



BENCHTOP MULTI-PARAMETER METER

NBMM-102



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1. Introduction

Benchtop Multi-Parameter Meter NBMM-102 measures pH within a range of -2.000 to 20.000 with an accuracy of ± 0.002 . It offers automatic and manual temperature compensation for accurate results. This meter can store up to 1000 data sets per parameter, adhering to GLP compliance standards. Our unit offers automatic barometric adjustment for precise dissolved oxygen measurements. It features a 7.0-inch high-contrast LCD touchscreen for easy operation.

2. Features

- Supports USB and RS-232 communication
- Data Analysis function
- Automatic Reset Option
- Manual Salinity Factor Correction
- Date and time display
- Automatic electrode diagnosis
- IP54 Waterproof Rating

3. Specifications

Model	NBMM-102
Test Parameters	pH/EC/ISE/DO/Temp. (mV/ORP/pX/Resistivity/TDS/Sal. /DO Saturation)
pH	Range: -2.000 to 20.000 pH Resolution: 0.1, 0.01, 0.001 pH Accuracy: ± 0.002 pH Calibration Points: Up to 6 Standard Customization: Yes Calibration Reminder: Yes Slope Limit: Yes
Calibration Solutions	NIST, GB, DIN, USA, MERK, JIS buffers
mV/ORP	Range: -2000.00 to 2000.00 mV Resolution: 0.1, 0.01 mV Accuracy: reading whichever is greater Calibration Points: 1 custom point (relative mV) EH ORP Mode: Yes
pX	Range: -2.000 to 20.000 pX Resolution: 0.1, 0.01, 0.001 pX Accuracy: ± 0.002 pX Calibration Points: Up to 6
ISE	Range: 1.000e-9 to 9.999e+9 Units: mol/L, mmol/L, g/L, mg/L, $\mu\text{g/L}$, ppm, ppb Resolution: Up to 4 significant digits Accuracy: $\pm 0.3\%$ Calibration Points: Up to 6
Conductivity	Range: 0.000 $\mu\text{S/cm}$ to 2000 mS/cm Resolution: 0.001 $\mu\text{S/cm}$ minimum, varies with range selection Accuracy: $\pm 0.5\%$ FS Calibration Points: Up to 5

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	<p>Settable parameters: Cell constant, reference temperature, temperature compensation coefficient, and TDS factor</p> <p>Standard Recognition: 10 $\mu\text{S}/\text{cm}$, 84 $\mu\text{S}/\text{cm}$, 500 $\mu\text{S}/\text{cm}$, 1413 $\mu\text{S}/\text{cm}$, 12.88 mS/cm; 146.5 $\mu\text{S}/\text{cm}$, 1408 $\mu\text{S}/\text{cm}$, 12.85 mS/cm, 111.3 mS/cm</p> <p>Reference Temperature: 5, 10, 15, 18, 20, 25 $^{\circ}\text{C}$</p> <p>Calibration Reminder: Yes</p>
Resistivity	<p>Range: 5.00 $\Omega\cdot\text{cm}$ to 100.0 $\text{M}\Omega\cdot\text{cm}$</p> <p>Resolution: 0.01 $\Omega\cdot\text{cm}$ minimum</p> <p>Accuracy: $\pm 0.5\%$ FS</p>
TDS	<p>Range: 0.000 to 1000 ppt</p> <p>Resolution: 0.001 ppm minimum, varies with range selection</p> <p>Accuracy: $\pm 0.5\%$ FS</p>
Salinity Type	<p>Type: NaCl</p> <p>Range: 0.0 to 80.0 ppt</p> <p>Resolution: 0.1 ppt</p> <p>Accuracy: ± 1 ppt</p>
Dissolved Oxygen	<p>Concentration (Polarographic) Range: 0.00 to 99.99 ppm</p> <p>Resolution: 0.01 ppm</p> <p>Accuracy: $\pm 0.10\text{ppm}$, 0.00 to 50.00ppm $\pm 0.50\text{ppm}$, 50.0 to 99.99ppm</p> <p>Calibration Points: Air-saturated water or zero point</p> <p>Auto barometric pressure compensation</p> <p>Selectable pressure unit: kPa, mbar, Torr, Atm.</p> <p>DO Calibration Reminder: Yes</p>
% Saturation	<p>(Polarographic) Range: 0.0 to 600%</p> <p>Resolution: 0.10%</p> <p>Accuracy: $\pm 2.0\%$</p>

