INSTRUCTION MANUAL

pHTutor

Bench meter

Introduction

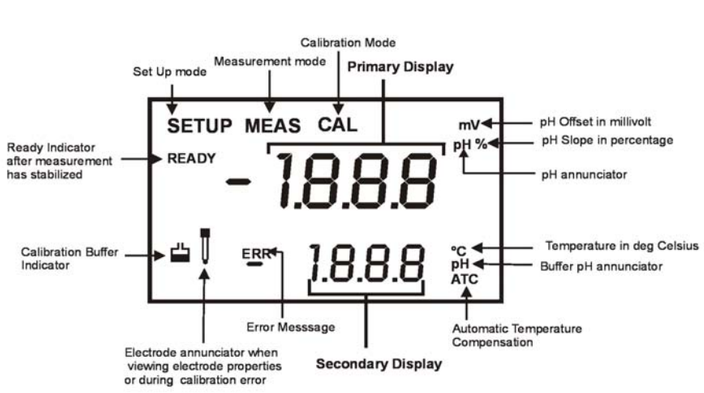
Thank you for selecting our pHTutor pH/Temperature bench meter.
This manual provides a step-by-step guide to operate the pHTutor bench meter.

Display And Keypad Functions

Display

The LCD (Liquid Crystal Display) has an upper and lower display which shows the measured pH and the measured temperature.

The display also shows error messages, keypad functions and program functions.



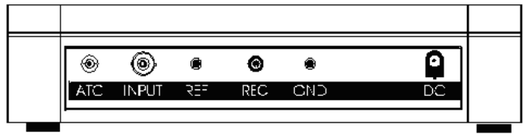
Keypad

A large splash proof membrane keypad with tactile feedback makes meter easy to use.

ON/OFF	Powers on and shuts off the meter
CAL MEAS	Toggles between the measurement and calibration modes of the meter. In SETUP mode, pressing CAL/MEAS key returns meter to the measurement mode
ENTER	Confirms the calibration values in calibration mode and the selections in the SETUP menu.
▲ ▼	Sets the calibration values during the calibration mode. Scrolls through each SETUP menu and the configuration settings.

Rear Instrument Panel

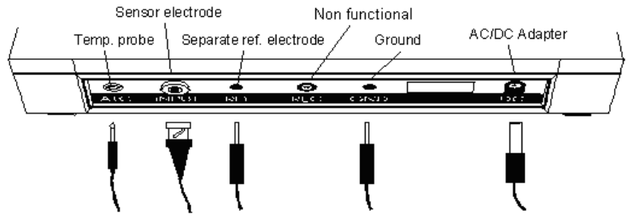
The pHTutor bench meter provides a complete set of connectors for the various accessories commonly used.



Connection	Function
ATC	For phono jack connection from the temperature probe for Automatic Temperature compensation. The probe should be a 30KW thermistor type.
INPUT	For connection to pH electrodes with BNC type connectors. Always ensure that the connector is clean and dry.
REF	For connection to pin type reference electrode normally used with half cell (mono) type pH electrodes.
REC	Non-functional
GND	For connection to the ground earth jack (standard tip connectors).
DC	For connection for the AC/DC power adapter

Starting Up

Connect the accessory connectors at the rear of the instrument panel. During operation, it is important that water does not get onto the BNC connector. Also avoid touching the connector with soiled or wet hands.

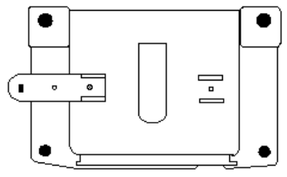


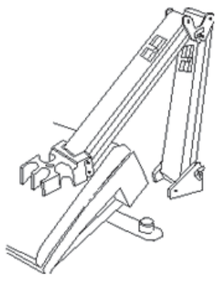
Connecting the Electrode Holder *(Optional Purchase)*

This meter's base plate has a side metal bar to which you can attach an integral swivel electrode holder. You can mount the electrode holder on either right or left side of the meter.

