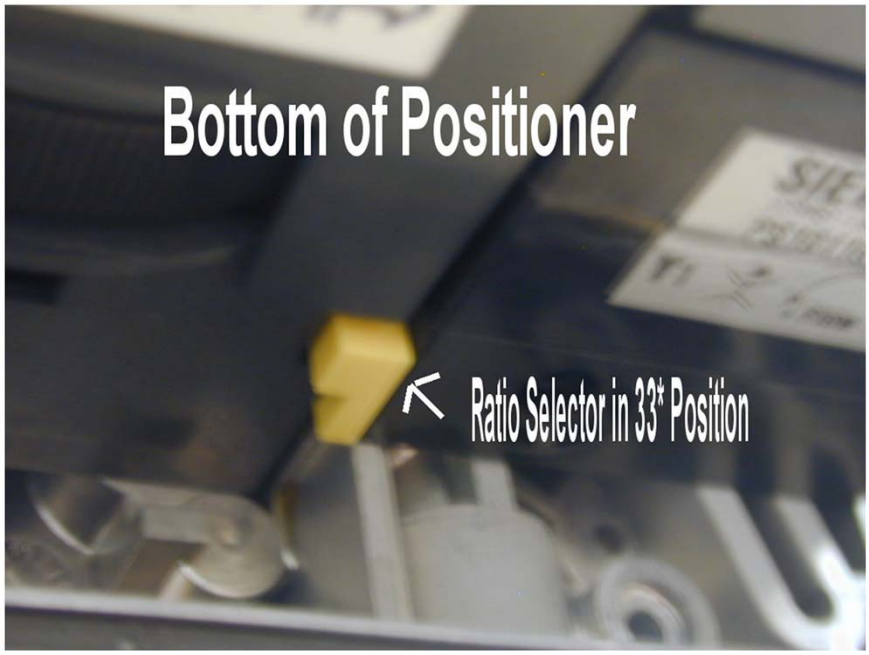
The menu number is listed on the bottom left, and the menu abbreviation is on the bottom right. The top in large font shows the current setting. These menu items correspond with pages 4-6 of the supplied Positioner Programming Guide (http://www.jordanvalve.com/products/control-valves/positioners/84/mark-16iq-series--smart-valve).

Resetting to Siemens Factory Settings

Use the hand button to scroll through the menu items.
Stop when you are at menu #50 – Reset. (On older positioners this may be option #55)
Push and hold the + key for approximately 5 seconds. The readout will change to ‘Start.’
Once the memory is reset, the positioner display will say ‘Ocay’.
The positioner has now been set back to the Siemens factory defaults.

Please keep in mind these are Siemens factory settings … NOT Jordan Settings

Once reset; use the Positioner Programming Guide (http://www.jordanvalve.com/products/control-valves/positioners/84/mark-16iq-series--smart-valve) to change the menu items per your specific valve.



Make sure the transmission ratio selector is in the proper position. This is a yellow plastic bar that shifts vertically up and down inside of the positioner body.

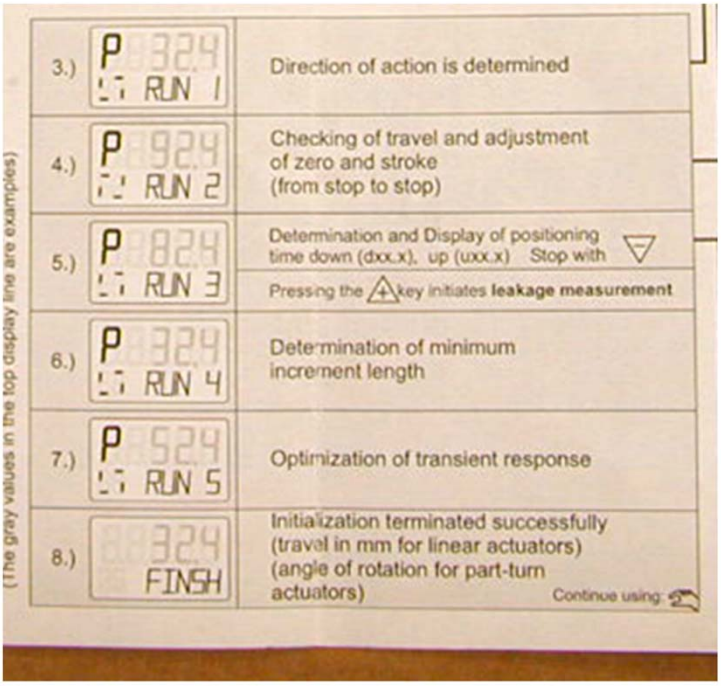
If the stroke is in the 90° range, the bar must be shifted up.