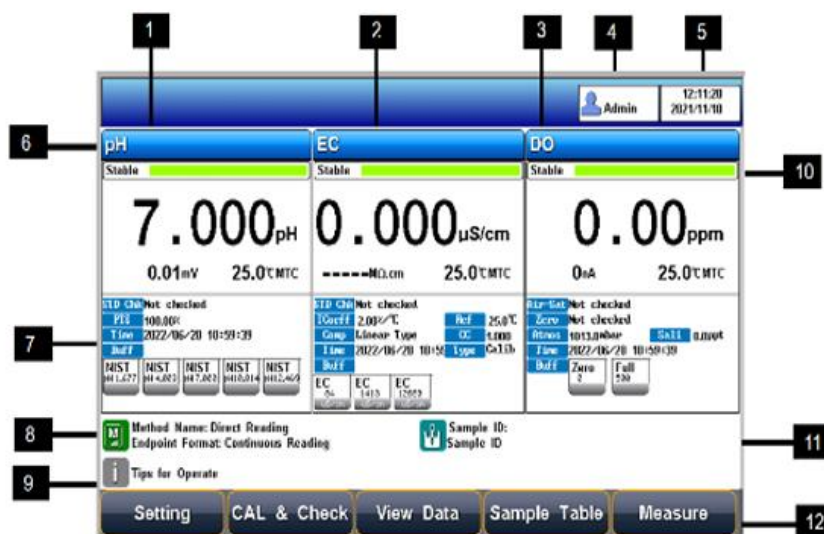
Benchtop Multi-Parameter Meter NBMM-102

Temperature	Range: -10 to 135 °C, 14 to 275 °F Resolution: 0.1 Accuracy: ±0.1
Temperature Compensation	ATC, MTC
Measurement Reading Mode	Auto Read (Fast, Medium, Slow), Timed, Continuous
Measurement Reading Prompts	Reading, Stable, Locked
Data Storage	1000 Groups
GLP Features	Yes
Log Management	Yes
pH Electrode Input	BNC(Q9)
DO with Temp. Probe Input	4-pin aviation connector
Conductivity with Temp. Probe Input	5-pin aviation connector
Outputs	USB: USB 2.0 flash memory device, PC, scanner RS 232: Printer, auto-sampler
Backlight	Yes
Auto Shutdown	1 to 60 min, off
Date and Time	Yes
Power	AC Adapter, 100-240V AC input, DC 24V output
Dimensions	220 × 195 × 68 mm
Weight	950g (2.09 lb.)

4. Applications

Benchtop Multi-Parameter Meter measures various parameters such as pH, dissolved oxygen, and conductivity. It is commonly used in environmental monitoring, water quality testing, and laboratory analysis.

5. Instrument Introduction



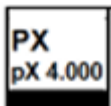
5.1 Annotation

No	Explanation
1	Measurement box
2	Measurement box
3	Measurement box
4	User ID
5	System time
6	Measurement parameters
7	Calibration information
8	Method
9	Tips information
10	Reading mode and reading states
11	Sample ID
12	Function buttons

5.2 Symbol

Symbol	Explanation
	Reading status
PTS	The percentage slope of the pH electrode calibration data.
ATC	Automatic temperature compensation
MTC	Manual temperature compensation
ORP	Redox potential value, in mV
Offset	Offset potential, in mV

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	Measurement method management displays the current method information
	Standard solution for pH calibration
	Standard solution for ion calibration
	User ID
	Sample ID

