



PC100 Handheld pH/Cond./TDS/Sal. Meter

Instruction Manual



ISO9001: 2008

IP67
WATERPROOF

Table of Contents

1. Introduction	1
2. Specifications	2
3. Instrument Description	3
3.1 LCD display	3
3.2 Keypad functions	4
3.3 Meter sockets	5
3.4 Reading stable display mode	5
3.5 Auto power-off	5
4. pH measurement	6
4.1. pH probe information	6
4.2. pH calibration related information	6
4.3. pH Meter calibration	7
4.4. Customer-defined calibration	8
4.5. Solution Measurement	9
4.6. pH probe maintenance	10
5. mV measurement	11
6. Conductivity measurement	12
6.1. Conductivity probe information	12
6.2. Conductivity calibration related information	12
6.3. Conductivity Meter calibration	14
6.4. Relationship among TDS, Salinity, and Cond.	14
6.5. Customer-defined calibration	15
6.6. Sample measurement	15
6.7. Conductivity probe maintenance	16
7. Parameter setting	17
7.1. Main menu	17
7.2. Submenu	17
7.3. Submenu of pH parameter setting	19
7.4. Submenu of Cond. parameter setting	20
7.5. Basic parameter setting submenu	21
8. Meter Kits	21
9. Warranty	23
Appendix I: Parameter setting & Restore to factory default setting	24
Appendix II: Code Symbol & Abbreviation Glossary	25
Appendix III: Self-diagnostic Information	26

1. Introduction

Thank you for purchasing our PC100 Handheld pH/Cond./TDS/Sal. Meter.

This meter is a perfect combination of the advanced electronic technology, sensor technology and software design, and is the most cost effective handheld electrochemical meter which is suitable for usage in industrial and mining enterprises, water treatment engineering, environmental protection industry, etc, especially suitable for application in field.

With built-in microprocessor chip, beautiful appearance and easy to use, this meter has the following prominent features:

1.1 Basic features

- With built-in microprocessor chip, the meter has intelligent functions like automatic calibration, automatic temperature compensation, function setting, self-diagnostic information, auto power-off and low voltage display, etc.
- With advanced digital processing technology, the response speed and accuracy of the meter are greatly improved. Stable reading display mode is also equipped.
- The meter meets IP67 dust and water proofing rate.

1.2 pH measurement features

- 1-3 point automatic calibration with calibration instruction and automatic checking functions.
- Automatically recognize 6 types of pH buffer solution. Buffer solution selectable: USA series, NIST series and customer-defined solution.
- The criteria of the reading stability are selectable.

1.3 Conductivity measurement features

- 1- 4 point automatic calibration with calibration instruction and automatic checking functions.
- Automatically recognize 4 types of conductivity standard solution and customer-defined solution can also be set up.
- With conductivity, TDS and salinity three measurement modes, can switch to display the results.

Specifications

2.1 Technical Parameters:

	Technical Parameters	
pH	Measuring Range	(0.00 ~ 14.00) pH
	Resolution	0.1/0.01 pH
	Accuracy	±0.01 pH ±1digit
	Temperature Compensation Range	(0 ~ 100) °C (Auto. or Manual)
mV	Measuring Range	±1000mV
	Resolution	1mV
	Accuracy	±0.1% FS ±1digit
Cond.	Measuring Range	Conductivity: 0~200 mS/cm(divided into four ranges): (0~199.9) µS/cm ; (200~1999) µS/cm ; (2.00~19.99) mS/cm; (20.0~199.9) mS/cm TDS: (0~100)g/L; Salinity: (0~100)ppt
	Resolution	0.1/1µS/cm 0.01/0.1 mS/cm
	Accuracy	±1.0% FS ±1digit
	Temperature Compensation Range	(0 ~ 80) °C (manual or automatic)
	Cell constant	0.1 / 1 / 10 cm ⁻¹
Temp.	Measuring Range	0~100 °C
	Resolution	0.1 °C
	Accuracy	±0.5°C±1digit

1.2. Other technical parameters:

Power	AA batteries × 3 (1.5V× 3)
IP rating	IP67 water-proof and dust-proof
Dimension & Weight	Meter: (86×196×33)mm / 335g

2. Instrument Description

3.1. LCD display:

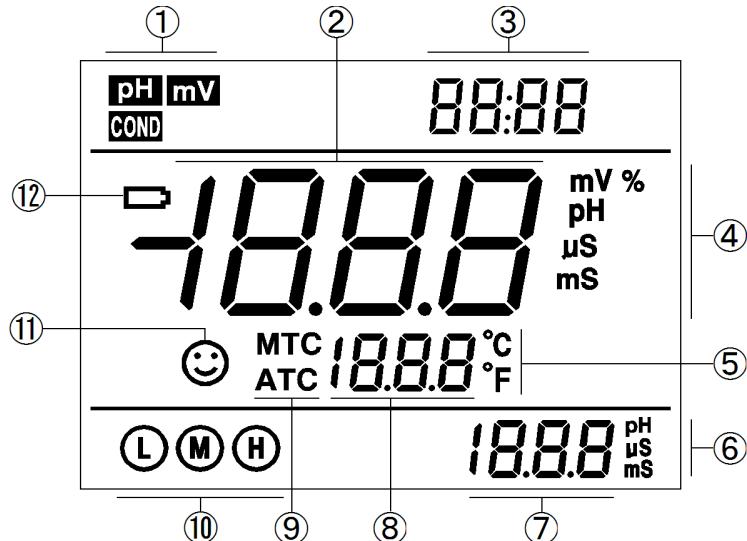


Diagram-1 LCD Display

- ① — Measuring mode icons
- ② — Measurements
- ③ — Prompts
- ④ — Measurement Units
- ⑤ — Temperature unit
- ⑥ — pH and Cond. calibration units
- ⑦ — Calibration value and prompts
- ⑧ — Temperature value and prompts
- ⑨ — Temperature compensation state icons

ATC — automatic temperature compensation,

MTC — manual temperature compensation

- ⑩ — Calibration indication icon

- ⑪ — Stable reading indication icon

- ⑫ — Low battery icon, when this icon appears, please renew the battery

3.2. Keypad functions

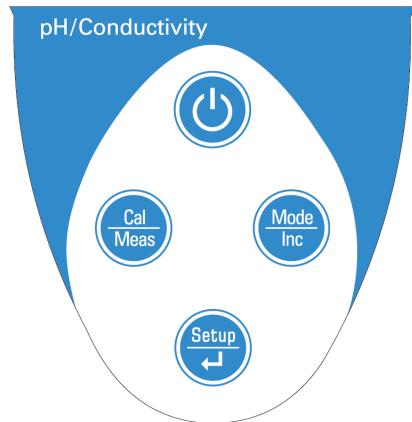


Diagram-2 Keypad panel

3.2.1. Keypad operations: Short press ----- <1.5 seconds , Long press ----- >1.5 seconds.

3.2.2. Turn on the meter: Press to turn on the meter: LCD full display → display some parameters setting content→ display the last measuring mode before turning off

3.2.3. Turn off the meter

In the measurement mode, press and hold for 2 seconds to turn off the meter.

