

Instruction Manual

pH 1000/ pH 2500

Bench pH/Ion Meter



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Preface

Thank you for choosing the pH 1000/ 2500 bench meter series.

This manual serves to explain the use of the pH 1000/ 2500 Bench meter. The manual functions in two ways, firstly as a step-by-step operational guide to help you familiarize with the meter's features and functions. Secondly, it serves as a handy reference guide.

This instruction manual is written to cover as many anticipated applications and uses of the pH 1000/ 2500 bench meter as possible. If there are doubts in the use of the meter, please do not hesitate to contact the nearest Authorized Distributors.

Eutech Instruments/ Oakton Instruments cannot accept any responsibility for damage or malfunction to the meter caused by improper use of the instrument.

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1 INTRODUCTION

Thank you for selecting pH1000/ 2500 bench meter. This step-by-step instruction manual gives you a detailed description on the use and operation of features on the meter. There are 2 models: pH1000 (pH/ mV/ Relative mV/ Temperature/ RS232C) and pH2500 (pH/ Ion/ mV/ Relative mV/ Temperature / RS232C). These meters are designed to be user-friendly while providing unprecedented levels of accuracy, repeatability and reliability.

The pH 1000/ 2500 bench meter is an advanced microprocessor-based (ASIC-Application Specific Integrated Circuit) ideal for routine measurement that best meets discerning user's individual needs. This feature-rich meter has splash-proof keypad, simultaneous pH/ mV/ Ion and temperature display on a large angled custom LCD. Besides, the meter allows user customization via its SETUP feature, making the unit more powerful and user-friendly to cater to your individual needs. This instruction manual is illustrated with useful hints and diagrams that show which specific key-presses to access for each function.

2 METER INFORMATION

The pH 1000/ 2500 bench meter is packaged in a corrugated box which is made of environment-friendly materials and can be re-cycled.

2.1 Meter Parts

The instrument is designed to give an aesthetic look as well as ergonomic functionality. A large custom dual LCD is provided at an angle for optimum viewing. A splash proof keypad with audible tactile response gives you a good feel of the instrument. A slide-out instruction card offers a handy reference in case of doubts. Listed below are the major parts of the meter.

2.2 Customized LCD

The pH 1000/ 2500 bench meter is characterized by large dual custom LCD (Liquid Crystal Display). The display has also mode annunciators for pH, temperature, relative mV and mV readings. The secondary (lower) display shows the temperature readings simultaneously with the primary (upper) display of measured mode. Special annunciators such as graphical symbols, error messages, measurement units and modes of operation are arranged around the primary and secondary displays to give a comprehensive display. The integration of graphics and error messages into the LCD provides you a higher level of user-friendliness and easy readability.

2.3 Slide Out Card

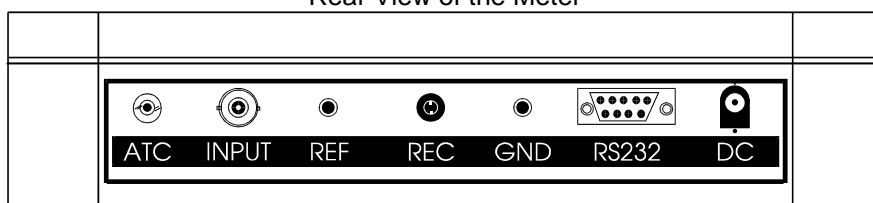
A plastic slide out card is provided at the bottom of the bench meter. The function of this card is to provide a quick guide to the functions of the individual keys as well as to provide a useful trouble shooting reference.

2.4 Rear Instrument Panel

The pH 1000/ 2500 bench meter provides a set of connectors for the various accessories commonly used. In addition to all the connectors, pH 1000/ 2500 bench meter has an additional RS232C port to allow for data transmission between the meter and a printer or computer, Furthermore; it can be remotely controlled using a software from Eutech Instruments. Listed as follows are various connections available.

Connector	Function
ATC	For phono jack connection from the temperature probe for Automatic Temperature Compensation. The probe should be a thermister type probe.
INPUT	For connecting sensors with a BNC connector to the meter. The meter accepts any pH, ORP or ISE electrode with a BNC connector. Always make sure that the connector is clean and dry.
REF	For connection to the pin tip type reference electrode normally used with half cell (mono) type pH or ISE electrodes.
REC	For connection to the strip chart recorder.
GND	For connection to the ground earth jack (standard pin tip connectors).
RS232C	For connection to the RS232C serial port.
DC	For connection to the AC power source to the power jack (DC).

Rear View of the Meter



2.5 AC/DC-Adapter

AC/DC adapters convert the power mains voltage 120/220 VAC to low DC voltage for the pH 1000/ 2500 bench meter operation. Two basic models of adapters are available depending upon power supply specification of each country. See accessories section.

