CLEAN **Water Analysis Solutions**

Basic 200/500 Series Operation Manual

PH200	DO200	CON200	PH500	DO500	CON500

Table Of Contents

1 Preface

Introduction

Thank you for selecting high quality CLEAN Instruments products : PH200 ,PH500 pH/mV/TEMP Meter, CON200,CON500 Conductivity/Resistant/TDS/Salinity Meter, DO200,DO500 Dissolved Oxygen/TEMP Meter. Easy to use and reliable results are always our goals for products.

CLEAN meters have an excellent performance/cost ratio and other highlights are:
- The instruction manual serves as a step-by-step operational guide to help you familiarize with the meters.
- Ergonomic design.
- Many accessories are selectable, such as different electrodes, buffer solutions, electrode arm for bench meters or a carrying bag for handheld meters.

Safety Measures

Measures For Your Protection

- Never work in an environment subject to explosion hazards! The housing of the instrument is not gas tight (explosion hazard due to spark formation, corrosion caused by the ingress of gases).

- When using chemicals and solvents, comply with the instructions of the producer and the general lab safety rules!

Measures For Operational Safety

- Maintenance of the products should be done by manufacturer only!
- Exclude the following environmental influences：
  - Strong vibrations
  - Direct sunlight
  - Atmospheric humidity over 95%
  - Corrosive gases
  - Temperatures below -10 °C or above 60 °C
  - Strong electric or magnetic fields

- This symbol indicates the useful tips that ease your meter operation.

2 Product Description

2.1 Description Of Instrument Specialty

CLEAN Instruments can be used to measure pH, ORP(Oxygen Reduction Potential), Conductivity, TDS(Total Dissolved Solid), Salinity, Resistance, Dissolved Oxygen, Temperature and so on.
Among They are
Handheld PH200 meter, bench PH500 meter can measure pH, ORP and Temperature.
Handheld CON200 meter, bench CON500 meter can measure Conductivity, TDS(Total Dissolved Solid), Salinity, Resistant and Temperature.
Handheld DO200 meter, bench DO500 meter can measure Dissolved Oxygen and Temperature.
All of the above meters can be used in water analysis, wastewater treatment, chemical industries, food processes, aquiculture and so on.

2.2 Measurement And Control System

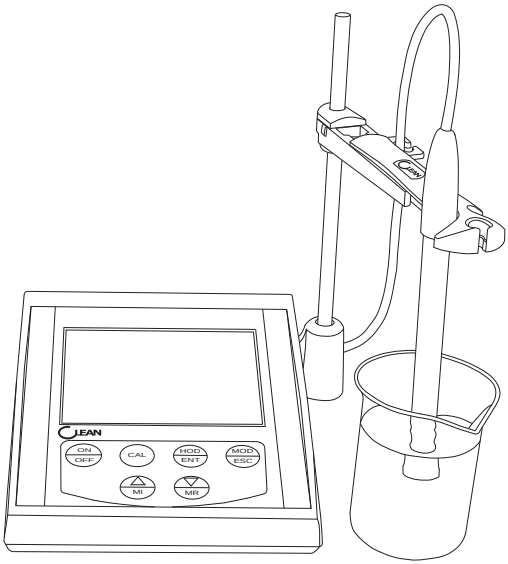
Typical measurement system of **PH200** And **PH500** meter includes:
- PH200 or PH500 meter
- Combination sensor or separated temperature sensor or ORP electrode.
- Suitable pH/ORP measurement cable.

Typical measurement system of **CON200** And **CON500** meter includes:
- CON200 or CON500 meter
- Sensor
- Suitable measurement cable.

Typical measurement system of **DO200** And **DO500** meter includes:
- DO200 or DO500 meter
- Sensor
- Suitable measurement cable.

2.3 Appearance：

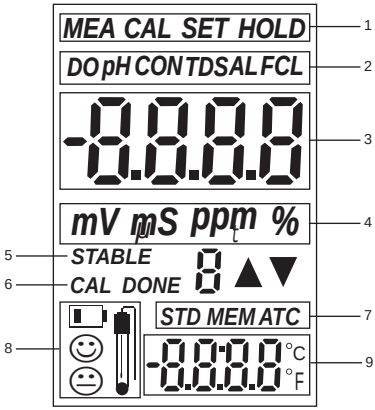
Handheld 200 Series (PH200、CON200、DO200)



Bench 500 Series (PH500、CON500、DO500)

2.3.1 Display Instruction

Multi-line liquid crystal regions show the measured value and the various status of the indication and parameters.



Handheld 200 Series
(PH200、CON200、DO200)

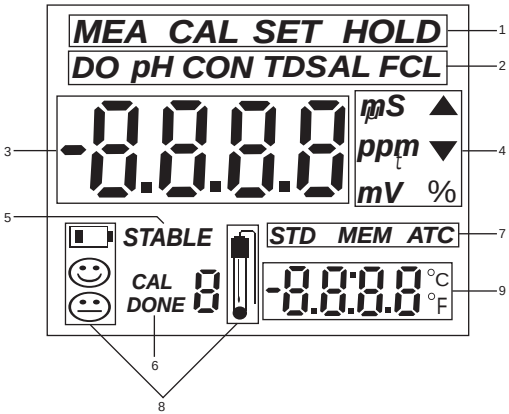
1. Mode：
- **MEA**： Measurement mode
- **CAL**： Calibration mode
- **SET**： Set-up mode
- **HOLD**： Hold mode

2. The type of measured value

3. Measured value, setting value under the set-up mode

4. Unit

5. Endpoint stability



Bench 500 Series
(PH500、CON500、DO500)

6. Calibration

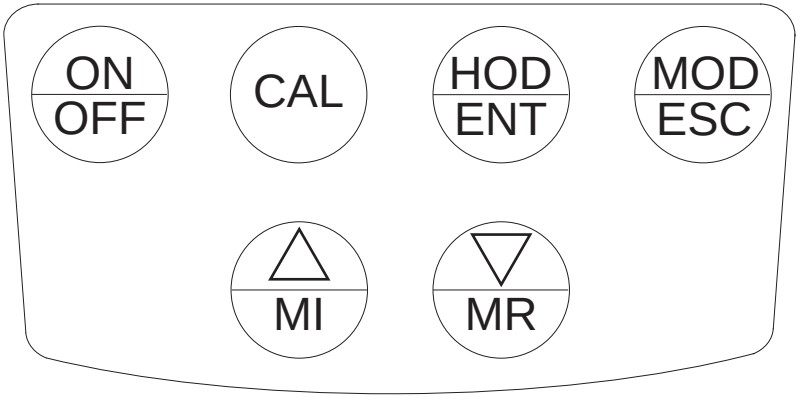
7. Auto temperature compensation, memory, buffer

8. Low power, electrode efficiency

9. Temperature, setting value under the set-up mode

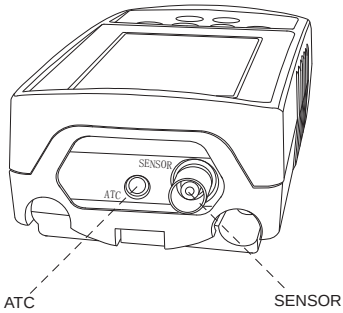
2.3.2 Key Instruction

KEY	Description
ON / OFF	● Power meter On or Off.
CAL	● Enter into calibration modes. ● Press for 3 seconds, show the slope after calibration.
HOD / ENT	● Freeze or unlock the displayed value. ● Confirm selection in setup mode.
MOD / ESC	● Mode switch. ● Turn on the meter and press and hold ON/OFF simultaneously, you will enter the set up mode. ● Exit from current mode of operation.
△ / MI	● Store the displayed value into memory. ● Increment values or scroll through the next options available.
▽ / MR	● Recall stored values from the memory ● Decrement values or scroll through the next options available.