6. Operations

6.1 pH Operation Quick Guide

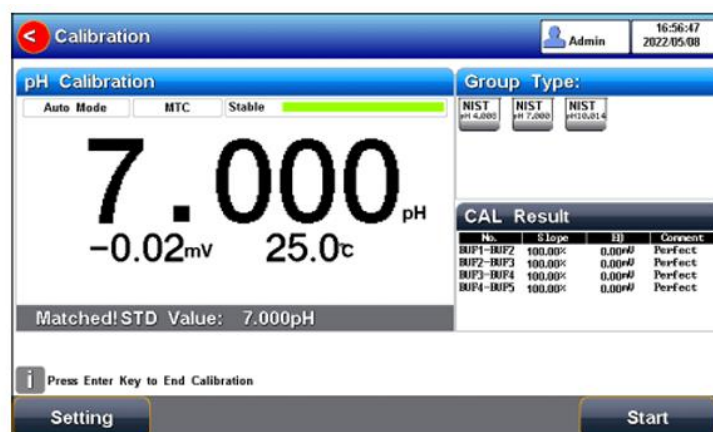
6.1.1 Preparation

- 1) Install the components of the instrument and connect the pH and temperature electrodes.
- 2) Prepare standard buffer solutions such as pH 4.01, pH 7.00, and pH 10.01 standard solutions.
- 3) Remove the protective cap at the lower end of the pH electrode and pull down the rubber cover at the upper end of the electrode. Expose the top hole, rinse the electrode with distilled water, and dry it with filter paper.
- 4) Press the power key to turn on the instrument.
- 5) Select measurement method:
 - The default measurement method of the instrument is "No.001 direct reading measurement method", pH measurement parameter, continuous reading mode, if adopting the default method for measurement, this step can be omitted.
 - Press  to enter the measurement method management. You can select the method in the method list or create new methods as required.
- 6) The main measurement parameter settings of the instrument:
 - Reading mode supports continuous, timing, and auto reading mode. The default is continuous reading mode, you can choose according to your requirements and press the "Enter" key to complete the setting.

6.1.2 Calibration

- 1) Setting.
 - Set the parameters (e.g., pH).
 - Select the NIST standard solution group, and check pH 4.01, pH 7.00, and pH 10.01 three standard solutions.
 - Set the Auto Mode recognition.
- 2) After pressing the "Cal & Check"-"pH Calibration".
- 3) Put the cleaned electrode into a pH 4.01 standard solution.
- 4) Wait for the instrument to display "Auto Mode Matched", or the instrument reading is stable, and press "Start" to calibrate 1-point, after the completion of the instrument, display calibration results.
- 5) If multi-point calibration is required, kindly replace the pH7.01 and pH10.01 standard buffer solutions. After cleaning the electrode, put the electrode into the standard solution. After the instrument recognizes it successfully, it reads stably, press the "Next Point" to complete the calibration.
- 6) During the calibration process, press the " Calibration" key to terminate the calibration, and the instrument will automatically display the window prompts to save the calibration results. After selecting, directly enter the start interface. interface. If the checked standard solution group is 6, automatically end the calibration after six points of calibration.

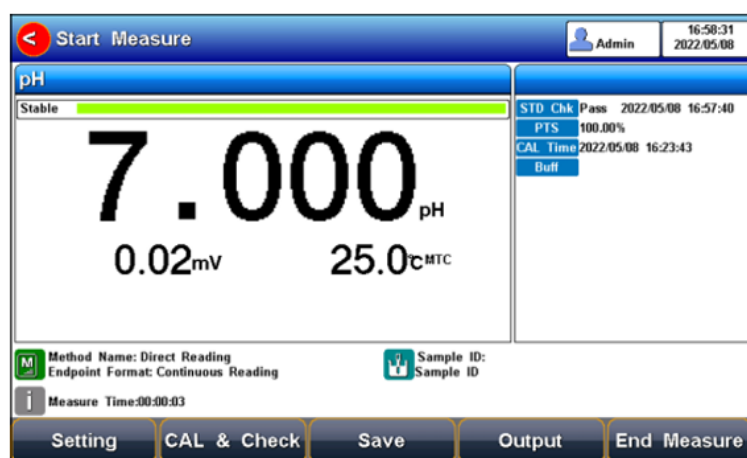
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6.1.3 Measurement

- 1) Setting.
 - Set the parameters (e.g., pH).
 - Set the reading mode (e.g., continuous reading, auto reading, or timed format).
- 2) Press "**Measure**" to enter the measurement interface, after the reading is stabilized (the data stability mark is full), then measure.
- 3) Press the "**Save**" to save the measurement results. Press the "Output" to print the measurement result when connected to the printer.

Note: Kindly calibrate and measure accurately at the same temperature.



