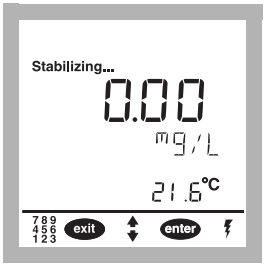
SECTION 6 DISSOLVED OXYGEN IN WATER

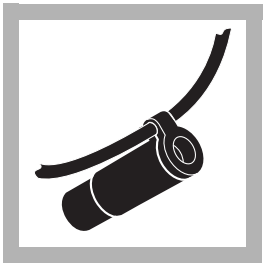
(0 to 20 mg/L)

1. Assemble the dissolved oxygen probe as described in *Section 3.3.1 Probe Assembly*.

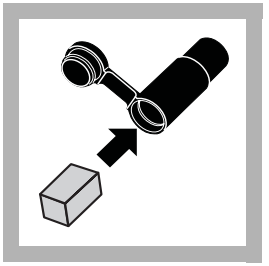
2. At least one hour before measurement, polarize the probe by connecting it to the meter. See *Section 3.3.2 Probe Polarization*.



3. Zero the *sens**ion***™*6* Dissolved Oxygen meter prior to calibration when measuring dissolved oxygen levels less than 1 mg/L or 10% saturation.



4. Secure the probe cable to the calibration and storage chamber by wrapping cable through the bottom of the chamber lid before filling with water.

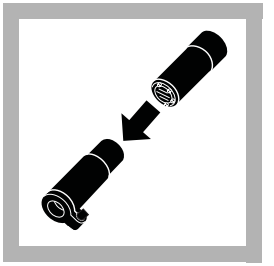


5. Prepare the calibration and storage chamber by holding it under water and squeezing it a couple of times to pull water into the lower chamber through the inlet.

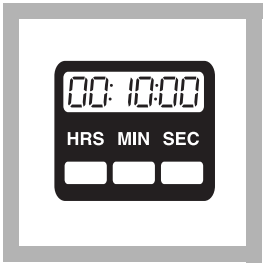
Alternately, open the bottom of the chamber and insert a water-soaked sponge.

Note: *New sponges will be compressed. Add water to expand them.*

Note: *Avoid completely filling the lower chamber with water.*



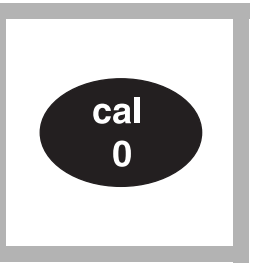
6. Insert the DO probe into the calibration and storage chamber. The probe tip must not be flooded with water or be holding a drop of water on the membrane.



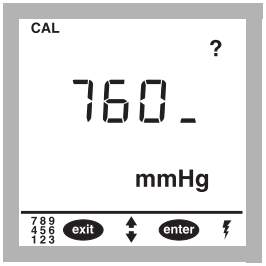
7. Allow at least ten minutes for the atmosphere in the chamber to reach a steady state.

Note: *To speed up probe stabilization, squeeze the lower chamber a couple of times to force water saturated air into the chamber.*

Note: *Keep the DO probe at a uniform temperature. When holding the probe, do not touch the metallic button on the side of the probe. The button is a temperature sensor. An inaccurate calibration will result if the temperature of the thermistor is different from the probe membrane.*



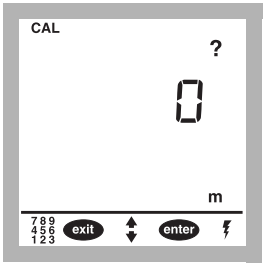
8. Press the **CAL** key located in the lower left corner of the display.



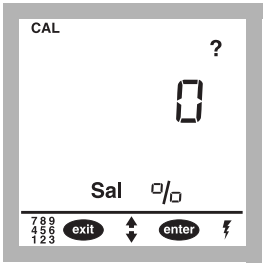
9. The main display will show the current value for the barometric pressure. If the meter has been moved to a different elevation or if the barometric pressure has changed, enter the new value. See *Table 5* on page *63*.

10. Press the **READ/ENTER** key. The display will show the current value for the altitude. Use the keypad to enter the altitude of the meter.

Note: *If the true barometric pressure has been entered then the altitude must be set to 0 meters (0 feet) or inaccurate calibration may result.*

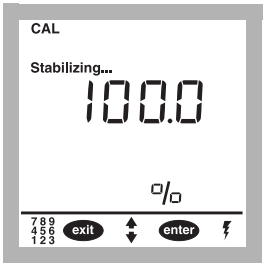


11. When the altitude is correct in combination with the barometric pressure press the **READ/ENTER** key. The current value for the sample salinity (**0/00**) will be shown.



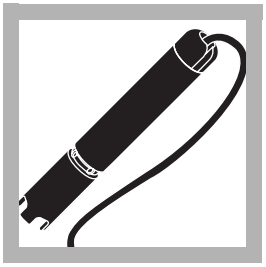
12. Since this calibration is performed in water saturated air, set the salinity to zero. If necessary, use the keypad to enter a salinity value of **0 0/00**.

13. Press the **READ/ENTER** key. The display will show **100%**.

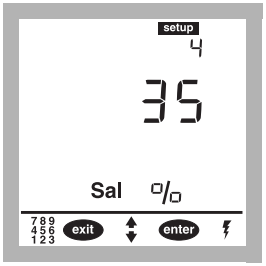


14. Press the **READ/ENTER** key. The stabilizing icon will appear while the meter completes the calibration.

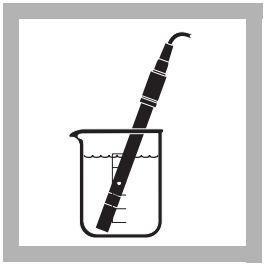
15. When the calibration is complete, the meter will return to the Reading mode. Press the **EXIT** key during the calibration sequence to back out of the calibration routine, one-screen-at-a-time, without completing a calibration.



