

LUTRON PH-222 MANUAL



Your purchase of this PEN pH METER marks a step forward into the field of precision measurement. Although this meter is a complex and delicate instrument, it offers durable structure that offer a long-life span if correct calibration and storage techniques are implemented. Please read the following instructions carefully and always keep this manual within easy reach.

TABLE OF CONTENTS

1. FEATURES

2. SPECIFICATIONS

3. FRONT PANEL DESCRIPTION

3-1 Display

3-2 Power (Logger, ▲) Button

3-3 Hold (Enter, CAL) button

3-4 REC (°C/°F button, ▼) Button

3-5 pH electrode (Temp. sensor)

3-6 Battery compartment/Cover

3-7 Protection cover

4. pH CALIBRATION PROCEDURE

4-1 Calibrating Consideration

4-2 Requiring Equipment for Calibration

4-3 Calibration procedures

5. MEASURING PROCEDURE

5-1 pH measurement

5-2 Data hold

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

5-4 Change Temp. unit °C, °F

6. DATA LOGGER

6-1 Save data

6-2 Call data

6-3 Delete data (Empty the memory)

7. REPLACEMENT OF BATTERY

8. REPLACEMENT OF pH ELECTRODE

1. FEATURES

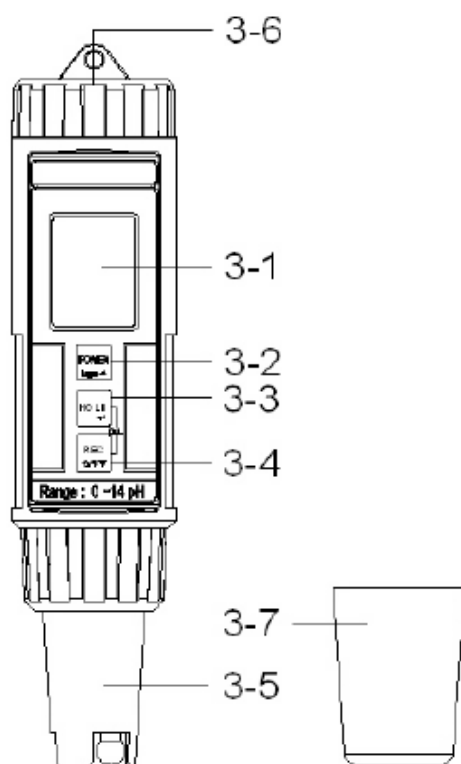
- Pen Style Digital pH meter with a built-in electrode for general purpose applications.
- Built in Temperature sensor for Automatic Temperature Compensation (ATC).
- User replaceable pH electrode.
- IP67 Rated.
- Records Maximum and Minimum Values.
- LCD with temperature and pH display along with bar graph indicator.
- Automatic Power off functionality to save battery life.
- Compact size and light weight.

2. SPECIFICATIONS

Display	LCD, size : 20 mm x 28 mm. <i>* With bar graph indicator.</i>	
Measurement Range	pH	0 to 14 pH.
	Temp.	-5 to 80 °C (23 to 176 °F).
Resolution	pH	0.01 pH.
	Temp.	0.1 °C/ 0.1 °F.
Accuracy	pH	± 0.02 pH <i>* After calibration, meter without PE-12 electrode.</i>
		± 0.2 pH <i>* After calibration, meter with PE-12 electrode.</i>
	Temp.	± 0.8 °C/ ± 1.5 °F.
pH Input Imped:	10 ¹² ohms.	
pH Electrode	Included. <i>* PE-12</i>	
pH Temp. Compensation	ATC (Automatic temperature compensation), build thermister Temp. sensor.	
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. <i>* Other calibration point that near the pH 7, pH 4, and pH 10 are available.</i>	

Data Logger	Max. can save 100 point data with recall. Manual, push the data logger button once will save data one time.
Circuit	Custom one-chip of microprocessor LSI circuit.
Operating Temperature	Meter : 0 to 60 °C (32 to 140 °F).
	pH electrode : -5 to 80 °C (23 to 176 °F).
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). <i>* Meter with pH electrode.</i>
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.

