



Tools and Materials Needed

1. TLC Replacement Probe (#107592) and/or TLC Faceplate with Electronics (assembled) (#107689)
2. Small flat screwdriver
3. Silicone based grease
4. Thermometer, accurate to ± 0.1 °C
5. De-ionized (DI) water, <10 μS
6. 80,000 $\mu\text{S}/\text{cm}$ conductivity calibration solution (#101417)
7. 1413 $\mu\text{S}/\text{cm}$ conductivity calibration solution (#101582)

Instructions to Change and Calibrate Probe

1. Remove 3 small screws at Probe connection.
2. Slowly pull Probe off the Top Plug Assembly, then pull green and white wire leads off brass tubes.
3. Remove old O-ring.
4. Position Top Plug Assembly so that the tape markings are facing you (as per the diagram above).
5. Lubricate new O-ring lightly and place it into O-ring groove.
6. Push green wire lead all the way onto the brass tube farthest from you.
7. Push white wire lead all the way onto the brass tube closest to you.
8. Slide Top Plug Assembly and new Probe together and align screw holes (do not damage O-ring).
9. Refasten screws all the way, being very careful not to cross-thread the pre-drilled holes. Do not over-tighten screws.
10. Calibrate the Temperature Sensor followed by calibration of the Conductivity Sensor. These calibrations must be followed EXACTLY as the following instructions indicate.

Instructions to Change and Calibrate Electronics

1. Unscrew three screws holding Faceplate and remove Faceplate from Reel with electronics attached.
2. Disconnect white Molex connector inside the Hub.
3. Connect new Faceplate and electronics with white Molex connector and replace the Faceplate with the three screws.
4. Calibrate the Temperature Sensor followed by calibration of the Conductivity Sensor. These calibrations must be followed EXACTLY as the following instructions indicate.

Temperature Calibration

Note: It is critical to maintain the temperature of the DI water at 22.0 °C (± 0.1 °C). Use of a water bath or insulated container is recommended.

1. Prepare vial of DI water at 22.0 °C (± 0.1 °C) using an accurate thermometer.
2. Completely rinse the Probe with warm tap water and liquid detergent, then with DI water. Place Probe in 22.0 °C water vial, and stir to ensure uniform temperature distribution. Let it stabilize for 10 minutes.
3. Remove the battery for 30 seconds then re-install.
4. Press and hold the ON Button repeatedly to scroll through the on screen menu, until you see the 'Press 2x for deg F' or 'Press 2x for deg C' screen and press 2 times quickly.
5. Cycle the screen to the EC and T screens 4 times. The first repeat will change the Temperature from °F to °C, the next from °C to °F and the final from °F to °C.
6. The 4th time the meter should give a long 'BEEP'. The TLC unit is now prepared to be temperature calibrated.
7. Scroll to the 'Press 2x to calibrate' screen and press 2 times quickly.
8. The thermistor in the Probe will then be calibrated at 22.0 °C (± 0.1 °C).

Conductivity Calibration

Note: When calibrating the TLC Probe, be sure to use fresh 80,000 $\mu\text{S}/\text{cm}$ and/or 1413 $\mu\text{S}/\text{cm}$ solutions only. Using other conductivity solutions or old solutions will produce unpredictable results.

1. Pull Shroud Cap off Probe. Rinse the Probe in DI water. Wipe off the Probe, Probe's Tip and Shroud. Replace Shroud Cap on Probe's Tip.
2. Place the Probe in vial with fresh 80,000 $\mu\text{S}/\text{cm}$ calibration solution, holding approx. 1" (25 mm) above the bottom surface. Solution must cover the shroud by at least 1" (25 mm). Stir and shake the vial for few seconds until the air bubbles disappear. Make sure there are no air bubbles at the electrode area of the Probe. Let the Probe stabilize for 1 minute. Press and hold the ON Button repeatedly to scroll through the on screen menu, until you see 'Press 2X for Cal.' message appear on the display. Press 2 times quickly and wait for a few seconds. A new conductivity value will appear on the display. The value should read between 78,400 μS - 81,600 μS .
3. Remove the Probe from calibration solution vial. Wipe it off and remove the Shroud Cap with clean towel. Rinse thoroughly with DI water. Carefully wipe the electrodes and replace the Shroud Cap on the Probe's Tip.
4. Place the Probe in vial with fresh 1413 $\mu\text{S}/\text{cm}$ calibration solution, soak, shake and stir as in Step #2. The value should read between 1200 μS - 1700 μS . If not, then repeat this step.
5. Repeat Step #3.
6. Verify the Probe by placing it in 1413 $\mu\text{S}/\text{cm}$ calibration solution. If the value is not between 1383 μS - 1441 μS , repeat Steps #2 to #6.
7. If suitable reading is obtained, repeat Step #3.
8. Carefully wipe the electrodes and Shroud and replace the Shroud Cap on the Probe. Turn OFF the TLC Meter. The TLC Meter is now ready for field use.

Note: TLC Meter is likely out of range if:

1. EC display $>10,000$ μS or, error message "999.9" when Probe is in 1,413 μS or 80,000 μS calibration solution.
Remedy: Long Probe soak in 80,000 μS calibration solution, and then proceed with calibrating in 80,000 μS calibration solution.
2. EC display >0 μS in air.
Remedy: Attempt calibration in DI water or very low EC tap water. Then, proceed with "Conductivity Calibration" steps.
3. EC display <900 μS in 1,413 μS calibration solution.
Remedy: Slowly add 80,000 μS calibration solution until stable readings reach >900 μS . Now, conduct calibration in this solution mixture. Then, calibrate using fresh 1,413 μS calibration solution.

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