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WM1 & WIND Contacting Conductivity Sensor Troubleshooting Guide

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Section 1: Sensor (Electrode) Responds Slowly

Step 1:

The sensor requires periodic cleaning and calibration.

- The method of cleaning the electrode will depend upon the coating, as well as the materials of construction of the electrode. Do not use a solvent that will attack the electrode
- Oily coatings should be removed with a mild detergent or isopropyl alcohol.
- Hard scales such as calcium carbonate can usually be removed with a dilute hydrochloric acid solution.
- Occasionally an electrode may become coated with various substances that require a more vigorous cleaning procedure. Usually the coating will be visible, but not always. To clean a coated electrode, use fine grit abrasive, such as emery paper. Lay the paper on a flat surface and move the electrode in a back and forth motion. The electrode should be cleaned parallel to the carbon electrodes, not perpendicular.
- Soft coatings can be removed using a soft cloth or soft toothbrush.
- A calibration should always be performed after cleaning the electrode.

Step 2:

If cleaning does not speed up the electrode's response

- Replace the electrode.

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Section 2: Sensor Reading is Stuck on one Value

Step 1:

If the sensor reading is stuck on one number

- If it is stuck near 0 mV then there is most likely an electrical short.
- If it is stuck near 1000 uS, then most likely there is an electrical short.
- If it is stuck at a high reading , then the circuit is open, which is either a sensor error or the conductivity of the water is really high (over 10,000 uS).

Step 2:

Check the sensor for an electrical short.

- Power down the controller.
- Disconnect the sensor from the controller.
- Power the controller up.
- If reading drifts then the sensor has a short. Replace the sensor. If the reading is still stuck on one number, proceed to **Section 4**.

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Section 3: Sensor Reads Low or High Versus a Calibrated Handheld Meter; Cannot Calibrate

Step 1:

Perform a sensor calibration in accordance with the controller manual.

- If the sensor cannot be calibrated, first thing to try is clean the sensor.
- If the sensor cannot be calibrated after cleaning, proceed to **Step 2**.

Step 2:

Go to the **Sensor mV menu, Resetting defaults.**

- A clean sensor should give a predictable signal in a solution of known conductivity. If the calibration adjusts the signal more than 50% away from the predicted value, the calibration will fail.

- The controller has a current conductivity reading and an uncalibrated conductivity reading. In the conductivity sensor menu, press the **Reset Defaults** button. This should bring the current conductivity reading and the uncalibrated conductivity (raw) reading back to the same value, or very close to it.

- If the conductivity still cannot be calibrated, proceed to **Section 4.**

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Section 4: Sensor Error

Step 1:

Perform a self-test for this sensor input.

- If the self-test passes, then the problem is not inside the controller. The preamp or electrode is faulty. Continue to **Step 2**.

- If the self-test fails, disconnect sensor from the controller and repeat the self-test and if it still fails, send the controller back for repair. Contact your distributor or Walchem Customer Service with the controller model number, serial number, failure mode, and application to initiate the Return Authorization process.

Step 2:

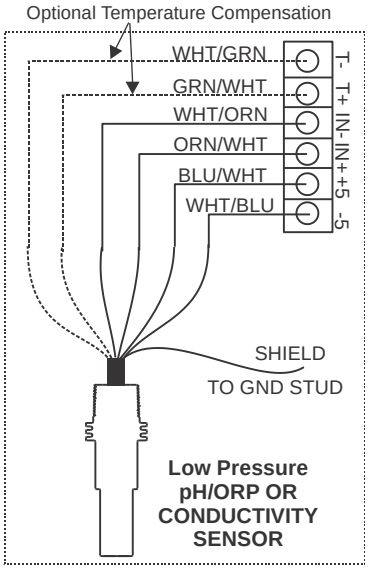
On the Conductivity sensor input terminals inside the controller, using a multimeter:

- Measure the VDC across IN- and +5V, should read +5 VDC +/- 5%
- Measure the VDC across IN- and –5 VDC, should read –4.6 VDC +/- 5%.

- If these measurements are out of spec with and without the preamp connected, the controller is faulty. Contact your distributor or Walchem Customer Service with the controller model number and serial number to initiate the Return Authorization process.

- If these measurements are in spec without the preamp connected, then replace the preamp. If these measurements are in spec with and without the preamp, then continue to **Step 3**.

- Make sure the preamp is wired correctly into the controller, as shown.
- Be cautious about junction box connections. The sensor cable shielding should only be grounded on one end (inside the controller) otherwise there will be a ground loop.



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Step 3:

Check the sensor cable.

- Make sure you are using shielded sensor cable, 3 twisted pair wire. Use Walchem p/n 102535 or Belden 9680.

- Make sure the sensor cable is not run near, or in the same conduit as AC voltage wire (All wires carry voltage. We are concerned with adjacent wires that are carrying voltage above 24 VAC). If you suspect the sensor cable may be the problem, then take the existing sensor (with the 5 or 20 feet of cable), and wire it directly into the controller by-passing the sensor extension cable. If the sensor reading gets corrected, then the sensor extension cable, or where it was routed, was the problem.

- If the sensor cable is good, replace the sensor.

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Section 5: Reading is Unstable

Step 1:

The sensor reading is unstable when the sensor is placed in the system water.

- Remove the sensor from the system water and place it in a beaker of water. Does the reading stabilize? If yes, then proceed to **Step 2**. If no, proceed to **Step 3**.

Step 2:

The sensor is still in the beaker, and the reading is stable.

- Obtain a length of wire (the ends of the wire must be striped) long enough to place one end in the water in the beaker, and the other end in the system water.
- With this length of wire connecting the beaker water to the system water, does the reading stay stable?
- If the reading does not stay stable, then there is some electrical interference in the system water. Possible root causes could be a mixer or recirculation pump(s).

Step 3:

The sensor is still in the beaker, and the reading is still unstable.

- Power down the controller, disconnect the sensor shield wire from the Earth ground stud inside the controller.
- Does the reading stabilize?
- If the reading stabilizes, then there is possibly some electrical noise coming in through the controller VAC mains.
- If the reading does not stay stable, then connect the controller to an alternate supply voltage circuit. This may necessitate temporarily running an extension cord for this test. If the reading still does not stay stable, please contact Walchem for further instructions.