

Thermo Scientific AquaTrace

Instructions for Trace DO Sensor TDO31B2A Preparation

For optimal performance of the Thermo Scientific™ AquaTrace™ Trace DO sensor TDO31B2A, please follow the 5-step instructions below to prepare the sensor. Please repeat these steps if the readings are above 5% accuracy or are not consistent.

1. Unpack a new sensor.
2. Polish the gold cathode.
3. Perform an Electronic Zero Calibration.
4. Install the membrane cap.
5. Perform Air or Single Point Calibration.

Unpack a new Trace DO sensor

NOTE: The new Trace DO sensor is packaged dry without solution in the cap.

1. Carefully remove the parafilm that wraps around the black protective cap.
2. Carefully remove the black protective cap.
3. Carefully unscrew the cap to remove it from the electrode head. Make sure to keep the cap clean.

Polishing the Gold Cathode

NOTE: Make sure to always keep the connector area dry; make sure to avoid getting any sealing grease to the sensor head area.

1. Carefully remove the protective cap or the membrane cap. Rinse the sensor front with water.
2. Cut a 1 inch by 1 inch strip of the polishing paper (1-3 μm SiC sandpaper) and place it on a soft surface (such as a polishing pad) with the abrasive side facing up.

3. Add a drop of water to the abrasive side. Holding the sensor upright to the polishing paper, bring the gold surface to contact with the polishing paper. Make slow circular moves to polish the gold surface. After no more than 30 circular moves, rinse the sensor tip, and examine the surface. Repeat the polishing only after observing surface contamination. Since the gold surface is curved, be cautious to avoid excessive polishing and creating flat areas. Use the weight of the sensor as a downward force during polishing. Do not use excessive force.
4. Rinse the gold surface and sensor head thoroughly with ample amount of DI water. For better cleaning results, ultrasonically clean in DI water for 2 minutes followed by thorough rinsing.
5. Gently wipe the sensor head dry with clean lint-free paper wipes.

Perform Electronic Zero Calibration

1. Inspect the area between the gold cathode and the gold guard ring to be sure it is completely dry and free of contamination.

NOTE: Any residual fill solution or contamination in this area will result in an inaccurate Electrical Zero Calibration.

2. Install the sensor head into the Thermo Scientific™ DataStick™. Do not install the cap at this time!
3. Turn on power to the AquaTrace system.
4. Allow at least 15 minutes for the electronics to stabilize before performing the Electronic Zero.
5. Perform a Zero Calibration (AV38 menu):
 - Press the MENU key and scroll to select the *Calibrate Menu*.
 - Press the ENTER key, and scroll through the Calibrate selections until *Zero Calibration* appears.
 - Press the ENTER key (Display shows *Sensor Ready?*)
 - Press ENTER key again, (Display shows *Calibrating*). The calibration will take approximately 1 minute then the message *Confirm Cal OK* will appear.
 - Press the ENTER key again to accept the calibration.

Electrical Zero calibration is complete.

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Install the membrane cap

Take the membrane cap (from step 1, or a new one), rinse inside gently with DI water and gently shake off the water (gently so that the membrane configuration is not disturbed.)

Fill the cap with fresh filling solution specified for Trace DO (080514) to the top internal threads. Look into the cap to make sure that there is no bubble trapped in the filling solution. Tap the cap to get rid of any bubble if needed.

Gently insert the sensor head into the filled cap; slowly screw the cap on and let air escape until the cap seats against the base of the sensor head; tighten the cap to seal. Some excess electrolyte will overflow out of the vent slot.

Rinse the sensor front with DI water. Blot dry, then inspect the sensor to make sure there is no leak and the membrane is intact.

Note on Filling Solution for Trace DO Sensor: The correct filling solution for the Trace DO sensor TDO31B2A is 080514 that contains potassium chloride. Do not use RDOK3 that is bromide based. If RDOK3 is misused, the silver anode can be “poisoned”. Recovery of the “poisoned” silver is not a convenient operation in the field.

Perform Air or Single Point Calibration (Optional, but Recommended for Optimal performance)

1. Allow the Trace DO sensor to polarize for a minimum of 2 hours after power has been applied to the Trace DO sensor.
2. Perform an Air Calibration or Single Point calibration as described in the AquaTrace User manual.

NOTE: If a Single Point Calibration is being performed, insure the cal point concentration is greater than 3 ppm for best results.

Additional Recommendation: Use of the sensor averaging filter.

At very low DO levels (below 50 ppb) the use of the Sensor Filter is recommended. The filter should be set for at least 10 seconds.

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