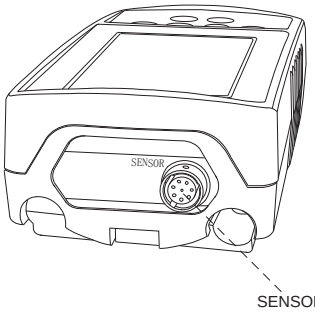


2.4 Installation

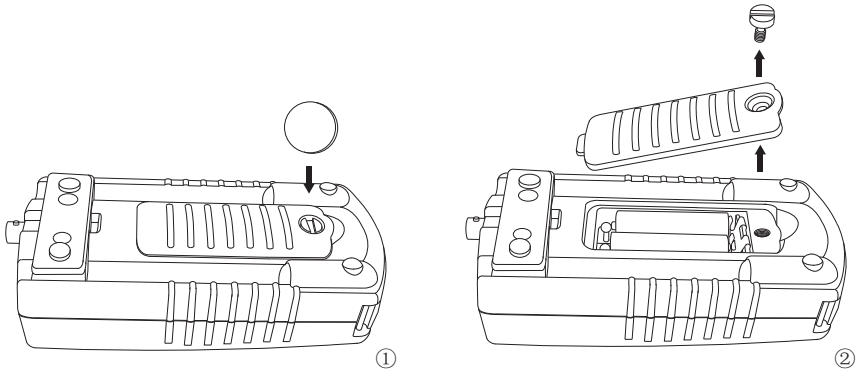
PH200 Signal Interface：



CON200 & DO200 Signal Interface：

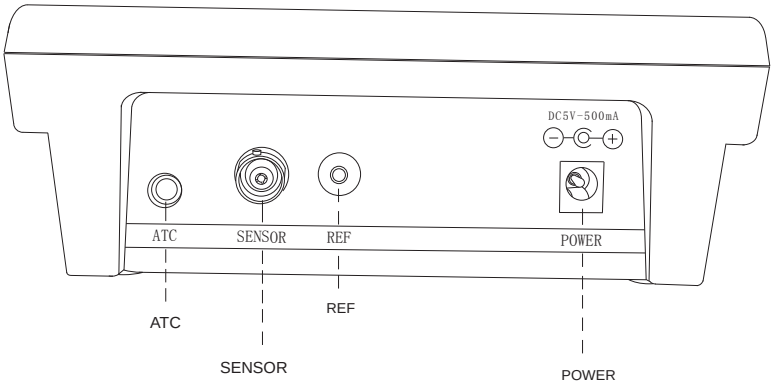


Installing Batteries



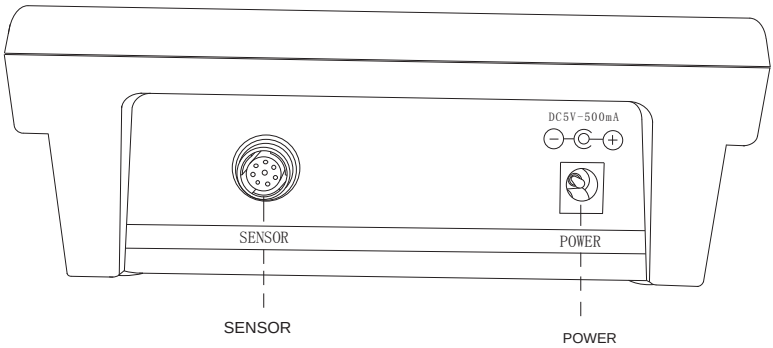
- Remove the battery cover by turning the battery cover screw counterclockwise with a coin or a screwdriver.
- Insert 2 AA batteries in the battery compartment as shown.
- Replace the battery cover and the screw.

PH500 Signal Interface：

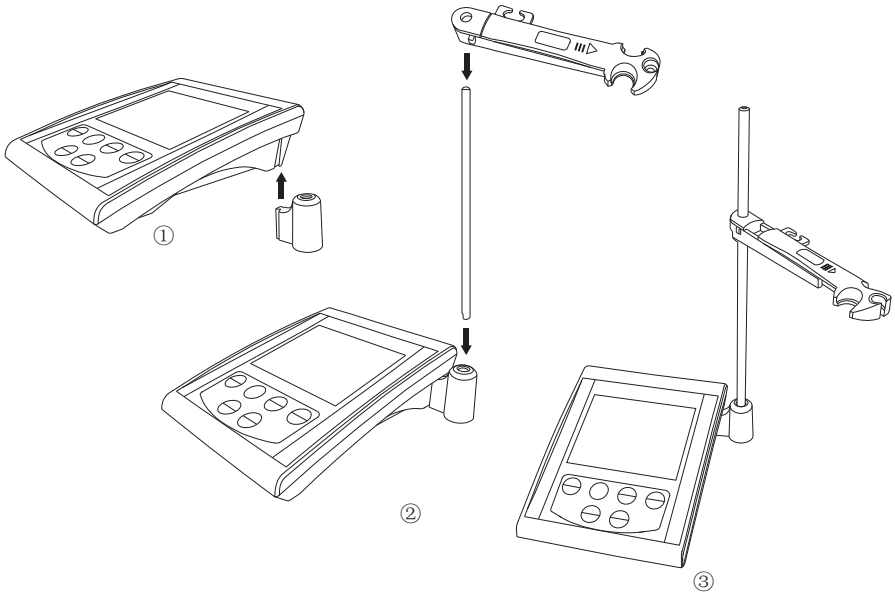


ATC : Automatic Temperature CompensationProbe
SENSOR : pH Combination Sensor
REF : pH Reference Sensor

CON500 & DO500 Signal Interface：



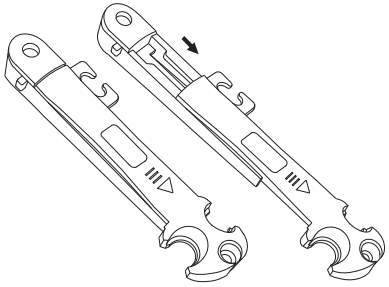
Installing The Electrode Bracket

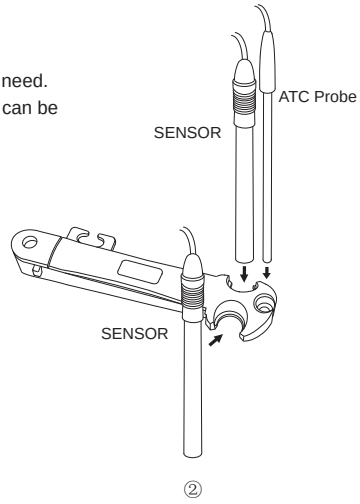


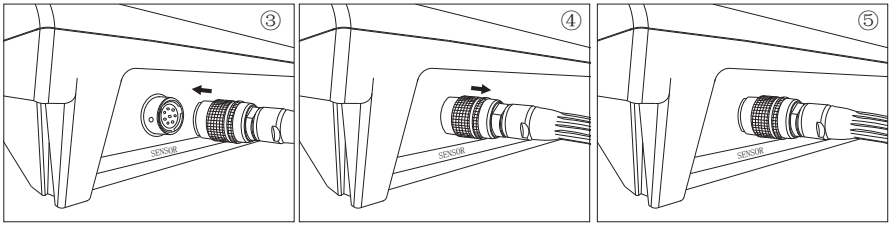
- The electrode bracket base can be fastened to PH500 on both side.
- Insert the electrode stand firmly into the base as shown.
- Fix the bracket upon the stand from above, adjust it to a moderate height.

Installing the Sensors

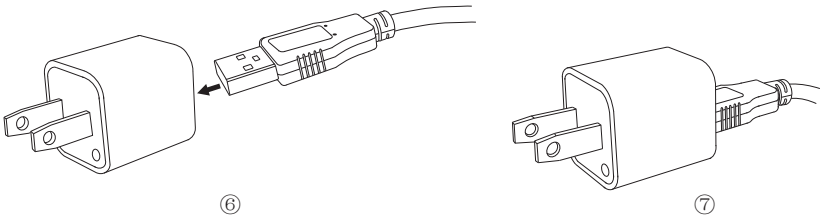
① The electrode bracket can be adjusted to your need.
② Three different kinds of measurement sensors can be installed with the electrode collets.







③ Plug in the electrode connection precisely to the intersection.
④–⑤ Take off the electrode loop downward to unload the electrode.



⑥–⑦ The power interface is USB type. You can use CP500 AC 100, 240V universal power adapter to connect to the power socket directly.

2.5 Product Serial Number Inquiry

Handheld 200 Series (PH200. CON200. DO200)	**Bench 500 Series** (PH500. CON500. DO500)	
		Powering up and press CAL simultaneously, come out product serial number. (Two seconds later, return to the measurement mode.)

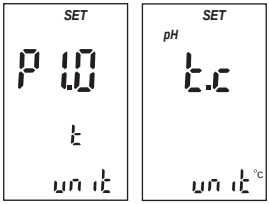
Notice: For more information about PH200/PH500, please refer to Page 10.
For more information about CON200/CON500, please refer to Page 22.
For more information about DO200/DO500, please refer to Page 36.

