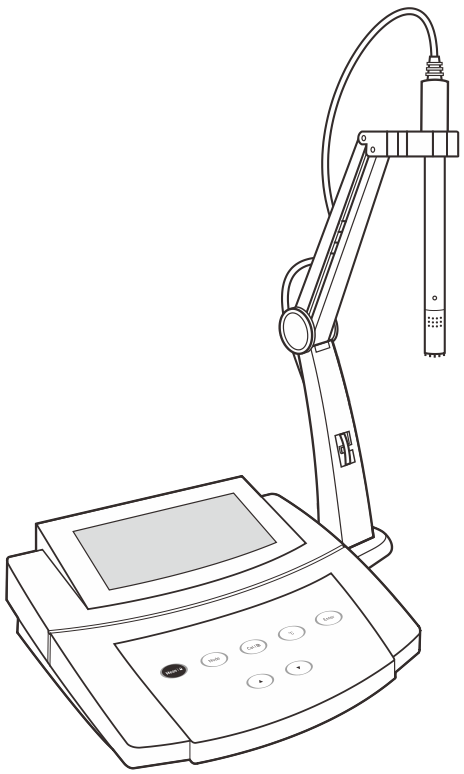
BANTE instruments

Bante 810 Benchtop Dissolved Oxygen Meter

USER MANUAL



Bante Instruments Inc.

CE

Introduction

Thank you for selecting the 810 benchtop dissolved oxygen meter. This user manual provides a step-by-step guide to help you operate the meter, please carefully read the following instructions before use. Any use outside of these instructions may invalidate your warranty and cause permanent damage to the meter.

Environmental Conditions

Before unpacking, ensure that current environmental conditions meet the following requirements.

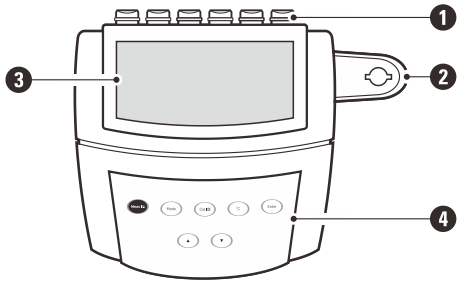
- Relative humidity is less than 80%
- Ambient temperature between 0°C (32°F) and 50°C (122°F)
- No potential electromagnetic interference
- No corrosive gas exists

Packing List

The following list describes all components of the meter. If any items are missing or damaged, contact the supplier immediately.

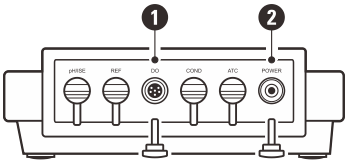
810 meter
Electrode arm
DC 9V power adapter
DO100 dissolved oxygen electrode
Membrane cap
Electrolyte solution

Meter Overview



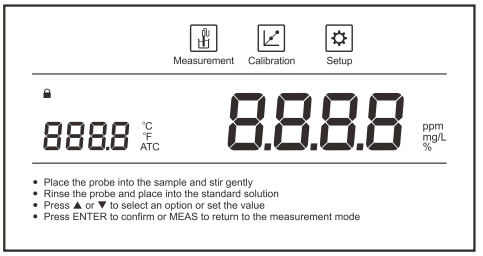
1	Sensor connections
2	Base plate of electrode arm
3	Display
4	Membrane keypad

Connectors



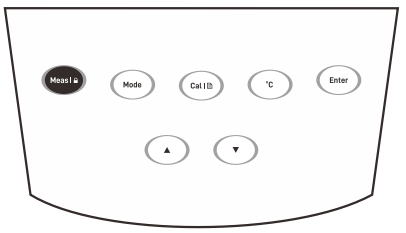
1	Socket for dissolved oxygen electrode (6-pin mini DIN)
2	Socket for power adapter

Display



Icon	Description
	Indicates that the meter is in the measurement mode
	Indicates that the meter is in the calibration mode
	Indicates that the meter is in the setup mode
	Indicates that the measurement is locked
ATC	Indicates that the automatic temperature compensation is enabled