Note: In the calibration mode or the parameter set-up mode, pressing is invalid. Please press key to return to the measurement mode, then press to turn off the meter.

Chart -1 Keypad operations and functions

Keypad	Operations	Functions
	Short press	<ul style="list-style-type: none"> In the power-off mode, press this key to turn on the meter
	Long press	<ul style="list-style-type: none"> In the measurement mode, press and hold this key for 2 seconds to turn off the meter.
	Short press and Long press	<ul style="list-style-type: none"> In measurement mode: Press this key to select measurement mode: pH → mV → COND → TDS → SAL In the mode of manual temperature compensation (MTC), when press and hold this key, the temperature value flashes. then press this key to change the temperature value (in one direction), and press to confirm. In the parameter set-up mode, press this key to change the serial number of the main menu and the submenu (in one direction). In the submenu mode, press this key to change parameters and set-up (in one direction).
	Short press	<ul style="list-style-type: none"> In the measurement mode, press this key to enter in the calibration mode In the calibration mode or the parameter set-up mode, press this key to return to the measurement mode.
	Short press	<ul style="list-style-type: none"> In the measurement mode, press this key to enter in the parameter set-up main menu. In the calibration mode, press this key to conduct calibration. In the parameter set-up mode, press this key to select programs.

3.3. Meter Sockets

The meter is with BNC and RCA sockets, which are protected by grey rubber caps. (As showed in Chart-2)

Chart-2- Meter sockets

Photos	Descriptions
	BNC socket (Right) — for pH or ORP probe; BNC socket (Left) — for Cond. probe; RCA socket (Middle) — for temperature probe. When both pH probe and Cond. probe are connected to meter, just plug in temperature plug of either probe.

3.4. Reading stable display mode

When the measuring value is stable, smiley icon  appears on LCD screen, see Diagram – 3. If the smiley icon  does not appear or flash, please do not get readings or make calibration until the measuring value is stable. In parameter-setting P1.6, there are 3 criteria for stability:  (Normal),  (High) and  (Low). The factory default set is “Normal”. “High” is set for stability for longer time; “Low” is set for stability for shorter time. User can select suitable stability criteria according to different testing requirements.

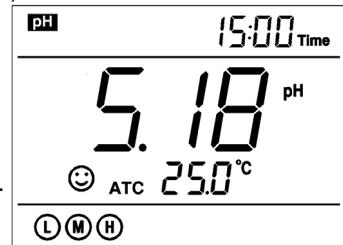


Diagram- 3

3.5. Auto power-off

The meter will be automatically power-off if nothing is done for 20 minutes. In the parameter setting menu P6.8, user can set up to turn on or turn off this function.

4. pH measurement

4.1. pH probe information

The meter is equipped with a 201T-F three-in-one combination pH probe, which has built-in temperature sensor to realize automatic temperature compensation. The BNC plug of the probe is connected to the pH socket while the RCA plug is connected to the temperature socket. When the probe is immersed in the solution, please stir the solution briefly to get rid of the air bulb and in this way, a stable measurement will be reached fast.

4.2. pH calibration related information

4.2.1. Standard buffer solution

Buffer solution selectable: USA series and NIST series, and also user-defined solution. Please refer to clause 7.3 and select a proper series in parameter setting menu P1.1. Please see Chart - 3 for the two series of standard buffer solution.

Chart - 3 pH standard buffer solution series

Calibration indication icons		pH standard buffer solution series	
		USA series	NIST series
Three-point calibration	(L)	1.68pH and 4.00 pH	1.68pH and 4.01 pH
	(M)	7.00 pH	6.86 pH
	(H)	10.01 pH	9.18 pH

4.2.2. Three-point calibration mode

The instrument can perform 1-3 point calibration. In three-point calibration mode, the first point calibration must use 7.00 pH (or 6.86 pH) standard solution, then select other standard solution to perform the second and the third point calibration. See chart – 4. During the calibration process, the instrument displays the probe slope of acidity range and alkalinity range respectively.

Chart - 4 Three-point calibration mode

	USA standard	NIST standard	Indication Icon	Applicable range
One-point calibration	7.00 pH	6.86 pH	(M)	Accuracy $\leq \pm 0.1\text{pH}$
Two-point calibration	7.00 pH and 4.00 pH or 1.68pH	6.86 pH and 4.01 pH or 1.68pH	(L) (M)	Range<7.00pH
	7.00 pH and 10.01 pH	6.86 pH and 9.18 pH	(M) (H)	Range>7.00pH
Three-point calibration	7.00 pH, 4.00 pH or 1.68pH, 10.01 pH	6.86 pH, 4.01 pH or 1.68pH, 9.18 pH	(L) (M) (H)	Large Range

4.2.3. Calibration intervals

Calibration intervals depend on the sample, the probe performance, and the required accuracy. For high accuracy measurements ($\leq \pm 0.02\text{pH}$), the meter should be calibrated before taking a measurement. For general accuracy ($\geq \pm 0.1\text{pH}$), after one time calibration, the meter can be used for approximately one week or longer.

The meter must be recalibrated in the following situations:

- (a) New probe or probe that is unused for a long period of time
- (b) After measuring acids solution ($\text{pH} < 2$) or alkaline solutions ($\text{pH} > 12$)
- (c) After measuring solution that contains fluoride or strong organic solution
- (d) If the solution's temperature differs greatly from that of the calibration solution

4.3. pH meter calibration (take three-point calibration as an example)

4.3.1. Press  key to enter into the calibration mode, "CAL 1" blinks at the top right of LCD screen and "7.00 pH" blinks at the bottom right of LCD screen, indicating using pH 7.00 buffer solution to make the 1st point calibration.