3 PH200 / PH500 Instruction

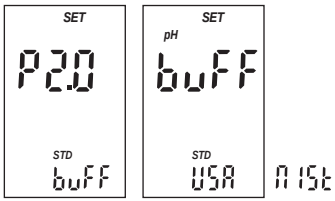
3.1 Function Preview

3.1.1 PH200 Function Preview

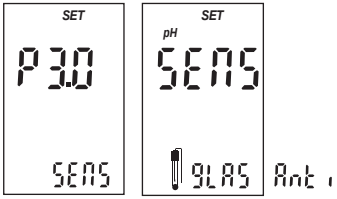
P01: Temperature Setting



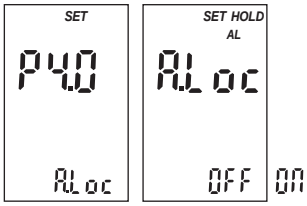
P02: Standard Buffer System function



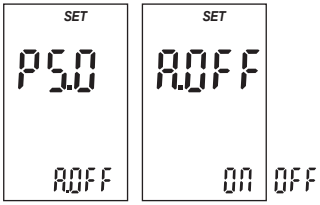
P03: Electrode function



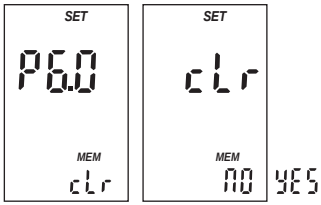
P04: Auto Lock function



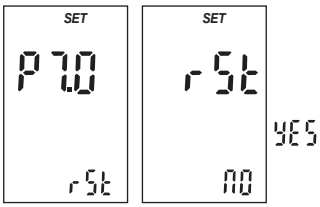
P05: Auto Power Off Function



P06: Clearing Memory Setting

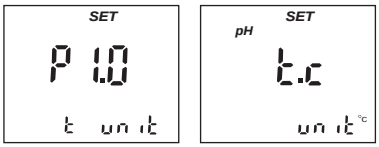


P07: Reverting to Factory Default Setting

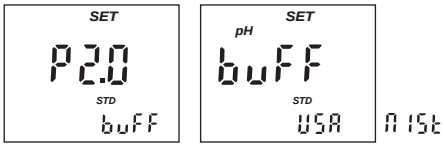


3.1.2 PH500 Function Preview

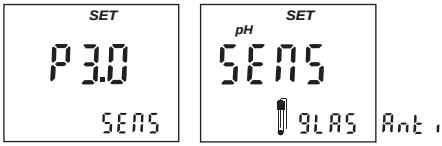
P01: Temperature Setting



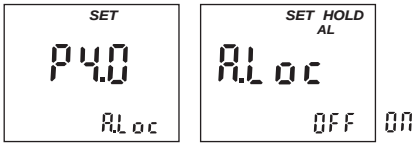
P02: Standard Buffer System function



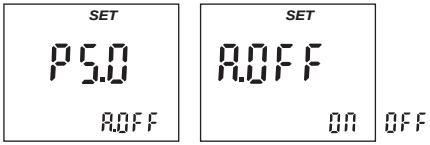
P03: Electrode function



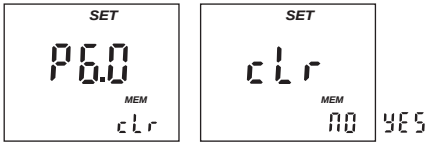
P04: Auto Lock function



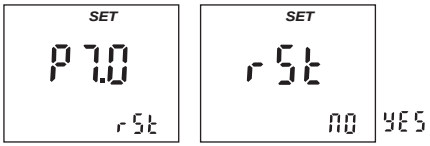
P05: Auto Power Off Function



P06: Clearing Memory Setting



P07: Reverting to Factory Default Setting



3.2 Measurement Mode

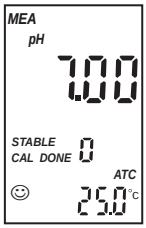
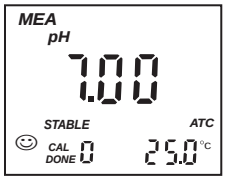
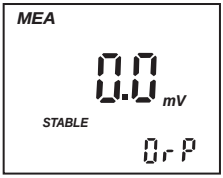
3.2.1 Entering Measurement Mode

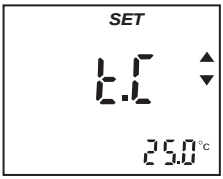
Enter the measurement mode after turning on the meter.

3.2.2 Measurement Mode

	**Notice**: For higher accuracy, we strongly recommend the calibration of meter and electrode first.

There are three kinds of mode that you can switch by MOD/ESC as the left figure shows.

PH200	PH500	
		● When MEA blinks, you can start on measurement. ● The sign " pH " indicates you can measure the pH value. ● The main display area shows the pH value of the sample. ● The sign " STABLE " indicates the readings has stabilized. ● The sign " CAL DONE 0 " indicates the calibration status. ● The smiling face indicates the electrode condition: the smile indicates the slope is between 85% and 100%, the expressionless indicates the slope is between 70% and 85%. ● Temperature on the lower right corner is the tempreture compensation conditon, sign " ATC " indicates automatic temperature compensation. ℃ and ℉ are both available.
		● When MEA blinks, you can start on measurement. ● The sign " mV " indicates the pH value unit . ● The sign " STABLE " indicates the readings has stabilized. ● The sign " ORP " indicates you can measure the ORP value of the sample.

PH200	PH500	
		● Left is the figure of manual temperature compensation. ● "SET" indicates you can set the manual temperature compensation. ● " t .C " refers to temperature compensation. ● You can use ▲ or ▼ to adjust the temperature of your sample. ● The temperature is the value of your manual temperature compensation.

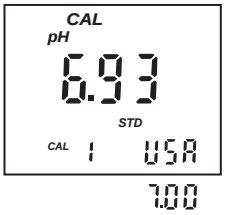
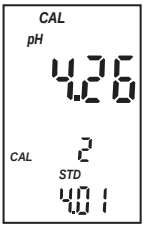
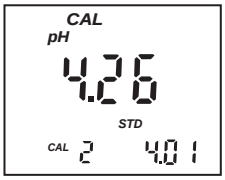
3.3 Calibration Mode

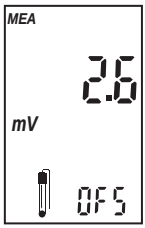
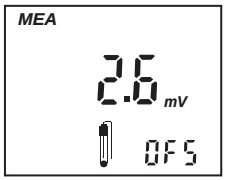
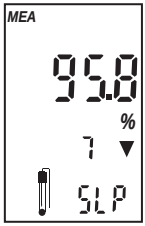
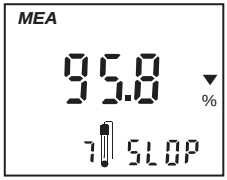
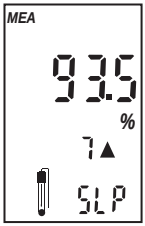
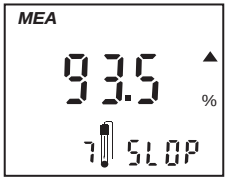
3.3.1 Entering Calibration Mode

You can only finish your calibration under the pH measurement mode, press CAL once to enter the calibration mode.

3.3.2 pH Calibration

This meter is capable of up to 5 point calibration with selectable buffer solutions sets (USA and NIST), the value of the buffer is measured at 25℃. You should select the pH buffer kind to match the value of the buffer in the calibration process. You can set up at P2.0.

PH200	PH500	
		Press CAL to enter the calibration mode at the pH measurement mode. USA or NIST will be selectable 7.00 (USA) or 6.86 (NIST) will be displayed,then starts your first point calibration. The endpoint will be automatically recognized, and the sign "CAL DONE 1" will be displayed when the first point calibration is done. When the electrode or buffer errored, the sign "ER1" will be shown and it will return to the measurement mode automatically.
		After the first point calibration, the second point calibration will begin, the buffer will be automatically recognized in this process, put the electrode into the buffer after cleaning it. The endpoint will be automatically recognized. The sign "CAL DONE 2" will be shown if the electrode or the buffer is done, then the third to the fifth point calibration will be continued. Press ESC back to the measurement mode.

PH200	PH500	
		The offset value and the slope will be shown after the calibration. Press CAL for 3 seconds to recall the offset value and the slope which be measured by the last calibration at the normal measured process.
		The left figure indicates the slope when the pH value is below 7.00pH.
		The left figure indicates when the pH value is above 7.00pH.

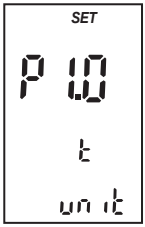
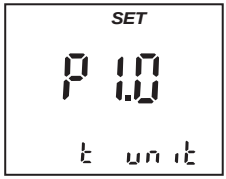
3.3.3 Temperature Calibration

The meter's temperature probe can also be calibrated, specific operations are: Connect the right temperature probe to the meter . Measure a solution at a fairly constant temperature. Turn off the meter after the endpoint stability. With the meter off, turn on the meter and press and hold MI/△ and MR/▽ until the LCD shows below, then release the keys.

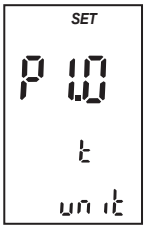
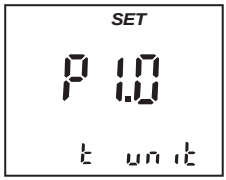
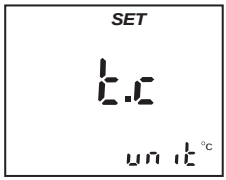
PH200	PH500	
		In this figure, there are two values, the upper is the current stable temperature value, the lower is the offset value. Place the temperature probe in the sample, turn on the meter and press and hold MI/△ and MR/▽ to enter the offset value adjustment mode, press MI/△ or MR/▽ to adjust the offset value. Press MOD/ESC back to the measurement mode, the calibrated temperature will come out.

3.4 Set Up Mode

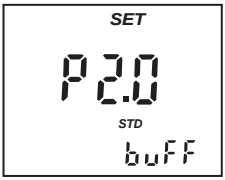
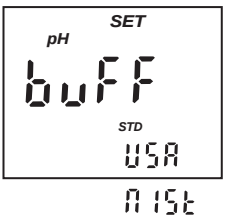
3.4.1 Entering Set Up Mode

PH200	PH500	
		Press and hold MOD/ESC to turn on the meter until the meter shows following, and enter the setup mode.

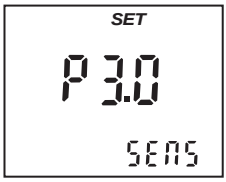
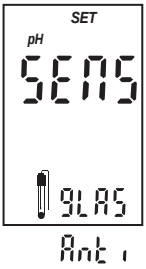
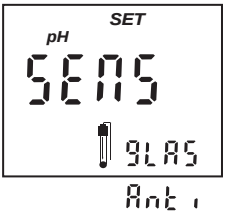
3.4.2 P01：Temperature Setting

PH200	PH500	
		P1.0 allow you to set the temperature, press ENT to enter. Press MI/△ or MR/▽ to select the temperature unit, press ENT to confirm, then comes to the next setting.
		

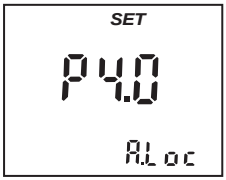
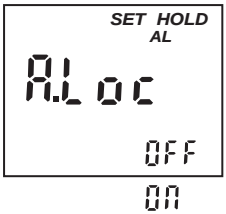
3.4.3 P02：Standard Buffer System Function

PH200	PH500	
		P2.0 allows you to select pH buffer sets, press ENT to enter. Press MI△/ or MR/▽ to select USA or NIST, press ENT to confirm, and comes to the next setting automaticly.
		

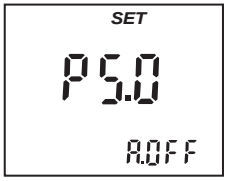
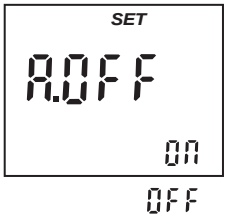
3.4.4 P03：Electrode Function

PH200	PH500	
		P3.0 allows you to select the electrode, press MI△/ or MR/▽ to select GLAS (the glass electrode) or ANTI (the antimony electrode, used in the scene of HF (hydrofluoric acid)), press ENT to confirm, and comes to the next setting automaticly.
		