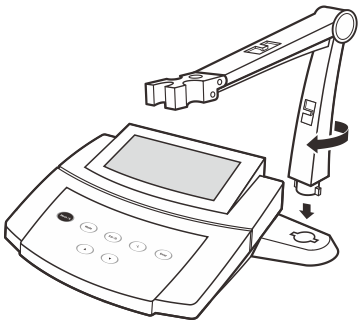
Keypad



Key	Function
Meas I 🔒	• Switch the meter on or off • Lock or unlock the measurement • Exit the calibration, settings and return to the measurement mode
Mode	Toggle between the % saturation and mg/L (ppm) mode
Cal I 🖹	• Start calibration • Press and hold the key to enter the setup menu
°C	Set the temperature
▲	Increase value or scroll up through a list of options
▼	Decrease value or scroll down through a list of options
Enter	Confirm the calibration or displayed option

Installing the Electrode Holder

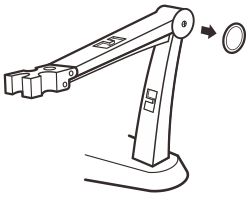
Take out the electrode arm from the accessory box. The base plate of electrode arm has a circular hole, the electrode arm has a connecting rod. Insert the connecting rod into the circular hole and swivel the electrode arm 90 degrees. The electrode holder is now ready to swing into desired position.



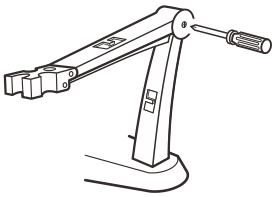
Adjusting the Electrode Arm

After installation, if the electrode arm automatically rises or falls, you are able to adjust the screw until arm locate at any position.

1. Remove the plastic cover from the right side of the electrode arm.



2. Use the screwdriver to tighten the screw moderately.



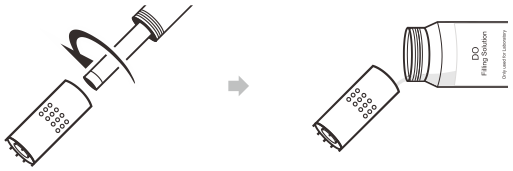
3. Insert the plastic cover to previous position.

Prior to Use

Filling the Electrolyte Solution

1.1 Take out the dissolved oxygen electrode from the packaging. Unscrew the membrane cap from the bottom of the electrode, rinse the inside and outside with distilled water and blot dry.

1.2 Fill the membrane cap halfway with electrolyte solution.



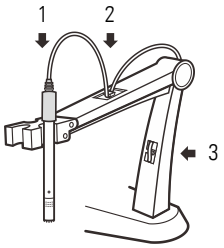
1.3 Screw membrane cap back onto the electrode. Some electrolyte solution will overflow during this process.

1.4 Check the electrode, ensure that no air bubbles are trapped in the electrolyte solution and membrane is not creased or damaged.

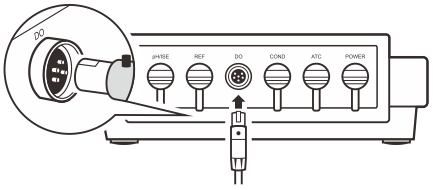
Remove air bubbles

Connecting the Dissolved Oxygen Electrode

2.1 Follow the steps below to place electrode into the left or right side of the electrode arm.



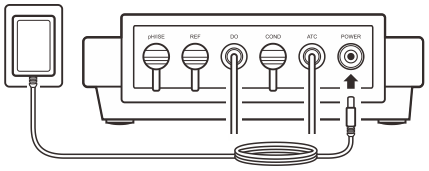
2.2 Insert 6-pin connector into the connector socket labeled DO. Ensure the connector is fully seated.