3. FRONT PANEL DESCRIPTION



3-1 Display

3-2 Power (Logger, ▲) Button

3-3 Hold (Enter, CAL) button

3-4 REC (°C/°F button, ▼) Button

3-5 pH electrode +Temp. sensor, PE-12

3-6 Battery compartment/Cover

3-7 Protection cover

4. pH CALIBRATION PROCEDURE

4-1 Calibration Considerations

pH electrodes rely on an mV signal in order to produce a pH reading. An ideal electrode will produce a 0mV reading at pH 7.00. However, most electrodes will be slightly off this until calibration is done. This is why calibration is an important step to ensure a high degree of accuracy.

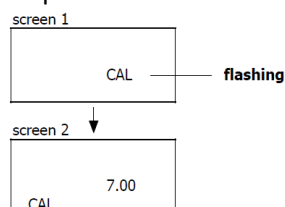
4-2 Required Equipment for Calibration

- pH-222 Meter with electrode fitted
- Buffer solutions:
 - pH 7.00 Buffer Solution (PH-07A, 50ml included)
 - pH 4.00 Buffer Solution (PH-04A, 50ml included)
 - Distilled Water for rinsing

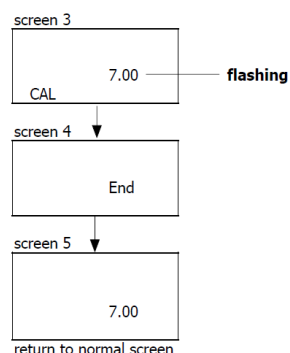
4-3 Calibration Procedure

pH 7 Calibration

- 1) Decant an appropriate amount of distilled water into a small beaker (enough to cover the electrode bulb).
- 2) Immerse the electrode and rinse it to remove any particulates from the sensor.
- 3) Power on the instrument by pressing the “POWER” Button (3-2, Front Panel Description).
- 4) Press the “HOLD” Button (3-3, Front Panel Description) once and then press the ▼ button (3-4, Front Panel Description) once. The display will then show the following sequence:

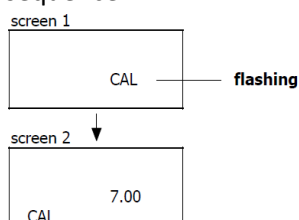


- 5) Remove the electrode from your distilled water and place it into the pH 7.00 Buffer solution (PH-07A) that came supplied. Press the “HOLD” button once. The display will show “7.00” flashing, followed by “END”. It will then return to the standard measurement screen and this concludes the pH 7.00 calibration process as shown below.

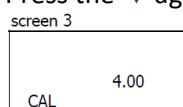


pH 4 Calibration

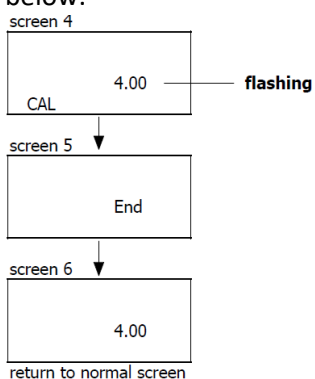
- 1) Rinse the electrode in distilled water to remove remnants of pH 7.00 buffer solution.
- 2) If the instrument isn't already on, turn it on by pressing the "POWER" Button (3-2, Front Panel Description).
- 3) Press the "HOLD" Button (3-3, Front Panel Description) once and then press the ▼ button (3-4, Front Panel Description) once. The display will then show the following sequence:



- 4) Press the ▼ again and the display will show:



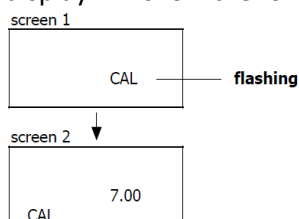
- 5) Remove the electrode from your distilled water and place it into the pH 4.00 Buffer solution (PH-04A) that came supplied. Press the "HOLD" button once. The display will show "4.00" flashing, followed by "END". It will then return to the standard measurement screen and this concludes the pH 4.00 calibration process as shown below.



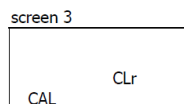
Calibration Clear Function

If for some reason, the calibration procedure is executed in the incorrect way, the meter offers the ability to clear the meter of calibration data.

