

Bante820 Portable Dissolved Oxygen Meter

# **Instruction Manual**

## Introduction

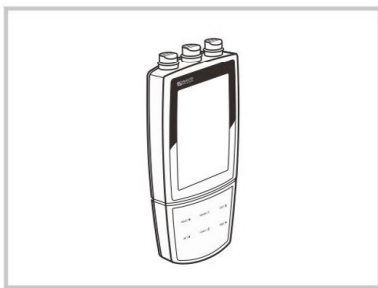
Thank you for selecting the Bante820 portable dissolved oxygen meter. This manual provides a step-by-step guide to help you operate the meter, please carefully read the following instructions before use.

## Unpacking

Before unpacking, ensure that the current work environment meets following conditions.

- Relative humidity is less than 80%.
- Ambient temperature is greater than 0°C and less than 60°C.
- No potential electromagnetic interference.

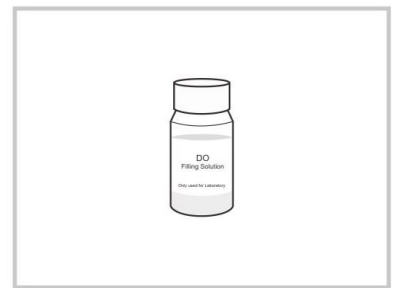
The following list describes the standard components of the meter. After the unpacking, please check all components are complete. If any are damaged or missing, please contact nearest distributor.



Bante820 Dissolved Oxygen Meter



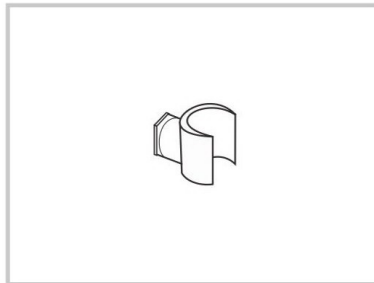
DO100 Dissolved Oxygen Probe



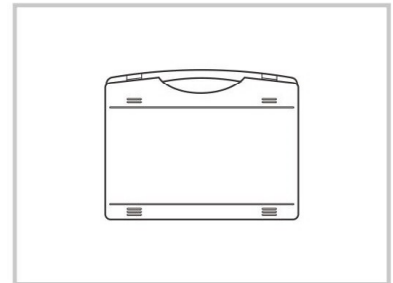
Electrolyte Solution



Membrane Cap



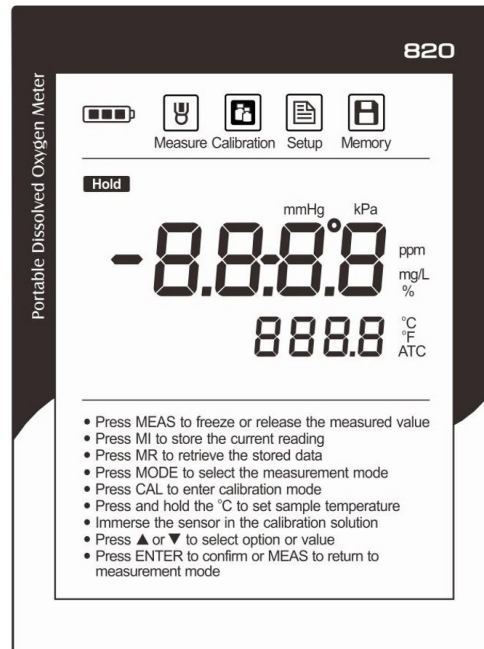
Electrode Clip









Carrying Case

## Display




The Bante820 portable dissolved oxygen meter is equipped with an easy-read LCD display that used to show the measured values and mode icons. The following table describes the function of each icon.