6.2 pX Operation Quick Guide

6.2.1 Preparation

- 1) Install the components of the instrument.
- 2) Prepare a standard solution for measuring the ions, such as the F ion standard solution (10⁻³ mol/L, 10⁻⁵ mol/L).
- 3) Remove the protective cap at the lower end of the ion electrode, rinse the electrode with distilled water, and place it in a blank solution.
- 4) Press the power key to turn on the instrument and stirrer.
- 5) Select measurement method:
 - The default measurement method of the instrument is "No.001 direct reading measurement method", pX measurement parameter, continuous

reading mode, if adopting the default method for measurement, this step can be omitted.

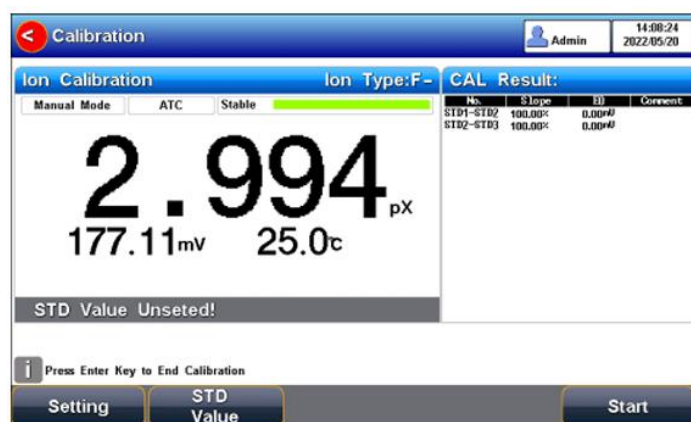
- Press  to enter the measurement method management. You can select the method in the method list or create new methods as required.

6) The main measurement parameter settings of the instrument:

- Reading Mode; support continuous timed and auto reading mode. The default is continuous reading mode, which can be selected according to your requirements, and press the "Enter" key to complete the setting.
- pX parameters: ion mode, ion measurement mode, resolution, result unit, etc. Note: Set the same ion mode as the ion to be measured, such as "F-", ion measurement mode such as "Direct reading concentration method", the unit of the measurement result is "pX, mol/L, g/L, ppm, ppb", etc.

6.2.2 Calibration

- 1) Select the "Direct Measure Method". The method includes:
 - Set the parameters (e.g., pX).
 - Set the ion mode (e.g., F-).
 - Set the direct reading as ion measure mode.
 - Set the concentration unit (e.g., mol/L).
 - Set the blank concentration (e.g., 0.000 mol/L).
- 2) Add an appropriate amount of standard solution (usually 100 ml) to the beaker, then add an ionic strength adjustment buffer. Adjust the stirring speed of the solution for measurement.
- 3) Press the "**Calibrate**" - "pX Calibration".
- 4) Put the cleaned electrode into a standard solution.
- 5) Press the F2 "STD value" to input the standard value of the standard solution (e.g., 10⁻³ mol/L, 10⁻⁴ mol/L, 10⁻⁵ mol/L)
- 6) Wait until the reading is stable and press the "Start".
- 7) If only 1-point calibration is required, after 1-point calibration is completed, press the  calibration. to complete the calibration.
- 8) If choosing multi-point calibration (up to 6), press "Next" to repeat the operation.
 - If the checked standard solution group is 6, automatically end the calibration after six points of calibration.



6.2.3 Measurement

- 1) Select the "Direct Measure Method". The method includes the parameter (e.g., pX), the ion type (e.g., F-), and the reading mode (e.g., continuous reading, auto-reading, or time format).
- 2) Setting.
 - Set the parameters (e.g., pX).
 - Set the ion type (e.g., F-).
 - Set the direct Reading as ion measure mode.
 - Set the concentration unit (e.g., mol/L).
 - Set the reading mode (e.g., continuous reading, auto reading, or timed format).
- 3) Add an appropriate amount of standard solution (usually 100 ml) to the beaker, then add an ionic strength adjustment buffer. Adjust the stirring speed of the solution for measurement.
- 4) Press **measure** to enter measurement status.
- 5) When the reading is stable, read the results.
- 6) Press the "**Save**" to save the measurement results.
- 7) Press the "**Output**" to print the measurement result when connected to the printer.

Note: Kindly calibrate and measure accurately at the same temperature.



