Bante980 Benchtop Dissolved Oxygen Meter

Instruction Manual

Introduction

Thank you for selecting the Bante980 benchtop 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.
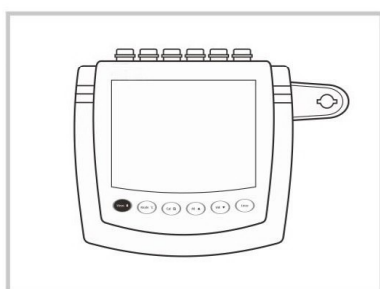
Bante980 Dissolved Oxygen Meter
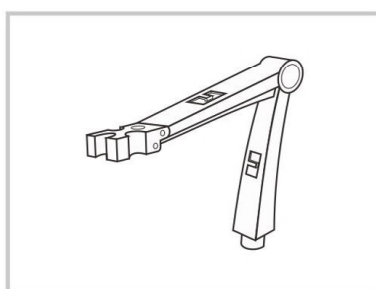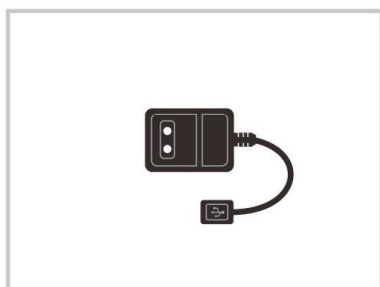

Electrode Arm

DO100 Dissolved Oxygen Probe

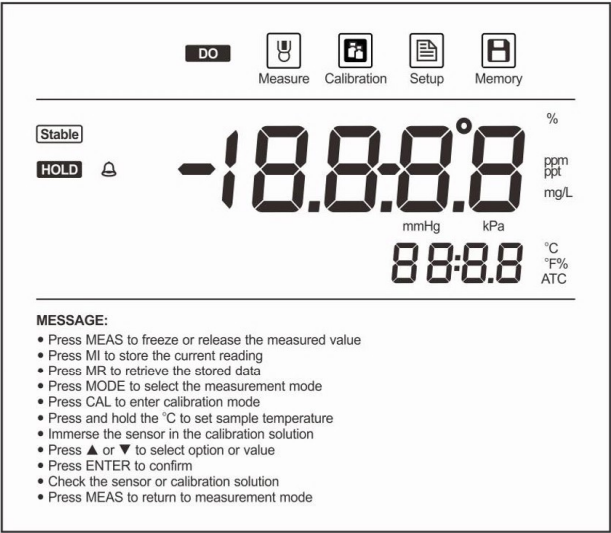DO Membrane Cap

Electrolyte Solution

USB Cable

DC5V Power Adapter

Display

The Bante980 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	Measurement mode icon: Indicates the meter is in the measurement mode.	Stable	Stable icon: Indicates the measuring value has stabilized.
Calibration	Calibration mode icon: Indicates the meter is in the calibration mode.	Hold	Hold icon: Indicates the measuring value has been locked.
Setup	Setup mode icon: Indicates the meter is in the setting mode.	🔔	Calibration Due Alarm: Prompts the user to calibrate the meter.
Memory	Memory icon: Indicates the data is stored into memory.	ATC	Automatic Temperature Compensation: Indicates the temperature compensation is enabled.

Keypad

KEY	FUNCTION
Meas | 🔒	• Switches the meter ON/OFF. • Locks the measured value, press the key again to resume measuring. • Exits the calibration or setting and returns to measurement.
Mode | °C	• Toggles between available measurement modes. • Sets the temperature (Press and hold the key for 3 seconds).
Cal | 📄	• Starts calibration. • Enters the setup menu (Press and hold the key for 3 seconds).
MI | ▲	• Stores current reading to memory. • Increase value or scroll up through the menu item.
MR | ▼	• Views the calibration report or data logs. • Decrease value or scroll down through the menu item.
Enter	• Confirms the calibration, settings or displayed options. • Turn on/off the backlight (Press and hold the key for 3 seconds).

