

OBJECTIVE

Details electrical testing to identify ORP sensor failures

Supporting Reference:

1. ORP tracking & cleaning: **FLXADV10.doc**. Ensure that you do not have a contaminated sensor. If fault persists after cleaning perform Electrical testing to identify fault.

Contact Aquatrac @ www.aquatrac.com if you have any questions or operating concerns.

Method

Required: Digital Voltmeter and test leads. Four pH buffer.
Aquatrac Flex or 'AS' cooling tower controller.
Test Step 4. does not work with boiler controllers.

Step	Test	Results – Fault Mode
1.	VERIFY WIRING Examine the connection end of the sensor cable. Verify that at least ¼” of the clear center conductor is visible before the black center sleeve starts.	The black, electrostatic shield layer on the <u>center</u> conductor is conductive. If the black layer contacts the copper center wire, the sensor will not track.
2.	VERIFY PLATINUM CONNECTION Remove the sensor. With DVM on 20K ohm range measure the resistance from the platinum ring or disc to the center conductor	Good Sensor: Less than 1 ohm Faulted Sensor: Greater than 10 ohms
3.	CHECK FOR INTERNAL BREAKAGE Shake excess water off the sensor and measure the resistance between the center conductor and shield using the DVM on the 20K range	Good Sensor: Greater than 20,000 ohms Meter shows 1, overrange. Faulted Sensor: Less than 10,000 ohms Internal short or internal mechanical damage caused by dropped sensor, operating over-pressure or overtemperature which fails internal seals.
4.	CHECK FOR REFERENCE PORE BLOCKING Place the sensor in a 4 buffer. Using Trackster, calibrate input 'A' to 70F And set the conductivity input 'E' to have Gain =10 and Offset=0 Connect sensor to E+ & E- for 30-60 seconds and then disconnect. Leaving the sensor connected for an extended period will polarize the sensor, requiring more than 30 minutes for recover	Good Sensor: 400 to 700 uS for the RED ½” diameter ORP sensors. Faulted Sensor: Less than 200uS indicates blocked or clogged reference junctions. Greater than 800 uS indicates the same fault as Step 3. See Notes

Notes: You are using the AC resistance measuring circuit of your controller to measure the internal resistance of an ORP sensor. Single point calibrate both **A**-Temperature and **E**-Conductivity to restore controller function. DC Ohm-meters cannot be used on wetted sensors because the measurement current polarizes the immersed surfaces.