4.3.2. Rinse pH probe in pure water, allow it to dry, and submerge it in pH7.00 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. The scanning and locking process of buffer solution will be showed at the bottom right corner of LCD screen. **Er 2** will be showed if press  key before the value is locked. See chart – 5.

4.3.3. When the meter locks 7.00 pH, stable  icon will appear on LCD screen. Press  key to calibrate the meter. **End** icon appears after calibration is done. The 1st point calibration is finished, meanwhile, the meter's display will show at the top right a blinking CAL2, and show at the bottom right a blinking 4.00pH and 10.01pH alternately, indicating using pH4.00 or pH10.01 buffer solution to make the 2nd point calibration.

4.3.4. Take out pH probe, rinse it in pure water, allow it to dry, and submerge it in pH4.00 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. The meter's screen will show scanning and locking process of calibration buffer solution at the bottom right of LCD. When the meter locks 4.00 pH, stable  icon displays on LCD. Press  key to calibrate the meter. **End** icon and probe slope of acidity range will be displayed after calibration is done, meanwhile, the meter's screen will show at the top right a blinking CAL3, and show at the bottom right blinking 10.01pH, indicating using pH10.01 buffer solution to make the 3rd point calibration.

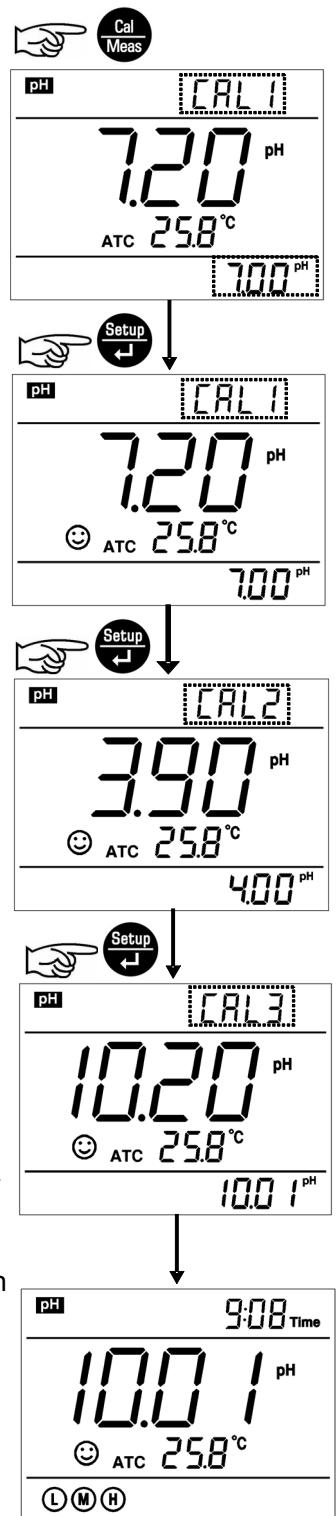


Diagram- 4

4.3.5. Take out pH probe, rinse it in pure water, allow it to dry, and submerge it in pH10.01 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. The meter's display will show scanning and locking process of calibration buffer solution at the bottom right of LCD. When the meter locks 10.01 pH, stable  icon displays on LCD screen. Press  key to calibrate the meter. **End** icon and probe slope of alkalinity range will be displayed after calibration is done. The meter goes to the measurement mode. Stable measuring value and calibration indication icons    will be showed. Please see Diagram – 4 for the above calibration process.

4.3.6. During the calibration process, press  key to exit from the calibration mode. The meter can perform one-point, two-point and three-point calibration. The corresponding calibration indication icons will appear on LCD screen.

4.4. Customer-defined calibration (take 1.60pH and 6.50pH calibration solution as an example)

4.4.1. Select **CUS** in parameter setting P1.1 (please refer to clause 7.3 for details). The meter enters into customer-defined calibration mode. Press  key, a blinking **CAL1** icon will be shown at the top right of LCD screen, indicating the meter enters into the 1st point user-defined calibration.

4.4.2. Rinse pH probe in pure water, allow it to dry, and submerge it in pH1.60 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. When the stable measurement value and  icon appear on the LCD screen, press  key, and the temperature value blinks. Press  key to adjust the temperature value, and then press  to confirm main displayed value. Press  key to adjust main displayed value to 1.60, then press  key to calibrate the meter. After calibration is done, blinking **CAL2** icon will be shown at the top right corner of the LCD screen, indicating the meter enters into the 2nd point customer-defined calibration. **Note: If with automatic temperature compensation, the temperature value will not blink. Press  key, the main displayed value will blink.**

4.4.3. Rinse pH probe in pure water, allow it to dry, and submerge it in pH 6.50 buffer solution. Stir the solution briefly and allow it to stay in the buffer solution until a stable reading is reached. When the stable measurement value and  icon appear on the LCD screen, press  key, and the temperature value blinks. Press  key to adjust the temperature value, and then press  key to confirm main displayed value. Press  key to adjust the main value to 6.50, then press  key to calibrate the meter. After calibration is done, the meter goes to the measurement mode. For customer-defined calibration, LCD does not show probe calibration indication icons. **Note: If with automatic temperature compensation, the temperature value will not blink. Press  key, the main displayed value will blink.**

4.4.4. Notes

(a) The meter can perform 1-2 point customer-defined calibration. When the 1st point calibration is done,

press  key, the meter exits from calibration mode. This is one-point customer-defined calibration.

(b) The value set in “Customer-defined” is at a fixed temperature. The meter has to perform calibration and measurement at the same temperature to avoid big error. The meter cannot recognize customer-defined calibration solution.