If the stroke is in the 33° range, the bar must be shifted down.

Use a pen or a pencil to click the bar into the proper position.

Now go to menu item #4, you are ready to initialize the positioner.

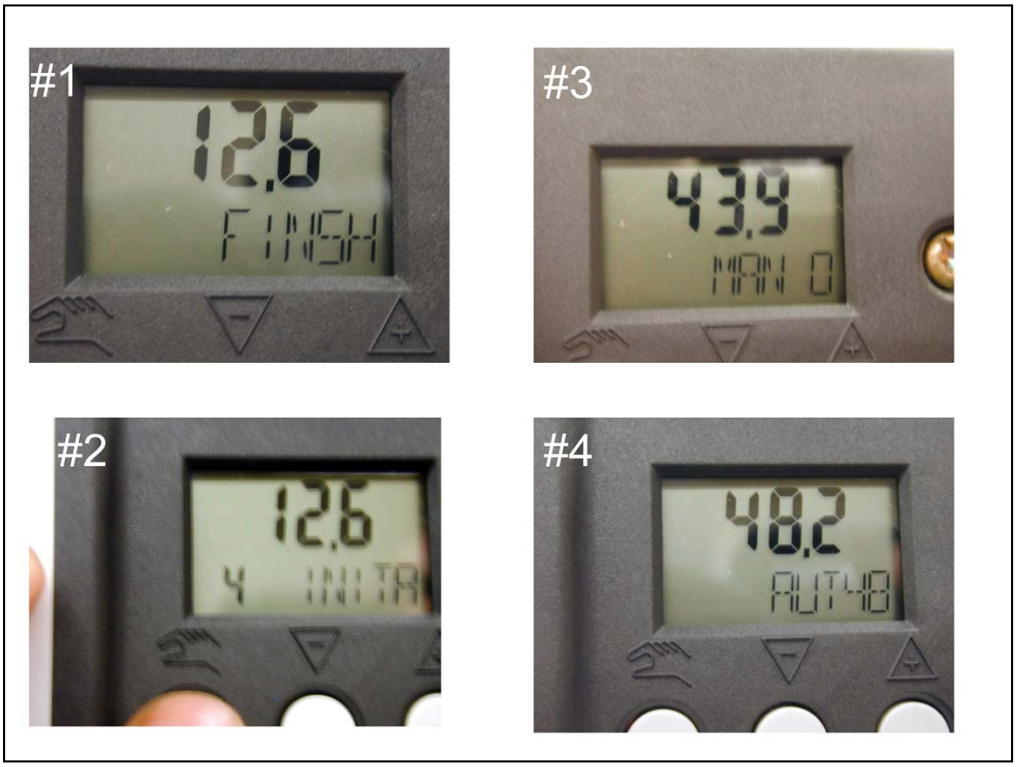
To initialize, push and hold the + key for 5 seconds.



The positioner will go through five different runs. The total initialization can take from 2 minutes up to 5 minutes.

If an Error occurs, please refer to the Error Section of this guide (pages 18-23).

Rarely does an error occur after run 3. If one occurs, please contact the factory for help.