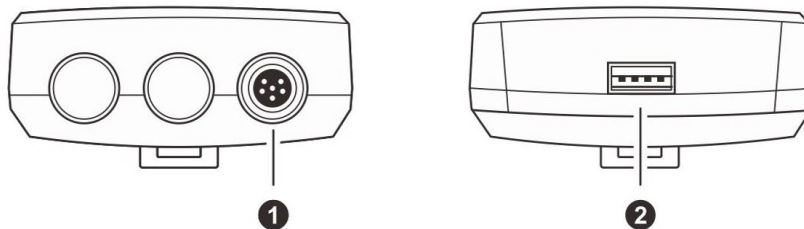
### INDEX:

 Measure	<p>Measurement mode icon: Indicates the meter is in the measurement mode.</p>	 	<p>Low battery alarm: When the battery is depleted, the icon will disappear.</p>
 Calibration	<p>Calibration mode icon: Indicates the meter is in the calibration mode.</p>		<p>Hold icon: Indicates the measuring value has been locked.</p>
 Setup	<p>Setup mode icon: Indicates the meter is in the setting mode.</p>	<p>ATC</p>	<p>Automatic Temperature Compensation: Indicates the temperature compensation is enabled.</p>
 Memory	<p>Memory icon: Indicates the data is stored into memory.</p>		

## Keypad

KEY	FUNCTION
Meas   	<ul style="list-style-type: none"> <li>• Switches the meter ON/OFF.</li> <li>• Locks the measured value, press the key again to resume measuring.</li> <li>• Exits the calibration or setting and returns to measurement.</li> </ul>
Mode   °C	<ul style="list-style-type: none"> <li>• Toggles between % saturation and concentration measurement modes.</li> <li>• Sets the temperature (Press and hold the key for 3 seconds).</li> </ul>
Cal   	<ul style="list-style-type: none"> <li>• Starts calibration.</li> <li>• Enters the setup menu (Press and hold the key for 3 seconds).</li> </ul>
MI   ▲	<ul style="list-style-type: none"> <li>• Stores current reading to memory.</li> <li>• Increase value or scroll up through the menu item.</li> </ul>
MR   ▼	<ul style="list-style-type: none"> <li>• Views the data logs.</li> <li>• Decrease value or scroll down through the menu item.</li> </ul>
Enter   	<ul style="list-style-type: none"> <li>• Confirms the calibration, settings or displayed options.</li> <li>• Turn on/off the backlight (Press and hold the key for 3 seconds).</li> </ul>

## Connectors



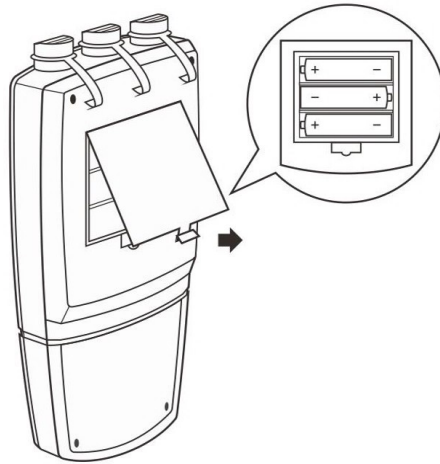
### INDEX:

NO.	CONNECTOR	DESCRIPTION
1	6-pin Connector	Used for connecting the dissolved oxygen probe
2	USB	Used for connecting the USB cable

## Installing the Batteries

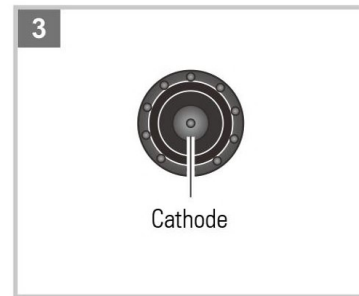
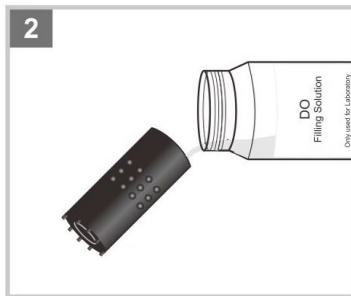
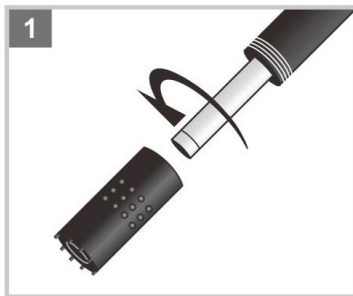
- Remove the battery cover from backside of the meter.
- Insert three AA batteries into the battery compartment, note polarity.
- Replace the battery cover into its original position. Installation is completed.

① When the batteries are depleted, the meter allows using the DC5V power adapter with USB cable for power supply. NOTE, take out the batteries.