2.3 After the connection is completed, DO NOT pull on the cable. Always make sure that the connector is clean and dry.

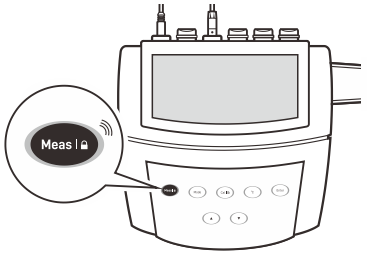
Connecting the Power Adapter

3.1 Insert the connector of power adapter to the power socket.
3.2 Plug the DC 9V power adapter into the wall outlet.



Switching the Meter On and Off

- Press the **Meas** key for about 3 seconds and release to switch on the meter.
- Press and hold the **Meas** key to switch off the meter.



Polarizing the Electrode

Switch on the meter and wait 10 minutes for the electrode to polarize.

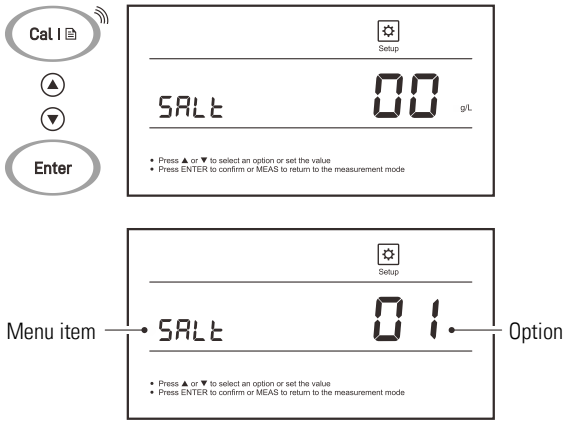
Meter Setup

The 810 meter contains an integrated setup menu for customizing the displayed option to meet measurement requirements. The following table describes the functions of each menu item.

Menu Item	Option and Description	
SALt	**Salinity Coefficient** Set the salinity compensation coefficient of sample.	
	00	0 to 35 g/L (default 0 g/L)
PrES	**Pressure Coefficient** Set the barometric pressure coefficient according to the local altitude (refer to page 4).	
	760	450 to 850 mmHg (default 760 mmHg)
CAL	**Calibration Points** Set the number of calibration points.	
	1	1 point (default)
	2	2 points
UNIt	**Measurement Unit** Set the default measurement unit.	
	mg/L	Milligrams per liter (default)
	ppm	Parts per million
	%	Percentage saturation
	°C	Degrees Celsius (default)
	°F	Degrees Fahrenheit
HOLd	**Auto-Hold** If enabled, the meter will automatically sense and lock the measurement endpoint.	
	YES	Enable
	nO	Disable (default)
OFF	**Auto-Power Off** If enabled, the meter will automatically switch off if no key is pressed within 3 hours.	
	YES	Enable
	nO	Disable (default)
rSt	**Factory Reset** Reset the meter to factory default settings. Note, the meter must be recalibrated.	
	YES	Enable
	nO	Disable (default)

Setting the Default Option

1. In the measurement mode, press and hold the 🖹 key to enter the setup menu.
2. Press the ▲ / ▼ key to select an option, press the **Enter** key to confirm and switch to the next menu item.
3. Repeat the steps above until the meter returns to the measurement mode.



To exit the setup menu without saving changes, press the **Meas** key.

The following table describes the relationship between the altitude and barometric pressure, make sure to set a compatible parameter before the calibration and measurement.

Altitude (m)	kPa	mmHg	Altitude (m)	kPa	mmHg
0	101.3	760	1600	82.9	622
100	100.1	750	1700	81.9	614
200	98.8	741	1800	80.9	607
300	97.6	732	1900	79.9	599
400	96.4	723	2000	78.9	592
500	95.2	714	2100	77.9	584
600	94.0	705	2200	76.9	577
700	92.8	696	2300	76.0	570
800	91.7	688	2400	75.0	563
900	90.5	679	2500	74.1	556
1000	89.4	671	2600	73.2	549
1100	88.3	662	2700	72.3	542
1200	87.2	654	2800	71.4	536
1300	86.1	646	2900	70.5	529
1400	85.0	638	3000	69.6	522
1500	84.0	630	3100	68.7	515

Dissolved Oxygen Calibration

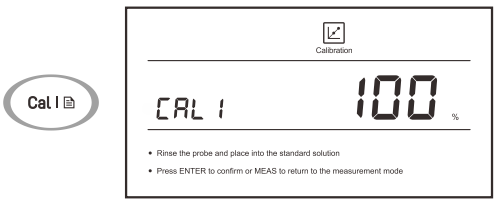
The 810 meter allows 1 or 2 points dissolved oxygen calibration. If you have selected the single point calibration in the setup menu, we recommend that you perform a 100% saturation calibration in the air-saturated water. If the 2 points calibration is selected, the zero oxygen solution needs to be used.