Connectors
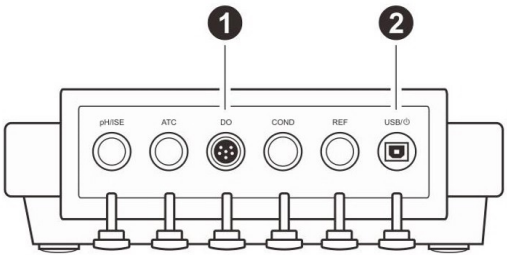
INDEX:

NO.	CONNECTOR	DESCRIPTION
1	DO	Used for connecting the dissolved oxygen probe
2	USB ⏻	Used for connecting the USB cable and DC5V power adapter

Filling the Electrolyte Solution

1. Take out the electrolyte solution from the packaging. Unscrew the membrane cap from the buttom of the dissolved oxygen probe.
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.

Installing the Electrode Holder

Take out the electrode arm from the packaging. The base plate of the electrode holder 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°. Electrode holder is now ready to swing into desired position.
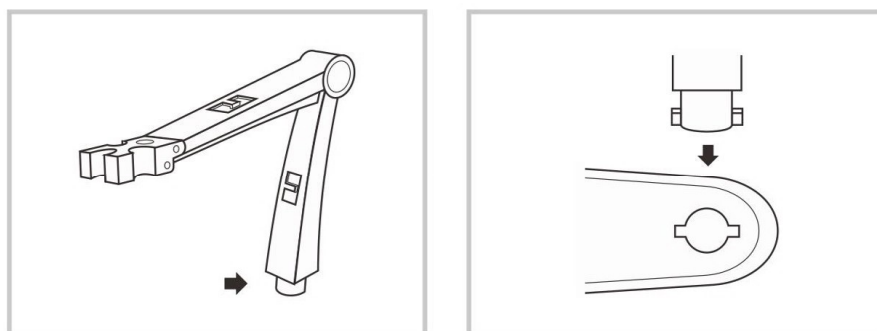
Adjustment of electrode arm

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

1. Remove the plastic cover from the electrode arm.
2. Use the screwdriver to tighten the screw moderately.
3. Insert the plastic cover to previous position. Installation is completed.
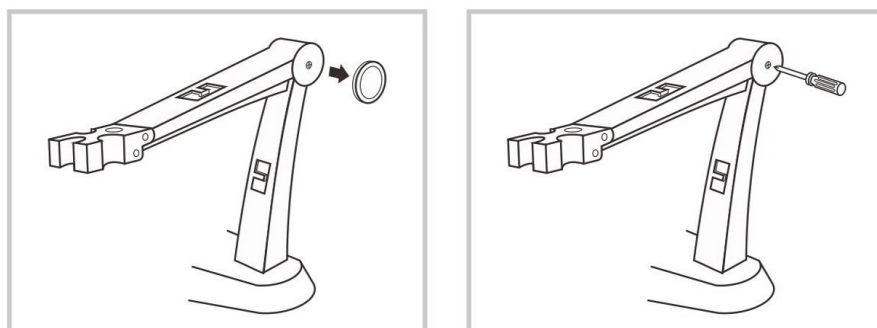
Connecting the Dissolved Oxygen Probe

