

# Technical Note #101

## CO2 Solenoid Does Not Turn ON or OFF When Expected

### Symptoms

The CO2 solenoid does not turn on or off at the programmed pH levels. The problem may be intermittent, where it works only part of the time.

### Causes

- The pH control programming of the outlet is incorrect.
- The controller has sensed a problem in the pH Module or pH Electrode.
- The AC load on the outlet is insufficient.
- The CO2 Solenoid is defective.

### Troubleshooting Procedure

- Unplug the CO2 solenoid from the Lighthouse Pro outlet. Plug the solenoid directly into a wall outlet. You should hear a click sound as the solenoid engages. Some solenoids also contain a light that will turn on as power is applied. If no clicking sound is heard or its light does not come on when you insert the plug in the wall outlet, the solenoid is defective and needs replacing.
- Check and verify outlet programming. Note that the *Start Time* and *Stop Time* on the outlet setup web page must be set to the exact same time values (i.e., 12AM and 12AM) to operate the pH controller 24/7.
- If the solenoid is turning on and off at slightly higher or lower pH values, this is normal. The solenoid is activated on one minute intervals- it is possible for the pH to climb or fall slightly before the solenoid engages or disengages at the top of the next minute. Also note that the pH must rise or fall .05 units before the solenoid is reactivated. This is done to prevent “relay chatter” which can damage to solenoid. For example, if the pH level is set to 6.50, the pH must drop to 6.45 before the solenoid is turned off, then rise to 6.51 before it is turned on.
- If a failure is sensed by the controller in either the pH Module or the pH electrode readings, the solenoid will be disengaged. This can happen if the pH probe falls out of the water, the glass bulb breaks on the tip of the probe, or there is a hardware failure in either the pH Module or the pH electrode. Any of these things will cause an error message on the display. If no error message is present, then this is not the problem.
- Insufficient AC Load on the outlet. Each outlet on the power bar requires a minimum amount of current to operate. Some CO2 solenoids, especially those with neon indicator lamps (instead of LEDs)

or no indicator lamp at all, draw so little current that the controller cannot accurately sense that anything is plugged into the outlet. The symptoms of this are usually intermittent operation of the outlet. It may take several minutes or longer to turn off, even though the pH level is more than adequate to disengage the solenoid.

To test this, plug an extension cord into the pH controlling outlet and plug both a table lamp and the solenoid into the extension cord. Allow to run for several hours. If the solenoid is operating correctly in response to pH changes (as indicated by the table lamp bulb turning on/off), this is the problem.

To fix this you need to increase the load on the outlet slightly so the controller can accurately detect its usage. You can do this by adding a small inexpensive night light, plug-in air freshener, unused AC adapter, etc. any device that draws small amounts of power. With the added load, the controller will then properly sense when the outlet is in use and the solenoid will operate correctly.