ION 100 Portable Ion Meter

Instruction Manual

35613-65, -68

CE RoHS compliant IP57 WATERPROOF ISO 9001:2015

Environmental Express

Table of Contents

1 BRIEF INTRODUCTION

Thank you for purchasing Environmental Express Ion 100 Portable Ion Meter.

This meter is a perfect combination of the most advanced electronics technology, sensor technology, and software design, and is the most cost-effective portable electrochemical meter. In order to use and maintain the instrument properly, please read the manual thoroughly before use. (To improve instrument performance constantly, we reserve the right to change the manual and accessories without giving notice in advance.)

Main features and functions

- The microprocessor-based portable meter features automatic calibration, automatic temperature compensation, function setup, self-diagnostics, automatic power-off and low voltage display. The meter's digital filter improves measurement speed and accuracy. There is a stable reading indication on the display.
- The instrument can measure pH, mV, ion concentration and the temperature.
- Ion units switchable among pX, mol/L, mg/L (ppm).
- The meter is dust resistant and waterproof, meeting the IP57 rating.

2 TECHNICAL SPECIFICATIONS

	Technical Specification	
pH	Range	0.00 ~ 14.00pH
	Resolution	0.01/0.1 pH
	Accuracy	±0.01 pH
	Temperature compensation	(0 to 100)℃ (manual or automatic)
	Calibration	1~3 points automatic
	Buffer series	1.68, 4.00, 7.00, 10.01 and 12.45 pH (USA) 1.68, 4.01, 6.86, 9.18 and 12.45 pH (NIST)
mV	Range	±1000mV
	Resolution	-200 ~ 200mV: ±0.1mV; Other range: ±1mV
	Accuracy	±0.2% F.S.
Ion	Range	pX: 0.00~10.00 Ion concentration: 0~1999 Switchable unit: pX, mol/L, ppm (mg/L)
	Resolution	3~4 significant digits
	Accuracy	±1.0% F.S.
Temperature	Range	0~100°C
	Resolution	0.1°C
	Accuracy	±0.5°C±1 digit
Other	Power	AA batteries x 3 (1.5V×3)
	IP Rating	IP57 Waterproof
	Size and Weight	Meter: 91×190×33mm, (3.58”x7.48”x1.29”) /354 gm
		Carrying case: 330×270×82mm, (12.99”x10.63”x3.22”) /1.28 kg

3 INSTRUMENT DESCRIPTION

3.1 LCD display

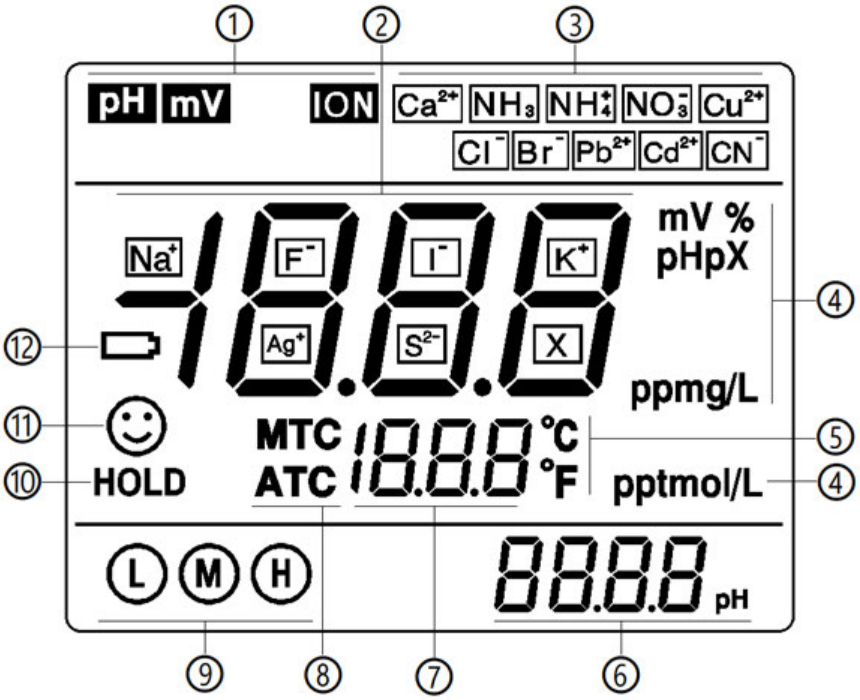


Diagram - 1

①	Parameter mode icons	⑦	Temperature value and indicator icons
②	Measurement reading	⑧	ATC—automatic temperature compensation. MTC—manual temperature compensation
③	Ion symbol	⑨	Calibration guide icon
④	Units of measurement	⑩	Automatic reading hold icon
⑤	Temperature units	⑪	Stability icon of readings
⑥	Indicator icons	⑫	Low battery icon

3.2 Keypad functions

Diagram - 2

Short press ----- < 2 seconds.

Long press ----- > 2 seconds

.Table -1 Keypad operations and descriptions

Keypad	Operations	Descriptions
	Short press	● Press this key to turn on/off the meter
	Short press Long press	● Short press to select measuring parameter or unit： pH → mV → ION → pX → mol/L → ppm (mg/L) ● Long press to enter the main parameter setup menu.
	Short press Long press	● In the measurement mode, long press to enter calibration mode. ● Short press to cancel operation, get back to measurement mode or the previous operation. ● When the measure value is locked-up, short press release lock-up.
	Short press	● In measurement mode: press to turn on/off the backlight. ● In calibration mode: press to calibrate. ● In the parameter setup mode: press to enter and open the sub-menu, confirm parameter. ● When measurement value is locked-up, press to release lock-up.
	Short press Long press	● Under MTC (see Section 3.5.1), short press to change temperature, long press for quick changing of the value. ● In parameter setup mode: press to select parameter.