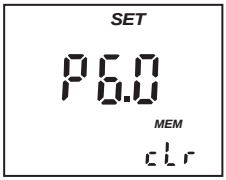
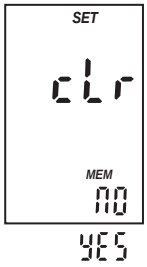
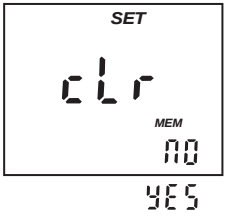
3.4.5 P04：Auto Lock Function

PH200	PH500	
		P4.0 allows you to set the meter into auto lock, the meter can lock the measured value after the reading has stablilised. Press ENT to enter, press MI/△ or MR/▽ to select ON or OFF to set. Press ENT to confirm, then comes to the next setting automaticly.
		

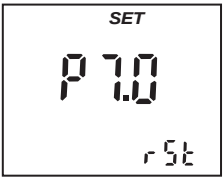
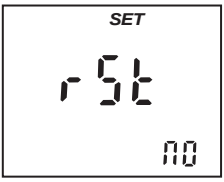
3.4.6 P05：Auto Power Off Setting

PH200	PH500	
		P5.0 allows you to set the meter auto power off. Press ENT to enter, press MI/△ or MR/▽ to select ON or OFF to set. Press ENT to confirm, then comes to the next setting automaticly.
		

3.4.7 P06：Clearing Memory Function

PH200	PH500	
		P6.0 is to clear memory. Press ENT to enter, press MI/△ or MR/▽ to select YES or NO to set. Press ENT to confirm, then comes to the next setting.
		

3.4.8 P07：Reverting to Factory Default Setting

PH200	PH500	
		P7.0 is to reverting to factory setting. Press ENT to enter, press MI/△ or MR/▽ to select YES or NO to set. Press ENT to confirm, then back to P1.0. After all the setting are finished, you can choose to modify some values of the setting. Press MOD/ESC back to the measurement mode in PX.0.
		

3.5 Technical Parameters

Model	PH200	PH500
pH Range	-2.00 to 16.00 pH	
pH Resolution	0.01 pH	
pH Accuracy	± 0.01 pH	
mV Range	-2000 to 2000 mV / -600.0 to 600.0 mV	
mV Resolution	1 mV / 0.1 mV	
mV Accuracy	± 1 mV / ±0.2 mV	
Temperature Range	-5.0 to 120 ℃ / 23.0 to 248.0 ℉	
Temperature Resolution	0.1℃ / 0.1℉	
Temperature Accuracy	±0.3℃ / ±0.5℉	
Temperature Electrode	NTC22KΩ	
Temperature Compensation Range	-5.0 - 120.0 ℃; Automatic (± 10 ℃ offset adjustment) / manual	
Calibration Point	Up to 5 (auto recognized)	
pH Buffer Kinds	USA：1.68、4.01、7.00、10.01、12.45 NIST：1.68、4.01、6.86、9.18、12.45	
Sensor	Glass electrode or antimony electrode (HF hydrofluoric acid environment)	
Memory	100 sets	
Auto Power Off	Optional (No action after 10 minutes)	
Power	2x1.5V AA battery	AC 100 - 240V; Built-in rechargeable lithium battery (1300mAh)
Electrode Stand	/	300mm / ∮ 6mm
Electrode Holder	/	145mm - 220mm
Dimensions	73*152*42mm (W*L*H)	150*194*56mm (W*L*H)
Weight	250 g	1.0 Kg
Working temperature	-10 - 50 ℃ (14 to 122 ℉)	
Humidity	10 - 5% (no dew)	
Protection grade	IP 54	IP 54

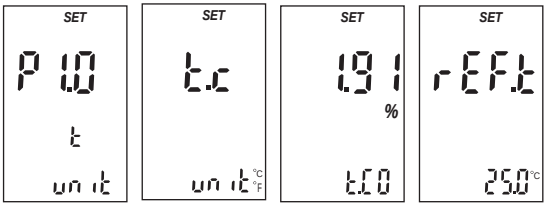
Notice: For more information about Error Mesages, please refer to Page 48.

4 CON200 / CON500 Operation

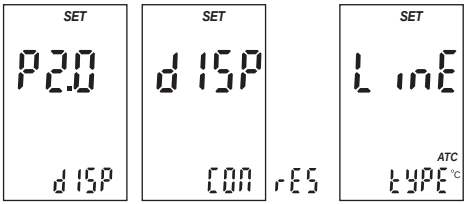
4.1 Function Preview

4.1.1 CON200 Function Preview

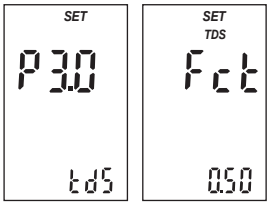
P01: Temperature Setting



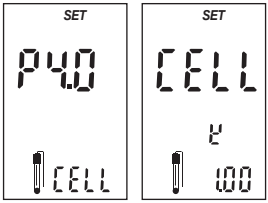
P02: Measuring Function



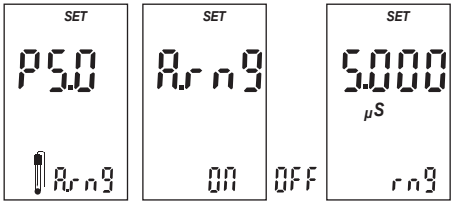
P03: TDS Converting Parameter Function



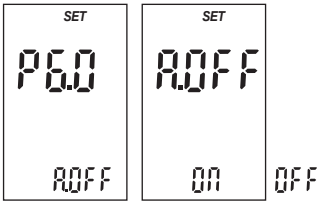
P04: Electrode Constant Setting



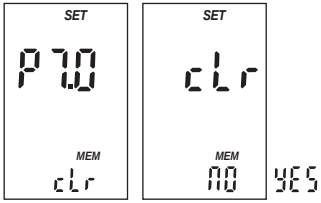
P05: Range Function



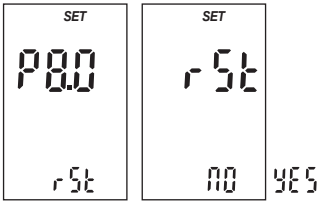
P06: Auto Power Off Setting



P07: Clearing Memory Function

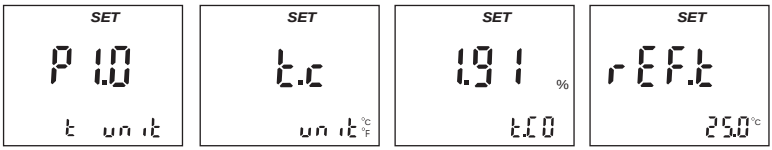


P08: Reverting to Factory Default Setting

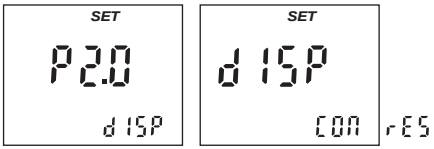


4.1.2 CON500 Function Preview

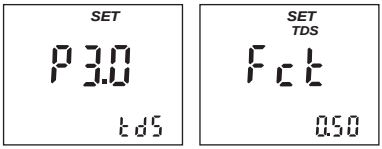
P01: Temperature Setting



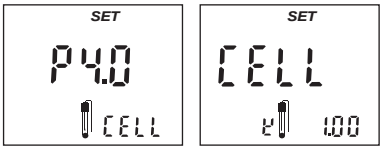
P02: Measuring Function



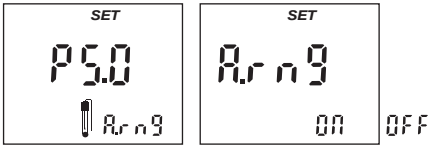
P03: TDS Converting Parameter Function



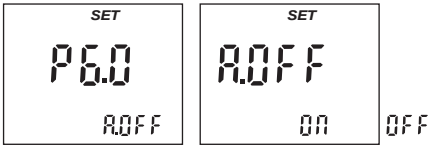
P04: Electrode Constant Setting



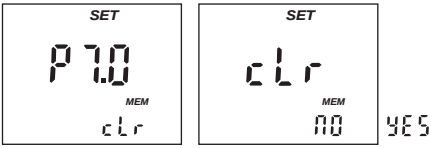
P05: Range Function



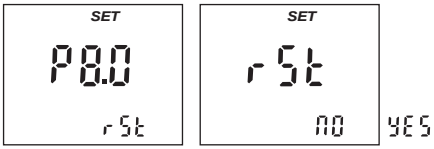
P06: Auto Power Off Setting



P07: Clearing Memory Function



P08: Reverting to Factory Default Setting



4.2 Measurement Mode

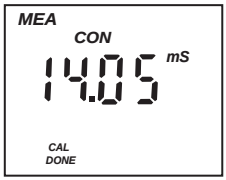
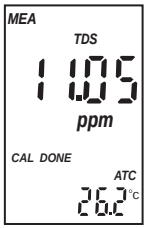
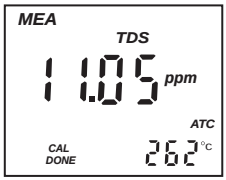
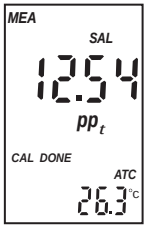
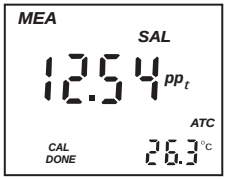
4.2.1 Entering Measurement Mode

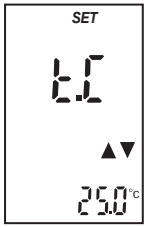
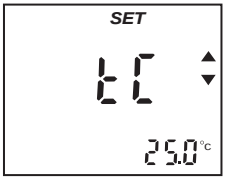
Turn on the meter.Enter the measurement mode.