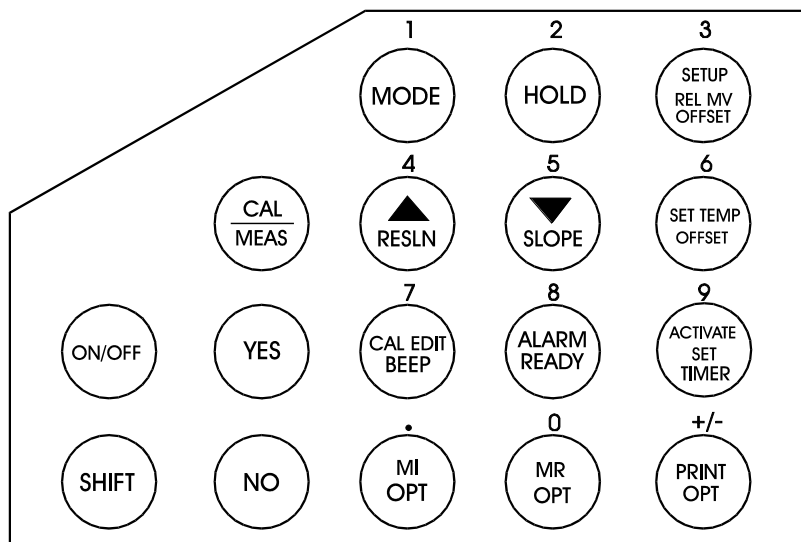
2.6 Electrode

Electrode is one of the most important parts of the meter. The electrode glass membrane is fragile and must be handled with care. A protective rubber cap containing a suitable storage solution to protect the glass membrane and to maintain activation of the glass membrane covers the pH electrode provided with the meter (when ordered). A special protective guide for use during measurements is enclosed to offer added protection against damage to the pH electrode glass bulb during operation. Maintenance of electrode is necessary from time to time. Please refer to Section 14 on Electrode Care.

3 KEYPAD FUNCTIONS

The pH 1000/ 2500 bench meter is equipped with large tactile response keypad for ease of use. All keys have primary function with some keys having secondary functions.

3.1 Primary & Secondary Functions of Keypad



ON/OFF	
Primary Function	Turns meter on or off.
Secondary Function	None
Numeric Value	None
SHIFT	
Primary Function	Press to access the secondary functions of the meter.
Secondary Function	None
Numeric Value	None
YES	
Primary Function	Enter numeric values, confirm calibration points, or confirm and scroll program options or values selected.
Secondary Function	None
Numeric Value	None
NO	
Primary Function	Use to cancel incorrectly selected numeric value or selection made.
Secondary Function	None
Numeric Value	None

CAL/MEAS	
Primary Function	Press to toggle between measurement and calibration modes of the meter - pH, Temperature, mV, Relative mV and Ion. Also use as exit from SETUP mode, secondary functions and to abort operation while in calibration mode.
Secondary Function	None
Numeric Value	None
1 / MODE	
Primary Function	Select one of four measurement modes: pH/mV/Relative mV/Ion.
Secondary Function	None
Numeric Value	1
2 / HOLD	
Primary Function	Freeze the displayed value. Allow you to print the held reading or store it into memory.
Secondary Function	None
Numeric Value	2
3 / SETUP / REL MV BASE	
Primary Function	Enter SETUP mode of the meter for customization of meter functions as well as view some diagnostic functions.
Secondary Function	Display the Relative mV base value while in Relative mV mode and Ion Electrode Slope while in the Ion mode.
Numeric Value	3
4 / Δ / RESLN	
Primary Function	Select next higher pH buffer values in the pH calibration mode. Also used to scroll through SETUP mode options.
Secondary Function	Toggle the pH resolution between 0.01 pH and 0.1 pH.
Numeric Value	4
5 / ▽ / SLOPE	
Primary Function	Select the next lower pH buffer value option in pH calibration mode. Also used to scroll through some SETUP mode options.
Secondary Function	Display the percentage slope of the pH electrode when in the pH mode. While in Ion mode, it displays slope of ion electrode in mV/decade.
Numeric Value	5
6 / SET TEMP / OFFSET	
Primary Function	Press to calibrate ATC temperature probe or to set manual temperature.
Secondary Function	Displays the offset of pH electrode. This is useful as a diagnostic function to determine the quality of the probe that is connected to the meter.
Numeric Value	6

7 / CAL EDIT / BEEP	
Primary Function	Press to edit pH buffer value while you are in pH calibration mode.
Secondary Function	Turns on or off 'beep' sound whenever a key-press is depressed.
Numeric Value	7
8 / ALARM / READY	
Primary Function	Enter the high and/or low alarm values.
Secondary Function	Turns on or off the READY function.
Numeric Value	8
9 / ACTIVATE / SET TIMER	
Primary Function	Press to start timer countdown.
Secondary Function	Sets the time interval.
Numeric Value	9
. / MI / OPT	
Primary Function	Stores the displayed value into memory.
Secondary Function	Activate different Memory Input Options, these include: Data Log on Ready Data Log on Time Interval Set Time Interval for Data Log
Numeric Value	. (decimal point)
0 / MR / OPT	
Primary Function	Recalls stored values from the memory in the Last-In-First-Out (LIFO) sequence.
Secondary Function	Activate different Memory Recall options. There are two options: Print all memory data Clear memory
Numeric Value	0
+/- / PRINT / OPT	
Primary Function	Output the displayed data through the serial/RS232C port. Can be activated in the measurement, HOLD functions and memory recall functions.
Secondary Function	Sets the different print options. There are three options: Print on ready Print on time interval Set print time interval
Numeric Value	+/-