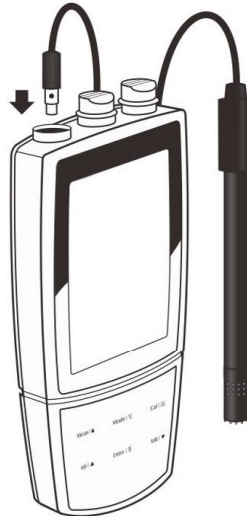
## Filling the Electrolyte Solution

1. Take out the dissolved oxygen probe and electrolyte solution from the packaging. Unscrew the membrane cap.
2. Fill the membrane cap halfway with electrolyte solution.
3. Screw the membrane cap onto the probe, excess electrolyte solution will drain out.
4. Be sure the cathode of probe makes contact with membrane cap, the electrolyte solution in membrane cap should be without an air bubble.



## Connecting the Sensor

Insert the 6-pin connector of the dissolved oxygen probe into the corresponding connector socket on meter. Ensure the connector is fully seated. After connection is completed, DO NOT pull on the sensor cord. Always make sure that the connector is clean and dry.



## Switching the Meter On and Off

- Press the **Meas** key to switch on the meter, the display shows the measured value.
- Press and hold the **Meas** key for 5 seconds, the meter will switch off.

① To enable the Auto-Power Off feature, please refer to chapter SETUP MENU.

## Prior to Use






- Remove the protective cap from the bottom of the probe.
- Switch on the meter 10 to 15 minutes and wait for the probe to polarize.


## Setup Menu

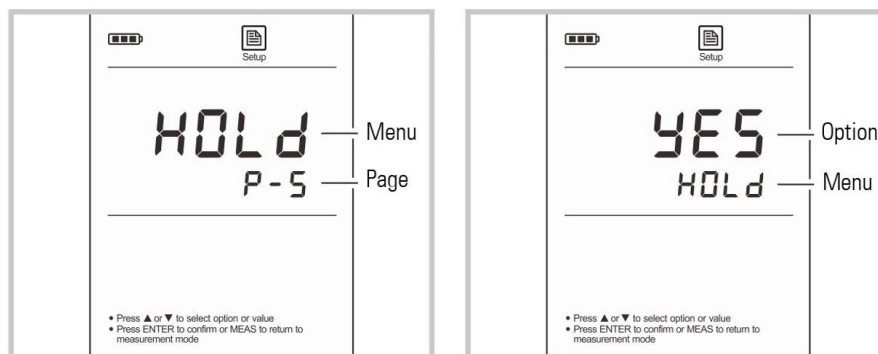
The Bante820 dissolved oxygen meter contains an integrated setup menu that is used to customize the displayed option to meet measurement requirements. The following table describes the functions of the menu items.

MENU	DESCRIPTION	OPTIONS	DESCRIPTION	DEFAULT
CAL	Set the number of calibration points.	1	1 point	1 point
		2	2 points	
PRES	Set the barometric pressure coefficient.	760	Range: 450~850mmHg or 60.0~113.3kPa	760mmHg
SALT	Set the salinity coefficient.	00	Range: 0.0~50.0ppt	0.0ppt
UNIT	Set the default temperature unit.	°C	Degrees Celsius	°C
		°F	Degrees Fahrenheit	
HOLD	If enabled, the meter will automatically sense a stable reading and lock the measurements.	YES	Enable	Disable
		NO	Disable	
OFF	If enabled, the meter will automatically turn off if no key is pressed within 30 minutes.	YES	Enable	Disable
		NO	Disable	
CLR	Delete all stored readings in the memory.	YES	Enable	Disable
		NO	Disable	
rSt	If enabled, all of the calibration data and selected parameters will back to factory default settings, the meter must be recalibrated.	YES	Enable	Disable
		NO	Disable	

### Setting the default option

1. Press and hold the  key for 3 seconds to enter the setup menu and the  or  key to select the menu item.
2. Press the **Enter** key, the meter shows an option.
3. Press the  or  key to select the desired option, press the **Enter** key to confirm. Setting is completed.








 If you want to exit the setting, press the **Meas** key.