4.2.2 Measurement Mode (Conductivity/TDS/Salinity)

	**Notice**: For better accuracy, we recommend the calibration of meter and electrode.

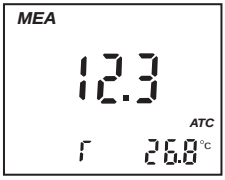
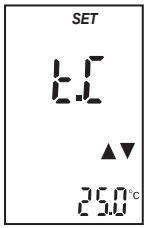
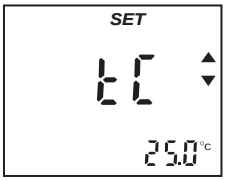
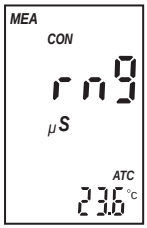
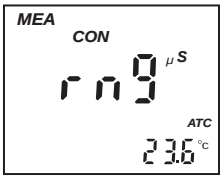
There are four kinds of mode that you can switch by MOD/ESC as the left figure shows.

CON200	CON500	
		● When MEA blinks, you can start on measurement. ● The sign CON, TDS, SAL indicates the different measuring mode. ● The main display area shows the Conductivity, TDS, Salinity value. ● The sign " STABLE " indicates the readings has stabilized. ● The sign " CAL DONE 0 " indicates you can calibrate the meter. ● The smiling face on the lower left corner indicates the meter is under Manual calibration. ● Temperature compensation condition on the lower right corner, the sign " ATC " indicates automatic temperature compensation, with ℃ and ℉ selectable.
		
		

CON200	CON500	
		● You can use ▲ or ▼ to adjust the temperature of your sample.

4.2.3 Measurement Mode (Resistivity)

There are two kinds of mode that you can switch by MOD/ESC as the left figure shows.

CON200	CON500	
		● The symbol " r " besides CAL DONE indicates the resisitivity, Mohm is the unit in the display area.
		● You can use ▲ or ▼ to adjust the temperature of your sample.
		● The following is Conductivity Auto-ranging Indication figure. This figure will come out when the meter is in the auto-ranging mode, to indicate that the meter is choosing the suitable range to calculate.

4.3 Calibration Mode

Attention: There are two kinds of calibration in CON200, one is one point calibration in auto range switching, the other is multipoint calibration in manual range switching.

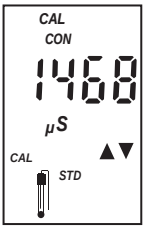
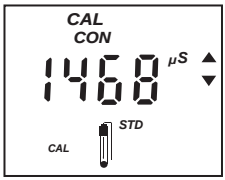
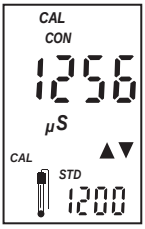
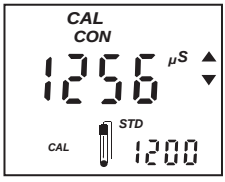
One point calibration is independent from multipoint calibration. The calibration parameter will not change when users switch from each other. Same with the multipoint calibration in manual range switching.

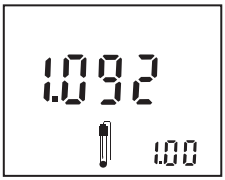
4.3.1 Entering Calibration Mode

Calibration under the measuring mode, press CAL once to enter the calibration mode.

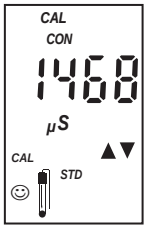
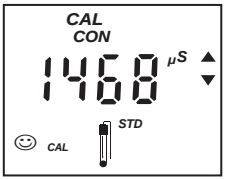
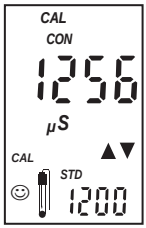
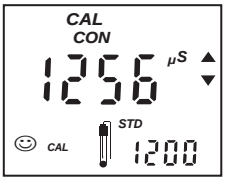
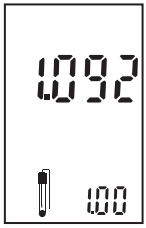
4.3.2 Calibration (One Point Calibration)

Attention: This meter is capable of ATC(Automatic Tempreture Compensation) calibration between 15℃ to 30℃. If it is not in this tempreture range, the calibration needed to be done with KCl. If the buffer is not KCl, you need to set the Temperature Compensation Parameter at 0.0%. Refer to the Standard Buffer Form to attain better Calibration.

CON200	CON500	
		Press CAL to enter the calibration mode at the CON measurement LCD upper line indicates the value before calibration, CAL and probe sign blinks. The upper and down sign indicates you can press to adjust the standard value.
		By pressing the upper and down key, the lower line will indicate the value, adjust the value to the standard value, press ENT to enter you can also press MOD/ESC to exit with no calibration.

CON200	CON500	
		The conductivity constant (lower line) and the slope (upper line) will be shown after the calibration. Multiply the upper and lower line value, we can get the accurate conductivity value. As shown in the left figure 1.092*1.00=1.092.

4.3.3 Calibration (Multipoint Calibration)

CON200	CON500	
		When there is a smiling face, press CAL to enter the calibration. The whole process is the same with 4.1.
		
		The conductivity constant (lower line) and the slope (upper line) will be shown after the calibration. Multiply the upper and lower line value, we can get the accurate conductivity value. As shown in the left figure 1.092*1.00=1.092

Attention: the slope in different range will not affect each other, CAL DONE will show every time when calibration is done.

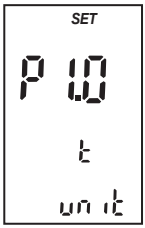
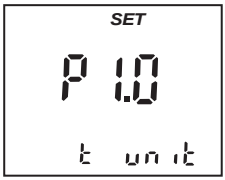
4.3.4 Temperature Calibration

The meter's temperature probe can also be calibrated, specific operations are: Connect the right temperature probe to the meter. Measure a solution at a fairly constant temperature. Turn off the meter after the endpoint stability. With the meter off, turn on the meter and press and hold MI/△ and MR/▽ until the LCD shows below, then release the keys.

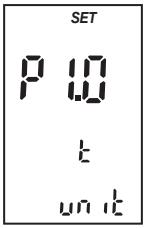
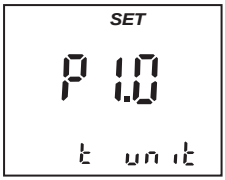
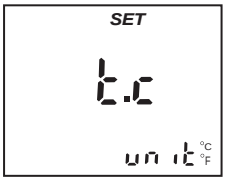
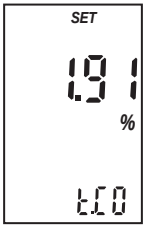
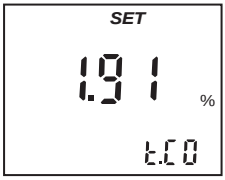
CON200	CON500	
		In this figure, there are two values, the upper is the current stable temperature value, the lower is the offset value. Place the temperature probe in the sample, turn on the meter and press and hold MI/△ and MR/▽ to enter the offset value adjustment mode, press MI/△ or MR/▽ to adjust the offset value. Press MOD/ESC back to the measurement mode, the calibrated temperature will come out.

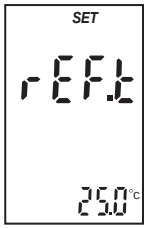
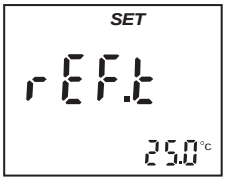
4.4 Set Up Mode

4.4.1 Entering Set Up Mode

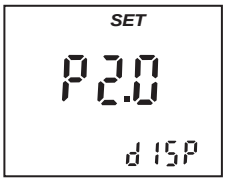
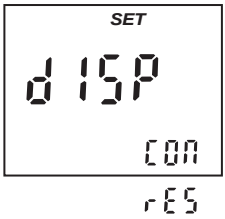
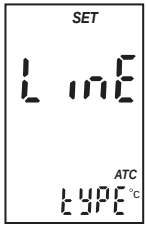
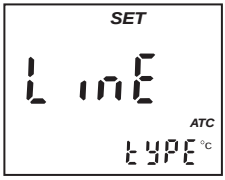
CON200	CON500	
		Press and hold MOD/ESC to turn on the meter until the meter shows following, and enter the setup mode.

4.4.2 P01：Temperature Setting

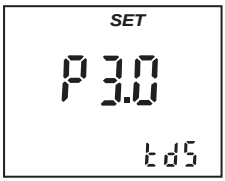
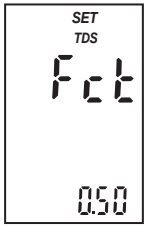
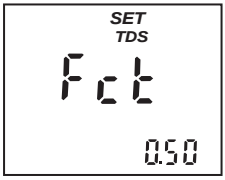
CON200	CON500	
		P1.0 allow you to set the temperature, press ENT to enter. Press MI/△ or MR/▽ to select the temperature unit, press ENT to confirm, then comes to temperature compensation parameter setting you can set between 0.0-10%, press enter to the next setting.
		
		

CON200	CON500	
		

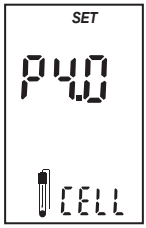
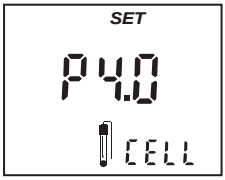
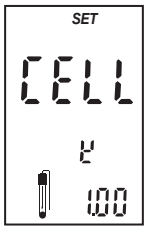
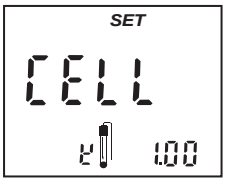
4.4.3 P02：Measuring function

CON200	CON500	
		Press ENT to enter measuring mode, press MI/△ or MR/▽ to choose from CON or RES. Press ENT to set the basic temperature between 15- 30℃. Press ENT to enter to choose between LINE and PURE, and press ENT to enter to the next setting.
		