4 STARTING UP THE METER

4.1 Connecting the Sensor Electrode

Slide the sensor electrode connector of the electrode over the INPUT BNC socket. Then push the connector into the socket and turn the connector clockwise to lock into position. Do not use excessive force. This applies to combination pH/ORP/ISE electrodes. For half-cell sensors where a reference electrode is used, connect the sensor connector to socket marked (REF). Always ensure that the connectors are dry when connection is done.

4.2 Connecting the Temperature Probe

The temperature probe uses a phono jack to connect with the socket marked ATC on the meter. Insert the jack directly into the socket until it is firmly seated.

4.3 Connecting the AC/DC Adapter

Ensure that the power to the AC/DC adapter is switched off. Slide the AC/DC adapter jack into the socket marked DC of the meter until it is firmly seated. For AC/DC adapter always ensure that the power mains voltage matches that of the adapter used. AC/DC adapters used should have the following specifications or settings. Output:- Voltage: 9 V DC Current: 500 mA.

NOTE: Ensure that the input power mains voltage (120/220 V) matches your adapter requirements.

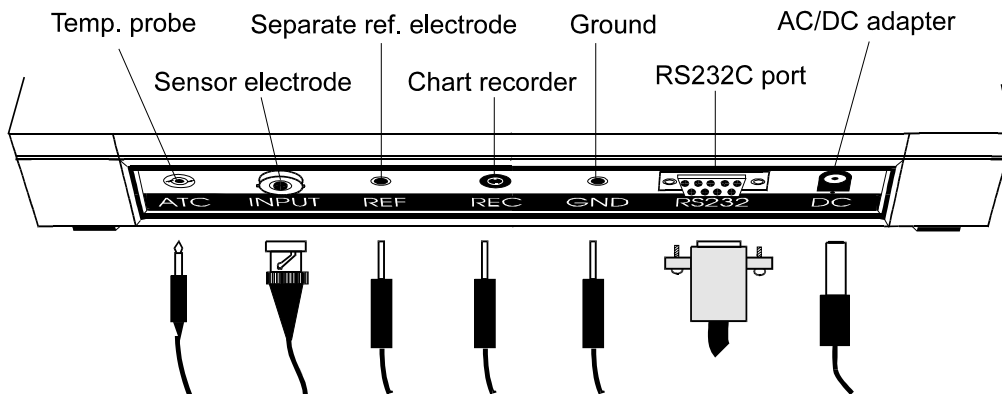
4.4 Connecting the Chart Recorder

The meter provides a recorder output of +/- 2000 mV for transmission of readings either to a chart recorder or to a data acquisition device (Analog/Digital Cards). When the chart recorder is in operation, continuous absolute mV readings will be charted. Note that readings are independent of the operating mode and is uncompensated and set to a one to one (1:1) ratio.

Where the charting is made in reference to ground potential, a cable is connected from the GND port of the meter to the chart recorder. Plug the phono connector to the meter at the designated port (marked REC). The tip (inner) connection should be wired to the high side of the recorder and the sleeve (outer) side should be wired to the low side of the recorder.

4.5 Connecting RS232C Cable

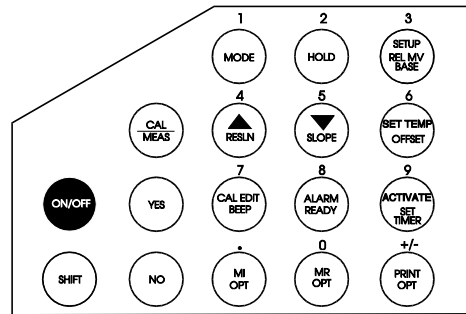
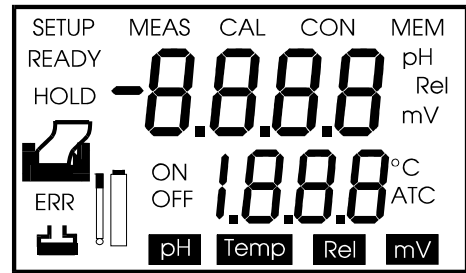
Noting the orientation of RS232C connector, insert the 9-pin male connector from your device (a printer or computer) into the RS232C port (marked RS232) of the meter. Fasten the RS232C connector using the two screws at the side of the male RS232C connector. Do not over-tighten.



5 TURNING THE METER ON AND OFF

Once the AC/DC adapter is connected and powered on, the meter beeps and the full LCD lights up for a few seconds to display all segments as a self-diagnostic test of the LCD. Then the meter will display the current time.