3.3 Meter socket

The meter sockets are protected by silicon caps, waterproof and dust resistant. Open the silicon caps before connecting with the electrodes: BNC connector (left) connects with the pH electrode and the ion electrode, Φ2.5 connector (middle) connects with the temperature probe.

3.4 Display mode

3.4.1 Stable Reading Mode

When the measurement value is almost stable, smiley icon appears on LCD, see Diagram - 4. If the smiley icon does not appear or flash, please do not get the reading value or conduct calibration until the measuring value is stable.

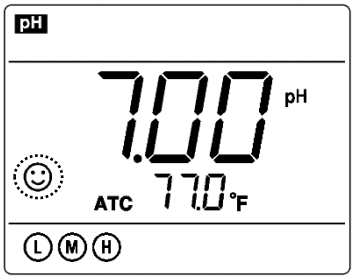


Diagram- 4

3.4.2 Automatic Lock-up Display Mode

Select on from parameter P6.2 to turn on automatic lock-up display function. When the reading value stabilizes more than 10 seconds, the meter locks the reading value automatically and Displays **HOLD** icon, see Diagram - 5. In **HOLD** mode, press CAL MEAS to release lock-up.

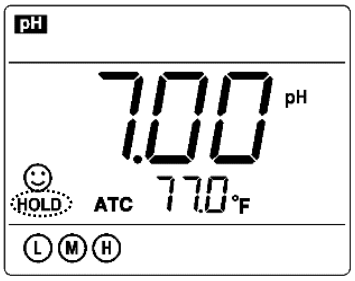


Diagram- 5

3.5 Other functions

3.5.1 Manual Temperature Compensation

When temperature probe is not connected, press or to change the temperature value, long press for quick changing of the temperature value.

3.5.2 Automatic Power-off

The meter is with automatic power-off function. Select from parameter P6.4 to select automatic power-off time: 10-20-30-off, i.e. user can select automatic power-off time to be 10 minutes, 20 minutes or 30 minutes (starting from the last operation). When Off is selected, the meter will not turn off automatically.

3.5.3 Back-light

The meter is with white backlight, suitable for application even in dark environments. However, when backlight is on, the consumption of the power will increase. Press ENTER to turn on/off the backlight in measurement mode. Select from P6.3 to select lasting time for backlight: 1-2-3-Off, i.e. select backlight lasting time to be 1 minute, 2 minutes or 3 minutes. When Off is selected, the backlight will be turned on all the time.

3.5.4 Battery

The meter adopts 3x AA batteries. Please use LR6 alkaline battery to ensure the battery quality. Battery life > 200 hours (without backlight). When LCD displays icon, please replace with new batteries, see Diagram - 6.

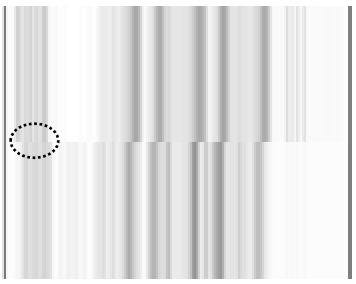


Diagram- 6

4 PH MEASUREMENT

4.1 pH electrode information

4.1.1 The meter connects to plastic combination pH electrode, with BNC connector. Configured with temperature probe (built in 30kΩ thermistor), Phono plug. The meter can use other pH combination electrodes with the BNC connector.

4.1.2 When both the pH electrode and the temperature probe are connected to the meter, it directly goes to automatic temperature compensation mode. When the meter is connected to the pH electrode only, it will enter manual temperature compensation mode. Press or to input the temperature into the meter.

4.1.3 Gently stir the pH electrode for a few seconds after it's dipped into the test solution to eliminate air bubbles for the stable measurement in a short period of time.

4.2 Calibration solution and calibration mode

4.2.1 Calibration solution

The meter can calibrate up to 5 pH values using USA or NIST buffer series, corresponding to calibration indicator icons, see Table - 2.

Table - 2 pH buffer solution series

Calibration icon		pH buffer solution series	
		USA	NIST
3 points calibration	(L)	1.68 or 4.00 pH	1.68 or 4.01 pH
	(M)	7.00 pH	6.86 pH
	(H)	10.01 or 12.45 pH	9.18 or 12.45 pH

4.2.2 Calibration mode

The meter can adopt 1 to 3 points of calibration. The 1st point must be using 7.00 pH (or 6.86 pH) buffer solution, and then choose other buffers to do 2nd point and 3rd point. Please refer to Table-3 for details.

Table - 3 Calibration mode

	USA	NIST	Calibration icon	When to adopt
1-Point Calibration	7.00 pH	6.86 pH	(M)	Accuracy: ±0.1pH
2-Point Calibration	7.00 pH→4.00 or 1.68pH	6.86 pH→4.01 or 1.68pH	(L)(M)	Measuring range: 0 to 7.00 pH
	7.00 pH→10.01 or 12.45pH	6.86 pH→9.18 or 12.45pH	(M)(H)	Measuring range: >7.00 pH
3-Point Calibration	7.00pH→4.00 or 1.68pH→10.01 or 12.45pH	6.86pH→4.01 or 1.68pH→ 9.18 or 12.45pH	(L)(M)(H)	Wide measuring range

4.3 pH Measurement

4.3.1 The 1st point calibration

Rinse the pH electrode and the temperature probe in distilled or deionized water and allow it to dry, long press CAL MEAS to the enter calibration mode. CAL1 icon will flash in the bottom right corner of the LCD, reminding you to use pH7.00 buffer to conduct the 1st point of calibration. Dip the pH electrode and the temperature probe into pH7.00 buffer solution, stir gently and let it stand still and wait for the reading to be stable. When the stable icon ☺ displays on LCD, press ENTER to finish 1st point calibration, meter goes to measurement mode, the bottom left of LCD indicating (M).