		

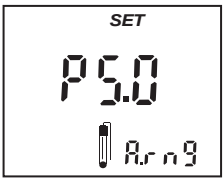
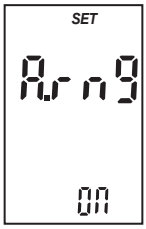
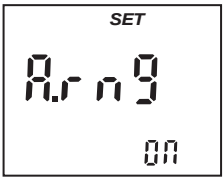
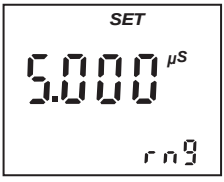
4.4.4 P03：TDS Converting Parameter Function

CON200	CON500	
		P3.0 is TDS converting parameter function. It can convert the CON to TDS, with the setting range from 0.40-1.00, press ENT to enter and comes to the next setting.
		

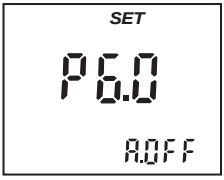
4.4.5 P04：Electrode Constant Setting

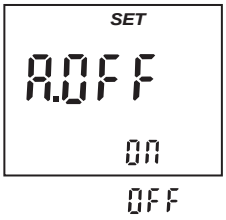
CON200	CON500	
		P4.0 is the electrode constant setting. You can choose the suitable constant to measure, press ENT and comes to the next setting.
		

4.4.6 P05：Range Function

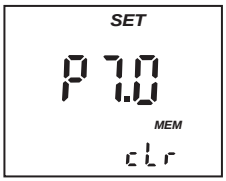
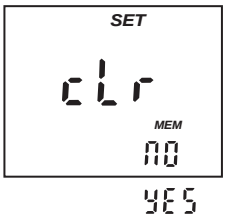
CON200	CON500	
		P5.0 is the range function, press ENT to enter, turn on or off this function by MI/△ or MR/▽. Choose suitable range by MI/△ or MR/▽ and press ENT to come to the next setting.
		
		

4.4.7 P06：Auto Power-Off Function

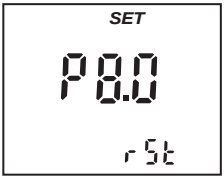
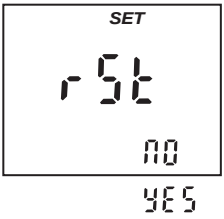
CON200	CON500	
		Power on or off the function by MI/△ or MR/▽, press ENT to enter and comes to the next setting.

CON200	CON500	
		

4.4.8 P07：Clearing Memory Function

CON200	CON500	
		Pressing MI/△ or MR/▽ to choose YES or NO to decide whether to clear the memory or not, press ENT to enter and comes to the next setting.
		

4.4.9 P08：Reverting to Factory Default Setting

CON200	CON500	
		P8.0 is the reverting to Factory default setting, Power on or off the function by MI/△ or MR/▽, press ENT to enter and back to the P1.0 function.
		

These are all the setup functions, users can change some of the parameters in your needs. When at PX.0, press MOD/ESC back to the measurement mode.

4.5 Technical Parameters Form

Model	CON200	CON500
Conductivity Range	0 - 5.000 µS/cm；0 - 50.00 µS/cm；0 - 500.0 µS/cm；0 - 5000 µS/cm；0 - 50.00 mS/cm；0 - 500.0 mS/cm	
Conductivity Resolution	0.001 µS/cm；0.01 µS/cm；0.1 µS/cm；1 µS/cm；0.01 mS/cm；0.1 mS/cm	
Conductivity Accuracy	±1% F.S.	
TDS Range	0 - 5.000 ppm；0 - 50.00 ppm；0 - 500.0 ppm；0 - 5000 ppm；0 - 50.00 ppt；0 - 500.0 ppt	
TDS Resolution	0.001 ppm；0.01 ppm；0.1 ppm；1 ppm；0.01 ppt；0.1 ppt	
TDS Accuracy	±1% F.S.	
Resistivity Range	0 - 20.0 MΩ*cm	
Resistivity Resolution	0.1 MΩ*cm	
Resistivity Accuracy	±1% F.S.	
Temperature Range	-5.0 - 120 ℃ / 23.0 - 248.0 ℉	
Temperature Resolution	0.1℃ / 0.1℉	
Temperature Accuracy	±0.3℃ / ±0.5℉	
Switching	Auto / Manual	
Temperature Compensation Range	-5.0 - 120.0 ℃；Automatic (± 10℃ offset adjustment) / Manual	
Calibration	One Point / Multipoint	
Reference Tempereture	15 - 30 ℃	
TDS Parameter	0．40 - 1.00	
Salinity Parameter	0.65	
Electrode Constant	0.01，0.1，1，10	
Tempereture Parameter	0.00 - 9.99%	
Ulterpure Water Linear Compensation	Yes	
Memory	100 sets	
Auto Power Off	Optional (No action after 10 minutes)	
Power	2x1.5V AA battery	AC 100 - 240V;Built-in rechargeable lithium battery (1300mAh)
Electrode Stand	/	300mm / ∮ 6mm
Electrode Holder	/	145mm - 220mm
Dimensions	73*152*42mm (W*L*H)	150*194*56mm (W*L*H)
Weight	250 g	1.0 Kg
Working Temperature	-10 to 50 ℃ (14 to 122 ℉)	
Humidity	10 to 95% (no frozen dew)	
Protection Grade	IP 65	IP 54

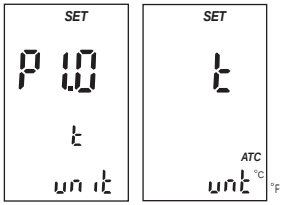
Notice: For more information about Error Mesages, please refer to Page 48.

5 DO200 / DO500 Instruction

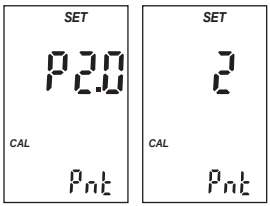
5.1 Function Preview

5.1.1 DO200 Function Preview

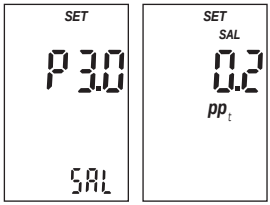
P01: Temperature Setting



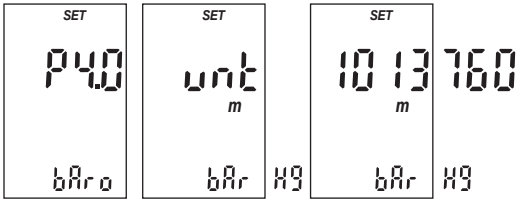
P02: The Number Of Points Selectable In Calibration



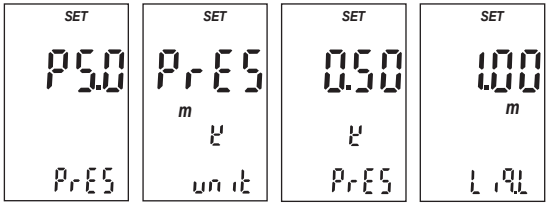
P03: Salinity Compensation



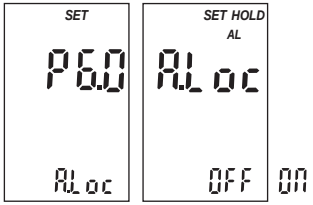
P04: Atmospheric Pressure Compensation



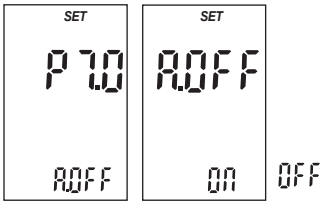
P05: Process Pressure Or Liquid Level Compensation



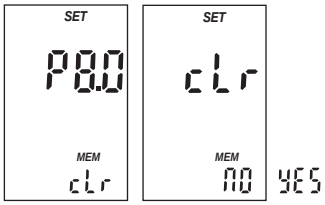
P06: Auto Lock Function



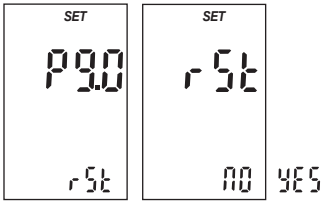
P07: Auto Power Off Function



P08: Clearing Memory Function

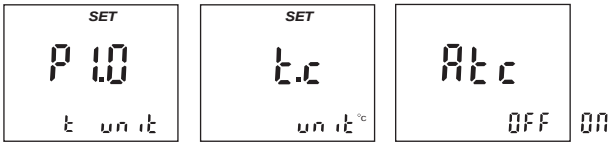


P09: Reverting to Factory Default Setting

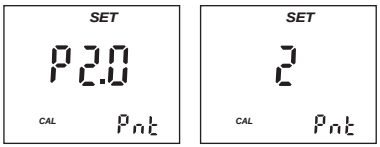


5.1.2 DO500 Function Preview

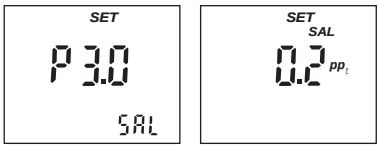
P01: Temperature Setting



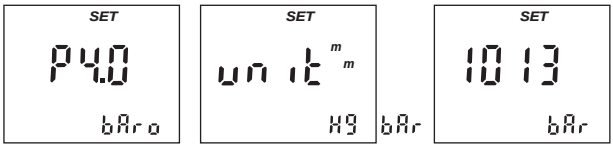
P02: The Number Of Points Selectable In Calibration