To access the meter functions, press **ON/OFF** key. The meter beeps and performs a diagnostic test before going into the pH measurement [MEAS] mode. To turn the meter off, press ON/OFF key within the operation mode. The meter performs a self-diagnostic LCD test before displaying the current time.



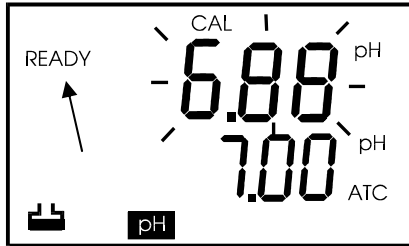
IMPORTANT :

Remember to remove the protective cap from the electrode tip prior to measurement. Replace it in place after use or store electrode in some storage solution to avoid possible dehydration of glass bulb which may result in slow response.

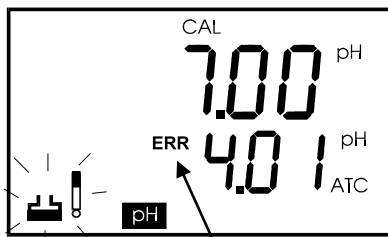
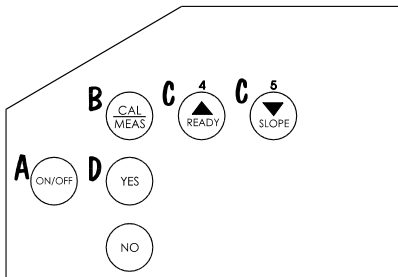
In any case if the electrode is not in use for long period, condition the electrode by soaking into tap water for 1-2 hours before use.

Make sure to wash electrodes/probes before/after each sample measurements to prevent any carry-over of samples.

HINT: For best results, perform at least a 2-Point Calibration using buffers that bracket the expected range of measurement. If a 1 Point Calibration is to be used, it is highly recommended that measurement be performed only at points close to the calibration value.



The primary display of the LCD shows the measured pH value; the secondary display shows the value of the standard solution (pH 1.68, 4.01, 7.00, 10.01, 12.45). To select other buffer values, use arrow keys.



Note: The LCD will display the actual pH value of the buffer at the point of calibration. For example, a pH 10.01 (@ 25 °C) buffer when calibrated at 20 °C will actually have a value of pH 10.06. Therefore, the meter will display this value of 10.06.

6 CALIBRATION

6.1 pH Calibration (With ATC)

The pH 1000/ 2500 bench meter is capable of multi-point calibration up to 5 points for enhanced full range accuracy using standard pH buffer options at pH 1.68, 4.01, 7.00, 10.01 and 12.45. In addition, these meters allow added flexibility for you to calibrate using other non-standard calibration buffers (via the CAL EDIT feature).

6.1.1 1 Point pH Calibration

1. Make sure the meter is ON and if necessary, press the **MODE** key to select pH mode. The pH indicator appears in the upper right hand corner of the display.
2. Rinse the electrode thoroughly with deionised water or a rinse solution. If using the ATC function with a separate temperature probe, rinse the temperature probe as well. **DO NOT** wipe both probes dry as it will cause a build-up of static and create instability in calibration and measurement.
3. Select the pH buffer and pour some into a clean container. Immerse both probes into the selected buffer and press **CAL** key, a [CAL] annunciator appears. The primary display shows the measured pH reading while the secondary display indicates the pH buffer value for calibration.
4. Select the correct buffer value on the meter. If the buffer used is a standard value, use **OPTION 1**. Otherwise use **OPTION 2** to calibrate the meter to the required value.

6.1.2 Option 1 - Standard Buffers

Select desired pH buffer standard using **▲** or **▼** key to scroll to the correct buffer value as indicated in the secondary display to that of the prepared buffer solution.

If the selected buffer is not within the accepted window (see below) from the measured pH value, the electrode and buffer icons flash and [ERR] annunciator appears next to the secondary display.

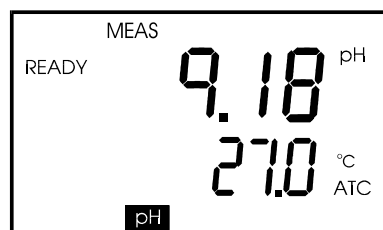
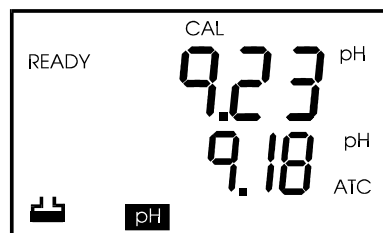
Window of Accepted Values:

pH 1.68	±1.00	pH 10.01	±1.00
pH 4.01	±1.00	pH 12.45	±1.00
pH 7.00	±1.50		

1. When reading stabilizes, a [READY] annunciator is displayed on left hand side of the LCD. Note the READY annunciator will be displayed after you have activated this function prior to measurement or calibration. For details refer to Section 7.1.
2. Press **YES** to confirm calibration or **NO** to cancel and re-enter. Upon confirmation, the CON indicator flashes at the top right hand side of the LCD to indicate that the instrument is now calibrated to the selected buffer. The secondary display automatically scrolls to the next pH buffer option.
3. You have performed one-point calibration successfully using standard buffer option after pressing YES key. To resume to measurement mode, press **CAL/MEAS** key while you are in the calibration mode.