4.3.2 The 2nd point calibration

Rinse the electrodes in distilled or deionized water, allow it to dry. Long press CAL MEAS to enter calibration mode. CAL2 icon flashes at the bottom right corner of the LCD, reminding you to make the 2nd point of calibration. Submerge the electrodes into pH4.00 buffer solution, stir the solution gently 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 4.00pH, stable icon ☺ displays and stays on LCD. Press ENTER to calibrate the meter. Electrode slope displays after calibration is done, the 2nd point calibration finished, the meter goes to measurement mode, and the bottom left of LCD indicates (L)(M).

4.3.3 The 3rd point calibration

Repeat the steps as per Section 4.3.2, use pH10.01 buffer solution, and complete the 3rd point calibration. The bottom left of LCD indicates (L) (M) (H).

4.4 Sample test

Rinse pH electrode in distilled or deionized water, allow it to dry, and submerge it in the sample solution. Stir the solution briefly and allow it to stay in the sample until the value becomes stable and ☺ icon appears on LCD, get the reading which is the pH value of the sample solution.

4.5 Information regarding pH calibration and measurement

4.5.1 During the process of calibration and measurement, submerge both the pH electrode and the temperature probe into the solution to ensure automatic temperature compensation.

4.5.2 In calibration mode, press CAL MEAS to exit.

4.5.3 The meter can conduct 1~3 points of calibration according to measurement requirements. Refer to Table - 3 to check when to adopt.

4.5.4 During the process of calibration and measurement, the meter has self-diagnosis functions, indicating information Er1~Er4, please refer to Table - 4 for relevant solutions.

4.5.5 The calibration frequency depends on the sample, electrode performance and accuracy requirement. For high accuracy measurements (≤±0.03pH), the meter should be calibrated before testing every day. For ordinary accuracy measurements (≤±0.1pH), once calibrated, the meter can be used for about a week or even longer.

In the following cases, the meter must be re-calibrated:

a) The electrode hasn't been used for a long time or the electrode is brand new.

b) After measuring strong acid (pH<2) or strong base (pH>12) solutions.

c) After measuring fluoride-containing solution and strong organic solution.

d) There is a big difference between the temperature of the test sample and the temperature of the buffer solution that is used in the last calibration.

4.5.6 pH temperature principle

Please note that the closer the temperature of the sample is to the calibration solution, the more accurate will be the readings.

4.5.7 Factory default setting

The meter has a function to return to factory default setting, which can be set up in P1.3. All calibration data will be deleted, and the meter will restore to the theory value (zero electrical potential of pH is 7.00, the slope is 100%). Some functions restore to the default 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 once set the factory default, all the data deleted will be irretrievable.

4.6 Customized calibration (take 1.60pH & 6.50pH as example)

4.6.1 Choose CUS (customized calibration) in parameter setting P1.1, the meter enters customize calibration mode.

4.6.2 Rinse the electrode with distilled or deionized water, allow it to dry. Long press CAL MEAS to enter calibration mode, dip it into 1.60pH calibration solution, stir gently and let it stand still and wait for the reading to become stable. When the smiley icon ☺ displays on LCD, press ▲ to adjust the value to 1.60, then press ENTER to confirm the calibration. The meter goes back to measurement mode, and the 1st point calibration is completed.

4.6.3 Dip the electrode into 6.50pH buffer solution, follow the steps as per Section 4.6.2 to finish the 2nd point of calibration. The meter can conduct 1 or 2 points of customized calibration.

4.7 Notes regarding customized calibration

4.7.1 Calibration indicator will NOT appear at the bottom left of the LCD for a customized calibration.

4.7.2 The pH of “customized calibration” is the measurement under certain temperature. The meter must calibrate and measure in the same temperature, otherwise it will be inaccurate. The meter does not recognize customize calibration solutions.

4.8 Self-diagnosis information

Among the calibration and measurement procedure, the meter has self-diagnosis function, indicating relevant information, see Table - 4.

Table - 4 Self-diagnosis information in pH measurement mode

Display Icon	Contents	Checking
Er 1	Press ENTER before measuring value becomes stable.	Press ENTER when ☺ icon appears and stays.
Er2	Wrong pH buffer solution or the buffer solution out of range.	1. Check whether pH buffer solution is correct. 2. Check whether the meter connects the electrode properly. 3. Check whether the electrode is damaged.
Er3	During calibration, the measuring value being unstable (⩾3min).	1. Check whether there are air bubbles in glass bulb. 2. Replace with a new pH electrode.
Er4	pH electrode zero electric potential out of range (<-60mV or >60mV) Electrode slope<75%	1. Check whether there are air bubbles in glass bulb. 2. Check whether pH buffer solution is correct. 3. Replace with a new pH electrode.

4.9 Maintenance of the pH Electrode

4.9.1 Daily maintenance

The soaking solution contained in the supplied protective bottle is used to maintain hydration of the glass bulb and liquid junction. Loose the cap, take out the electrode and rinse in distilled or deionized water before taking a measurement. Insert the electrode and tighten the cap after measurements to prevent the solution from leaking. If the storage solution is cloudy or moldy, rinse the bottle and replace the soaking solution (The method to prepare dissolve 26 gm KCl into 100ml distilled water). Make sure the meter is dry and clean all the time, especially the sockets and connectors, or else it may lead to measurement inaccuracy or invalid readings.