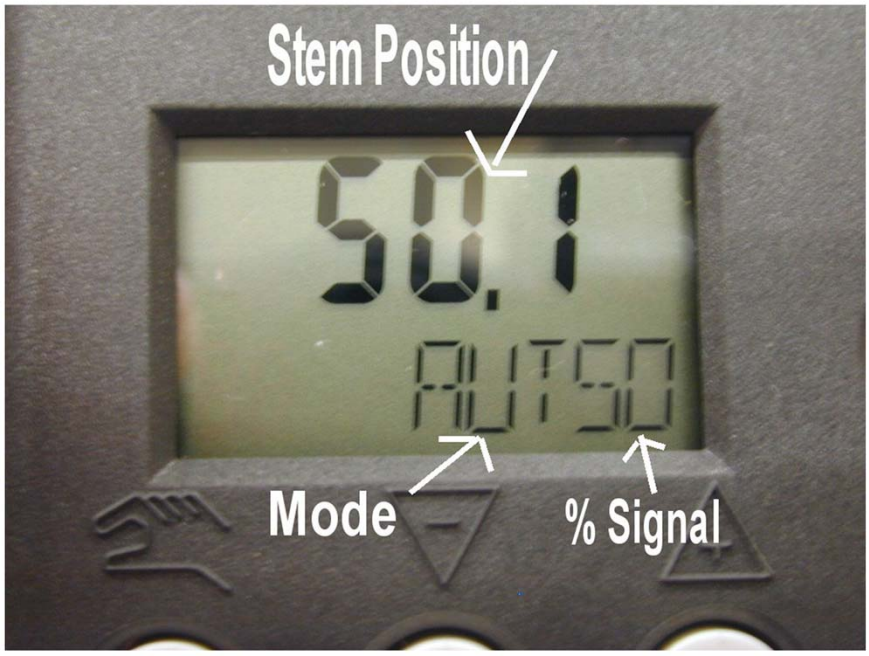


Step #1 - When the positioner is finished the display will read ‘Finish’.

Step #2 - To complete the calibration, momentarily push the hand key. This will return you to the menu mode.

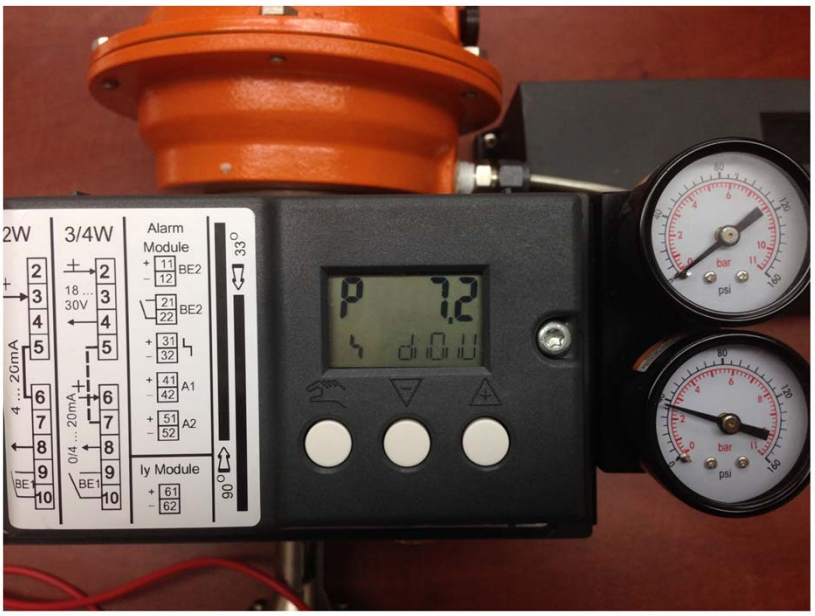
Step #3 - Now, press and hold the Hand key for 5 seconds. This will place the positioner in a manual mode.

Step #4 - Press the Hand key momentarily one more time and the display will show ‘Aut’ for automatic mode, or in service.



