

## Pressure Switch adjustment.

A pressure switch is a device that opens and closes based on the pressure it sees not the flow. Pressure is a function of flow but there can be pressure and not flow. This device is used in this manner because it is cheap and easy to install as opposed to a flow switch that is more expensive and requires extra plumbing to install. Note: Balboa M7 series control boxes do not use pressure switches.

Most pressure switches are simply a micro-switch and an air diaphragm. The pressure on one side of the diaphragm will deflect the diaphragm and actuate the switch. The greater the pressure the greater the deflection. The distance the switch is from the diaphragm is adjustable and that adjustment determines at what pressure the switch closes and opens.

There are 4 zones in the adjustment range of the pressure switch. Zone 1 is where the switch is always in contact with the diaphragm and therefore always closed. Zone 2 is the other extreme, when the switch is never in contact with the diaphragm and is always open. In Zone 3 the switch is in an unstable condition where the turbulence of the water surrounding the diaphragm causes the switch to randomly open and close. Zone 4 is the sweet spot in the adjustment range that closes the switch when there is water flow and opens it when the flow stops.

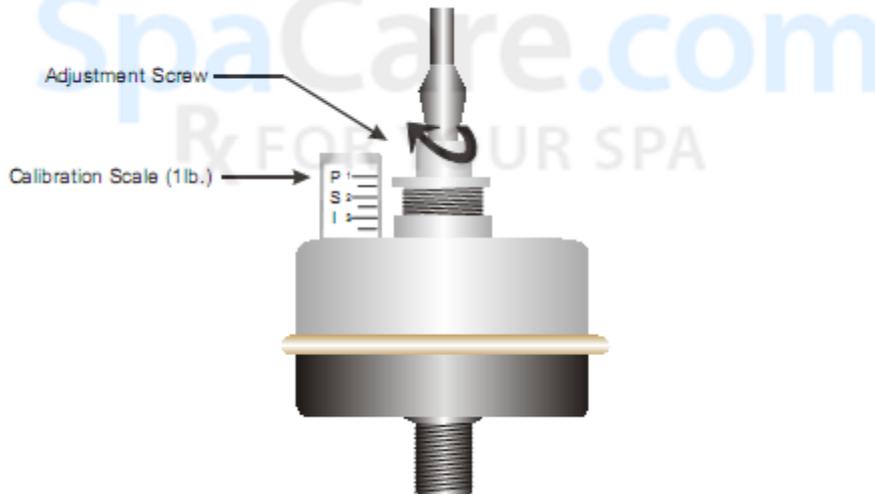
The sweet spot in the adjustment range is fairly large and considered a coarse adjustment. To find the sweet spot for the pressure switch is straight forward but must be done on site to compensate for the weight of the water in each situation. Most pressure switches are adjusted for mid-range right out of the box and will work that way for most applications. If the pressure switch does not work in an application as is, a simple set of tests can be made to determine what zone the switch is in. Once the zone is identified then the adjustments can be made.

The first test should be made with an ohmmeter with the system off. Remove the connection from one side of the switch to open the circuit and measure across the 2 terminals. The reading should be the same as if you were holding the two probes in the air. If the reading is anything other than that, the switch needs adjustment. Most pressure switches have a slot for a screwdriver blade or rotating wheel to make the adjustments. Turn counterclockwise  $\frac{1}{4}$  turn to close or clockwise to open. Take the measurement again. Continue until the meter reads an open circuit.

The next test is made with the system pumping water thru where the pressure switch is located at the speed that the switch will see when heat is called for. Either turn the heat all the way down or disconnect the heater. It is best to only deal with one thing at a time. With the water moving, make another test. The meter should read a steady 0 ohms. If the reading fluctuates, you are in Zone 3. This is where the turbulence of the water is causing the switch to open and close. Using  $\frac{1}{4}$  turns continue turning counter-clockwise until a steady reading is obtained. Turn  $\frac{1}{2}$  to 1 full turn to move further into Zone 4.

Once in Zone 4 you are done. The switch is adjusted to the conditions on site and is ready to go. Reconnect the wire to the pressure switch terminal and do a power off reset of the system

Upon restart the system will go out a look for an open pressure switch. If the switch is open it will continue with the start up routine. If the switch is closed it may display an error code. Some systems will not display an error code and will just wait for the closed switch and not heat. On some Gecko systems the error will be 3 dots flashing along the bottom of the display. Most systems will say some variation of FLO. Some are more advanced and say FLO or FLC meaning open or closed switches. Consult the owners manual for proper error codes for your system. See Pressure Switches or Flow Switches.



**IMPORTANT:** After any pressure switch adjustment, it is important to test the control by turning on the pump low speed and heater. While operating, unplug the pump, the heater must turn off. If the heater stays on, plug the pump back in and readjust the pressure switch to achieve proper operation.