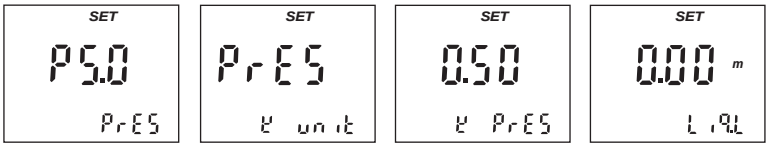
P03: Salinity Compensation



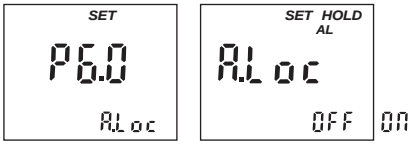
P04: Atmospheric Pressure Compensation



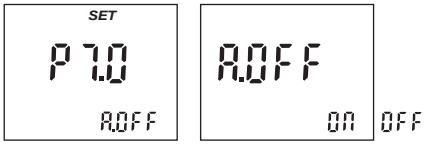
P05: Process Pressure Or Liquid Level Compensation



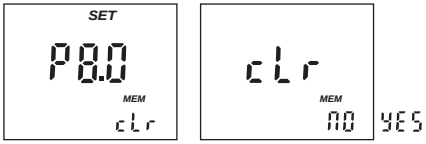
P06: Auto Lock Function



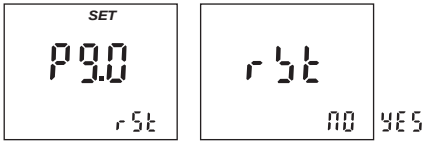
P07: Auto Power Off Function



P08: Clearing Memory Function



P09: Reverting to Factory Default Setting



5.2 Measurement Mode

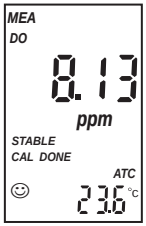
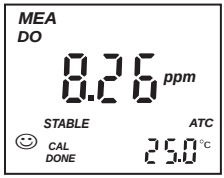
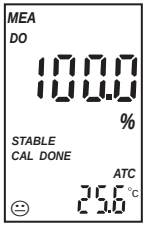
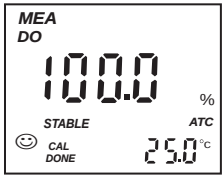
5.2.1 Entering Measurement Mode

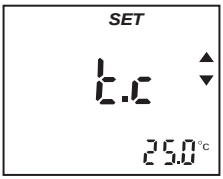
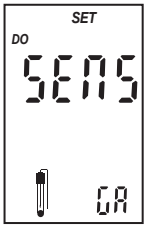
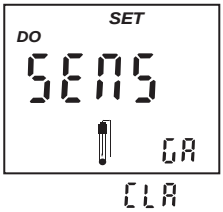
Turn on the meter,enter the measurement mode.

5.2.2 Measurement Mode

Notice: For higher accuracy, we strongly recommend calibration of meter and electrode first.

There are three kinds of mode that you can switch by MOD/ESC as the left picture shown.

DO200	DO500	
		● When MEA blinks, you can start on measurement. ● The sign "DO" indicates you can measure the dissolved oxygen value of the sample. ● The main display area shows the dissolved oxygen value of the sample (ppm absolute value). ● The sign "STABLE" indicates the readings has stabilized. ● The sign "CAL DONE" indicates you can calibrate the meter. ● The smiling face indicates the electrode condition: the smile indicates the slope between 85% and 100%, the expressionless indicates the slope between 70% and 85%. ● Temperature compensation condition on the lower right corner, the sign " ATC " indicates automatic temperature compensation. ℃ and ℉ are both available.
		● When MEA blinks, you can start on measurement. ● The sign "%" indicates the unit of the dissolved oxygen value of the sample (% relative value). ● The sign "STABLE" indicates the readings has stabilized.

DO200	DO500	
		• Left is the figure of manual temperature compensation. • " SET " indicates you can set the manual temperature compensation. • " t .C " refers to temperature compensation. • You can use ▲ or ▼ to adjust the temperature of your sample. • The temperature is the value of your manual temperature compensation.
 GA – Galvanic Electrode CLA – Clark Electrode	 GA – Galvanic Electrode CLA – Clark Electrode	• The following is DO electrode choosing figure. Power on the meter with HOLD simultaneously, enter the above figure. User can select the electrode with ▲ and ▼ key. GA refers to Galvanic electrode, CLA refers to Clark electrode, press ENT to confirm, press MOD to exit. The meter will revert to Factory Default Setting automatically. User should reverting the meter once again.

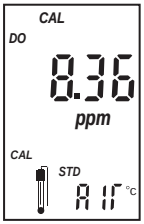
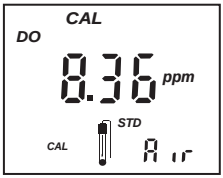
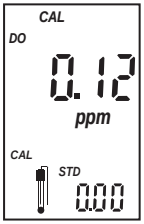
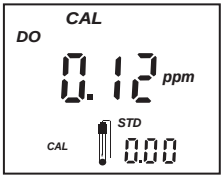
5.3 Calibration Mode

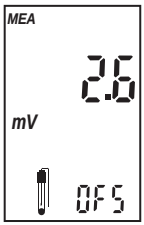
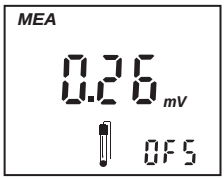
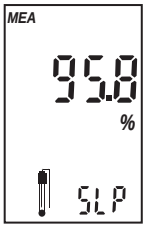
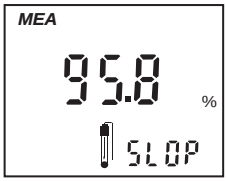
5.3.1 Entering Calibration Mode

You can only finish your calibration under the dissolved oxygen measurement mode, press CAL once to enter the calibration mode.

5.3.2 Dissolved Oxygen Calibration

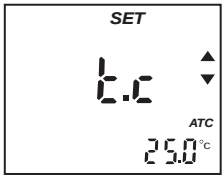
The meter allow you to perform 1- or 2- point calibrations. 1-point calibration means that you can calibrate the full-scale directly (saturated dissolved oxygen). 2-point calibrations means that you should calibrate the full-scale after the zero calibration.

DO200	DO500	
		1-point calibration: Press CAL to enter the calibration mode at the dissolved oxygen measurement mode. The sign "AIR" will be displayed to tell you that you can start the full-scale calibration. The endpoint will be automatically recognized, and the sign "CAL DONE 1" will be displayed to tell you that the first point calibration is done. When the electrode or buffer errored, the sign "ER1" will be shown and it will return to the measurement mode automatically.
		2-point calibrations: Press CAL to enter the calibration mode at the dissolved oxygen measurement mode. The sign "000" will be displayed to tell you that you can start the zero calibration. Put the electrode into the zero-oxygen solution, the endpoint will be automatically recognized. After the first point calibration, the second point calibration will begin. The sign "AIR" will be displayed to tell you that you can start the full-scale calibration. The endpoint will be automatically recognized. The sign "CAL DONE" will be shown if the electrode or the buffer is done.

DO200	DO500	
		The offset value and the slope will be shown after the calibration. Press CAL for 3 seconds to recall the offset value and the slope which be measured by the last calibration at the normal measured process.
		The left figure indicates the DO electrode slope.

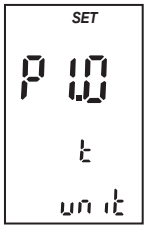
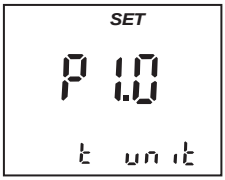
5.3.3 Temperature Calibration

The meter's temperature probe also can be calibrated, specific operation is:
Connect the temperature probe to the meter in the right way. Measure a solution at a fairly constant temperature. Turn off the meter after the endpoint stability.Turn on the meter by pressing MI/△ and MR/▽, until the LCD as shown, then release the keys.

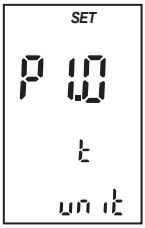
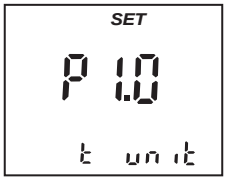
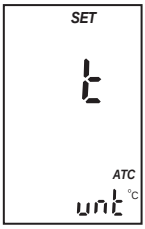
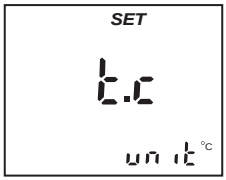
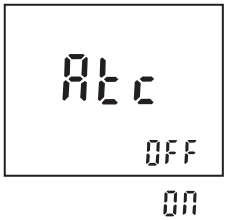
DO200	DO500	
		In this figure, there are two values, the upper line is the temperature value when the current measurement has endpointed,the lower line is the offset value. You can press MI/△ or MR/▽ to adjust the offset value. The temperature value minus the offset value can correct the temperature probe's error. Press MOD/ESC to back to the measurement mode, then the calibrated temperature will show.

5.4 Set Up Mode

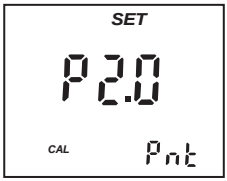
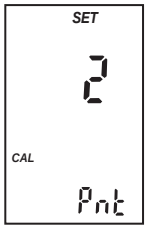
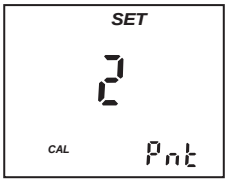
5.4.1 Entering Set Up Mode

DO200	DO500	
		Press and hold MOD/ESC to turn on the meter until the meter shows as following, and enter the setup mode.