1. Follow the steps below to place the probe into left or right side of the electrode arm.
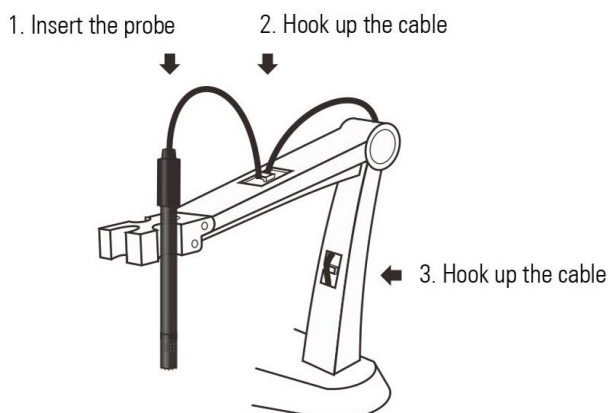
2.2 Insert the 6-pin connector into the connector socket labeled DO. After the connection is completed, DO NOT pull on the cable. Always make sure that the connector is clean and dry.
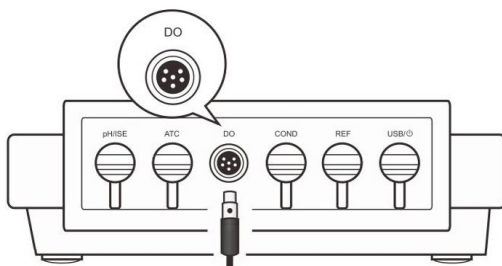
Connecting the Power Adapter

1. Connect the USB cable to power adapter.
2. Insert the other side of cable into the power socket. The meter is now ready for use.
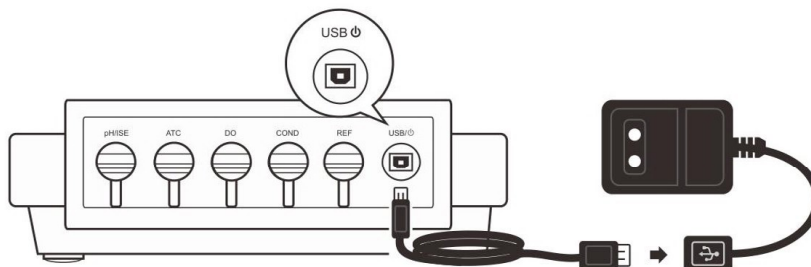
Switching the Meter On and Off

*   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.

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 Bante980 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	Calibration Points: Set the number of calibration points.	1	1 point	1 point
		2	2 points	
PrES	Pressure Coefficient: Set the barometric pressure coefficient.	760	Range: 450~850mmHg or 60.0~113.3kPa	760mmHg
SAL	Salinity Coefficient: Set the salinity coefficient.	0.0	Range: 0.0~50.0ppt	0.0ppt
rESO	Resolution: Set the resolution of the DO measurement.	0.01	0.01mg/L (0.1%)	0.01mg/L
		0.1	0.1mg/L (1%)	
UNIt	Measurement Unit: Set the default measurement units.	℃	Degrees Celsius	℃ mg/L mmHg
		℉	Degrees Fahrenheit	
		mg/L	Milligrams per liter	
		ppm	Parts per million	
		mmHg	Pressure unit	
		kPa	Pressure unit	
StA	Stability Criteria: When the LO option is enabled, the Stable icon will quickly appear on the display. When the HI option is enabled, the icon will take longer to appear, but guarantees high accuracy of the measurement.	LO	Low	Low
		HI	High	
HOLd	Auto-Hold: When the option is enabled, the meter will automatically sense a stable reading and lock the measurements.	YES	Enable	Disable
		NO	Disable	
OFF	Auto-Power Off: When the option is enabled, the meter will automatically turn off if no key is pressed within a specified time period.	10	10 minutes	Disable
		20	20 minutes	
		30	30 minutes	
		NO	Disable	
CALL	Calibration Due: When the option is enabled, if the meter does not calibrated within a specified time period, the meter will automatically show the ⌂ icon.	1...31	1 to 31 days	Disable
		OFF	Disable	

dAtE	Date and Time: Set the current date and time.	---	Year-month-day, hour-minutes	
CLr	Clear Stored Data: Delete all stored readings in the memory.	YES	Enable	Disable
		NO	Disable	
rSt	Factory Reset: 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

1.1   Press and hold the 🗎 key for 3 seconds to enter the setup menu and the ▲ or ▼ key to select the menu item (e.g., CAL/P-01).