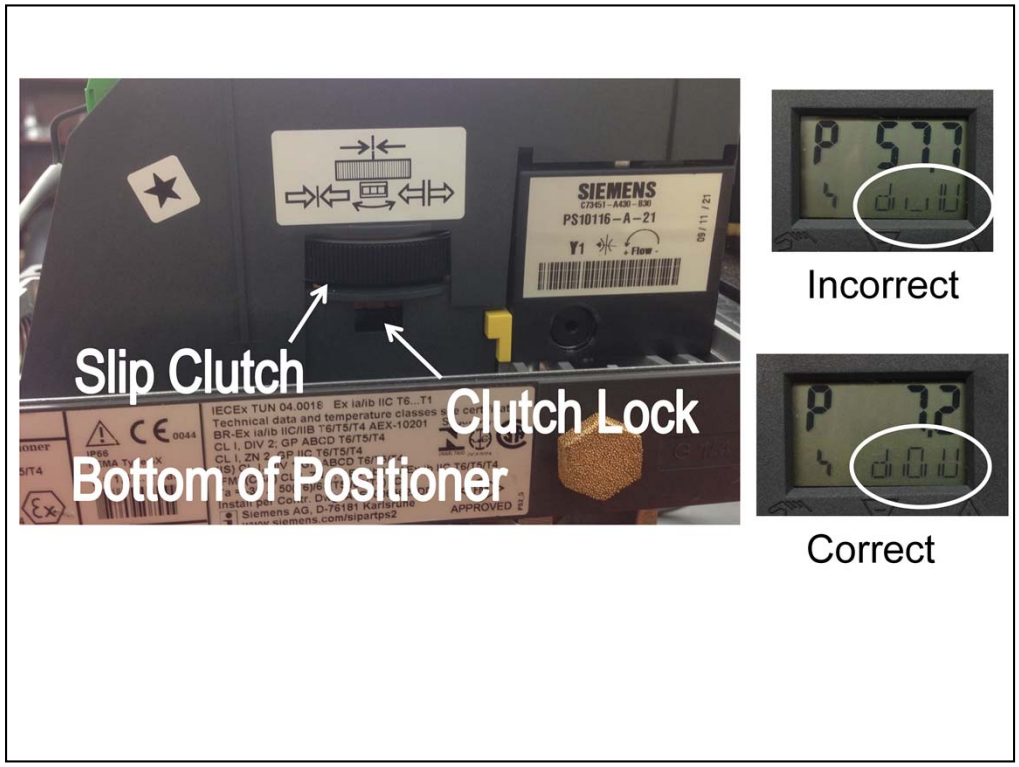
Double check that the valve is operating properly by changing the signal to the valve.

Errors



In Run 1, the positioner is trying to determine the direction the valve operates when given an input signal. If you get an error, it is simple to correct with the following steps…

- Push the hand key momentarily to get out of the initialization.
- Push and hold the hand key for 5 seconds to get to manual mode.
- Make sure the positioner and actuator gauges are not equal in pressure and verify the actuator arm is horizontal.
- If not, use the + or – keys to get the actuator somewhere near mid stroke.
- Push and hold the hand key until you are back at the menu #4.
- Restart initialization.



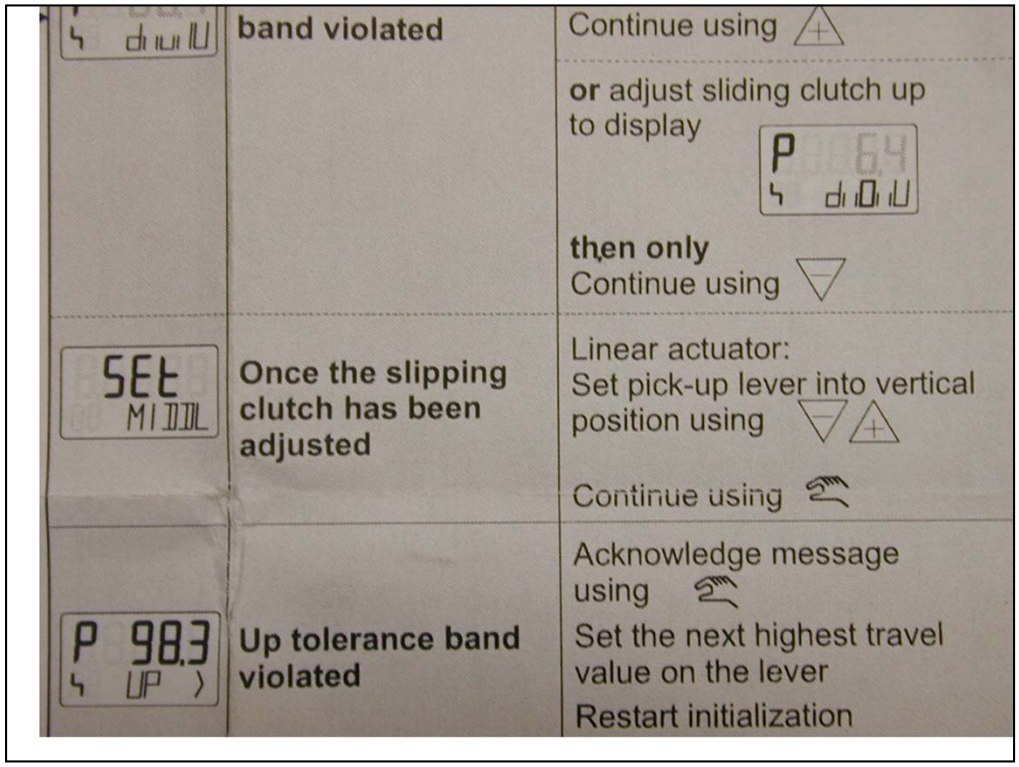
If an error occurs during Run 2, there are three potential problems.