Once contaminated, use cotton and water free alcohol to wipe clean and allow it to dry.

The electrode should **NOT be soaked and stored in **purified or distilled** water, protein solution, acid fluoride solution or organic lipids. Storing in distilled or deionized water will cause the electrolyte to be diluted and will result in unstable readings.*

4.9.2 Calibration buffer solution

For calibration accuracy, the pH of the standard buffer solution must be reliable. The buffer solution should be refreshed often, especially after heavy use.

4.9.3 Protect glass bulb

The sensitive glass bulb at the front of the combination electrode should not come in contact with hard surfaces. Scratches or cracks on the electrode will cause inaccurate readings. Before and after each measurement, the electrode should be rinsed with distilled or deionized water. Do not wipe the glass bulb with tissue paper as it may lead to unstable electric potential of the electrode and the slow response. If a sample sticks to the electrode or it's contaminated, the electrode should be thoroughly cleaned with soap water and then rinsed with distilled water.

4.9.4 Renew glass bulb

Electrodes that have been used for a long period of time will become aged. Submerge the electrode in 0.1 mol/L hydrochloric acid for 24 hours, then rinse the electrode in distilled water, then submerge it in the soaking solution for 24 hours. For serious passivation, submerge the bulb in the pH soaking solution (sold separately) to renew it.

4.9.5 Clean contaminated glass bulb and junction (see Table - 5)

Table - 5 Clean contaminated pH glass bulb and junction

Contamination	Cleaning Solutions
Inorganic metal oxide	Dilute acid less than 1mol/L
Organic Lipid	Dilute detergent (weak alkaline)
Resin macromolecule	Dilute alcohol and ether
Protein hematocyte sediment	Acidic enzymatic solution (saccharated yeast tablets)
Paints	Dilute bleacher, peroxide

The electrode housing is polycarbonate. Please avoid using detergents including perchloromethane, trichloroethylene, diethylene oxide and acetone, as these solutions will dissolve the shaft material and lead to passivation or failure of the pH electrode.

5 MV (ORP) MEASUREMENT

5.1 mV measurement

Short press MODE/SETUP , switch the meter to mV mode, connect the ion combination electrode and the temperature probe or the pH electrode and the temperature probe, submerge into the solution, stir gently and let it stand still, wait for the reading to be stable and displays ☺ , and then get the reading.

5.2 ORP measurement

Short press MODE/SETUP , switch the meter to mV mode, connect the ORP electrode (sold separately), submerge into the solution, stir gently and let it stand still, wait for the reading to be stable and LCD displays ☺ , get the reading which is the ORP value.

ORP means Oxidation Reduction Potential. The unit is mV.

5.3 Notes on ORP measurement

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

5.3.2 Clean and activate ORP electrode

After the electrode has been used over a long period of time, the platinum surface will get tarnished which can cause inaccurate measurement and slow response. Please refer to the following methods to clean and activate ORP electrode:

(a) For inorganic tarnish, submerge the electrode in 0.1mol/L dilute hydrochloric acid for 30 minutes, then wash it in distilled water, then submerge it in the electrode storage solution for 6 hours.

(b) For organic or lipid tarnish, clean the platinum surface with detergent, then wash it in distilled water, then submerge it in the electrode storage solution for 6 hours.

(c) For heavily tarnished platinum surface on which there is oxidation film, polish the platinum surface with toothpaste, then wash it in distilled water, then submerge it in the electrode storage solution for 6 hours.

6 ION CONCENTRATION MEASUREMENT

6.1 Preparation work

6.1.1 Press MODE/SETUP and switch to ION mode, connect to the ion combination electrode and the temperature probe.

6.1.2 Choose the unit of the ion measurement:

Press MODE/SETUP to select the unit among pX→mol/L→ ppm(mg/L), select ppm or mg/L in parameter setting P5.2. Note that the reading in the unit of mol/L shows in combinations. See Diagram - 8, E-3 means 10^{-3}, and the complete reading should be 1.00 x 10^{-3} mol/L. When we use the unit of pX and ppm, the reading we get is the value, see Diagram - 7 and - 9.

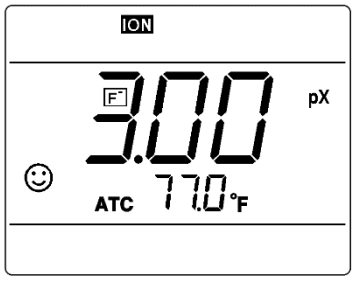


Diagram - 7

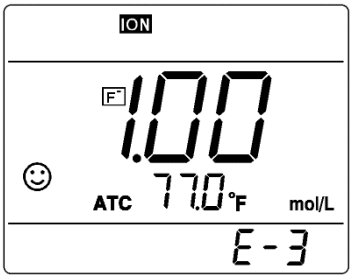


Diagram - 8

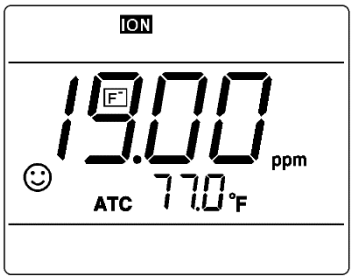


Diagram - 9

6.1.3 Choose the ion type

The meter is built-in with 16 ions frequently being used: Ca^{2+}, NH_3, NH^{4+}, NO_3^-, Cu_2^+, Cl^-, Br^-, Pb^{2+}, Cd^{2+}, CN^-, Na^+, F^-, I^-, K^+, Ag^+ and S^{2-}.