1.2   Press the **Enter** key, the display shows an option.

1.3   Press the ▲ or ▼ key to select the desired option.

1.4   Press the **Enter** key to confirm, the meter returns to the measurement mode. Setting is completed.

ⓘ   If you want to exit the setting, press the **Meas** key.
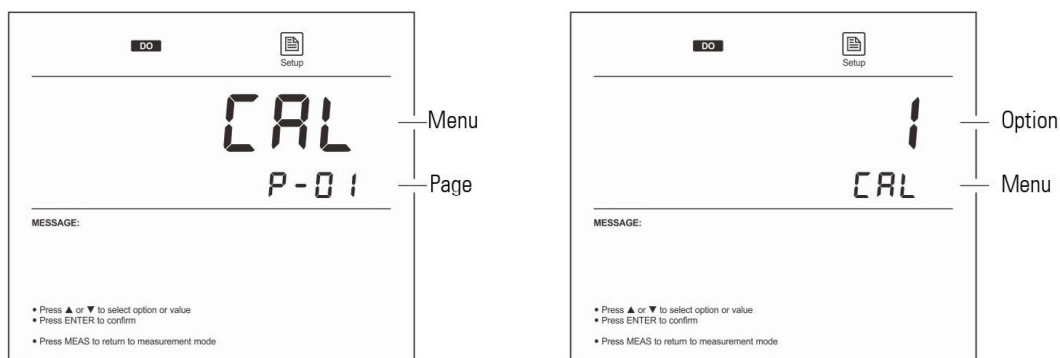
Setting the date and time

2.1   Press and hold the 🗎 key for 3 seconds to enter the setup menu and the ▲ or ▼ key until the display shows DATE/P-10.

2.2   Press the **Enter** key, the meter shows current year (e.g., 2018).

2.3   Press the ▲ or ▼ key to set year and the **Enter** key to confirm, the display shows current date and time (Format: month-day, hour-minutes).

2.4   Press the ▲ or ▼ key to set the date and time, press the **Enter** key to confirm until the meter returns to the measurement mode. Setting is completed.

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-02.
2. Press the **Enter** key, the meter shows the default barometric pressure.
3. Press the ▲ or ▼ key to set the value, press the **Enter** key to confirm. Setting is completed.
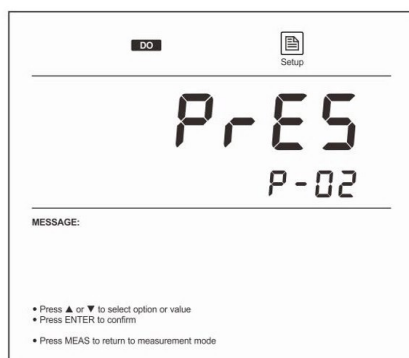
ⓘ During the setting process, press the ▲ or ▼ key once, the setting value will increase or decrease by 0.1. Press and hold the ▲ or ▼ key, the setting value will increase or decrease by 1.

Setting the salinity coefficient

Salt dissolved in water will influences oxygen content of water. If your sample belong 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 SAL/P-03.
2.   Press the **Enter** key, the meter shows the default salinity coefficient (0.0 g/L).
3.   Press the ▲ or ▼ key to set the salinity of sample, press the **Enter** key to confirm. Setting is completed.
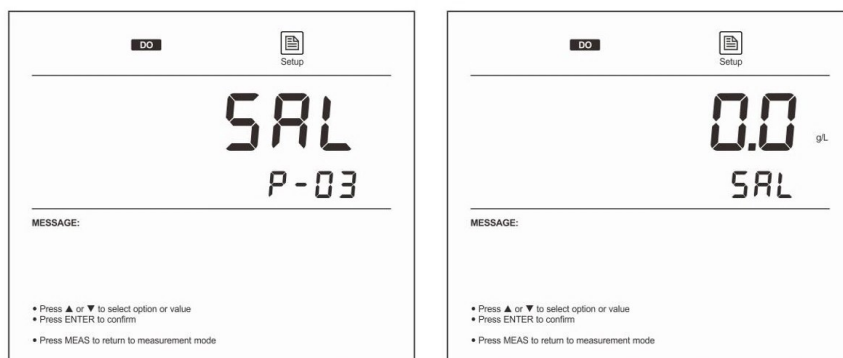
DO Calibration in % Saturation Mode

The Bante980 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.