6.3 ORP Operation Quick Guide

6.3.1 Preparation

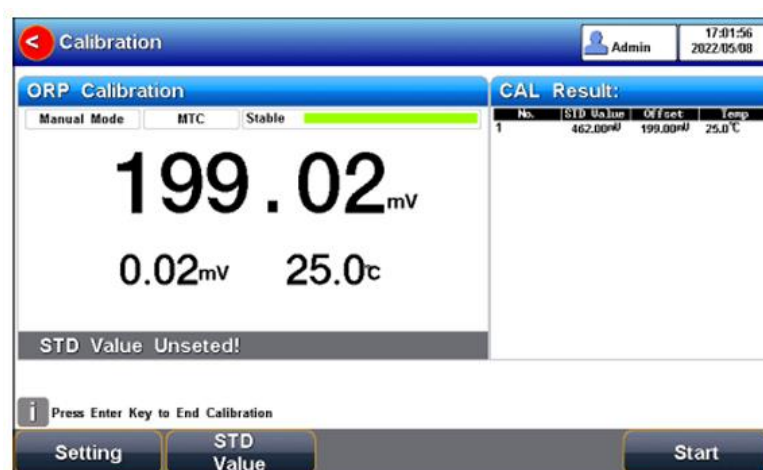
- 1) Install the components of the instrument.
- 2) Prepare a standard solution of ORP 462 mV solution.
- 3) Remove the protective cap at the lower end of the ORP electrode, rinse the electrode with distilled water, and dry it out.
- 4) Press the power key to turn on the instrument.
- 5) Select measurement method:
 - The default measurement method of the instrument is the "No.001 direct reading measurement method". Kindly choose the ORP measurement parameter in the parameter setting.
 - Press **M** to enter the measurement method management. You can select the "No. 004 ORP measure method".
- 6) The main measurement parameter settings of the instrument:
 - Reading mode: support continuous, timing, and auto reading mode.

- The default is continuous reading mode, which can be selected according to your requirements, and press the "Enter" key to complete the setting.
- ORP parameters: ORP electrode information, mV resolution, alarm setting, and calibration reminder setting.

6.3.2 Calibration

- 1) Select "CAL & Check" - "ORP Calibration" to enter the ORP electrode calibration interface. If you need to change the calibration parameters, in the calibration state, you can select "Setting" to modify the mV resolution, alarm limit, and calibration reminder.
- 2) Put the cleaned electrode into ORP standard solution (e.g., 462mV ORP standard).
- 3) Press the "**STD value**" to input the ORP standard value (e.g., 462mV ORP standard).
- 4) After the reading is stable, press the "Start" to complete the first point calibration, and the instrument displays and stores the calibration results.

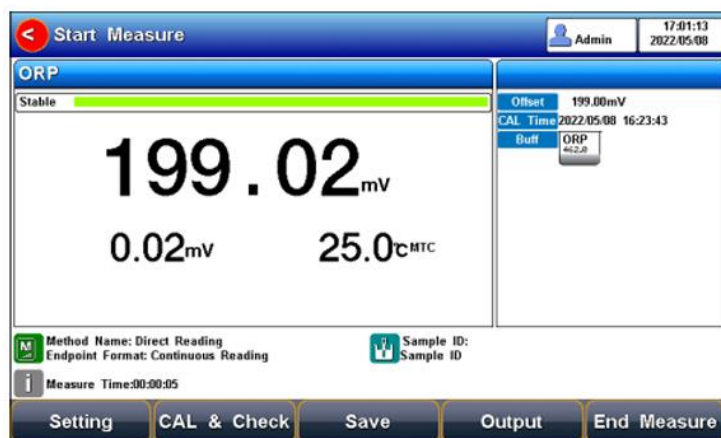
Note: The ORP supports one-point calibration. After one calibration, the analyzer saves the calibration information ends the calibration, and back to the main interface.



6.3.3 Measurement

- 1) Select the "ORP Measure Method".
- 2) The method includes:
 - Set the parameters (e.g., ORP).
 - Set the reading mode (e.g., continuous reading, auto reading, or timed format).
- 3) Connect the ATC probe or enter the temperature manually.
- 4) Rinse the pH electrode with DI water and dry out.
- 5) Put the electrode into the test solution under test.
- 6) Put the measurement end of the electrode into the sample solution.
- 7) Press "**Measure**" to enter measurement status.
- 8) After the reading is stable, read the results.
- 9) Press the "**Save**" to save the measurement results and press the "Output" to print the result.