Take F- as an example. Long press MODE/SETUP and enter parameter setting P5.0. Press ENTER, enter parameter setting P5.1, and then press ENTER to enter ion selection interface, see Diagram - 10 (a), press ▲ or ▼ and move the cursor to F⁻, press ENTER to confirm, see Diagram -10(b), and then press CAL/MEAS twice to go back to the measurement mode, see Diagram -10 (c).

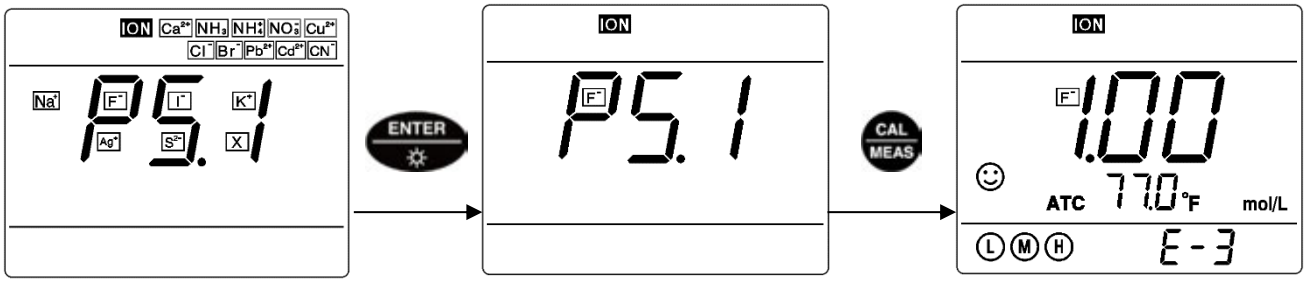


Diagram - 10

(a) (b) (c)

When testing the concentration of ions other than the above 16 ions, move the cursor to [X], press ENTER to confirm, see Diagram - 11. Then press MODE SETUP to switch among the concentration units: pX→mol/L→ppm(mg/L).

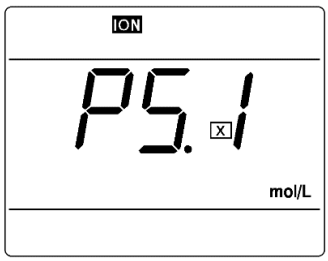


Diagram - 11

Note: The unit of [X] ion concentration can ONLY be switched in parameter setting P5.1. Once set up, it will be fixed and cannot be switched to other concentration units in measurement mode.

6.2 Ion calibration (Take F^- electrode as an example, unit of mol/L, 3-point calibration)

6.2.1 Prepare F^- calibration solutions: $1.00x10^{-3}$ mol/L, $1.00x10^{-4}$ mol/L and $1.00x10^{-5}$ mol/L. Make sure that the unit of the calibration solutions is the same unit as the selected ion.

6.2.2 Rinse the fluoride ion combination electrode and the temperature probe in distilled or deionized water, dip into $1.00x10^{-5}$ mol/L solution, gently stir and let it stand still, long press and enter CAL MEAS the calibration mode, the measurement value flashes, CAL 1 icon will flash in the bottom right corner of the LCD. When the reading is stable ☺ and the stable ion displays on LCD, press ▲ or ▼ to adjust the value to be 1.00 E-5 (1.00×10^{-5}), press ENTER to finish the 1st point calibration, the bottom left of LCD indicating CAL 2 and Ⓜ icon flashes reminding the user to conduct the 2nd point calibration.

6.2.3 Shake off the excess liquid on the ion combination electrode, dip it into $1.00x10^{-4}$ mol/L calibration solution, gently stir and let it stand still, when the reading is stable and the stable icon ☺ displays on LCD, press ▲ or ▼ to adjust the value to be 1.00 E-4 (1.00×10^{-4}), press ENTER to finish the 2nd point calibration, the bottom left of LCD indicating Ⓛ Ⓗ, CAL 3 icon flashes reminding the user to conduct the 3rd point calibration.

6.2.4 Shake off the excess liquid on the ion combination electrode, dip it into $1.00x10^{-3}$ mol/L calibration solution, gently stir and let it stand still, when the reading is stable and the stable icon ☺ displays on LCD, press ▲ or ▼ to adjust the value to be 1.00 E-3 (1.00×10^{-3}), press ENTER to finish the 3rd point calibration, the meter will automatically go back to the measurement mode, the bottom left of LCD indicate Ⓛ Ⓜ Ⓗ .

6.3 Notes on ion calibration

6.3.1 Ion calibration can be conducted with 1 point, 2 points or 3 points calibration.

(a) 1-point calibration: refer to Section 6.3.2, press CAL MEAS and go back to the measurement mode after the 1st point calibration. The bottom left of LCD indicates (M) Note that the default slope is 90%, suitable for low measurement of low accuracy requirement.

(b) 2 points calibration: refer to Section 6.3.3, press CAL MEAS and go back to the measurement mode after the 2nd point calibration. The bottom left of LCD indicates (L) (H) For most of the cases, 2 points calibration will be good enough if the measurement value is between the two calibration points.

(c) 3 points calibration: refer to Section 6.3.4, the meter goes back to the measurement mode after the 3rd point calibration. The bottom left of LCD indicates (L)(M)(H) suitable for wide measurement ranges.

6.3.2 Ion concentration calibration is suggested to be performed from low concentration to high concentration, so that when calibration the second and the third point, the electrode doesn't have to be rinsed and the solution contamination can be avoided.

6.3.3 Calibration error reminder

Ion electrode calibration may fail often. The reason could be calibration solution error, the quality problem of the ion electrode or the improper operation. Such errors are not easy to be found, but they can cause errors and could be misleading. The meter will automatically calculate the slope when calibrating the 2nd and the 3rd points. When the slope is less than 75%, LCD will display Er4 error indicator. See Diagram - 12, when pressing ENTER to calibrate CAL2 becomes Er4 indicating that calibration fails. When this happens, please check the solution, electrode and the calibration method and then re-calibrate or reset the meter to factory default and then re-calibrate.