2 points calibration

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

2.2   Press the **Cal** key, the meter shows 100.0%/CAL 1, press the ▲ or ▼ key until the display shows 0/CAL1.

2.3   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.

2.4   Wait for the reading to stabilize, the display will show "100%/CAL2", the meter prompts you to continue with second point calibration.

2.5   Immerse the dissolved oxygen probe into the air-saturated water for 15 minutes, press the **Enter** key to confirm. Wait for the reading to stabilize, the meter automatically shows END. Calibration is completed.
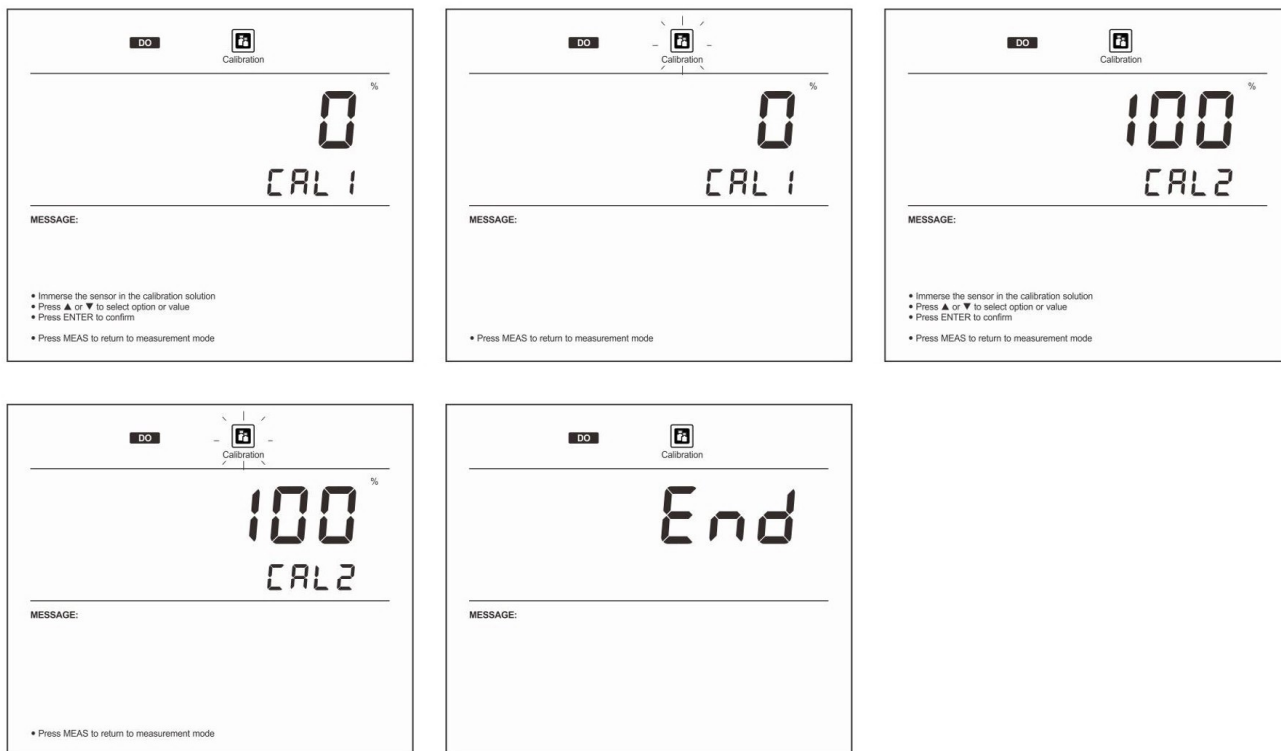
ⓘ   Performing a percentage saturation calibration will simultaneously calibrate the corresponding mg/L (or ppm) concentration value. Therefore, additional mg/L calibration is not required in most circumstances.