Note: Kindly calibrate and measure accurately at the same temperature.



6.4 Conductivity Operation Quick guide

6.4.1 Preparation

- 1) Connect the EC electrode (e.g., k=1, with ATC) to the meter.
- 2) Take off the electrode protection cap.
- 3) Rinse the conductivity electrode with DI water and dry it out.
- 4) Switch on the meter.

6.4.2 Calibration

6.4.2.1 Cell Constant Setting

- 1) In the idle status, press "Setting"- "Parameters" to select "Conductivity".
- 2) Press "**Setting**" - "EC Electrode" and select "Input Manually".
- 3) Press "**Setting**" - "EC Calibration", select the "Cell const 1" for the "Electrode Type" and edit the constant manually for the "Set Cell Constant".
- 4) Press the "<Setting/Conductivity calibration key to save the setting and return to the idle status.

6.4.2.2 Manual Calibration

- 1) In the idle status, press "Setting"- "Parameters" to select "Conductivity".
- 2) Press "**Setting**" - "EC Electrode" and select "Cal by Standards".
- 3) Press "**Setting**" - "EC Calibration" and select the "Cell const 1" for the "Electrode Type", select the "Auto Mode" for the "Recognition", select the "Universal Group" for "EC Standards Group", and select the standard solutions.
- 4) Prepare one or more standard conductivity solutions (e.g., 1413 $\mu\text{S}/\text{cm}$ conductivity solution).
- 5) Prepare a thermostatic bath, and set the temperature to $(25.0 \pm 0.1) ^\circ\text{C}$.
- 6) Place a standard conductivity solution in a thermostatic bath, and set the temperature to $(25.0 \pm 0.1) ^\circ\text{C}$.
- 7) Place the conductivity electrode into a standard solution.
- 8) In the idle status, press the "Calibrate" and enter the calibration status.
- 9) When the conductivity and temperature reading is stable, press the "Start".
- 10) If choosing one-point calibration, press "Calibration" to end the calibration.
- 11) If choosing multi-point calibration (up to 5), press "Next Point" to calibrate the next standard solution.
- 12) The meter saves calibration data automatically and turns to idle status.

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Parameter Setting/EC Parameter

Name: EC Electrode
 Serial No.: 12345678
 EC CAL Type: CAL By Standards
 CAL Result:
 CAL Time: 2022/05/08 15:35:18
 User ID: REX Team

Calibration

Cell Constant: 1413 uS/cm
 708 uS/cm
 25.0°C
 Matched STD Value: 1413 uS/cm

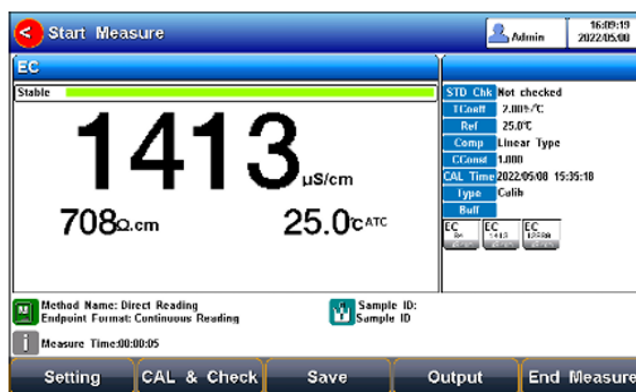
CAL Result:

No.	STD Value	Measured	Cell	Coef
STD1	84.0uS/cm	84.0uS/cm	1.000	
STD2	1413uS/cm	1413uS/cm	1.000	
STD3	12.0uS/cm	12.0uS/cm	1.000	

6.4.3 Measurement

- 1) Setting.
 - Set the parameters (e.g., conductivity).
 - Set the reading mode (e.g., continuous reading, auto reading, and timed format).
 - Set the temperature compensation (e.g., Linear compensation, temperature compensation coefficient 2.00%/°C).
 - Set the reference temperature (e.g., 25°C).
- 2) Rinse the conductivity electrode with DI water and dry it out.
- 3) Put the measurement end of the electrode into the sample solution.
- 4) In the idle status, press "Measure" to enter the measuring status.
- 5) When the reading is stable, read the results.
- 6) Press the "**Save**" to save the measurement results.
- 7) Press the "**Output**" to print the measurement result when connected to the printer.
- 8) Press the "**End measurement**" to end the measurement and turn to the idle status.
- 9) During measurement, the stored EC electrode was in distilled or deionized water.
- 10) After measurement, rinse the EC electrode with deionized water thoroughly and put on the electrode protection cap.