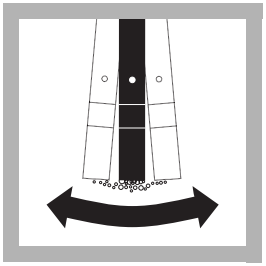
16. Add the weight assembly to the probe if required (3- or 15-m cable versions only).



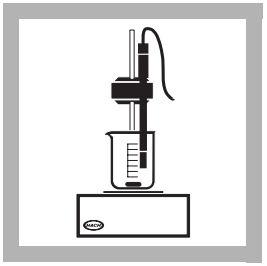
17. If sample salinity has been measured using an Electrolytic Conductivity Meter, enter the value in setup 4.



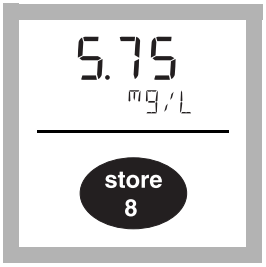
18. Insert the probe into the sample. The probe must be deep enough to cover the thermistor (metallic button) located on the side of the probe.



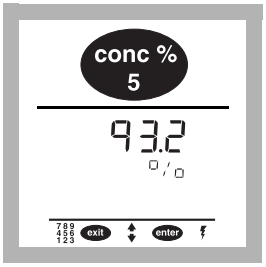
19. Agitate the probe in the sample to dislodge air bubbles from the sensing area of the probe tip.



20. Stir the sample vigorously with the probe or use a stir stand and stir bar. When measuring deep bodies of water, create sufficient flow across the probe tip by pulling on the cable to move the probe up and down.



21. When the reading on the meter stabilizes, record or store the value in the meter memory.



22. Press the **CONC %** key on the keypad to change the display from concentration in mg/L to % saturation.

Note: *In low light conditions, the backlight may be turned on by pressing the light key on the keypad.*

Note: *The displayed % saturation will be based on a meter calculation for the equilibrium dissolved oxygen concentration. The calculation uses the sample temperature, salinity, barometric pressure, altitude and measured concentration in mg/L values. Changing the entries in setups 4, 5 or 6 will alter the displayed mg/L or % saturation.*

Table 5 Adjusting Barometric Pressure and Altitude

Enter a new barometric pressure when the barometric pressure or the altitude of the instrument changes using one of the methods below:	
Using Sea Level Equivalent	**Using True Barometric Pressure**
1. Obtain the sea level equivalent barometric pressure from TV, radio, or a local airport.	**1.** Obtain the true barometric pressure from a nearby mercury barometer or use *Table 8* on page *68*.
2. Enter this value into the meter according to *Section 3.1.5 Changing the Barometric Pressure.*	**2.** Enter this value into the meter according to *Section 3.1.5 Changing the Barometric Pressure.*
3. Enter the local altitude according to *Section 3.1.6 Adjusting the Altitude*.	**3.** Enter the altitude as **0** feet or meters according to *Section 3.1.6 Adjusting the Altitude*.

Sampling and Storage

Collect samples in 300 mL glass BOD bottles. Fill completely. Analyze immediately.

Accuracy Check

Checking Calibration Accuracy

Return the electrode to the calibration and storage chamber. The chamber should contain a wet sponge or a small amount of water. Allow at least 10 minutes for stabilization. Enter the current barometric pressure and altitude into the meter according to *Sections 3.1.5* and *3.1.6*. The meter should display **100% saturation**. If not, recalibrate the meter.

Method Performance

Precision

In a single lab using one sample at 7.45 mg/L DO and one sample at 5.10 mg/L DO, the electrode was moved between the two samples with no rinsing in between. A single operator with a single sens***ion6*** meter obtained a standard deviation of 0.03 mg/L DO.

Interferences

Oxidizing gases such as chlorine, chlorine dioxide, sulphur trioxide, and bromine can react at the cathode to produce positive interferences. Reducing gases such as hydrogen, hydrogen sulfide, sulfur dioxide, and boranes can react at the anode. After exposure to reducing gases, the user may need to clean the anode and replace the internal filling solution and membrane cap.

Summary of Method

The sens***ion6*** Dissolved Oxygen Meter responds to the dissolved oxygen concentration activity by developing an electrical current. At a constant temperature, the electric current varies linearly with the oxygen concentration of the solution. An increase in temperature will increase the oxygen diffusion through the membrane exponentially. The meter utilizes automatic temperature compensation to ensure accurate results.

SECTION 7 TROUBLESHOOTING

7.1 Error Codes

Error codes inform the user of an out-of-range value or meter problem. *Table 6* outlines the operator assistance codes available in the meter series.

Table 6

Error Code	Error Type	Possible Remedy
E-1	Data error in the non-volatile memory.	Turn off the meter, then turn it on again.
E-3	Failure to correctly store a reading.	Call Service. Meter cannot store data in at least one location, but is otherwise functional.
E-9	Failure to correctly retrieve a reading that was stored earlier.	Call Service.
E-10	Sample temperature is out of range (0 to 50 °C).	

Note: *To display the electric current coming from the dissolved oxygen electrode, press the* **READ** *and* **CONC %** *keys simultaneously.*