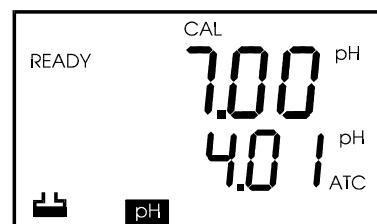
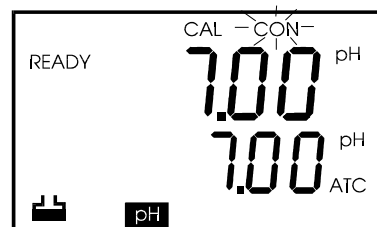
6.1.3 Option 2 - Non-Standard Buffers

1. Press **CAL EDIT** key after entering into pH calibration mode. The buffer icon blinks at the bottom left hand corner of the LCD. Select the buffer value by entering the value directly via the **keypad numeric keys**. For example, 9.18. The value entered is displayed in the secondary display. Please ensure the correct pH buffer sample is available during calibration.
2. When reading stabilizes, a [READY] annunciator is displayed on left hand side of the LCD. Note this READY annunciator will be displayed after you have activated this function prior to measurement or calibration. For details refer to Section 7.1.
3. Press **YES** to confirm calibration or **NO** to cancel and re-enter. Upon confirmation, the CON indicator flashes at the top right hand side of the LCD to indicate that the instrument is now calibrated to the selected buffer. The secondary display automatically scrolls to the next pH buffer option.
4. You have performed one-point calibration using non-standard buffer option successfully after pressing YES key. To resume to measurement mode, press **CAL/MEAS** key while in the calibration mode. The primary display shows the calibrated pH buffer value (in this case, pH 9.18) and the secondary display shows the measured temperature value.



6.2 Multi-Point pH Calibration (Up to 5 Points)

1. Follow steps 1 to 4 of "1 Point Calibration".
2. If your 1 Point Calibration began with the default buffer value of pH 7.00 (@ 25 °C), then the meter automatically scrolls to the next value, pH 4.01. The next value automatically shown is 1.68 after which the value scrolls round to 12.45 and then 10.01 and back again to 7.00.
3. To select the second buffer you wish to calibrate at, use **▲** or **▼** key to scroll through the buffer options.
4. Follow steps (2) to (4) of the 1 Point Calibration procedure until the entire buffer values that you wish to calibrate are complete. Do not press **CAL/MEAS** key until all calibration is complete.
5. Press **CAL/MEAS** key when all calibrations are complete to return to the measurement mode. Display now shows MEAS.



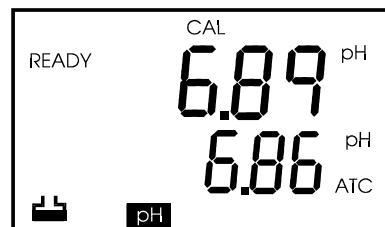
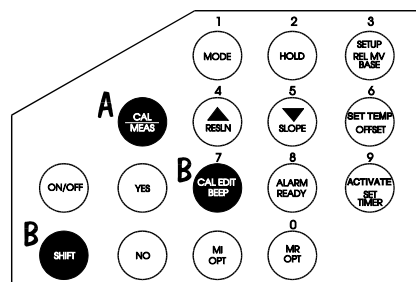
Important: OR Indicator

The ERR indicator flashes if the buffer value is not within +/-1 pH of the measured buffer value. This indicator also flashes if the buffer value is different from that shown on the secondary display.

6.3 Special Topic: CAL EDIT (for Custom/Non-Standard Buffers)

The pH 1000/ 2500 bench meter allows non-standard or custom buffer solutions to be used for calibration. This is especially useful in applications where the use of special or non-standard pH buffer solution is required. To use, follow the steps as described.

1. When in the CAL (pH) mode, press **CAL EDIT** key. Refer to section 6.1.3 for further details.
2. The buffer icon at the bottom of the LCD blinks.
3. Enter the desired pH value using the **numeric keys**.
4. Confirm calibration by pressing **YES** or **NO** to re-enter the value.
5. To enter another non-standard value, repeat steps 1 to 4 again.



NOTE :

As the buffer value entered in the CAL EDIT mode is non-standard, the meter will not retain that buffer as an option in future calibrations. You have to re-enter the value of the buffer.

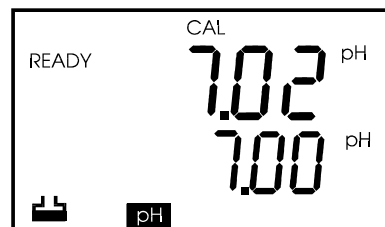
The division of the calibration ranges to a pH range within +/1 pH of the standard buffer options ensures that only one point can be calibrated in any one of the five ranges.

