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AQUAREAD
water monitoring instruments

CALIBRATION GUIDE TURBIDITY

OBJECTIVE

Procedure for calibrating the Turbidity sensor.

PREPARATORY STEPS

1. Check

Check that the sapphire lenses of the turbidity sensor are clean and free from scratches that may impair the clarity. Check the probe sleeve is clean and not damaged. Check that your calibration vessels are clean. Its good practise to use a dedicated vessel for the zero point and a dedicated vessel for the 1000NTU point, this will reduce the chance of contamination. Ensure the Turbidity electrode is assigned to the correct AUX port.

2. Required Items

- Bottled still mineral water for the 0 point
- 1000NTU Formazin turbidity standard
- Water bath set to 25˚C, where possible

3. Precautions

Aeration, Aeration is air in the form of both visible and microscopic bubbles. These act like tiny prisms and can refract and reflect both the excitation light and the return signal being measured. Steps must be taken to reduce aeration.

Reflection, Reflected IR light from the sensor that is present during calibration, but not there once the calibration vessel is removed, will cause an offset in the calibration and may result in readings being displayed as -0NTU. Steps must be taken to reduce reflection. Do not use reflective calibration vessels such as glass as these may cause reflection and always ensure the sleeve and end cap are fitted.

Sensor saturation, if the sensor is calibrated in direct sunlight, it's possible that the IR receiver can become saturated or maxed out. DO not calibrate in direct sunlight. If avoiding this is not possible, wrap a towel around the vessel and probe during calibration to reduce the ambient light in the probe's measurement chamber.

4. Preparations

Pour the still mineral water into the calibration vessel by tipping the vessel and gently pouring the water down the inside of the vessel, this will reduce the chance of introducing air bubbles .

Mix the 1000NTU solution in its bottle as the formazin will sediment to the bottom of the bottle, do this by inverting the bottle gently 5 times. Ensure you do not shake, as this will introduce air bubbles.

Pour the 1000NTU solution into the calibration vessel by tipping the vessel and gently pouring the solution down the inside of the vessel, this will reduce the change of introducing air bubbles.

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Remove the pH storage cap from the probe's pH sensor prior to probe insertion, rinse with deionised water and thoroughly dry with a lint free cloth.

Ensure that the probes sleeve and end cap are correctly fitted to the probe. Ensure all calibration solutions fill the vessel to at least the mark on the outside of the sleeve.

5. Conditioning

If using a water bath, or calibrating on the bench, the Aquaprobe should be placed into the calibration solution, for approximately 5 minutes so that the temperature of the probe and calibration solution can reach equilibrium.

6. Equipment

- Aquaprobe.
- Calibration instrument; Aquameter / Bluelink / Aquacal PC software
- Chosen calibration solution.
- Water bath.

CALIBRATION

Calibration guidance will assume you are using an Aquameter, procedure will be similar when using Bluelink or AquaCal.

If you are performing a full 2 point calibration; 0 and 1000NTU, then the 0% calibration MUST always be performed first.

If this is the sensors initial calibration both the 0 and 1000NTU points must be calibrated to establish the sensors slope.

Procedure :

1. With the Aquaprobe having soaked in the 0 calibration solution for 5 minutes ensure the temperature is stable (before calibration the 0 point can read anywhere up to 300NTU in zero solution).
2. Tap the probe on the base of the calibration vessel to dislodge any air bubbles if the probe does not have a cleaning mechanism. If the probe has a cleaning mechanism, deploy the wiper to dislodge air bubbles.
3. Select the desired calibration solution. Press the MENU key then select Calibration>Full Cal>Aux electrodes to enter the Aux sensor calibration screen.
4. Select Turbidity from the list.
5. Move the cursor downwards to the correct calibration solution option, for example Zero or point 1.
6. Once your desired calibration option is selected, press the OK button on the Aquameter to begin the calibration process.
7. A calibration report value will be displayed after the calibration is complete.
8. No need to wash the probe between the 0 and 1000NTU point when going from 0 to 1000. Shake the excess water off the probe and pat dry with a lint free cloth or use an air blower to remove excess water droplets before inserting into the 1000NTU solution.

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OPERATING MODE

9. Soak the Aquaprobe in the 1000NTU solution for 5 minutes to ensure the turbidity and temperature readings are stable.
10. Tap the probe on the base of the calibration vessel to dislodge any air bubbles if the probe does not have a cleaning mechanism. If the probe has a cleaning mechanism, deploy the wiper to dislodge air bubbles.
11. Move the cursor downwards to the correct calibration solution option, for example pt2 or 1000NTU.
12. Once your desired calibration option is selected, press the OK button on the Aquameter to begin the calibration process.
13. A calibration report value will be displayed after the calibration is complete.

CONTROL

Check the calibration report value is within the acceptable range.
The acceptable range for the 0 calibration is >1250mV
The acceptable range for the 1000NTU calibration is >300mV over the 0 calibration.
Typical values would be ~1350mV for the 0 point and ~1950mV for the 1000NTU point.

Once calibration is complete press the escape button until you can see the live readings. Check that the Turbidity reading is 1000NTU in the calibration solution.

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