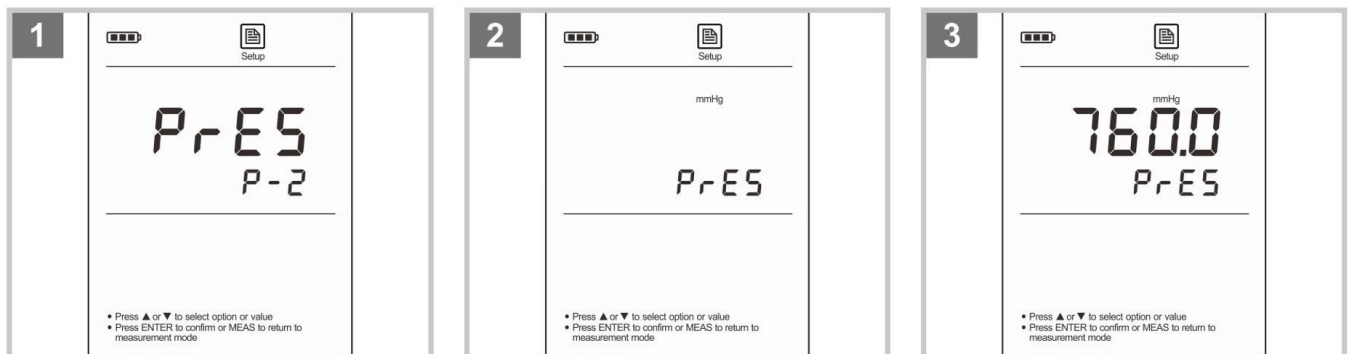







### Setting the barometric pressure

The following table describes the relationship between altitude and barometric pressure. Prior to the calibration or measurement, you need to set the compatible parameter according to the local altitude.

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

1. Press and hold the  key for 3 seconds to enter the setup menu and the  or  key until the meter shows PRES/P-2.
2. Press the **Enter** key, the meter shows the default pressure unit (mmHg).
3. If necessary, press the  or  key to modify. Press the **Enter** key, the meter shows 760.0mmHg/PRES.
4. Press the  or  key to set the barometric pressure, press the **Enter** key to confirm. Setting is completed.








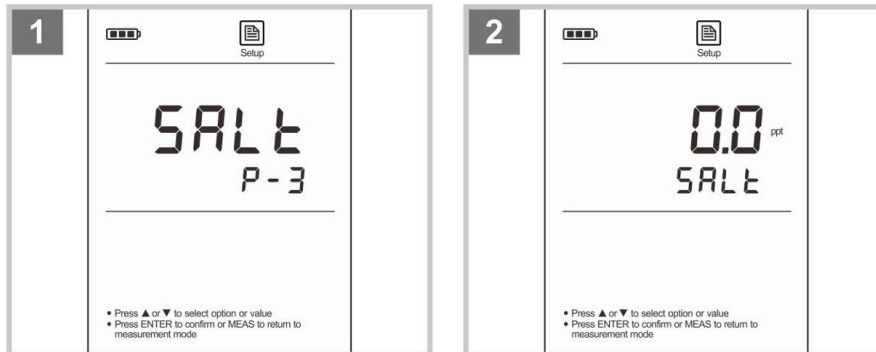
-  During the setting process, press the  or  key once, the setting value will increase or decrease by 0.1. Press and hold the  or  key, the setting value will increase or decrease by 1.



### Setting the salinity coefficient

Salt dissolved in water will influence oxygen content of water. If your sample belongs to high concentration liquids, please make sure that you have selected an applicable salinity coefficient before measurement. For the low concentration liquids, please use the default coefficient 0.0 ppt.

1. Press and hold the  key for 3 seconds to enter the setup menu and the  or  key until the meter shows SALT/P-3.
2. Press the **Enter** key, the meter shows the default salinity coefficient (0.0 ppt).
3. Press the  or  key to set the salinity of sample, press the **Enter** key to confirm. Setting is completed.