6.4 pH Calibration (without ATC)

Manual Temperature Compensation (MTC) is done by manually setting the temperature to that of the buffer prior to calibration. The procedure to set the temperature is outlined in the section on Temperature Calibration.

Set the desired temperature value in the meter using software calibration procedure outlined in the Temperature Calibration. Calibrate for pH using the steps for pH calibration (ATC) using steps (1) - (5) of Multi-point pH Calibration.

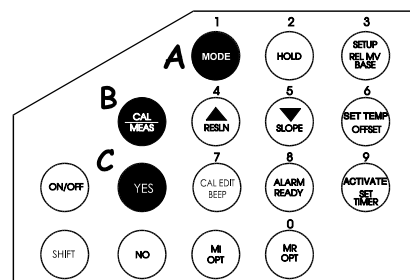
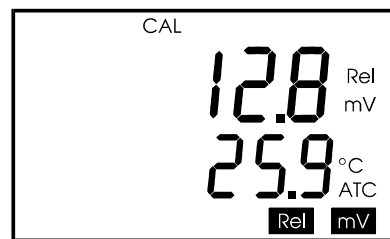
IMPORTANT: For manual compensation, the temperature probe must be disconnected. The ATC annunciator is not displayed on the right hand side of LCD when in calibration and measurement modes.



6.5 Relative mV Calibration

Relative millivolt calibration is normally used for Redox sensors in which you set a base value. For the selection and preparation of appropriate calibration solutions, consult the instruction manuals for the Redox/ORP electrodes.

1. Make the appropriate electrode connections and switch on the meter.
2. Select [Rel] [mV] mode by pressing **MODE** key repeatedly until the Relative mV mode is accessed.
3. Press **CAL/MEAS** key to activate calibration mode. The [CAL] annunciator displays on top of the LCD. The LCD displays the absolute mV reading.
4. Select the Base Offset value using the **numeric keys**. The resulting value displayed in the measurement mode, is [Absolute mV displayed] - [Base Offset]. Once this value is entered, the Redox/ORP probe is calibrated to the selected standard.
5. Press **YES** to confirm selected value or **NO** to cancel and re-enter the value. If calibration has been successfully performed, the meter is now calibrated for relative mV measurements.
6. Press **CAL/MEAS** key to return to the measurement mode. The primary display shows the measured relative mV readings.

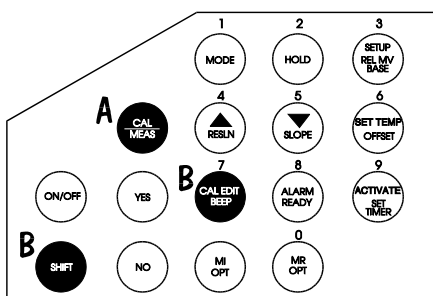
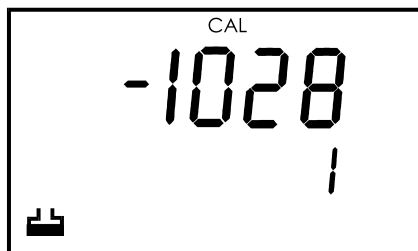


Hint 1: To set the Relative mV offset to 0.0 using the present calibration solution, proceed to step (5) without entering any value.

Hint 2: For Redox/ORP calibration, set the Relative mV offset using the following equation:

$$[\text{Relative mV Offset}] = [\text{Displayed Value}] - [\text{Value of Standard/Desired Value}]$$

Hint 3: To recall the selected Base Offset, press SHIFT and followed by Relative mV Base key on the keypad.



6.6 Ion Calibration (for pH 2500 only)

Ion calibration is used for ion selective electrodes (ISE). For the selection and preparation of appropriate calibration solutions, consult the instruction manuals for the list of ISE probes and calibration standards available.

1. Make the appropriate electrode connections and switch on the meter.
2. Select mode by pressing **MODE** key repeatedly until the Ion mode is accessed, as indicated in the LCD. Dip electrode(s) in first standard.
3. Press **CAL/MEAS** key to activate calibration mode. The 'CAL' indicator displays on the LCD. Top display shows measured mV value from electrode and bottom display shows 1 indicating first standard.
4. Once the 'READY' indicator displays, press **CAL EDIT** key to enter the concentration value of the standard. Use **numeric keys** to enter the value 0 to 9999. When entering concentration value, if decimal point is pressed, then rest of the digits (total 4 digits) must be entered e.g. 10 or 10.00. The available calibration options include 0.1; 1.0 or 1; 10.0 or 10; 100.0 or 100 and 1000. Refer to below notes for details.
5. Press **YES** to confirm the selected value or **NO** to cancel and re-enter the value.
6. For the next calibration value, wash electrode with deionised water and dip it into second standard and repeat step 4. Proceed to next calibration points until you have finished. Press **CAL/MEAS** key to switch to measurement mode if calibration is done using less than 5 standards.
7. At the end of fifth standard ion calibration, the meter switches to [MEAS] mode automatically once these values are entered. The ISE probe is calibrated to the selected standard solutions.