4.5. Solution measurement

4.5.1. Rinse pH probe in pure water, allow it to dry, and submerge it in tested solution. Stir the solution briefly and allow it to stay in the tested solution until  icon appears on LCD and a stable reading is reached. The reading is the pH value of tested solution. Diagram – 5 is the calibration and measurement process of pH meter

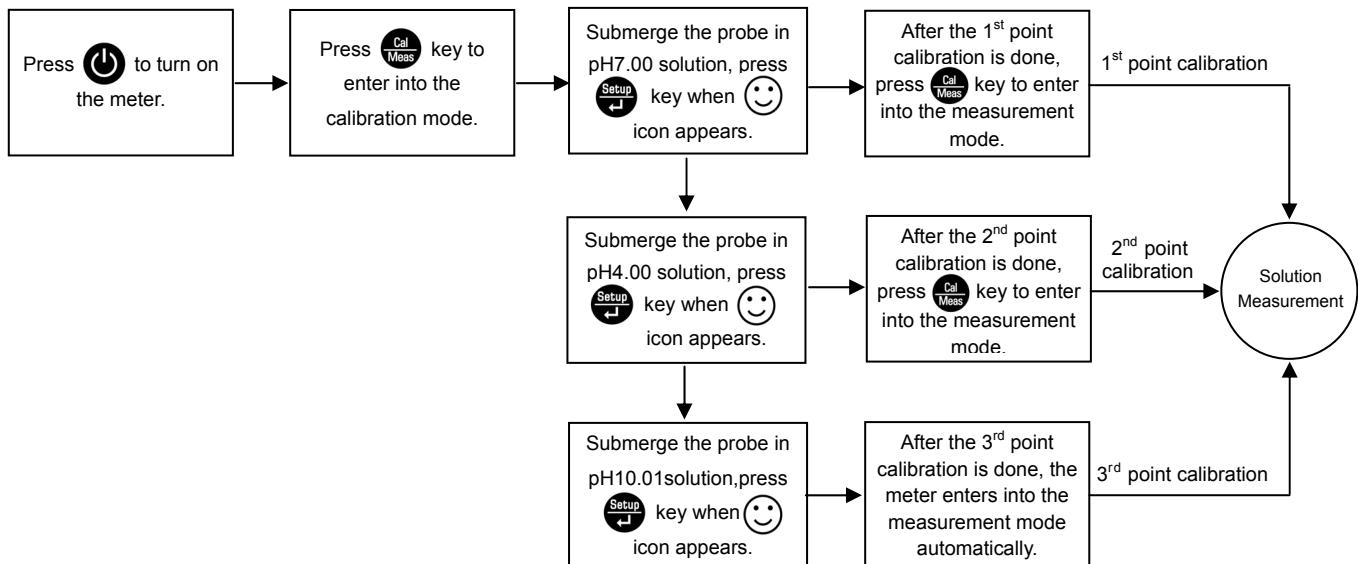


Diagram – 5 Calibration and measurement process of pH meter

4.5.2. Self-diagnostic information

During the process of calibration and measurement, the meter has self-diagnosis functions, and will indicate the relative information as below. Please refer to chart – 5.

Chart – 5 Self-diagnostic information of pH measurement mode

Icons	Self-diagnostic information	Check up
<i>Er 1</i>	Wrong pH buffer solution or exceed the recognition range of the meters	1.Check if the pH buffer solution is correct 2.Check if the connection between meter and probe is good 3.Check if the probe is failed
<i>Er 2</i>	Press  key when measuring value is not stable during calibration.	Press  when  icon appears
<i>Er 3</i>	During calibration, the measuring value is not stable for ≥3min.	1.Check the probe bulb and make sure there is no air bulb in it 2.Replace the pH probe with a new one
<i>Er 4</i>	pH probe zero electric potential exceeds standard (<-60mV or >60mV).	1.Check the probe bulb and make sure there is no air bulb in it
<i>Er 5</i>	pH probe slope exceeds standard (<85% or >110%).	2.Check if the pH buffer solution is correct 3.Replace the pH probe with a new one
<i>Er 6</i>	pH measuring range exceeds standard (<0.00 pH or >14.00pH).	1.Check if the probe is suspended in the air 2.Check if the connection between meter and probe is good 3.Check if the probe is failed

4.5.3. pH isothermal measurement principle

The closer the temperature of the sample solution to the calibration solution, the more accurate readings will be. Please be aware of this principle.

4.5.4. Restore to factory default setting

For factory default setting, please refer to parameter setting P1.5 (clause 7.3). With this function, all calibration data is deleted and the meter will be calibrated to the theory value (pH value of zero electric potential is 7.00, the slope is 100%). Some function settings restore to the original value (refer to appendix -1). When calibration or measurement fails, please restore the meter to factory default setting and then perform re-calibration or measurement. Please note all the data deleted will not be retrievable if the meter is restored to factory default setting.

4.6. pH probe maintenance

4.6.1. Daily maintenance

The soaking solution contained in the supplied protective bottle is used to maintain activation of the glass bulb and junction. Unscrew the bottle cap, pull out the probe and rinse the probe in pure water before taking a measurement. Insert the probe and tighten the bottle cap after measurements to prevent the solution from leaking. If the soak solution is turbid or moldy, please replace the solution in time. The probe should not be soaked in pure water, protein solution or acid fluoride solution for long periods of time. In addition, do not soak the probe in organic grease lipids.

For best accuracy, always keep the meter, especially the connectors of the meter and probe clean and

dry. Clean with medical cotton and alcohol if polluted.

4.6.2. Buffer solution

For better measurement accuracy, the pH value of the standard buffer solution must be reliable. The buffer solution used should be fresh. The buffer solution should be replaced after frequent usage.

4.6.3. Protection of glass bulb

The sensitive glass bulb at the front of the combination probe should not touch with hard surfaces. Scratches or cracks on the probe will cause inaccurate readings. Before and after each measurement, the probe should be washed with pure water and dried. Do not clean the glass bulb with tissue as it will affect the stability of the probe potential and prolong the response time. The probe should be thoroughly cleaned if testing in sticky samples. Or wash the probe with proper solvent.

5. mV measurement

5.1. Press  key, and switch the meter to mV measurement mode. Connect ORP probe (need to purchase it separately) and dip it in sample solution, stir the solution briefly and allow it to stay in the solution until  con appears. The reading obtained is ORP value. ORP stands for Oxidation Reduction Potential. Its unit is mV.

5.2. Notes

5.2.1. ORP measurement does not require calibration. When the user is not sure about ORP probe quality or measuring value, use ORP standard solution to test mV value and see whether ORP probe or meter works properly.