6.3.4 Ion calibration will not automatically recognize solution. If there's calibration error, press MODE SETUP key to exit and then re-calibrate. User can also "reset to factory default setting" (select Yes in parameter setting P5.3), then calibrate again.

6.3.5 The ion calibration solution has no buffer and could easily be contaminated, especially the low ion-concentration solutions. Therefore, the calibration solution must be prepared very carefully. Make sure all clean to prevent contamination.

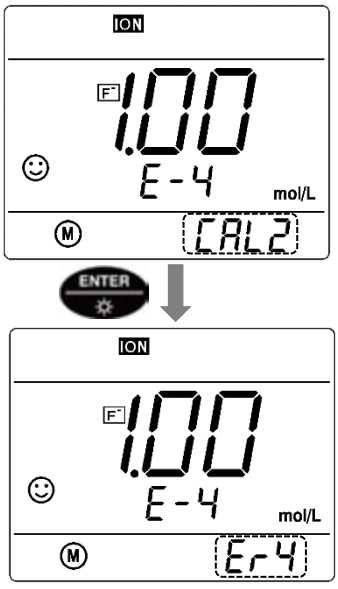


Diagram - 12

6.4 Ion measurement

6.4.1 Rinse the fluoride ion combination electrode and the temperature probe in distilled or deionized water, allow it to dry, dip it into the sample solution, stir gently and let it stand still and wait for the reading to be stable. When the stable icon ☺ displays on LCD, get the reading which is the concentration of the F^-.

6.4.2 Press MODE/SETUP to switch among other ion concentration units: mol/L→mg/L (ppm) →pX.

6.4.3 The calibration and the measurement of the ion electrode is complicated. Sometimes user needs to add the ion strength adjuster buffer or use a magnetic stirrer to improve. Please refer to the ISE user manual for the electrode maintenance, activation, sample preparation and other important information involving the calibration solution and the ion strength adjuster buffer solution.

6.4.4 Factory default setting

For factory default setting, please refer to parameter setting P5.3. All calibration data is deleted, and the meter restores to the theory value. Some functions restore to the original value (refer to appendix - 1). When calibration or measurement fails, please restore the meter to factory default and then perform re-calibration or measurement. Please note once factory default setting is set, all the data deleted will be irretrievable.

6.5 Self-diagnosis information

During the process of calibration and measurement, the meter has self-diagnosis functions, indicating the relative information as below, please refer to Table - 6.

Table - 6 Self-diagnosis information

Display Icons	Contents	Checking
Er 1	Press ENTER when measuring value is not stable during calibration.	Press ENTER after ☺ icon displays and stays on screen
Er3	During calibration, the measuring value being unstable (≥3min).	Check whether the ISE works properly and refer to the ISE user manual.
Er4	ISE slope<75%	Check calibration solution and the ISE, re-calibrate.

7 PARAMETER SETTING

7.1 Main menu of parameter setting

Long press MODE SETUP in measurement mode, the meter enters P1.0 mode, then press ▲ or ▼ to change menu P1.0→P5.0→P6.0. For details, please see Diagram - 13. P1.0 is the menu for pH setup; P5.0 for Ion menu and P6.0 for basic parameter menu.