Note: Kindly calibrate and measure accurately at the same temperature. For accurate measurement, the meter may need to do the STD Check before measurement.



6.5 Dissolved Oxygen Operation Quick Guide

6.5.1 Preparation

- 1) Install the DO electrode following the steps:
 - Take the cap off the electrodes, rinse the cap with DI water, and dry out.
 - Rinse the inner electrode with DI water and dry the electrode.
 - Add the filling solution (electrolyte) into the membrane cap up to 3/4.
 - Install the cap onto the electrode.
- 2) Polarographic DO electrodes need to be polarized before use:
 - Connect the DO electrode to the meter.
 - Turn on the meter, wait for 1 hour and the electrodes are auto polarized.
 - When the electrodes are unplugged from the meter for no more than 1 hour, measurements are allowed after 25 minutes of polarization.
- 3) Prepare the samples and standards.
- 4) Select the measurement methods.
- 5) Select the reading mode to process measurement.

6.5.2 Calibration

- 1) Press "CAL & Check" to electrode calibration.
- 2) Place the electrode into an oxygen-free solution.
- 3) After the reading is stable, press the "CAL Zero" to complete the zero calibration.
- 4) Rinse the electrode with DI water again and place the probe in the upper part of a bottle filled with air-saturated (well-shaken) water.
- 5) After the reading is stable, press the "Air-Sat" to complete the air calibration.

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Parameter Setting/DO Parameter

Name: DO Electrode

Serial No.: 12345678

CAL Result:

No.	Name	Measured	Temp
1	Zero Point	0.00	25.0°C
2	Air-Sat	5.00	25.0°C

CAL Time: 2022/05/20 11:46:47

User ID: REX Team

Enter

Calibration

Manual Mode ATC Stable

500 nA
25.0c

CAL Result:

No.	Name	Measured	Comment
1	Zero Point	0.00	Uncalibrated
2	Air-Sat	5.00	Uncalibrated

Start Calibrate When Stable

Setting CAL Zero Air-Sat

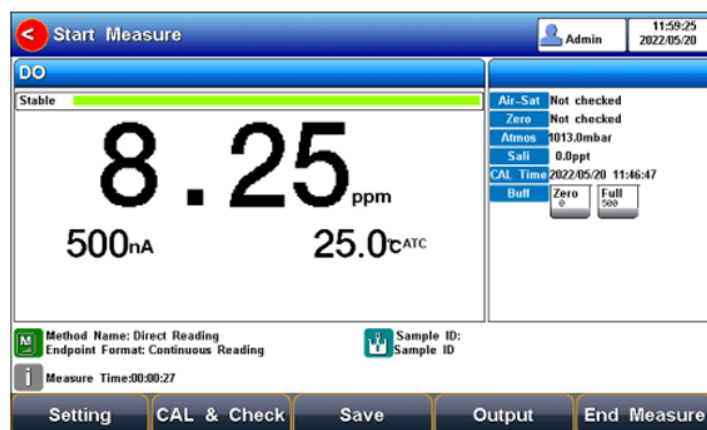
6.5.3 Measurement

- 1) Select a method or create a new method (e.g., DO measure method).
- 2) Or set the parameter.
 - Set the parameters (e.g., DO).
 - Set the reading mode (e.g., continuous reading, auto reading, and timed format).
 - Set the DO salinity compensation.
 - Set the DO barometric compensation.
 - Set the alarm.
- 3) Press "**Measure**" to measure.
- 4) Put the electrode into the test solution under test and shake the electrode gently in a circle, in a circular motion, or use a stirrer to avoid air bubbles during the process.
- 5) When the reading is stable, record the results.
- 6) Press the "**Save**" to save the measurement results.
- 7) Press "**End Measure**" to end the measurement.

Note 1: Kindly calibrate and polarize the electrode before the measurement for an accurate measurement.

Note 2: Before the measurement, select "CAL & Check" - "DO Air-Sat check" or "DO Zero check" to check.

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