5.2.2. Clean and activate ORP probe

After the probe has been used over long period of time, the platinum surface of the ORP probe will get polluted which causes inaccurate measurement and slow response. Please refer to the following methods to clean and activate ORP probe:

- (a) For inorganic pollutant, submerge the probe in 0.1mol/L dilute hydrochloric acid for 30 minutes, wash it in pure water, and then submerge it in 4M KCl soaking solution for 6 hours.
- (b) For organic or lipid pollutant, clean the platinum surface with detergent, then wash it in pure water, then submerge it in 4M KCl soaking solution for 6 hours.
- (c) For heavily polluted platinum surface on which oxidation film is formed, polish the platinum surface with toothpaste, then wash it in pure water, then submerge it 4M KCl the soaking solution for 6 hours.

6. Conductivity Measurement

6.1. Conductivity probe information

6.1.1. Matching conductivity probe

The meter includes one plastic conductivity probe (Model 2301T-F, K=1.0). With built-in temperature sensor, the meter can realize automatic temperature compensation. BNC plug of the probe is connected to the meter's conductivity socket while RCA plug is connected to the temperature socket. When the probe is submerged in solution, stir the solution briefly to eliminate the air bubbles and in this way, a stable measurement will be reached fast.

6.1.2. Conductivity probe constant

The meter can use with conductivity probes with three constants (K=0.1, K=1.0 and K=10.0). Please refer to chart-7 for the measuring range. Set up constant in menu P2.1 and refer to details in clause 7.4.

Chart – 7 Probe constant and measuring range

Range	< 20 $\mu\text{S}/\text{cm}$	0.5 $\mu\text{S}/\text{cm} \sim 100 \text{ mS}/\text{cm}$	> 100 mS/cm
Conductivity probe constant	$K=0.1 \text{ cm}^{-1}$	$K=1.0 \text{ cm}^{-1}$	$K=10 \text{ cm}^{-1}$
Standard solution	84 $\mu\text{S}/\text{cm}$	84 $\mu\text{S}/\text{cm}$ 1413 $\mu\text{S}/\text{cm}$ 12.88 mS/cm 111.9 mS/cm	

6.2. Conductivity calibration related information

6.2.1. Conductivity calibration solutions

The meter uses Standard series of conductivity solution. The meter can recognize the standard solution automatically and perform 1-point or multi-point calibration (Maximum 4- point). The calibration icons at the bottom left of LCD screen is corresponding to four built-in standard values. See chart – 8:

Chart – 8 Conductivity standard solution series

Calibration indication icons	Calibration solution series	Measuring range
(L)	84 $\mu\text{S}/\text{cm}$	0-200 $\mu\text{S}/\text{cm}$
(M)	1413 $\mu\text{S}/\text{cm}$	200-2,000 $\mu\text{S}/\text{cm}$
(H)	12.88 mS/cm	2-20 mS/cm
	111.9 mS/cm	20-200 mS/cm

6.2.2. Calibration intervals

- The meter is calibrated before leaving the factory and can generally be used right out of the box.
- Normally, performing calibration once a month is recommended.
- For high accuracy measurement or larger temperature deviation from the reference temperature (25°C), performing calibration once a week is recommended.

- (d) Use conductivity standard solution to check the probe. Perform calibration if the error is big.
- (e) When use a new probe for the first time, or the meter has restored to factory default setting, 3-point or 4-point calibration is recommended. For everyday use, standard solution closer to the sample solution can be chosen to perform 1-point or 2-point calibration. For example: 1413 $\mu\text{S}/\text{cm}$ standard solution is suitable for measuring range 0-2,000 $\mu\text{S}/\text{cm}$.

6.2.3 1-point and multi-point calibration

If 1-point calibration is performed after 3-point or 4-point calibration, the previous calibration value in the same range will be replaced, meanwhile, the meter will show the calibration indication icon of this point, other two calibration indication icons will be deleted, but the chip will reserve the last calibration data. All calibration data will be deleted after restoring to factory default, and restore to theory value. When perform multi-point calibration, the calibration solution should be chosen from low to high concentration in order to avoid contamination of standard solution in low concentration.

6.2.4. Reference temperature

Factory set reference temperature is 25°C. Other reference temperature can also be set within the range 15°C – 30°C. Set up reference temperature in menu P2.5 and see details in clause 7.4.

6.2.5. Temperature coefficient

Factory set temperature compensation coefficient of the meter is 2.0%. However, the conductivity temperature coefficient is different from that of various kinds of solution and concentration. Please refer to chart – 9 and the data collected during testing and set up the parameter in menu P2.6. See details in clause 7.4.

Note: When the temperature compensation coefficient is set to 0.00 , meaning no temperature compensation, the measurement value will be based on the current temperature.

Chart -9 Temperature compensation coefficient of certain solutions

Solution	Temperature compensation coefficient
NaCl solution	2.12%/ $^{\circ}\text{C}$
5% NaOH solution	1.72%/ $^{\circ}\text{C}$
Dilute ammonia solution	1.88%/ $^{\circ}\text{C}$
10% hydrochloric acid solution	1.32%/ $^{\circ}\text{C}$
5% sulfuric acid solution	0.96%/ $^{\circ}\text{C}$

6.2.6. Avoid contamination of standard solution

Conductivity standard solution has no buffer. Please avoid being contaminated during usage. Before submerging the probe in standard solution, please wash the probe and allow it dry. Please do not use the same cup of conductivity standard solution frequently, especially for standard solution of low concentration 84 $\mu\text{S}/\text{cm}$. The contaminated standard solution will affect accuracy of measurements.

6.3. Conductivity meter calibration (take standard solution 1413 μ S/cm as an example)

6.3.1. Rinse the probe in pure water, allow it to dry, then wash it with a small amount of standard solution and submerge it in standard solution. Stir the solution briefly and allow it to stay in the solution until a stable reading is reached.

6.3.2. Press  key to enter into the calibration mode.

"std" icon will blink at the top right of the screen, while scanning and locking process of calibration solution will be showed at the bottom right.

Er 2 appears if press  key before the value is locked. See chart – 11.

6.3.3. When the meter locks 1413 μ S, stable  icon will appear on LCD screen. Press  key to calibrate the meter. **End** icon appears after calibration is done. The meter returns to the measurement mode and LCD shows  icon at the bottom left. See Diagram – 6 for the above calibration process.

6.3.4. If exit from calibration mode without confirmation, press  key to return to the measurement mode without calibration.

6.3.5. For multi-point calibration, please repeat clause 6.3.1-6.3.3 until all the calibration is done. The meter can perform calibration in the same calibration solution repeatedly until the value displayed is stable and repeatable.