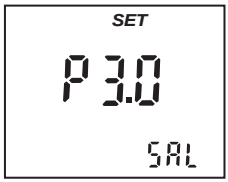
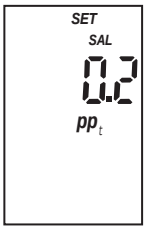
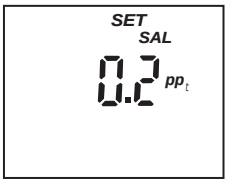
5.4.2 P01：Temperature Setting

DO200	DO500	
		P1.0 allows you to set the temperature, press ENT to enter. Press MI△/ or MR/▽ to select the temperature unit, press ENT to confirm, then **DO200** comes to the next setting, **DO500** comes to the automatic temperature compensation setting.
		
		**DO500** comes to the automatic temperature compensation setting, you can turn on or turn off the automatic temperature compensation, press MI/△ or MR/▽ to select ON or OFF to set, after that, you come to the next setting.

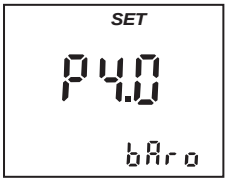
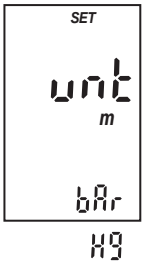
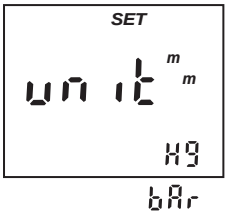
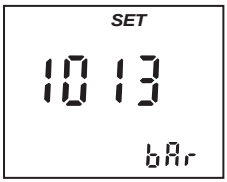
5.4.3 P02：The number of points selectable in Calibration

DO200	DO500	
		P2.0 allows you to select the number of points in calibration, press ENT to enter. Press MI/△ or MR/▽ to select 1- or 2- point calibrations, select 1-point calibration, you can calibrate the saturated dissolved oxygen directly; select 2-point calibrations, you should calibrate the saturated dissolved oxygen after the zero calibration. Press ENT to confirm,then comes to the next setting.
		

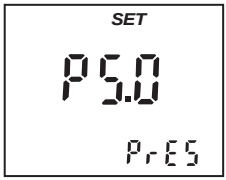
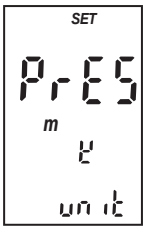
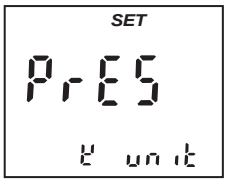
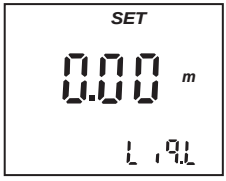
5.4.4 P03：Salinity Compensation

DO200	DO500	
		P3.0 allows you to set salinity of the sample, you can compensate the effects of salinity on dissolved oxygen, press ENT to enter. Press MI/△ or MR/▽ to adjust the values for setting salinity. Press ENT to confirm,then comes to the next setting.
		

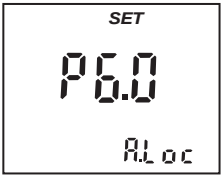
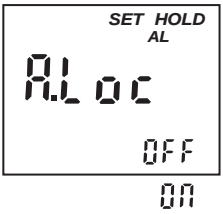
5.4.5 P04：Atmospheric Pressure Compensation

DO200	DO500	
		P4.0 allows you to set the value of atmospheric pressure, you can compensate the effects of atmospheric pressure, Press ENT to enter, you can select the unit of atmospheric pressure, mmHg(millimetre of mercury) and bar selectable, press MI/△ or MR/▽ to select the unit. Press ENT to enter, you can set the value of atmospheric pressure, press MI/△ or MR/▽ to set the value. Press ENT to confirm, then comes to the next setting.
		
		

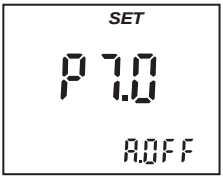
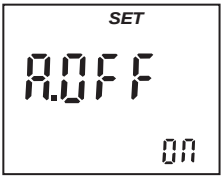
5.4.6 P05：Process Pressure Or Liquid Level Compensation

DO200	DO500	
		P5.0 allows you to set the value of process pressure or liquid level compensation, you can compensate the effects of pressure or liquid level compensation on dissolved oxygen. Press ENT to enter, you can set process pressure or liquid level compensation, press MI/△ or MR/▽ to select the first value you want to set, press ENT to enter, you can set the value of your choice, press MI/△ or MR/▽ to set the value. Press ENT to confirm, then comes to the next setting.
		
		
		

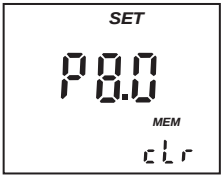
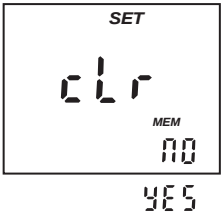
5.4.7 P06：Auto Lock Function

DO200	DO500	
		P6.0 allows you to set the meter into auto lock, the meter can lock the measured value after the reading has stablilised. Press ENT to enter, press MI/△ or MR/▽ to select ON or OFF to set. Press ENT to confirm,then comes to the next setting automaticly.
		

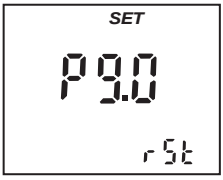
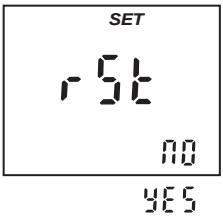
5.4.8 P07：Auto Power Off Function

DO200	DO500	
		P7.0 allows you to set the meter auto power off. Press ENT to enter, press MI/△ or MR/▽ to select ON or OFF to set. Press ENT to confirm,then comes to the next setting.
		

5.4.9 P08：Clearing Memory Function

DO200	DO500	
		P8.0 allows you to clear the memory. Press ENT to enter, press MI/△ or MR/▽ to select YES or NO to set. Press ENT to confirm, then comes to the next setting.
		

5.4.10 P09：Reverting to Factory Default Setting

DO200	DO500	
		P9.0 allows you to reverting to factory setting. Press ENT to enter, press MI/△ or MR/▽ to select YES or NO to set. Press ENT to confirm,then back to P1.0 again. All the setting are finished, you can choose to modify some values of the setting. Press MOD/ESC back to the measurement mode in PX.0.
		

5.5 Technical Parameters

Model	DO200	DO500
Dissolved Oxygen Range	0.00 - 20.00 mg/L；0.0 - 200.0%	
Dissolved Oxygen Resolution	0.01 mg/L ；0.1%	
Dissolved Oxygen Accuracy	±1.5% F.S.	
Temperature Range	-5.0 - 120.0℃ / 23.0 - 248.0℉	
Temperature Resolution	0.1℃ / 0.1℉	
Temperature Accuracy	±0.3℃ / ±0.5℉	
Temperature Compensation Range	0.0 - 60.0℃； Automatic (± 10 ℃ offset adjustment) / manual	
Calibration	1 or 2 point auto / manual calibration (0% or air 100% saturation)	
Salinity Compensation	0.0 - 45.0 ppt	
Atmospheric Pressure Compensation	450 - 800mmHg / 0.600 - 1.100 BAR	
Pipeline pressure Compensation	0.00 - 1.00 Kg	
Liquid Level Compensation	0.0 - 10.0 m	
Memory	100 sets	
Auto Power Off	Optional (No action after 10 minutes)	
Power	2x1.5V AA battery	AC 100 - 240V； Built-in rechargeable lithium battery (1300mAh)
Electrode	Galvanic Primary cell type	
Electrode Stand	/	300mm / ∮ 6mm
Electrode Holder	/	145mm - 220mm
Dimensions	73*152*42mm(W*H*D)	150*194*56mm(W*L*H)
Weight	250g	1.0 Kg
Working temperature	-10 to 50 ℃ (14 to 122 ℉)	
Humidity	10 to 95% (no frozen dew)	
Protection grade	IP 65	IP 54

Notice: For more information about Error Mesages, please refer to Page 48.

6 Error Messages

ER1：The readings can not be stabilised, or over the recognized standard range.

ER2：Calibration under the ATC mode,the input tempreture is out of the range of 0-60℃.

ER3：The value is over range(Or) or under range(Ur) when memorising the value(MEM).

7 General Information

Warranty

Clean Instruments warrants this product to be free from significant deviations in material and workmanship for a period of one year from the date of purchase. If repair is necessary and has not been the result of abuse or misuse within the warranty period, please return to Clean Instruments and amendment will be made without any charge.
Clean Instruments Customer Service Center will determine if product problem is due to deviations or customer abuse. Out of warranty products will be repaired on a charge basis.

Returning the Items

Authorization must be obtained from Clean Instruments Customer Service Center to issue a RIR number before returning items for any reason. When applying for authorization, please include date requiring the reason of return. Instruments must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Clean Instruments will not be responsible for any damage resulting from careless or insufficient packing.
Warring: Damage as a result of inadequate packaging is the User / distributor's responsibility. Please follow the guidelines below before transporting.

Guidelines for Returning the Items

Use the original packaging material if possible, when transporting back the unit for repair. Otherwise wrap it with bubble pack and use a corrugated box for better protection. Include a brief description of any faults suspected for the convenience of Customer Service Center, if possible.If there are any questions, feel free to contact our Customer Service Center or distributors.

Clean Instruments reserve the rights to change, make improvement and modify specifications without prior notice.

For more information on Clean Instruments' products, please contact your nearest distributor or visit our website : www.cleaninst.com

Manufacturer	**Distributor**
First Clean Corporation 14656 Valley Blvd. City of Industry, CA 91746,U.S. TEL : 1-626-333-6622 FAX : 1-626-333-6612 E-mail: cs@cleaninst.com	

www.cleaninst.com

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First Clean Corporation
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