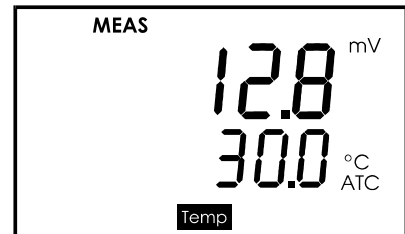
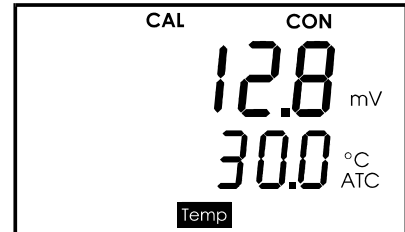
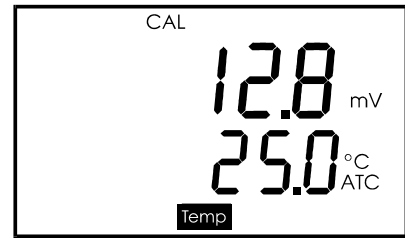
NOTE: Minimum number of calibration for Ion is 2 points, maximum is 5 points. At least 2 standards (preferably one decade apart in concentration value) must be used to complete the calibration. If less than 2 standards are used then calibration is ignored. Refer to Troubleshooting

IMPORTANT :
Make sure to wash electrode between samples to prevent cross-contamination. It is advisable to read samples in the order of low concentration to high concentration.

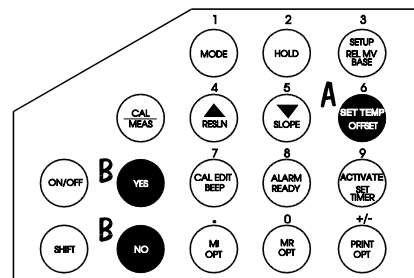
6.7 Temperature Calibration

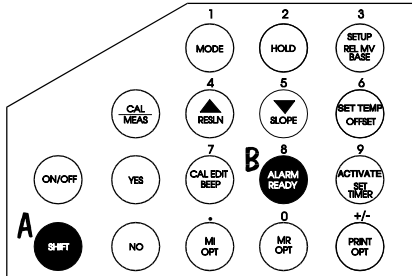
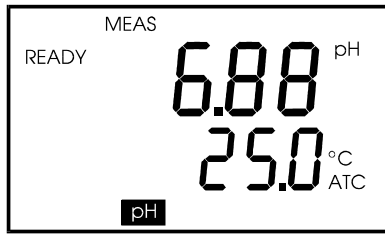
In this calibration procedure, the ATC probe is attached to the meter and the ATC annunciator displays on the right hand side of the LCD.

1. Dip the temperature probe into a solution of known temperature, such as a temperature bath for a few minutes until the temperature probe stabilizes. Determine the temperature of the sample to be measured using an accurate thermometer.
2. To perform temperature calibration, press **MODE** key to select the temperature mode.
3. Press **SET TEMP** to set the desired temperature to match that measured value. The CAL annunciator lights up.
4. Select the temperature value using the **numeric keys**.
5. Press **YES** to confirm the selected temperature. The CON annunciator flashes for one second and disappears. The meter reverts to the pH measurement mode. The temperature is now set to the temperature selected. Note: Temperature can only be set between -9.9 °C to 110.0 °C.



IMPORTANT :
 Always conform to the temperature limits of the sensor probe (e.g. epoxy pH probes with a built in temperature sensor should not be used or calibrated at temperatures above 80 °C.) If unsure, check with specifications of the probe.





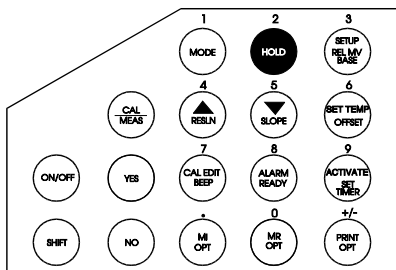
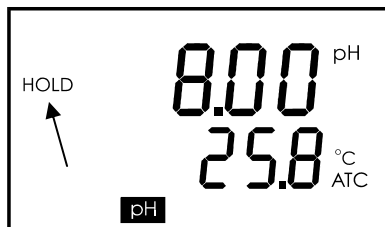
7 MEASUREMENT: READY, CONTINUOUS AND HOLD

7.1 Measurement in the READY Mode

The READY annunciator appears the readings are stable at the top left corner of the LCD. The reading is held as long as the variation of readings is within a range. (For pH, tolerance is +/- 0.02 pH. For mV, tolerance is +/- 0.3 mV < 400 mV and +/- 1.2 mV > 400 mV).