6.4 Relationship among TDS, salinity and conductivity

6.4.1 Press  key to switch the measurement mode : **COND** → **TDS** → **SAL**

6.4.2 TDS and conductivity is linear related. The conversion coefficient is 0.40~1.00 which can be adjusted in parameter setting P2.7.

Factory default setting is 0.71 and please refer to clause 8.4 for details. Salinity and conductivity are interrelated. The calculation formula has been put in the program of the meter. So the meter only needs to be calibrated in conductivity mode, then switch to TDS and salinity mode.

6.4.3 Customers can adjust TDS conversion coefficient in parameter setting P2.7 according to testing data and experience. Please refer to chart-10 for some frequently-used conductivity and TDS conversion coefficients. Just for your reference.

Chart -10 Conversion coefficient between conductivity and TDS

Conductivity of solution	TDS conversion coefficient
0~100 μ S/cm	0.60
100~1,000 μ S/cm	0.71
1~10 mS/cm	0.81
10~100 mS/cm	0.94

6.5. Customer-defined calibration (take 10.50 μ S/cm standard solution as an example)

6.5.1. Select CUS in parameter setting P2.2 (please refer to clause 7.4 for customer-defined calibration) and the meter enters into customer-defined calibration mode. Press  , LCD shows blinking CUS at the top right, indicating that the meter enters into customer-defined calibration.

6.5.2. Rinse the probe in pure water, allow it to dry, and submerge it in 10.50 μ S/cm standard solution. Stir the solution briefly and allow it to stay in the solution until a stable reading is reached and  icon appears on LCD.

6.5.3. Press  key, the measuring value blinks. Icon CUS will appear on the top right of the LCD screen. Press  key to adjust the measuring value to 10.50 μ S/cm, and press  key to calibrate the meter. After the calibration is done," End" will appear and the meter will return to measurement mode. In conductivity mode with customer-defined calibration, the probe calibration indication icons will not appear on the screen.

Note: If use conductivity electrode without temperature sensor, meaning manual temperature compensation (MTC) is adopted, the temperature value blinks when press  key, press  key to adjust the temperature value, and when press  key, conductivity value blinks.

6.5.4. Only 1-point calibration for customer-defined calibration. The conductivity value of the customer-defined solution is at a fixed temperature. There is no regulation of temperature coefficient and reference temperature. The meter has to perform calibration and measurement at the same temperature to avoid large error. The meter cannot recognize customer-defined calibration solution.

6.6. Sample Measurement

6.6.1. Rinse conductivity probe in pure water, allow it to dry, and submerge it in the sample solution. Stir the solution briefly and allow it to stay in the sample solution until a stable reading is reached and  icon appears on LCD screen. The reading got is the conductivity value of the solution.

6.6.2. During the process of calibration and measurement, the meter has self-diagnosis functions, indicating the relative information as showed in chart – 11.

Chart – 11 Self-diagnostic information of conductivity measurement mode

Icons	Self-diagnostic information	Check up
<i>Er 1</i>	Wrong conductivity calibration solution or exceed recognition range of the meter	1.Check if the pH buffer solution is accurate. 2.Check if the connection between meter and probe is good 3.Check if the probe is failed.
<i>Er 2</i>	Press  key when measuring value is not stable during calibration.	Press  key when  icon appears
<i>Er 3</i>	During calibration, the measuring value is not stable for ≥3min.	1.Shake the probe to eliminate bubbles in probe head. 2. Replace with new pH probe.

6.6.3. Factory default setting

For factory default setting, please refer to parameter setting P2.8 (Clause 7.4). With this function, all calibration data will be deleted and the meter will restore to the theory value. Some function settings will be restored to the original value (refer to appendix -1). When calibration or measurement fails, please restore the meter to factory default setting and then perform re-calibration or measurement. Please note that once the meter is restore to factory default setting, all the data deleted will not be retrievable.

6.7. Conductivity probe maintenance

6.7.1. Always keep the conductivity probe clean. Before taking a measurement, rinse the probe in pure water and then rinse it in the sample solution. When submerge the probe in solution, stir the solution briefly to eliminate air bubbles and allow it to stay in the solution until a stable reading is reached. Dry-stored conductivity probe should be soaked in pure water for 5-10 minutes before measuring. Rinse the probe in pure water after measuring.

6.7.2. The sensitive rod of Model 2301T-F conductivity probe is coated with platinum black to minimize probe polarization and expand measuring range. Do not scrub platinum black. Only stir the probe in pure water to avoid damage of the platinum black coating. Clean organic stain on the probe in warm water with detergent, or alcohol.

6.7.3. If the probe coated with platinum black is found unworkable, immerse it in 10% nitric acid solution or 10% hydrochloric acid solution for 2 minutes, then rinse the probe in pure water and take measurement after that. If the probe still does not work, re-coat platinum black, or replace with a new conductivity probe.

7. Parameter setting

7.1. Main menu

In the measurement mode, press  key to enter in P1.0, then press  to switch to main menu: P1.0→P2.0→P6.0. Please refer to chart – 7.

P1.0: pH parameter setting menu.

P2.0: Cond. parameter setting menu.

P6.0: Basic parameter setting menu.

7.2. Submenu

7.2.1. In P1.0 mode, press  key to enter in submenu P1.1 of pH parameter setting, then press  key to switch among submenu: P1.1→P1.4→P1.6, see Diagram – 7.

7.2.2. In P2.0 mode, press  key to enter in submenu P2.1 of Cond. parameter setting, then press  Key to switch among P2.1→P2.2→P2.5→P2.6, see diagram-7.

