Pen type, with electrode, ATC

PEN pH METER

Model : PH-223

Your purchase of this PH METER marks a step forward for you into the field of precision measurement. Although this METER is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

OPERATION MANUAL

TABLE OF CONTENTS

1. FEATURES

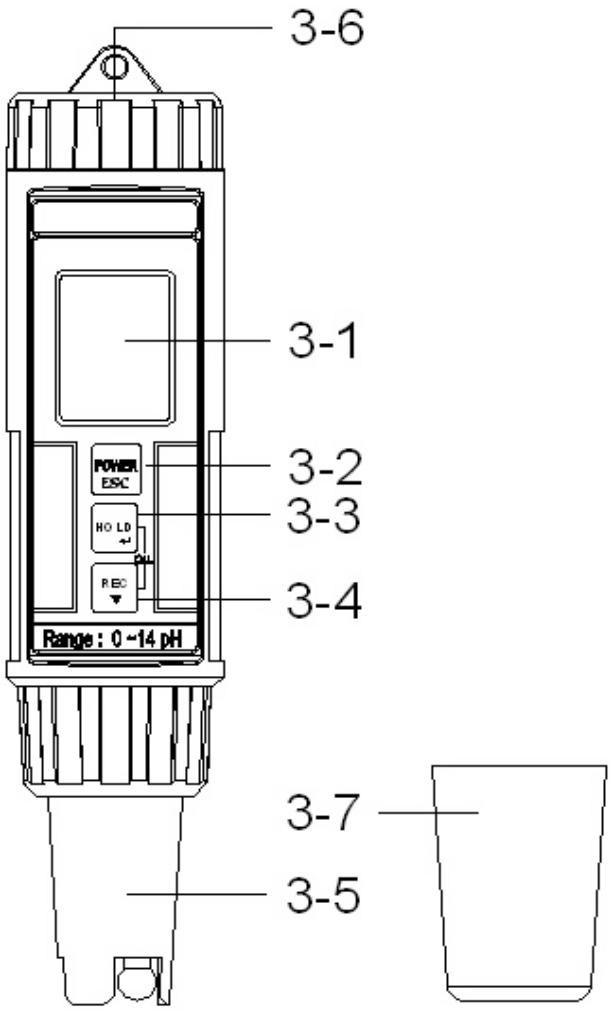
* Pen type digital pH meter, all in one, pH electrode is included, easy for general purpose application.
* Build in temperature sensor for auto temperature compensation (ATC).
* pH 4, pH 7 standard solution are standard accessories.
* Easy to change the pH electrode.
* IP67, water proof and protection.
* Auto calibration for pH 4, pH 7 or pH 10.
* High input impedance.
* LCD with two displays.
* Data hold function for freezing the desired value.
* Auto power off.
* Records max. and min. value with recall.
* Microcomputer circuit, intelligent function, high accuracy.
* Compact size, light weight.
* Power supply by DC 1.5 V battery (UM4/AAA) x 4 PCs,
* Available for wide applications, such as aquarium, beverage, fish hatcheries, food processing, photography, laboratory, quality control, school & colleges, swimming pools, water conditions.

2. SPECIFICATIONS

Display	LCD, size : 20 mm x 28 mm. ** With bar graph indicator.*	
Measurement Range	pH	0 to 14 pH.
Resolution	pH	0.01 pH.
Accuracy	pH	± 0.02 pH ** After calibration.*
pH Input Impeda	10^12 ohms.	
pH Electrode	Included. ** PE-12*	
pH Temp. Compensation	build thermister Temp. sensor for automatic temperature compensation (ATC).	
Data Hold	Freeze the display reading.	
Memory Recall	Maximum & Minimum value.	
Sampling Time	Approx. 0.8 second.	
pH Calibration	pH 7, pH 4 or pH 10, 3 points calibration ensure the best linearity and accuracy.	

Circuit	Custom one-chip of microprocessor LSI circuit.
Operating Temperature	Meter : 0 to 60 ℃ (32 to 140 ℉).
	pH electrode : 0 to 80 ℃ (23 to 176 ℉).
Operating Humidity	Less than 80% RH.
Power Supply	DC 1.5V battery (UM-4/AAA) x 4 PCs.
Power Consumption	Approx. 4.8 mA.
Dimension	186 x 40 x 32 mm (7.3 x 1.6 x 1.3 inch). ** Meter with pH electrode.*
Weight	131 g/0.36 LB (included electrode).
Power off	Auto power shut off to save battery life.
Standard Accessories	Instruction Manual..... 1 PC pH electrode, PE-12..... 1 PC pH 7.00 buffer solution, PH-07A..... 1 PC pH 4.00 buffer solution, PH-04A..... 1 PC **** PE-12, PH-07A, PH-04A are the consumer accessory.***
Optional Accessories	pH ELECTRODE, Model : PE-12 pH 7.00 buffer solution, Model : PH-07A pH 4.00 buffer solution, Model : PH-04A Hard carrying case, Model : CA-06 Soft carrying case, Model : CA-05A ** refer page 12.*