To position the electrode arm:

Use a Phillips screwdriver to remove the screw holding the electrode holder. Slide the side metal bar until the second screw slot lines up with the original screw hole. Use the screw removed earlier to secure the electrode holder into position.





To install the electrode arm to the meter:

To mount the electrode arm into the metal rod on the side bar, align the slot with the metal rod and base of electrode arm. Push it downwards until it fully sits into position.

NOTE: *Move the base of the electrode holder if you wish to swing the electrode holder about. To prevent the meter from toppling over causing accidental spills,* ***DO NOT*** *swing the body of the electrode holder.*

Temperature Calibration *(Optional Probe Purchase)*

For ATC, you must connect a temperature probe *(optional purchase).*

1. While pressing the ENTER key, switch on the meter by pressing the ON/OFF key.
2. Release the ENTER key. You will enter the setup mode with the display showing "CAL"
3. Press ENTER key to enter the Temperature Calibration mode. The upper display act as the adjustable temperature setting and the lower display shows the current measured temperature value.
4. Dip the temperature probe into a solution of known temperature, such as a temperature bath for a few minutes until the temperature probe stabilizes.
5. Press ▲ or ▼ key to adjust the temperature setting to the known temperature value from step 4.
6. Press the ENTER key to confirm the setting and to return to the measurement mode.

Note: To abort Temperature Calibration, do not press the ENTER key in step 6. Press the 'CAL / MEAS' key instead.

pH Buffer Set Selection

The pHTutor features USA (pH 4.01, pH 7.00 and pH 10.01) or NIST (pH 4.01, pH 6.86, and pH 9.18) standards. Select either one to suit your requirements.

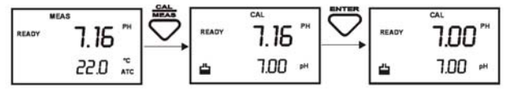
1. While pressing the ENTER key, switch on the meter by pressing the ON/OFF key.
2. Release the ENTER key. You will enter the setup mode with the display showing "CAL".
3. Press the ▲ or ▼ key to scroll through the setup page until you view the "bUF" display.
4. Press the ENTER key to enter the buffer set selection page.
5. Choose the buffer set selection you desire using the ▲ and ▼ key and confirm your selection by pressing the ENTER key.

pH Calibration

Calibration should be done regularly, preferably once a week. You can calibrate up to three points using either the USA or the NIST buffer set standards.

1. Press ON/OFF key to switch unit on.
2. Dip electrode about 2 to 3 cm into the pH standard buffer solution.
3. Press the CAL key to enter calibration mode. The 'CAL'annunciator will be shown on top of the LCD. The upper display will show the default measurement while the lower display will indicate the pH standard buffer solution.

Note: The meter automatically recognizes the buffers as the buffer standard you have set in the SETUP mode, i.e. either USA (pH 4.01, 7.00 or 10.01) or NIST (pH 4.01, 6.86 or 9.18) buffers.
Note: To abort calibration, press the 'CAL / MEAS' key.



4. Allow the meter reading to stabilize (READY will be displayed) before pressing the ENTER key to confirm the first calibration point. The upper display will be calibrated to the pH standard buffer solution and the lower display will switch to the next calibration point.

Note: If the upper measured display is not within the buffer acceptable window, an error message "ERR" and the electrode icon will flash upon pressing the ENTER key. Press CAL/ MEAS key to exit calibration and resume to the measurement mode. Check electrode condition and recalibrate.

5. Repeat with other buffers if necessary. Rinse electrode in tap water before dipping into next buffer.

Note: The calibration mode allows you to perform up to three calibration points before returning to the measurement mode automatically. However, if you opted to have only one or two calibration points, simply skip the remaining calibration points by exiting to the measurement mode by pressing the CAL / MEAS key.

pH Measurement

Automatic Temperature Compensation (ATC) *(Optional Probe Purchase)*

For ATC measurements, simply attach a temperature probe into the meter. The "ATC" annunciator lights up on the LCD. Submerse the probe in the liquid you are measuring so that the sample temperature can be recorded and compensated for.