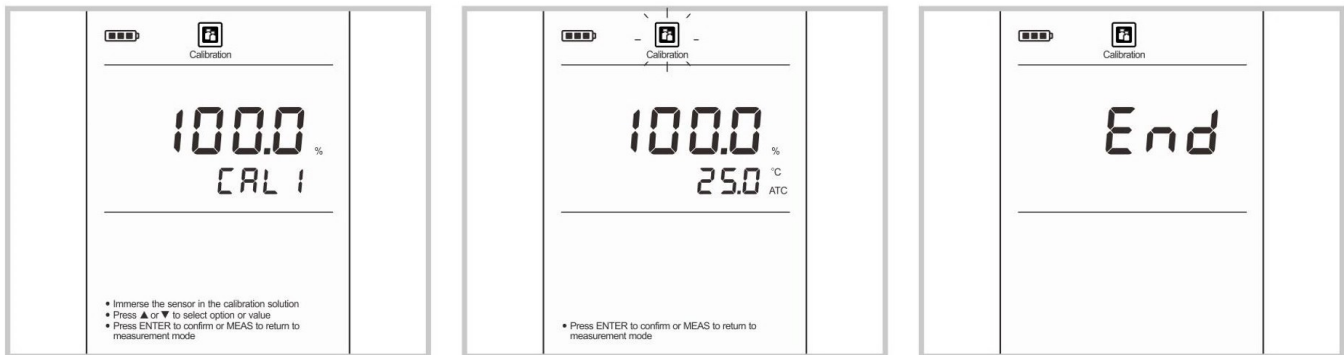


## DO Calibration in % Saturation Mode

The Bante820 dissolved oxygen meter is able to perform either 1 or 2 points calibration. For single point calibration, we recommend that you perform 100% saturation calibration in the air-saturated water. If the 2 points calibration is selected, the zero oxygen solution needs to be used.

### Single point calibration - 100% saturation

- 1.1 Ensure that the meter shows measurement unit “%” and you have selected 1 point calibration in the setup menu. Press the **Cal** key, the meter shows 100.0%/CAL 1.
- 1.2 Hold the dissolved oxygen probe in the air at 100% relative humidity or place the probe into the air-saturated water for 15 minutes. Press the **Enter** key, the meter begins the calibration, the Calibration icon continuously flashing.
- 1.3 Wait for the reading to stabilize, the meter automatically shows END. Calibration is completed.



### Single point calibration - zero oxygen

- 2.1 Ensure that the meter shows measurement unit “%” and you have selected 1 point calibration in the setup menu. Press the **Cal** key and the **▲** or **▼** key until the meter shows 0.0%/CAL 1.
- 2.2 Immerse the dissolved oxygen probe into the zero oxygen solution for at least 10 minutes. Press the **Enter** key, the meter begins the calibration, the Calibration icon continuously flashing.
- 2.3 Wait for the reading to stabilize, the meter automatically shows END. Calibration is completed.



## DO Calibration in mg/L or ppm Mode

### Single point calibration - air-saturated water

- 1.1 Ensure that the meter shows measurement unit "mg/L" and you have selected 1 point calibration in the setup menu. Press the **Cal** key, the meter shows 8.26mg/L/CAL 1.
- 1.2 Immerse the dissolved oxygen probe into the air-saturated water for 15 minutes. Press the **Enter** key, the meter begins the calibration, the Calibration icon continuously flashing.
- 1.3 Wait for the reading to stabilize, the meter automatically shows END. Calibration is completed.



### Single point calibration - zero oxygen

- 2.1 Ensure that the meter shows measurement unit "mg/L" and you have selected 1 point calibration in the setup menu. Press the **Cal** key and the **▲** or **▼** key until the meter shows 0.00mg/L/CAL 1.
- 2.2 Immerse the dissolved oxygen probe into the zero oxygen solution for at least 10 minutes. Press the **Enter** key, the meter begins the calibration, the Calibration icon continuously flashing.
- 2.3 Wait for the reading to stabilize, the meter automatically shows END. Calibration is completed.



### 2 points calibration

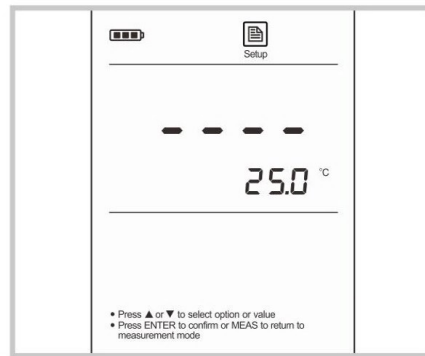
- 3.1 Ensure that you have selected 2 point calibration in the setup menu.
- 3.2 Repeat the steps above to calibrate the zero point and air-saturated water until the meter shows END.