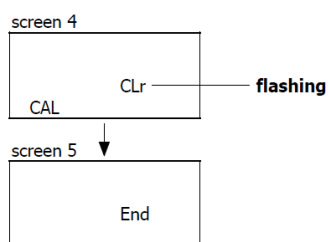
- 1) Power on the instrument by pressing the "POWER" button (3-2, Front Panel Description).
- 2) Press the "HOLD" button (3-3, Front Panel Description) once and the display will show the "HOLD" Symbol. Press the ▼ button (3-4, Front Panel Description) once and the display will show the following sequence:



- 3) Press the ▼ button 3 times. The display will show:



- 4) Press the "HOLD" Button (3-3, Front Panel Description) once. The "CLr will begin flashing and then show "END". It will then return to normal measurement mode and this confirms that the "CALBIRATION CLEAR" procedure has been completed as per the below:



5. Measurement Procedure

5-1 pH Measurement

After the calibration procedure has been completed the meter is ready for use.

- 1) Power on the meter (if not already on) by pressing the "POWER" button (3-2, Front Panel Description).
- 2) Place the electrode into the solution you wish to measure. Leave the electrode in the solution until the reading stabilises. The LCD will show you your pH Value (Upper section of main screen) and the temperature value (Lower section of the display).
- 3) After you have completed your measurement, rinse the electrode in distilled water and place it into the protection cap (3-7, Front Panel Description).

5-2 Data Hold

This meter has the ability to hold a particular measurement. To do this, during your measurement, simply press the "HOLD" Button. This will show a "HOLD" Symbol on the screen and will hold the current reading. To release the hold measurement, simply press the "HOLD" button once again.

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

The Data record function allows you to record your minimum and maximum readings whilst the unit is on. To perform this follow the procedure below:

- 1) Press the "REC" button (3-4, Front Panel Description) to start the data recording function. The meter will show "REC" on the display.
- 2) When the "REC" symbol is on the display press the "REC" Button and the "REC MAX" symbol along with the maximum value will be displayed.
- 3) Press the "REC Button" again and the "REC MIN" symbol will be displayed along with the minimum value.

- 4) To exit the Memory Record Function, press the "REC" Button for at least 2 seconds. The display will then revert to the standard measurement screen and will no longer show "REC"

NOTE: To reset your Minimum or Maximum reading, whilst in the "REC MAX" or "REC MIN" screen press the hold button and this will delete the current Minimum or Maximum reading.

5-4 Change Temperature Unit

Press the "°C/°F" button (3-4, Front Panel Description) continuously for a minimum of two seconds. Then release the button and the units will change from °C to °F or from °F to °C.

6. Data Logger

The meter can save up to a maximum of 100 data points to its internal memory. These can then be reviewed on the screen.

6-1 Saving Data

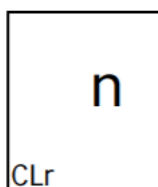
- 1) With the meter on press the "REC" Button, the display will show "REC" on the display.
- 2) Press the "LOGGER" Button (3-2, Front Panel Description) and the display will save one measuring value to memory. The display will then show you the position the data has been recorded to and how many memory points you have left.
- 3) To exit out of the data logging mode, press the "REC" button for at least two seconds. The display will then revert to the current reading and will no longer show "REC".

6-2 Recalling Data

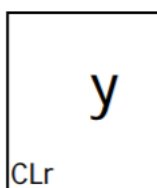
- 1) With the meter on press the "REC" Button, the display will show "REC" on the display.
- 2) Press the "REC" Button continuously until the display shows you "TTL" and your relevant data point.
- 3) Use the ▲ button or ▼ to select which reading you wish to view. When you call the data the pH unit will flash and show you the result at the time the record was taken.
- 4) Press the "HOLD" button to exit out of the data recall menu.

6-3 Deleting Data

- 1) Ensure the meter is turned off.
- 2) Press the "REC" Button continuously and then press the "POWER" button momentarily. The display will show the following screen:




- 3) Press the ▼ button, the display will show the following:



- 4) Press the ← Button to confirm your desire to delete data. The screen will now show you Null and this confirms the memory is empty.

7. Replacement of Battery

- 1) When the display shows "  " , it is necessary to replace the batteries.
- 2) To replace the batteries, rotate and remove the battery cover (3-6, Front Panel Description). Take out the depleted batteries and install 4 x AAA Alkaline Batteries ensuring correct polarity.
- 3) After installing the batteries, refit the battery cover.

8. Replacement of pH Electrode

- 1) This meter features the ability to replace the electrode. The electrode is the PE-12 and to remove the existing electrode unscrew the collar from the meter as per Figure 2.
- 2) Position the new electrode with the aligning tab of the meter and fit it to the meter. Screw the collar back on.
- 3) Rinse the new electrode in water and then insert it into the protection cap.



Fig. 2