Manual Temperature Compensation (MTC)

For MTC, you must disconnect the temperature probe.

1. While pressing the ENTER key, switch on the meter by pressing the ON/OFF key.
2. Release the ENTER key. You will enter the setup mode with the display showing "CAL"
3. Press ENTER key to enter the Temperature compensation mode. The upper display act as the adjustable temperature setting and the lower display shows the default temperature value of 25°C or indicates the last set temperature setting.
4. Check the temperature of your sample using an accurate thermometer.
5. Press ▲ or ▼ key to offset the temperature to the measured value from step 4.
6. Press the ENTER key to confirm the setting and to return to the measurement mode. The meter will compensate pH reading for the manually set temperature.

Note: To abort MTC calibration, do not press the ENTER key in step 6. Press the 'CAL / MEAS' key instead.

Taking Measurements

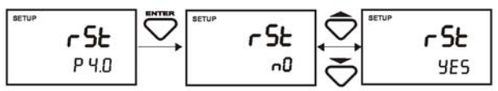
Be sure to remove any electrode soaker bottle or protective rubber cap from the electrode before measurement.

1. Press ON/OFF key to switch on meter. The MEAS annunciator appears on the top of the LCD. When used with temperature probe, an ATC annunciator will appear in the lower right-hand corner to indicate Automatic Temperature Compensation.
2. Dip the electrode about 2 to 3 cm into the test solution. Stir and let the reading stabilize.
3. "READY" annunciator will be displayed once the reading stabilizes. Note the reading on the display.

User Reset

You can reset the pH calibration to the factory default by using the user reset function. Buffer set selection and user temperature calibration are not affected by the user reset function.

1. Switch off the meter.
2. While pressing the ENTER key, switch on the meter by pressing the ON/OFF key.
3. Release the ENTER key. You will enter the setup mode with the display showing "CAL"
4. Press the ▲ or ▼ key to scroll through the setup page until you view the "rSt" display.
5. Press the ENTER key to enter the user reset option page.
6. Use the ▲ or ▼ key to decide your option on the user reset function.
   - nO deactivates reset function
   - YES activates the reset function
7. Press the ENTER key to confirm your option.
8. If you have selected 'YES', the display will flash momentarily and proceed to the measurement mode with the calibration reset back to factory default value.
9. If 'nO' is selected, the unit will proceed to the measurement mode without any user reset performed.



Viewing Electrode Properties

Your pHTutor lets you check the electrode parameters for diagnostic purposes. You can view the offset and slope of the electrode to determine its effectiveness.

1. While pressing the ENTER key, switch on the meter by pressing the ON/OFF key.
2. Release the ENTER key. You will enter the setup mode with the display showing "CAL"
3. Press the ▲ or ▼ key to scroll through the setup page until you view the "ELE" display.
4. Press the ENTER key to enter the electrode properties viewing page. The display will show the mV offset value of the electrode.
5. Press the ENTER key again to view the slope in % of the electrode.
6. To return to the "ELE" page, press the ENTER key.
7. Press ▲ or ▼ key to select a new program OR press CAL/MEAS key to return to the measurement mode.

Self-Diagnostic Messages

Over range / Under range signal	**Or / Ur**	Electrode is not in contact with solution or electrode is failing.
		Measured pH value or temperature value exceeds its specified maximum or minimum value
Error Message	**Err**	Wrong key selected
	Err	pH calibration error of attempting to confirm a calibration value which is not within the specified calibration window

Accessories

Replacement meter and accessories

Item Description	Eutech Instruments Order Code No.	Oakton Instruments Order Code No.
CyberScan pHTutor Bench pH/ Temp Meter	EC-PHTUTOR	35619-30
Temperature Probe for pHTutor bench	EC-PH5-TEMB01P	35613-05
meter, 1m cable length		
Electrode Stand with Swivel Arm & Base Plate	EC-PH-ELSTDC	35617-50
110/120VAC power adapter, 50/60 Hz	EC-120-ADA	35615-07
220/230VAC power adapter, 50/60 Hz	EC-220-ADA	35615-08