**i** If you want to exit the calibration, press the **Meas** key.

## Temperature Calibration

During the measurement process, if the temperature reading displayed differs from that of an accurate thermometer, the meter needs to be calibrated.

1. Press and hold the **°C** key for 3 seconds to enter the temperature calibration mode.
2. Press the **▲** or **▼** key to set the temperature value.
3. Press the **Enter** key to confirm. Calibration is completed.

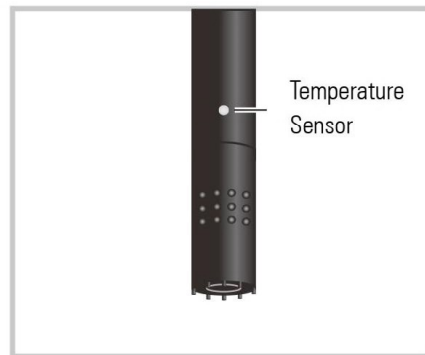


- ① During the setting process, press the **▲** or **▼** key once, the setting value will increase or decrease by 0.1. Press and hold the **▲** or **▼** key, the setting value will increase or decrease by 1.


## Dissolved Oxygen Measurement

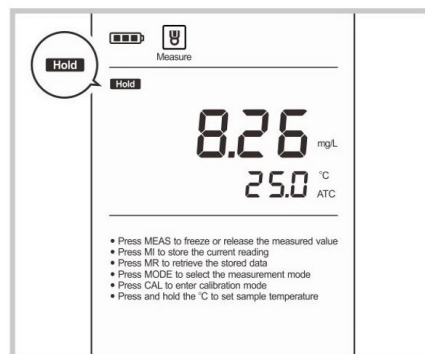
The Bante820 portable dissolved oxygen meter is suitable for measuring the water, wastewater, brine and other liquids. If the sample is belong to the seawater or other water containing large amounts of salt, please setting the salinity coefficient before measurement. Some gas and steam such as chloride, sulfur dioxide, sulfureted hydrogen, ammonium, carbon dioxide and iodine can permeate the membrane via diffusion. So their existence will influence the measurement of dissolved oxygen. If the sample contains the solvent, grease, sulfide and alga, the membrane on the probe will be blocked, damaged or eroded.

1. Connect the dissolved oxygen probe to meter and wait for 15 minutes to polarize the probe.
2. If necessary, to set the barometric pressure and salinity coefficient in the setup menu (Refer to page 7 and 8).
3. Immerse the probe in the sample solution, make sure the temperature sensor on the probe is fully immersed.
4. Stir the probe gently. Record the measured value when the reading is stable.

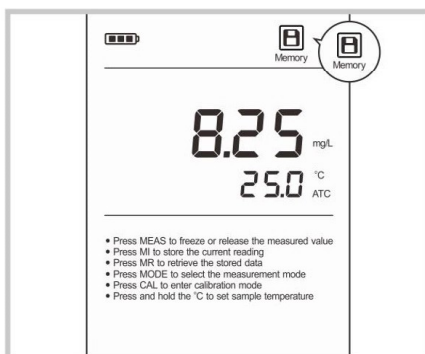


## Auto-Hold

The meter contains an Auto-Hold function. If enabled, the meter will automatically sense a stable reading and lock the measurements, the HOLD icon appears on the display. If disabled, press the  key, the meter will immediately lock the displayed value. Press the **Meas** key to resume measuring.



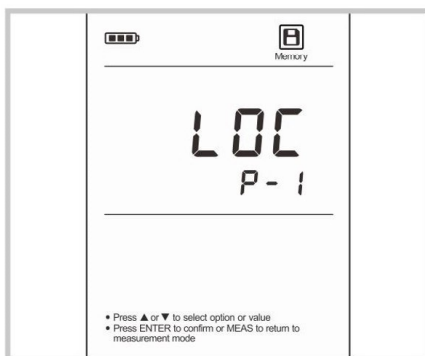
## Storing and Recalling Data



The Bante820 portable dissolved oxygen meter is capable of storing and recalling up to 100 data sets.