Note: During the calibration and measurement, the temperature sensor on electrode must be immersed in the sample solution completely, the solution should keep 0.3 m/s of minimum flow rate to avoid oxygen starvation at the membrane.

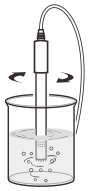
Single Point Calibration - 100% Saturation

Ensure that you have selected 1 point calibration in the setup menu.

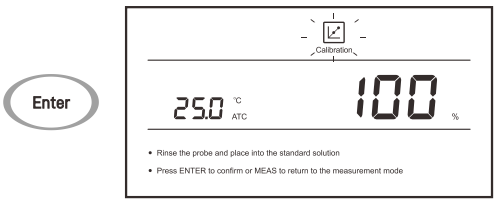
1.1 Press the **Cal** key, the display shows CAL1/100%



1.2 Hold the dissolved oxygen electrode in the air at 100% relative humidity or place the electrode into the air-saturated water for about 10 minutes.



Press the **Enter** key to begin the calibration.

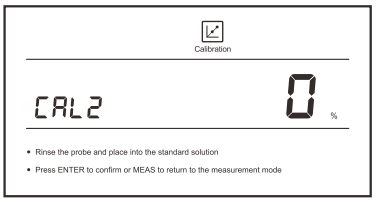


1.3 When the reading has stabilized, the meter will show End and return to the measurement mode.

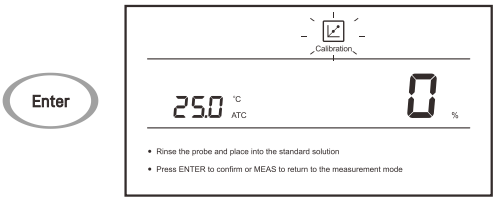
2 Point Calibration

Ensure that you have selected 2 points calibration in the setup menu.

2.1 Repeat steps 1.1 and 1.2 above. When the first calibration point is completed, the display will show CAL2/0%, the meter prompts you to continue with second point calibration.



2.2 Place the dissolved oxygen electrode into the zero oxygen solution for about 10 minutes, press the **Enter** key to begin the calibration.

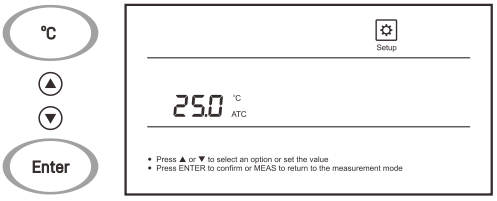


When the reading has stabilized, the meter will show End. Calibration is completed.

- Performing a percentage saturation calibration will calibrate the corresponding mg/L or ppm concentration value simultaneously.
- To exit the calibration without saving calibrated values, press the **Meas** key.

Temperature Calibration

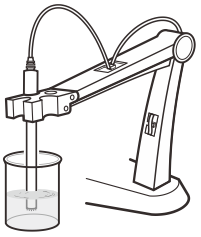
1. Place the dissolved oxygen electrode into a solution with a known accurate temperature.
2. Press the **°C** key to enter the temperature setting.
3. Press the ▲ / ▼ key to modify the temperature value.
4. Press the **Enter** key to save.