Main menu of parameter setting

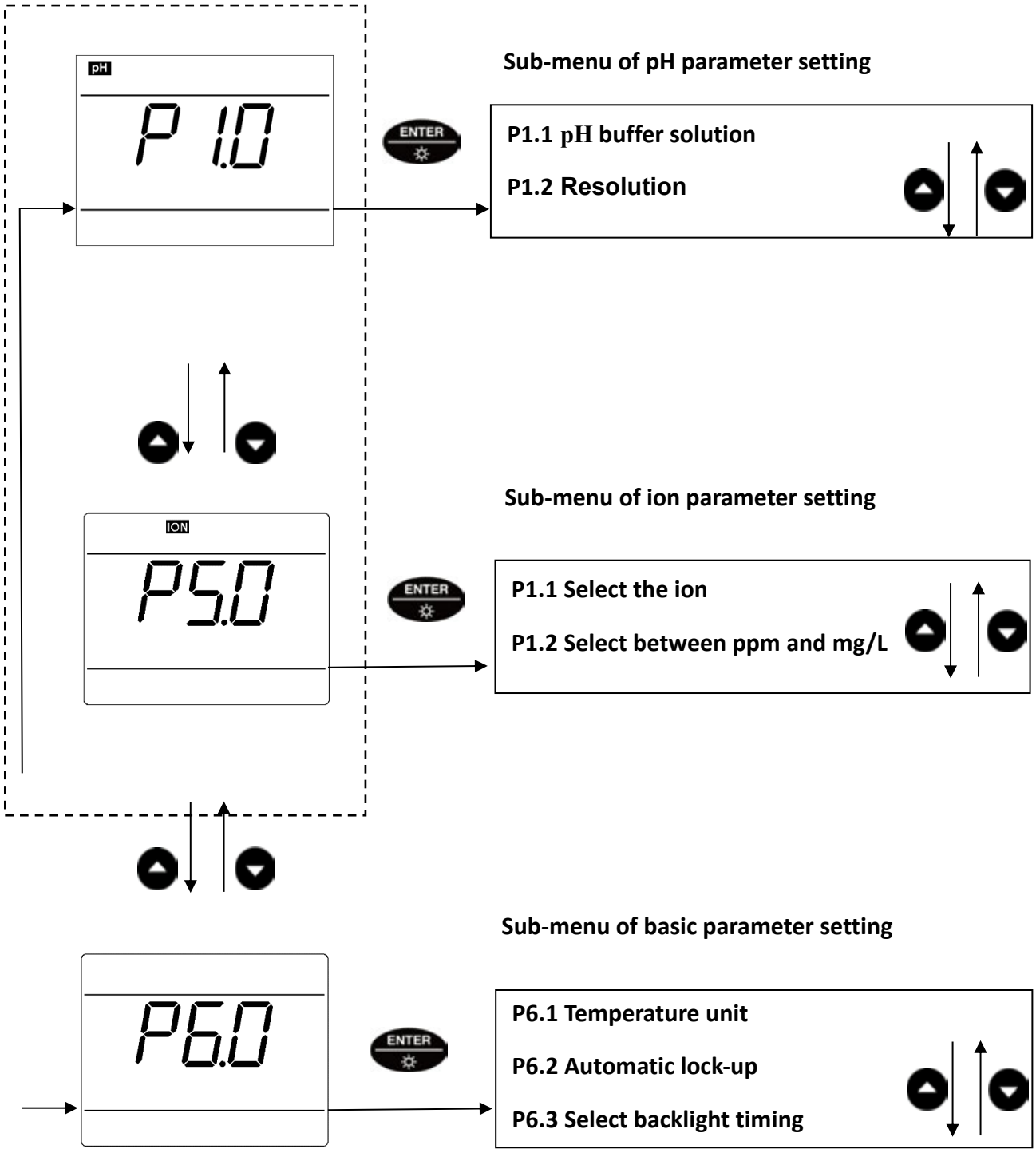
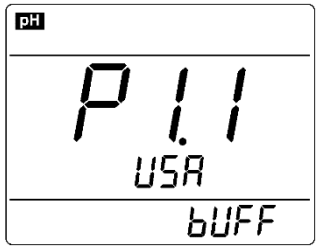
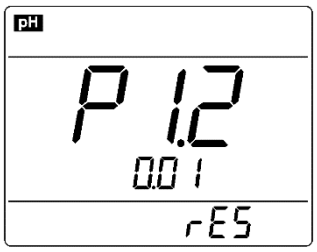
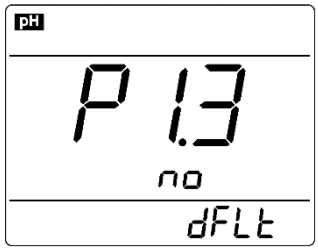


Diagram - 13

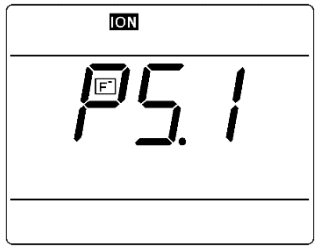
7.2 Sub-menu of pH parameter setting

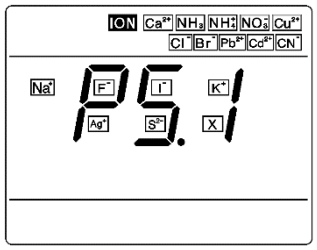
Press (L) in P1.0, enter P1.1 sub-menu of pH parameter setting, and then press ▲ or ▼ to switch among P1.1→P1.2→P1.3.

	**P1.1 — Select pH buffer series** (USA—NIST—CUS) 1. Press ENTER, USA icon flashes, press ▲ to select USA→nIS→CUS, press ENTER to confirm. USA—USAseries; nIS—NIST series; CUS—Customized calibration. 2. Press ▲ to enter P1.2 or press CAL/MEAS toreturn.
	**P1.2 — Resolution** (0.01—0.1) 1. Press ENTER and 0.01 flashes, press ▲ to select between 0 .01→0.1, Press ENTER to confirm. 2. Press ▲ to enter P1.3 or press CAL/MEAS to return.
	**P1.3 — Factory default setting** (No—Yes) Press ENTER, no flashes, press ▲ to select YES, press ENTER to confirm, the meter returns to measurement mode. No— Don't restore to factory default; Yes—Restore to factory default.

7.3 Sub-menu of ion parameter setting

Press ENTER in P5.0, enter P5.1 sub-menu of ion parameter setting, and then press ▲ or ▼ to switch among P5.1→P5.2→P5.3.

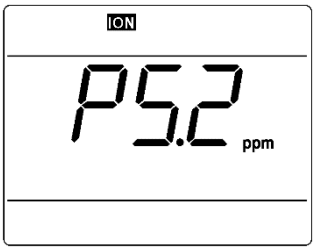
<table>
<tr>
<td> 

(a)


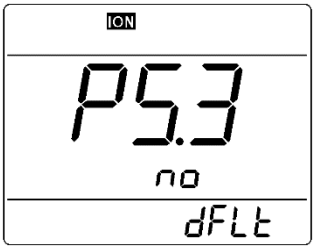
(b)</td>
<td>P5.1—Select the ion

1. Press ENTER in parameter setting P5.0, enter P5.1, see Diagram (a) on the left side, and then press ENTER to enter the ion selection interface, see Diagram (b).