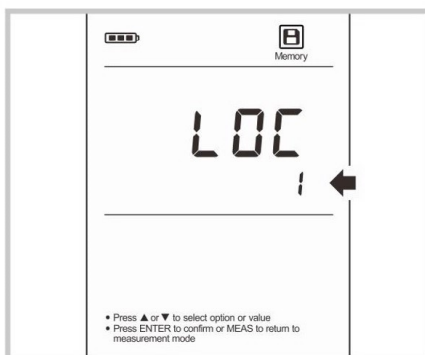
### Storing readings into memory

During the measurement process, press the **MI** key to store the reading into the memory, the Memory icon appears on the display.

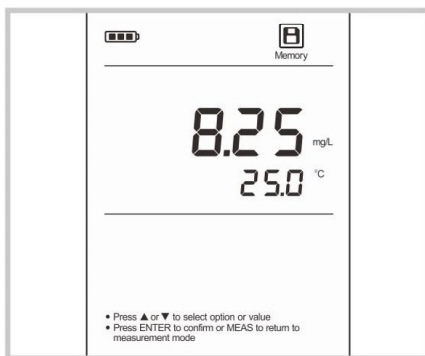


### Viewing stored readings

1. Press the **MR** key in the measurement mode, the meter shows LOC/P-1 (Data Log).



2. Press the **Enter** key, the meter shows the serial number of the stored data.



3. Press the **▼** key, the meter shows the stored data.

4. Press the **▼** key again, the meter shows next data set.

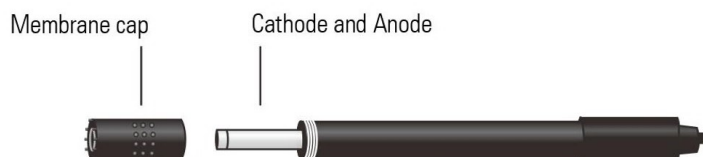
5. Press the **Meas** key, the meter returns to the measurement mode.

### Clearing the memory

Please refer to page 6 SETUP MENU.

## Electrode Care and Maintenance

- Always keep the membrane of the dissolved oxygen probe is wet or moist.
- If you do not use the probe for long periods, please screw off membrane cap and rinse the cathode, anode and membrane with deionized water, then soak up residual water on them with filter paper. Install the probe again.



## Troubleshooting

LCD DISPLAY	CAUSE	CORRECTIVE ACTION
---	DO probe does not connect to meter	Check the connector of probe.
	Measured value is out of range	Check the DO membrane whether clogged, dirty or broken.
Err	Electrolyte solution is depleted	Refilling electrolyte solution.
	Zero oxygen solution is contaminated	Replace the calibration solution.
	Keypad is not working properly	Replace the batteries.

## Specifications

Dissolved Oxygen	Model	Bante820
	Range	0.00~20.00mg/L
	Accuracy	±0.5mg/L
	Resolution	0.01mg/L
	Calibration Points	1 or 2 points
% Saturation of Oxygen	Range	0.0~200.0%
	Accuracy	±2.0%
	Resolution	0.1%
Others	Temperature Compensation	0~50°C, 32~122°F, Automatic
	Pressure Correction	60.0~112.5kPa, 450~850mmHg
	Salinity Correction	0~50g/L
	Memory	Stores up to 100 data sets
	Output	USB communication interface
	Power Requirements	3 × 1.5V "AA" batteries or DC5V power adpter
	Dimensions	170 (L) × 85 (W) × 30 (H)mm
Weight	300g	

**Addendum 1: Preparation of the zero oxygen solution**

Dissolve 500mg of sodium sulfate ( $\text{Na}_2\text{SO}_3$ ) reagent and a small amount of cobalt(II) chloride hexahydrate ( $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ ) in the 250mL distilled water, mix the solution until the reagent is completely dissolved.

**Addendum 2: Preparation of the air-saturated water**

Use an air-pump to blow air into distilled water at least 60 minutes, while stirring the solution.



## Hazardous Substance Statement

Instruments is committed to the reduction and eventual elimination of all hazardous substances in both the manufacturing process and finished products we supply. We have an active manufacturing and procurement program to minimize and eliminate the use of harmful heavy metals such as cadmium, lead, mercury and the like. New technologies and design parameters are also promoting these efforts and we expect to have little or no such materials in our product in the coming years. We welcome our customer suggestions on how to speed up these efforts.



## Warranty

The warranty period for meter is one year from the date of shipment. Above warranty does not cover the sensor and calibration solutions. 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 nearest authorized distributor.