3. FRONT PANEL DESCRIPTION



3-1 Display
3-2 Power (ESC) Button
3-3 Hold (Enter, CAL) button
3-4 REC (▼, CAL) Button
3-5 pH electrode +Temp. sensor, PE-12
3-6 Battery compartment/Cover
3-7 Protection cover
3-8 pH 7.00 buffer solution, PH-07A
3-9 pH 4.00 buffer solution, PH-04A

4. pH CALIBRATING PROCEDURE

4-1 Calibrating Consideration

The pH meter already calibrated by mV signal that simulated from the ideal pH ELECTRODE mV output (base on 25 ℃ environment). However due to (a) An ideal electrode will produce 0 mV at pH 7.00, but most electrodes are slightly off. (b) The measuring environment temperature may not near 25 ℃ (15 to 35 ℃).
If intend to keep instrument combined electrode within high accuracy, it is necessary to make the following calibration procedures (4-3).

* *Basic calibration (single point calibration) : pH 7 calibration.*
* *Complete calibration (two points calibration) : pH 7 calibration and pH 4 calibration.*
* *During execute the calibration procedures, if the Display show " Error " information, then please do the " Calibration clear " procedures, refer page 8.*

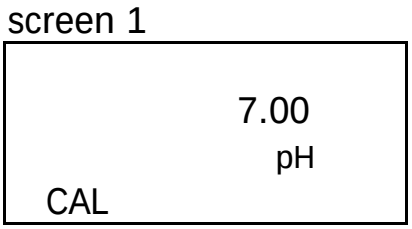
4-2 Requiring Equipment for Calibration

1) Combination pH electrode (PE-12, included).
2) Buffer solutions :
   pH 7.00 buffer solution (PH-07A, included).
   pH 4.00 buffer solution (PH-04A, included).

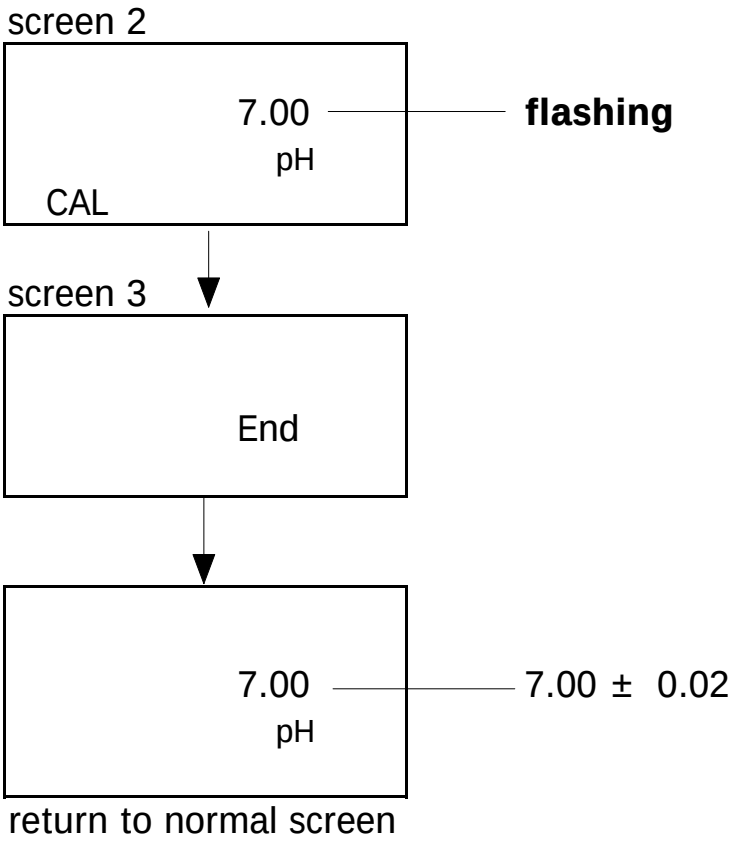
4-3 Calibration procedures

pH 7 calibration

1) Rinse the electrode in distilled water.
2) Power on the instrument by pressing the " Power button " (3-2, Fig. 1).
3) Press the " Hold button " (3-3, Fig. 1) once.
   the display will show the " HOLD " symbol.
   Press the " ▼ button " (3-4, Fig. 1) once, the display will show following screen.