7.2.3. In P6.0 mode, press  key to enter in submenu P6.1 of basic parameter setting, see Diagram – 7.

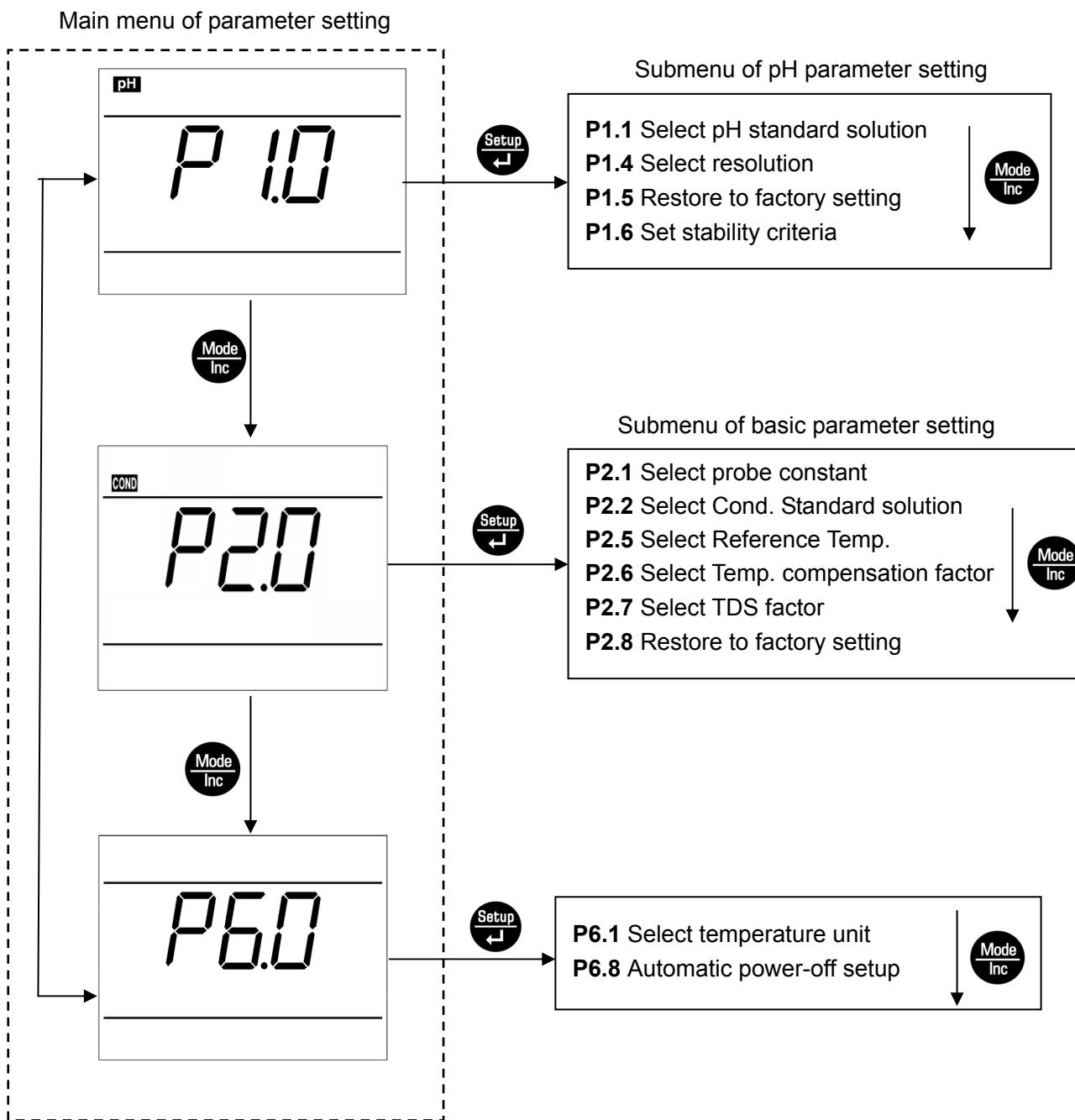
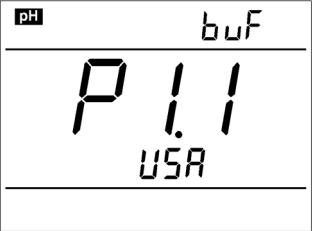
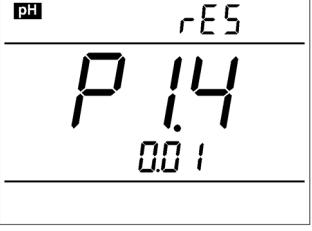
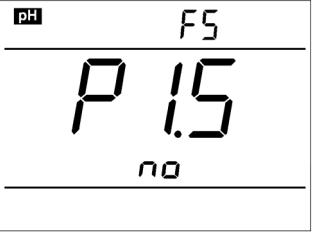


Diagram – 7 Main menu and submenu of parameter setting

7.3. Submenu of pH parameter setting (press  key to switch)

	<p>P1.1 – Select pH standard solution (USA-NIS-CUS)</p> <ol style="list-style-type: none"> 1. In P1.0 mode, press  to enter in P1.1, refer to the left Diagram. 2. Press  key, USA blinks, press  key to select NIS→CUS. Press  to confirm . USA-USA series; NIS-NIST series; CUS – customer-defined. 3. After confirm parameter, press  key to enter in P1.4 mode, or press  key to return to the measurement mode.
	<p>P1.4 – Select resolution (0.01 – 0.1)</p> <ol style="list-style-type: none"> 1. Press  key, 0.01 blinks, press  key to select 0.1→0.01 Press  to confirm. 2. After confirm parameter, press  key to enter in P1.5 mode, or press  to return to the measurement mode.
	<p>P1.5 – Restore factory setting (No – Yes)</p> <ol style="list-style-type: none"> 1. Press  key, No blinks, press  key to select Yes→No, Press  to confirm, the meter returns to the measurement mode. No – Do not restore, Yes – Restore to factory setting. 2. Press  key to enter in mode P1.6, or press  key to return to the measurement mode.
	<p>P1.6 – Set reading stability criteria (Normal – High – Low)</p> <ol style="list-style-type: none"> 1. Press  key, nor blinks. Press  key to select Hi→Lo→nor Press  to confirm. Nor – Normal, Hi – High, Lo – Low. 2. Press  to return to the measurement mode.