First is the down tolerance has been violated. In order to move the slip clutch, you need to make sure the clutch lock is unlocked (factory set in locked position). To unlock, rotate the yellow notched wheel counterclockwise with a flat head screw driver.

Once unlocked, try adjusting the slip clutch under the body of the positioner until the upper display reads somewhere between 4.0 to 9.9. This will also be visibly noticeable on the positioner readout, per the above pictures.

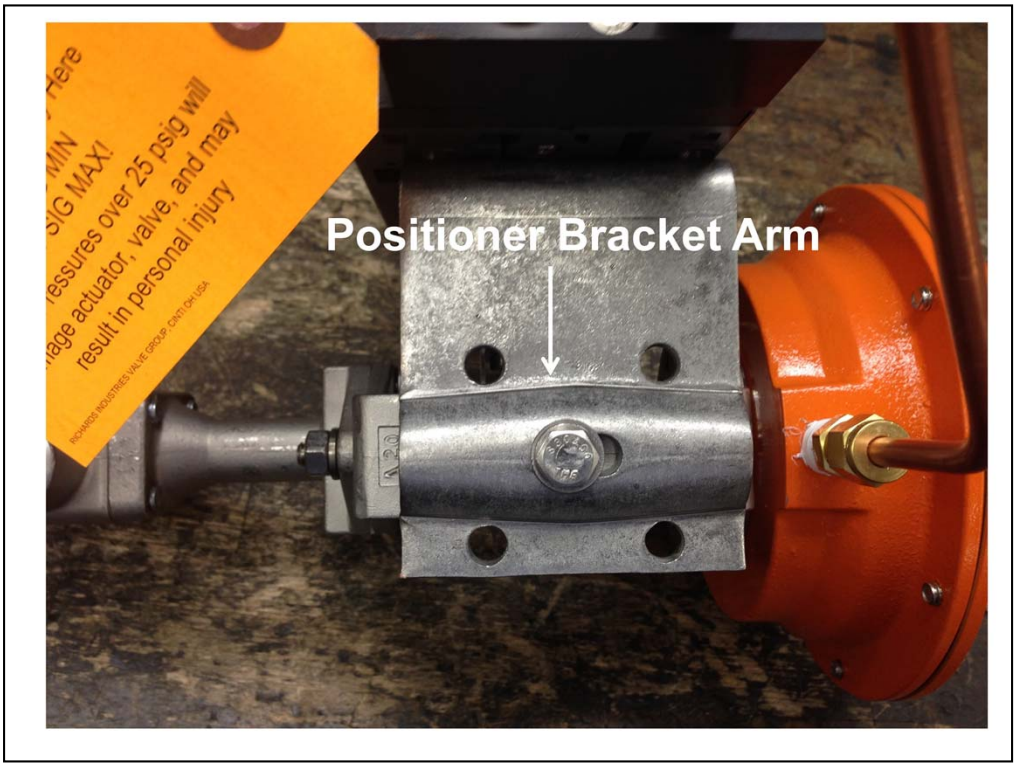
The factory recommends resetting the clutch lock. To lock, rotate the yellow notched wheel clockwise with a flat head screw driver until it locks.

Continue initialization by pressing the + key.



Another potential error in run 2 is that the positioner arm is not horizontal when the valve is at mid stroke. If you get an error, it is simple to correct with the following steps…

- Push the hand key momentarily to get out of the initialization.
- Push and hold the hand key for 5 seconds to get to manual mode.
- Make sure the positioner and actuator gauges are not equal in pressure and verify the actuator arm is horizontal.
- If not, use the + or – keys to get the actuator somewhere near mid stroke.
- Push and hold the hand key until you are back at the menu #4.
- Restart initialization.