2. Press ▲ or ▼ to move the cursor, press ENTER to confirm.

3. Press ▲ to enter P5.2 or press CAL MEAS to return.</td>
</tr>
<tr>
<td> 
</td>
<td>P5.2 — Select between ppm and mg/L

1. Press ENTER ppm flashes, press ▲ to select between ppm→mg/L, press ENTER to confirm.

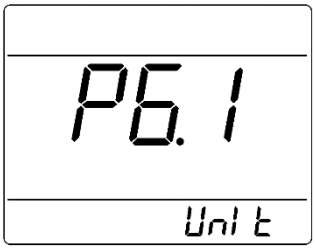
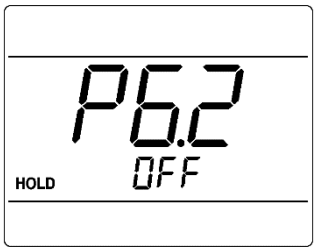
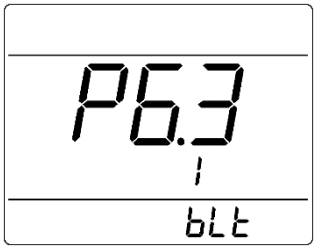
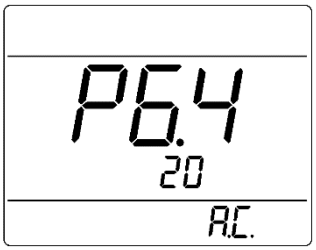
2. Press ▲ to enter P5.3 or press CAL MEAS to return.</td>
</tr>
<tr>
<td> 
</td>
<td>P5.3 — Factory default setting (No—Yes)

Press ENTER ,no flashes, press ▲ to select YES, press ENTER to confirm, the meter returns to measurement mode.

No— Don’t restore to factory default; Yes—Restore to factory default.</td>
</tr>
</table>

7.4 Sub-menu of basic parameter setting

Press ENTER in P6.0, enter P6.1 sub-menu of basic parameter setting, and then press ▲ or ▼ to switch among P6.1→P6.2→P6.3→P6.4.

	**P6.1 — Temperature unit** (℃—℉) 1. Press ENTER, **℃** flashes, press ▲ to select between ℃→℉, press ENTER to confirm. 2. Press ▲ to enter P6.2 or press CAL/MEAS to return.
	**P6.2 — Automatic lock-up** (Off→On) 1. Press ENTER, **OFF** flashes, press ▲ to select between OFF→On, press ENTER to confirm. Off—Unlock-up**;** On—lock-up （Stable reading > 10 seconds and the reading will be automatically locked up). 2. Press ▲ to enter P6.3 or press CAL/MEAS to return.
	**P6.3 — Select backlight timing** (1→2→3→Off) 1. Press ENTER, **1** flashes, press ▲ to select among 1→2→3→OFF, press ENTER to confirm. Select Off to turn on the backlight, the time unit is minute. 2. Press CAL/MEAS to return to measurement mode.
	**P6.4 — Automatic power-off setup** (10→20→30→Off) 1. Press ENTER, **20** flashes, press ▲ to select among 10→20→30→Off, press ENTER to confirm. Select off to turn off automatic power-off, the time unit is minute. 2. Press CAL/MEAS to return.

8 WHAT'S IN THE KIT?

	Content	Quantity	ION100	
			35613-68	35613-65
1	ION100 Portable Ion Meter	1	√	√
2	Temperature Probe	1	√	√
3	Instruction Manual	1	√	√
4	Carrying Case	1	√	
5	Paper Box	1		√

9 WARRANTY

We warrant this instrument to be free from defects in material and workmanship and agree to repair or replace free of charge, at option of Environmental Express, any malfunctioned or damaged product attributable to responsibility of Environmental Express, for a period of THREE YEARS (SIX MONTHS for the probe) from the delivery.

This limited warranty does not cover any damages due to:

Transportation, storage, improper use, failure to follow the product instructions or to perform any preventive maintenance, modifications, combination or use with any products, materials, processes, systems or other matter not provided or authorized in writing by us, unauthorized repair, normal wear and tear, or external causes such as accidents, abuse, or other actions or events beyond our reasonable control.

Appendix - 1 Table of Parameter Setting

Mode	Prompts	Parameter setting items	Abbreviation	Description	Factory Default
P1.0 pH	P1.1	Select pH buffer series	bUFF	USA - NIST - CUS	USA
	P1.2	Select resolution	rES	0.01 - 0.1	0.01
	P1.3	Restore to factory default setting	dFLt	No - Yes	No
P5.0 Ion	P5.1	Select ion	/	/	/
	P5.2	Select between ppm and mg/L	/	ppm - mg/L	ppm
	P5.3	Restore to factory default setting	dFLt	No - Yes	No
P6.0 Basic Parameter	P6.1	Temperature unit	Unit	℃ - ℉	/
	P6.2	Automatic lock-up timing	/	Off - On	/
	P6.3	Backlight timing	bLt	1 - 2 - 3 - Off	/
	P6.4	Automatic power-off timing	AC.	10 - 20 - 30 - Off	/

Appendix - 2 Icons and Abbreviation

Mode	Prompts	Abbreviation	Stand for	Explanation
P1.0 pH	P1.1	bUFF	Standard buffers	pH standard buffers
	P1.2	rES	resolution	Resolution
	P1.3	dFLt	Factory default setting	Factory default setting
P3.0 Ion	P3.1	/	/	/
	P3.2	/	/	/
	P3.8	dFLt	Factory default setting	Factory default setting
P6.0 Basic Parameter	P6.1	Unit	Unit	Temperature unit
	P6.2	/	/	/
	P6.3	bLt		
	P6.4	AC.		

Appendix - 3 Table of Self-diagnosis Symbol

Icon	Self-diagnosis Information	pH	Ion
Er 1	Press ENTER when measuring value is not stable during calibration.	√	√
Er2	Wrong pH buffer solution or the buffer solution out of range.	√	
Er3	During calibration, the measuring value being unstable (≥3min).	√	√
Er4	pH electrode performance error, electrode slope<75%	√	
	ISE slope<75%		√

Environmental Express