7.4 Conductivity parameter setting submenu (press  key to switch)

	<p>P2.1 – Select probe constant (1.0-10.0-0.1)</p> <ol style="list-style-type: none"> In P2.0 mode, press  key to enter in P2.1 mode, please refer to the left Diagram. Press  key, 1.0 blinks, then press  key to select 10.0→0.1→1.0, press  key to confirm. After confirm the parameter, press  key to enter in P2.2 mode, or press  key to return to the measurement mode.
	<p>P2.2 – Select conductivity standard solution (Standard-CUS)</p> <ol style="list-style-type: none"> Press  key, Std blinks, then press  key to select CUS→Sad. Press  key to confirm. Std – Standard series, CUS – customer-defined soltion After confirm the parameter, press  key to enter in P2.5 mode, or press  key to return to the measurement mode.
	<p>P2.5 – Select reference temperature (15.0°C-30.0°C)</p> <ol style="list-style-type: none"> Press  key, 25.0°C blinks, then press  key to select temperature value 15.0-30.0, press  key to confirm. After confirm parameter, press  key to enter in P2.6 mode, or press  key to return to the measurement mode.
	<p>P2.6 – Select temperature compensation coefficient (0.00-9.99%)</p> <ol style="list-style-type: none"> Press  key, 1.90 blinks, press  key to select temperature compensation coefficient 0.00 – 9.99, press  key to confirm. After confirm the parameter, press  key to enter in mode P2.7 or press  key to return to the measurement mode.
	<p>P2.7 –Select TDS coefficient (0.40~1.00)</p> <ol style="list-style-type: none"> Press  key, 0.71 blinks, press  key to select TDS coefficient, press  key to confirm. After confirm the parameter, press  key to enter in mode P2.8 or press  key to return to the measurement mode.
	<p>P2.8 – Restore to factory setting (No – Yes)</p> <ol style="list-style-type: none"> Press  key, No blinks, press  key, Yes blinks, press  key to confirm, the meter return to the measurement mode. No – Do not restore, Yes – Restore to factory setting. If do not select Yes, press  key to return to the measurement mode.

7.5. Basic parameter setting submenu (press key to switch)

	<p>P6.1. Select temperature unit (°C—°F).</p> <ol style="list-style-type: none"> 1. In P6.0 mode, press  key to enter in P6.1 mode, please refer to the left Diagram. 2. Press  key, °C blinks, then press  key to select °F → °C. Press  key to confirm. 3. When parameter is confirmed, press  key to enter in mode P6.8 or press  key to return to the measurement mode.
	<p>P6.8 – Automatic power-off setup (On-Off)</p> <ol style="list-style-type: none"> 1. Press  key, On blinks, press  key to select Off → On. Press  key to confirm. On – turn on automatic power-off, Off – turn off automatic power-off. 2. After confirm the parameter, press  key to return to the measurement mode.

8. Meter Kits

No.	Include	Quantity
8.1	PC100 pH/Cond./TDS/Sal. meter	1
8.2	201T-F three-in-one pH probe	1
8.3	2301 T-F plastic Cond. probe	1
8.4	AA Battery	3
8.5	Screw driver	1
8.6	Instruction manual	1
8.7	Quick Manual	1

9. Warranty

9.1 For three years since the date of purchasing, under regular service condition, we warrant that the instrument (probe is not included) will be repaired, replaced parts or product free of charge if the meter doesn't work well due to quality defects.

9.2 This warranty does not apply to defects resulting from incorrect usage, improper maintenance or repair.

Appendix I: Parameter setting & Factory default setting

Modes	Prompts	Parameter setting items	Code & Abbr.	Description	Restore to factory default
P1.0 pH	P1.1	Select pH buffer solution	<i>buF</i>	USA – NIST – CUS	USA
	P1.4	Select resolution	<i>rES</i>	0.01 – 0.1	0.01
	P1.5	Restore to factory default setting	<i>F5</i>	No – Yes	No
	P1.6	Set reading stability criteria	<i>SC</i>	Normal—High—Low	Normal
P2.0 Cond.	P2.1	Select probe constant	<i>CELL</i>	1.0 – 10.0 – 0.1	1.0
	P2.2	Select Cond. Standard solution	<i>SOL</i>	Std – CUS	Std
	P2.5	Select reference Temp.	<i>ErEF</i>	15~30°C	25°C
	P2.6	Adjust Temp. Compensation factor	<i>TCC</i>	0.00~9.99	1.90
	P2.7	Adjust TDS factor	<i>FREE</i>	(0.40~1.00)	0.71
	P2.8	Restore to factory default setting	<i>F5</i>	No – Yes	No
P6.0 Basic Parameters	P6.1	Select temperature unit	/	°C – °F	-
	P6.8	Automatic Power-off setup	<i>RoFF</i>	On – Off	-

Appendix II: Code symbol & Abbreviation Glossary

Modes	Prompts	Code and abbreviation	In English	Description
P1.0 pH	P1.1	b <u>F</u>	Standard buffers	Standard buffer solution
	P1.2	r <u>E</u> S	Resolution	Resolution
	P1.5	F <u>S</u>	Factory default setting	Factory default setting
	P1.6	S <u>C</u>	Stability criteria	Set up reading stability criteria
P2.0 Cond.	P2.1	C <u>ELL</u>	Cell constant	Probe constant
	P2.2	S <u>OL</u>	Standard Solution	Calibration solution
	P2.5	E <u>rEF</u>	Reference Temp.	Reference Temp.
	P2.6	E <u>CC</u>	Temp. compensation coefficient	Temp. compensation coefficient
	P2.8	F <u>S</u>	Factory default setting	Factory default setting
P6.0 Basic parameters	P6.1	/	/	/
	P6.8	A <u>oFF</u>	Automatic Power-off	Automatic Power-off
Others		U <u>SA</u>	United States of America	United States of America
		n <u>IS</u>	NIST	American National Standard
		C <u>US</u>	Customer-defined	Customer-defined
		n <u>or</u>	Normal	Normal
		H <u>I</u>	High	High
		L <u>O</u>	Low	Low
		S <u>td</u>	Standard	Standard
		O <u>FF</u>	Off	Off
		O <u>n</u>	On	On
		n <u>o</u>	No	No
		Y <u>E</u> S	Yes	Yes

Appendix III. Self-diagnostic Information

Icons	Self-diagnostic information	pH	Cond.
<i>Er 1</i>	Wrong pH buffer solution or exceed the recognition range of the meters	✓	✓
<i>Er 2</i>	Press  key when measuring value is not stable during calibration.	✓	✓
<i>Er 3</i>	During calibration, the measuring value is not stable for ≥ 3 min.	✓	✓
<i>Er 4</i>	pH probe zero electric potential exceeds standard (<-60mV or >60mV).	✓	
<i>Er 5</i>	pH probe slope exceeds standard (<85% or >110%).	✓	
<i>Er 6</i>	Exceed pH measuring range (<-2.00 pH or >16.00pH).	✓	