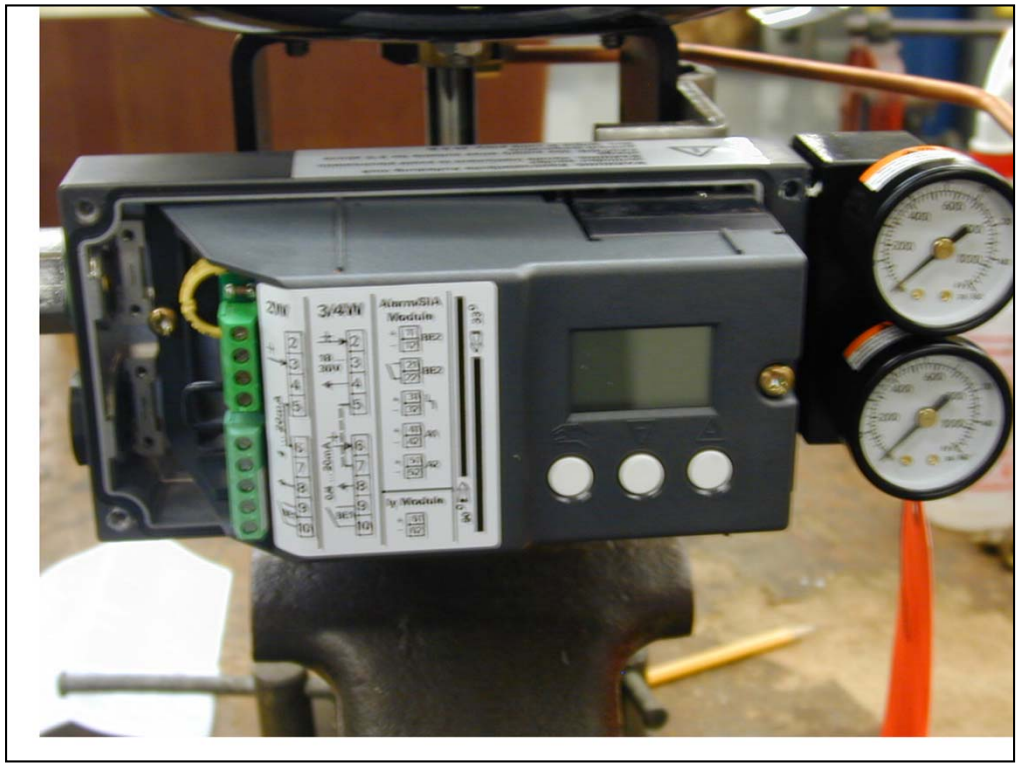
The last potential problem is that the Up band has been violated, meaning the positioner has entered an inactive zone. This indicates that either the transmission ratio selector or the pin on the positioner arm is not set properly. To correct…

- Push the hand key to abort initialization.
- Double check transmission ratio selector for the proper position.
- Double check that the positioner and actuator gauges are not equal in pressure
- Make sure the pin on the positioner arm is in the proper location.
- If all the above is correct, loosen the positioner bracket arm and move it downward slightly until the positioner arm is parallel.
- Restart initialization.

If an error occurs in run 3, this indicates that the positioning time is either too fast or too slow. The positioner does not like full strokes in less than two seconds.

To correct, adjust the restrictor screw. This is located under the body of the positioner on the right hand side, just under the – key. This screw is hard to see. It is in the back towards the base of the positioner.

- Use a 3/32” Allen wrench to adjust the nozzle.
- If the travel time is too short, insert the Allen wrench into the screw and turn the screw in until it hits the seat. Then unscrew the screw between ½ to 1 turn. This will slow down the travel time.
- If the time is too long, unscrew the restrictor screw some more to allow more air to escape faster. This will decrease the positioning time. You may also want to increase the supply pressure up to 45 psi.
- Press the + key to resume initialization.



These are the most common errors. Rarely do you get more than one during a setup. As always, if you cannot figure out what is wrong, give the factory a call at 513-533-5600. Someone at the factory will gladly assist you in getting your positioner back in operation.