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 or ppm" and you have selected 1 point calibration in the setup menu. Press the **Cal** key, the meter shows 8.25mg/L/CAL 1 (@25°C).

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.
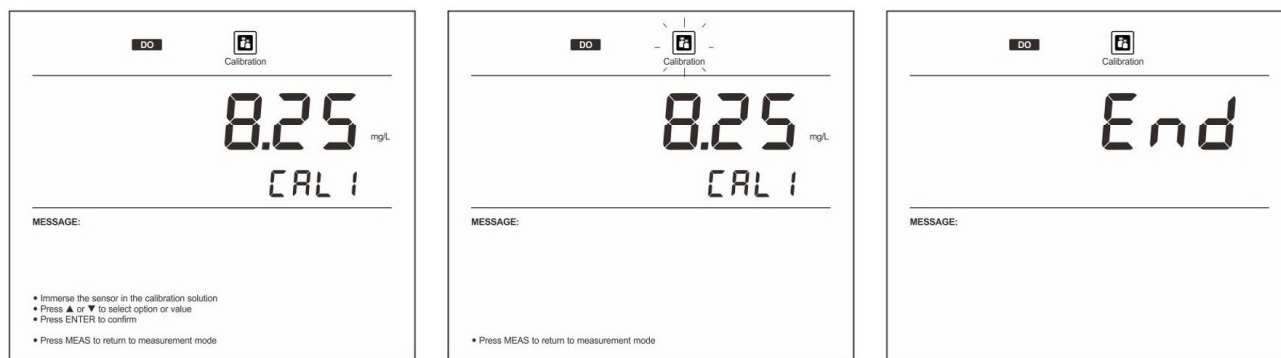
2 points calibration

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

2.2   Press the **Cal** key, the meter shows 8.25mg/L/CAL 1 (@25°C), press the ▲ or ▼ key until the display shows 0.00mg/L/CAL1.

2.3   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.

2.4   Wait for the reading to stabilize, the display will show "8.25mg/L/CAL 2", the meter prompts you to continue with second point calibration.