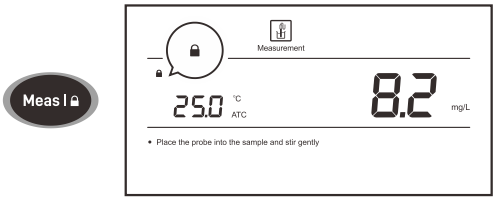
Measurement

The 810 meter can be used to measure the water, wastewater, brine and other liquids. If your sample is seawater or water containing large amounts of salt, make sure to set the salinity coefficient before measurement. Some gas and steam such as chloride, sulfur dioxide, sulfureted hydrogen and carbon dioxide can permeate the membrane via diffusion. Their existence will influence the measurements. If the sample contains solvent, grease, sulfide and alga, the membrane will be damaged or eroded.

1. Set the barometric pressure and salinity coefficient in the setup menu.
2. Rinse the electrode with distilled water, place the electrode into the sample solution and stir gently.



3. If the Auto-Hold option in the setup menu is enabled, the meter will automatically sense a stable reading and lock measurement, the 🔒 icon appears on the display. Press the **Meas** key to resume measuring.
   If the option is disabled, the meter will continuously measure and update the readings.

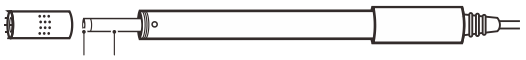


4. Wait for the measurement to stabilize and record the reading.
5. When all of the samples have been measured, rinse the electrode with distilled water.

If the meter shows ---- indicating the measurement exceeds the range, remove the electrode from the sample solution immediately.

Electrode Maintenance

- Rinse the dissolved oxygen electrode thoroughly with distilled water after use.
- Do not touch the membrane and always keep it is clean and wet.
- If you do not use the electrode for long periods, screw off the membrane cap, rinse the electrode anode, cathode, membrane cap with distilled water and blot dry. Install the electrode and store dry.



Appendix

Optional Accessories

Order Code	Description
DO100	Dissolved oxygen electrode, range: 0 to 20 mg/L
DO-MEM	Membrane cap, 2 PCS/set
DO-ES	Electrolyte solution, 30 ml
DO-ZO	Zero oxygen solution, 100 ml
DCPA-9V	DC 9V power adapter, european standard plug

Preparation of Air-Saturated Water

Use an air-pump to blow air into distilled water at least 1 hour, while stirring the solution.

Preparation of Zero Oxygen Solution

Dissolve 500 mg of the sodium sulfate (Na_2SO_3) reagent and a small amount of cobalt (II) chloride hexahydrate ($CoCl_2 \cdot 6H_2O$) in the 250 ml distilled water, mix the solution until reagent is completely dissolved.

Meter Specifications

Model	Bante 810
Dissolved Oxygen	
Range	0.0 to 20.0 mg/L
Resolution	0.1 mg/L
Accuracy	±0.5 mg/L
% Saturation	
Range	0.0 to 200.0%
Resolution	0.1%
Accuracy	±2.0%
Other Specifications	
Calibration Point	1 or 2 points
Temperature Compensation	0 to 40°C (32 to 104°F), automatic
Barometric Pressure Correction	450 to 850 mmHg, manual
Salinity Correction	0 to 35 g/L, manual
Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	0 to 60°C (32 to 140°F)
Relative Humidity	< 80% (non-condensing)
Display	LCD, 135 × 75 mm (5.3 × 2.9 in.)
Power Requirements	DC 9V/400mA power adapter
Auto-Off	3 hours after last key pressed
Dimensions	210 (L) × 205 (W) × 75 (H) mm, (8.2 × 8.0 × 2.9 in.)
Weight	1.5 kg (3.3 lb)

Troubleshooting

Fault	Cause and Corrective Action
Screen shows - - - -	Dissolved oxygen electrode does not connect to the meter or measured value is out of range.
Drifting erratic readings	Check whether the membrane cap is contaminated or the electrolyte solution is depleted.
Screen shows Err	Electrode is broken. Replace the dissolved oxygen electrode.

Disposal

This product is required to comply with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and may not be disposed of in domestic waste. Please dispose of product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

Warranty

The warranty period for meter is one year from the date of shipment.
Above warranty does not cover the electrode and electrolyte solution.
Out of warranty products will be repaired on a charged basis.
The warranty on your meter shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the products

For more information, please contact the supplier.

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