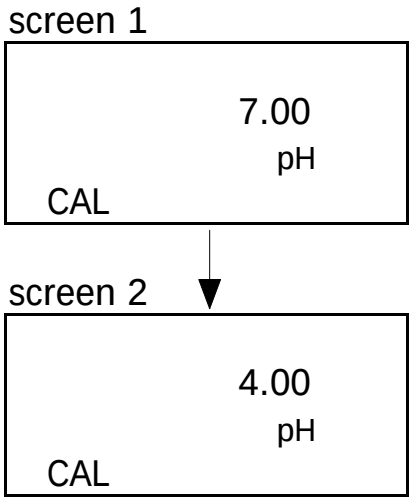


4) Place the electrode into pH 7.00 buffer solution (PH-07A)
Press the " Hold button " (3-3, Fig. 1) once.
The " 7.00 " will flashing, following show " End ".
then return the normal measurement screen and
finish the pH 7.00 calibration procedures.

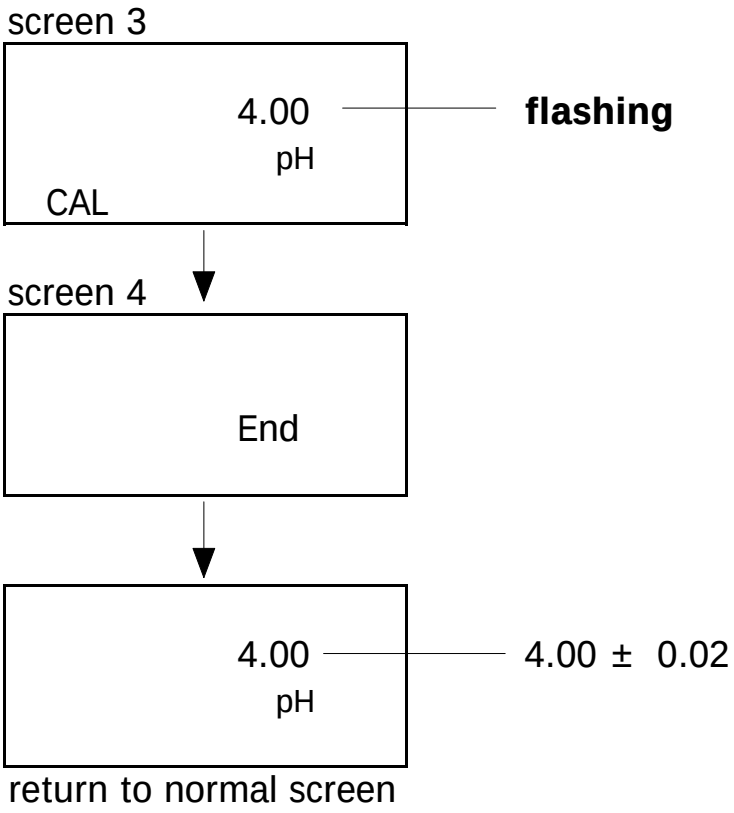


pH 4 calibration

1) Rinse the electrode in distilled water.
2) Power on the instrument by pressing the " Power button " (3-2, Fig. 1).
3) Press the " Hold button " (3-3, Fig. 1) once.
   the display will show the " HOLD " symbol.
   Press the " ▼ button " (3-4, Fig. 1) momentary with twice
   the display will show following screen in sequence.



4) Place the electrode into pH 4.00 buffer solution (PH-04A)
   Press the " Hold button " (3-3, Fig. 1) once.
   The " 4.00 " will flashing, following show " End ".
   then return the normal measurement screen and
   finish the pH 4.00 calibration procedures.



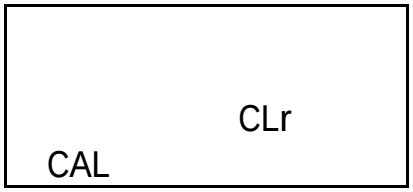
Calibration clear

During execute the calibration procedures, if happen some thing wrong (Display show Error information), then execute the following " Calibration clear " procedures will clear all the existing calibration data and return to the Default value.
However after execute the " Calibration clear ". then make the calibration again. if the Display still show the " Err " (error information), then the " Standard solution " or the pH electrode " may existing problem.