2.5   Immerse the dissolved oxygen probe into the air-saturated water for 15 minutes, press the **Enter** key to confirm. Wait for the reading to stabilize, the meter automatically shows END. Calibration is completed.
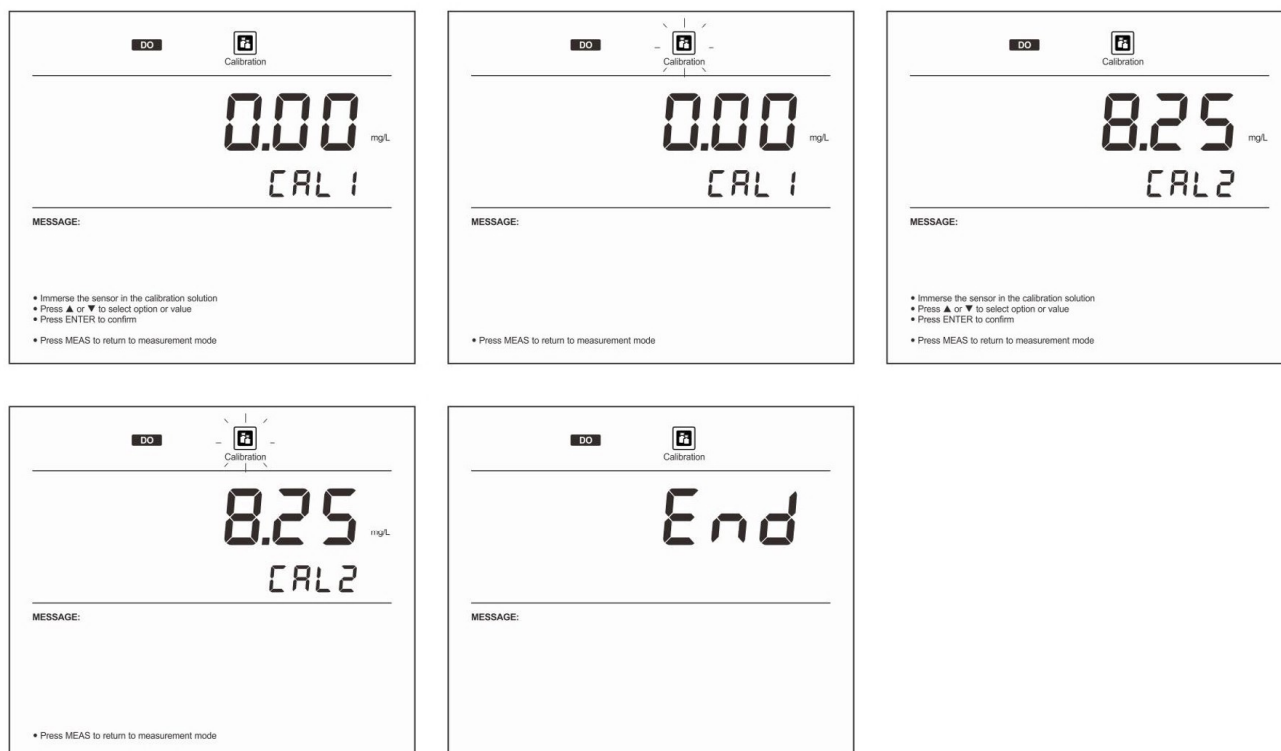
ⓘ   If you want to exit the calibration, press the **Meas** key.

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 **ºC** 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. Calibrating 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.

Dissolved Oxygen Measurement

The Bante980 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 iodin 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 8 and 9).
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.

Temperature Sensor
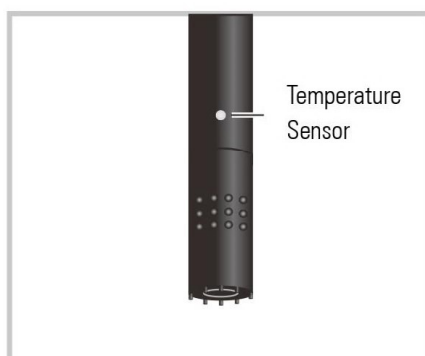
Auto-Hold

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 Bante980 dissolved oxygen meter is capable of storing and recalling up to 500 data sets.

DO — Memory — Memory

8.25 mg/L

25.0 ℃ ATC

MESSAGE:
• Press MEAS to freeze or release the measured value
• Press MI to store the current reading
• Press MR to retrieve the stored data
• Press MODE to select the measurement mode
• Press CAL to enter calibration mode
• Press and hold the ℃ to set sample temperature

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.

DO — Memory

LOC

P-01

MESSAGE:

• Press ▲ or ▼ to select option or value

• Press MEAS to return to measurement mode

Viewing stored readings

1. Press the **MR** key in the measurement mode, the meter shows LOC/P-01 (Data Log).
2. Press the **Enter** key, the meter shows the serial number of the stored data.

DO — Memory

12-31

10:59

MESSAGE:

• Press ▲ or ▼ to select option or value

• Press MEAS to return to measurement mode

3. Press the ▼ key, the meter shows the date and time of the stored data (Format: month-day, hour-minutes).

DO — Memory

8.25 mg/L

25.0 ℃

MESSAGE:

• Press ▲ or ▼ to select option or value

• Press MEAS to return to measurement mode

4. Press the ▼ key, the meter shows the stored data.
5. Press the ▼ key again, the meter shows next data set.
6. Press the **Meas** key, the meter returns to the measurement mode.
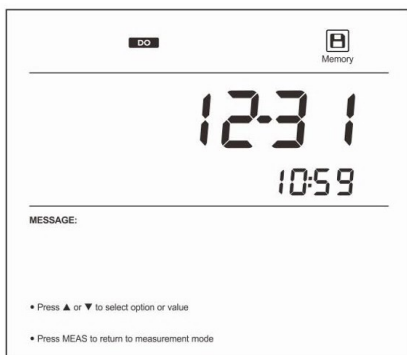
Clearing the memory

Please refer to page 6 SETUP MENU.