Replacement Electrodes

Item Description	Eutech Instruments Order Code No.	Oakton Instruments Order Code No.
General purpose, Epoxy-body double junction pH Combination Electrode, 12 X 110 mm, 1m cable length	EC-FC72522-01B	35641-51
General purpose, Epoxy-body "3-in-1" pH/Temp. Combination Electrode, 12 X 110 mm, 1m cable length	EC-FC73529-01B	35811-71
Glass body Refillable pH Combination Electrode: Annular ceramic reference junction with protective sensor guard, 1 m cable length	EC-FG73504-01B	05997-10

pH Buffers/Sachets, Reference Electrolyte & Others

Item Description	Eutech Instruments Order Code No.	Oakton Instruments Order Code No.
pH 4.01 Buffer Solution (480 ml bottle)	EC-BU-4BT	00654-00
pH 7.00 Buffer Solution (480 ml bottle)	EC-BU-7BT	00654-04
pH 10.01 Buffer Solution (480 ml bottle)	EC-BU-10BT	00654-08
pH 4.01 Buffer Sachets (20 ml x 20 pcs. per box)	EC-BU-4BS	35653-01
pH 7.00 Buffer Sachets (20 ml x 20 pcs. per box)	EC-BU-7BS	35653-02
pH 10.01 Buffer Sachets (20 ml x 20 pcs. per box)	EC-BU-10BS	35653-03
Reference Electrolyte (KCl with Ag/AgCl) (480 ml bottle)	EC-RE001	05992-47 (125 ml)
Reference Electrolyte (4MKCl) for Calomel (Hg/ Hg2Cl2) electrodes & double-junction electrodes	EC-RE002	05992-48 (125 ml)
Storage Solution for pH Electrode (480 ml bottle)	EC-RE005	00653-04
Protein Cleaning Solution (480 ml bottle)	EC-DPC-BT	00653-06

Specifications

pHTutor	Specifications
pH Range	0.00 to 14.00 pH
Resolution	0.01 pH
Relative Accuracy	0.01 pH
Calibration Points	Up to 3 points with Auto-buffer recognition
Buffer Set Standard Selection	USA- 4.01/7.00/10.01NIST- 4.01/6.86/9.18
Calibration Window (USA Buffer Set Standard)	+/-1.00 pH (pH 4.01 & pH 10.01),+/-1.50 pH (pH 7.0)
Calibration Window (NIST Buffer Set Standard)	+/-1.00 pH (pH 4.01 & pH 9.18),+/-1.25 pH (pH 6.86)
Temperature Compensation	Automatic / Manual (0 to 100 °C)
Temperature Range	0 to 100 °C
Temp Resolution	0.1 °C
Temp Accuracy	+/- 0.3 °C
Temp Calibration Window	+/- 5 °C
pH Slope and Offset Display	Yes
User reset	Yes
Non Volatile Memory Backup	Yes
LCD Display	Custom Dual LCD (1 x 4.5 digits, 1 x 3.5 digits, annunicators)
Power Requirement	AC/DC 9V Adapter (110 VAC/220 VAC, 50-60Hz)
Dimensions / Weight	Meter : 18 x 23 x 6 cm / 1250 g Boxed : 40 x 26 x 9 cm / 1950 g

Warranty

The pHTutor are warranted to be free from manufacturing defects for 3 years and electrode module for 6 months. If repair, adjustment or replacement is necessary and has not been the result of abuse or misuse within the time period, please return the product – freight prepaid – and correction will be made without charge. Out of warranty products will be repaired on a charge basis.

Return of Items

Authorization must be obtained from your distributor before returning items for any reason.
When applying for authorization, please include information regarding the reason the item(s) are to be returned.
Note: We reserve the right to make improvements in design, construction and appearance of products without notice. Prices are subject to change without notice.