The calibration clear procedures are :

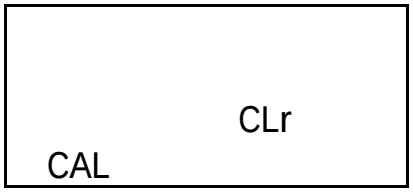
1) Power on the instrument by pressing the " Power button " (3-2, Fig. 1).
2) Press the " Hold button " (3-3, Fig. 1) once.
   the display will show the " HOLD " symbol.
   Press the " ▼ button " (3-4, Fig. 1) memontary with 4 time, the display will show following screen.

screen 1

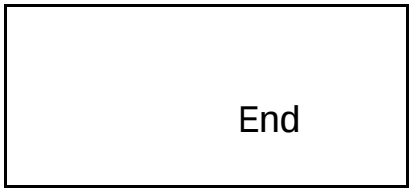


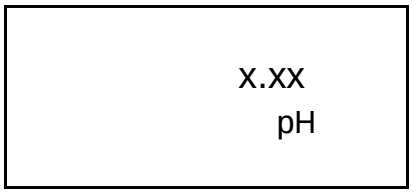
3) Press the " Hold button " (3-3, Fig. 1) once.
   The " CLr " will flashing, following show " End ".
   then return the normal measurement screen and finish the " Calibration clear " procedures.

screen 2



screen 3





return to normal screen

5. MEASURING PROCEDURE

5-1 pH measurement

After the pH electrode is calibrated
(section 4-3) , the unit is ready for measuring.

1) Power on the meter by pressing the " Power button " (3-2, Fig. 1).
2) Place the electrode into the measured solution, little shake the electrode and wait a few seconds to let the ATC (automatic temperature compensation) sensor to stabilize with the temperature of the solution.. The LCD will show pH value.

3) After make the measurement, please rinse the electrode in distilled water.
   **** After the measurement, the " pH electrode " (3-5, Fig. 1) should insert into the " Protection bottle " (3-7, Fig. 1).***
   **** PE-12, PH-07A, PH-04A is the consumer accessory.***

5-2 Data Hold

* During the measurement, press the " Hold Button " (3-3, Fig. 1) momentarily to hold the measured value. The LCD will show a " HOLD " symbol.
* Press the" Hold Button " once again to release the data hold function.

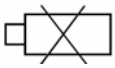
5-3 Data Record (Max., Min. reading)

1) The data record function records the maximum and minimum readings. Press the " REC Button " (3-4, Fig. 1) momentarily to start the Data Record function, shows " REC " on the display.

2) With the " REC " symbol on the display.
   a) Press the " REC Button " (3-4, Fig. 1) momentarily, the " REC MAX " symbol along with the maximum value will appear on the display.
   b) Press the " REC Button " (3-4, Fig. 1) momentarily again, the " REC MIN " symbol along with the minimum value will appear on the display.
      When display shows " REC MAX " or " REC MIN ",
   * *press the " Hold Button " (3-3, Fig. 1) momentarily will delete the max. (min.) value, the display will show the " REC. " only and execute the memory function continuously.*

   c) To exit the memory record function, press the " REC " button for 2 seconds at least. The display will revert to the current reading, not show " REC "

6. REPLACEMENT OF BATTERY

1) When the LCD display show "  " ,
   It is necessary to replace the battery. However, in-spec measurement may still be made for several hours after Low Battery Indicator appears before the instruments instrument become inaccurate.
2) To replace the battery, rotate and remove the " Battery Cover " (3-6, Fig. 1), take out the old batteries, install new batteries :
   DC 1.5V battery (UM-4/AAA) x 4 PCs.
3) When install the batteries, should make attention the battery polarity.
4) After install the batteries, reinstall the battery cover again.

7. REPLACEMENT OF pH ELECTRODE

1) Take away the pH electrode and change the new unit, refer the Fig. 2 .
2) The pH electrode, PE-12 is the standard accessory of the meter. However the PE-12 is also the consumer parts, its life is depend the working period and the maintenance.
3) Rinse the electrode in distilled water after the usage.
4) " pH Electrode sensing head " should insert into the " Protection bottle " if the meter is not used.

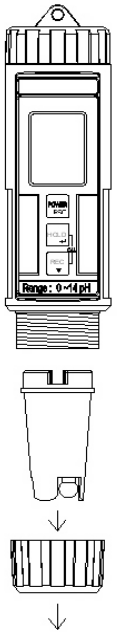


Fig. 2

8. OPTIONAL ACCESSORIES

pH ELECTRODE **Model : PE-12** General purpose & high quality pH electrode with BNC connector. Range : 1 to 13 pH (typical 0 to 14 pH).
pH 7.00 buffer solution **Model : PH-07A**
pH 4.00 buffer solution **Model : PH-04A**
CARRYING CASE Model : CA-06 Hard carrying case. (280 x195 x 65 mm).
CARRYING CASE Model : CA-05A Vinyl soft case. (260 x110 x 55 mm).

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