Communication

Instruments provides a Data Acquisition System that can be used to transfer data, receive the measuring values or import the data to Excel. You are able to download this software from our official website at _____. Before installation, ensure that Windows 7/8/10 operating system has been installed on your computer.

Receiving data

- Connect the USB cable to meter and computer. Click the DAS icon, the system will automatically scan an available communication port and show the message box "Found a port on your computer".
- Click the **OK** button, the application starts.

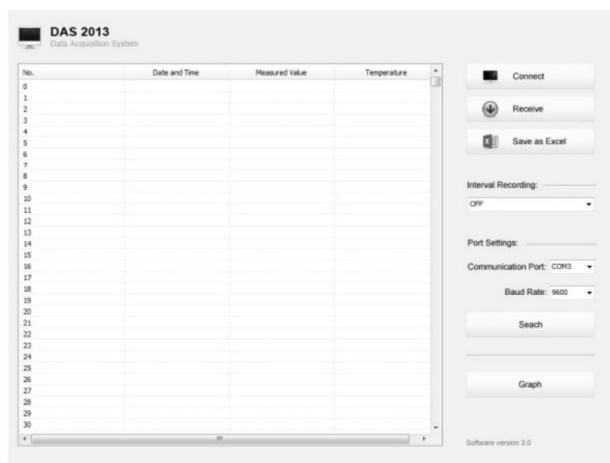- Click the **Connect** button, the screen shows "Port is connected" indicate that the communication between the meter and the computer has been established.
- Click the **OK** button to confirm.
- Click the **Receive** button, the stored data automatically transfer to computer.

Interval recording

This function is used for recording the measuring value within the specify time period.
- Click the **Interval Recording** button and select a time option.
- Click the **Receive** button, the measured value will automatically send to data sheet.

ⓘ
- The first data need 1 minute to be shown on screen.
- Do not press any key on meter during the Interval Recording mode, it will cause communication interruption.

Graph mode

This function is used for viewing the variations of the measured parameter continuously.
Click the **Graph** button, the screen immediately shows the curve graph. To quit current mode, click the **Back** button.

Create the excel file

When the transfer is completed, click the **Save as Excel** button, the measured values in the data sheet will automatically convert to Excel file.

ⓘ   Once the software is closed, all received data will be lost and can not be recovered.

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 pape. Install the probe again.

Membrane cap   Cathode and Anode
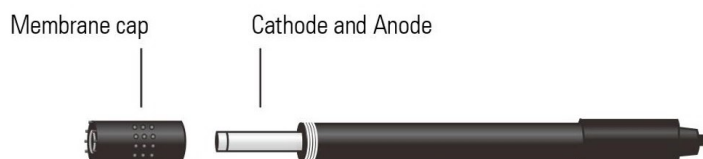
Troubleshooting

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.

Specifications

Dissolved Oxygen	Model	Bante980
	Range	0.00~20.00mg/L
	Accuracy	±0.2mg/L
	Resolution	0.01/0.1mg/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	60.0~112.5 kPa, 450~850 mmHg
	Salinity Correction	0~50g/L
	Memory	Stores up to 500 data sets
	Output	USB communication interface
	Connector	6-pin
	Power Requirements	DC5V, using AC adapters, 220VAC/50Hz
	Dimensions	210 (L) × 188 (W) × 60 (H)mm
	Weight	1.5kg

Addendum: Preparation of the Zero Oxygen Solution

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

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.