1. Rinse the pH electrode using de-ionized or distilled water prior to use. This will remove impurities that have adhered on the electrode body.
2. Switch to the MEAS mode for measurement. The MEAS mode is activated whenever the meter is switched on. If you are in the calibration mode, press **CAL/MEAS** key to revert to the measurement mode.
3. Dip the electrode into the sample ensuring that the glass bulb of the electrode is completely immersed into the sample. Swirl electrode gently in the sample. When reading stabilizes, the READY annunciator displays.

NOTE:
If the READY indicator is turned off, the readings are instantaneous readings. Allow readings to stabilize before reading for highest accuracy.



7.2 Measuring in the Continuous Mode

As the READY function provides stable readings, the continuous mode provides instantaneous readings for faster operation. Continuous mode readings, however, may not be as stable. To turn off READY, see page 22. Follow steps (1) to (3) of READY mode measurements.

7.3 HOLD Function

This feature allows you to hold the value of the measurement reading until it is more convenient to note the reading. This mode can be activated at any time when you are in the MEAS mode. You can store the held value into memory if HOLD is active.

7.3.1 Holding and Releasing a Measured Value

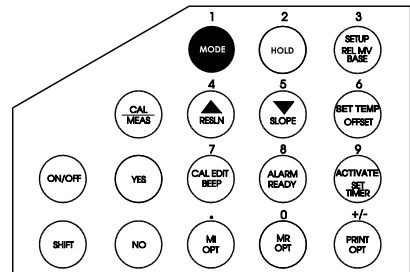
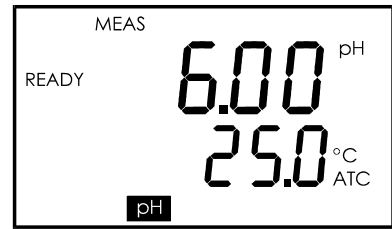
In the measurement mode, press HOLD key to hold a displayed value. When HOLD mode is activated, the HOLD mode annunciator displays.

To release a held value, press HOLD key again. The HOLD mode annunciator disappears from the LCD and the meter reverts to its measurement mode.

7.4 Measuring pH

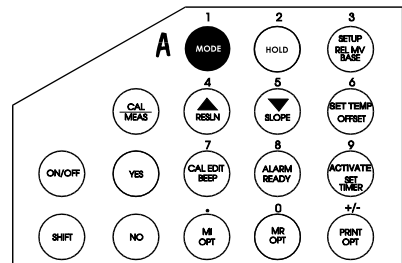
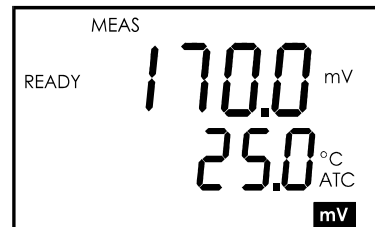
The meter automatically goes to the pH measurement mode when you power it on.

1. If you are not in the pH measuring mode, press **MODE** key until the mode annunciator at the bottom of the LCD shows that the meter is in the pH mode.
2. To measure in READY mode, follow steps (1) to (3) of the steps in "Measuring in the READY Mode".
3. The primary display shows the pH reading and the secondary field shows the temperature.

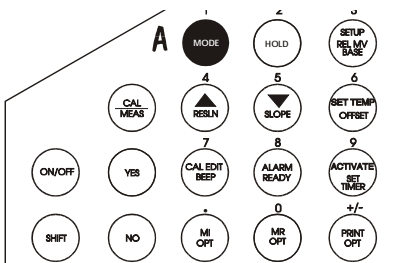
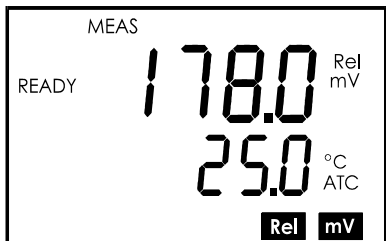


7.5 Measuring mV

1. If you are not in the mV measuring mode, press **MODE** key until the mode annunciator at the bottom of the LCD shows that the meter is in the mV mode.
2. To measure in READY mode, follow steps (2) to (3) of the steps in "Measuring in the READY Mode".
3. The primary display shows the mV reading and the secondary field will show the temperature. The resolution will be 0.1 mV within the +/-399.9 mV range and +/-1 mV beyond. Beyond the operation range of the meter, it will show "Ur" and "Or" in the primary display to denote under range and over range respectively.



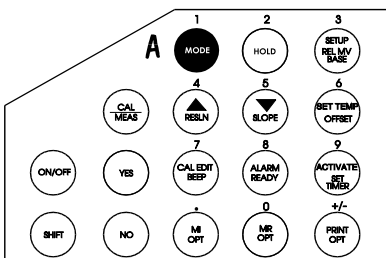
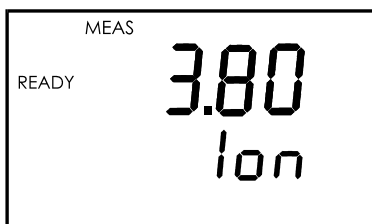
NOTE:
 Electrode can be attached to an electrode holder for a more stable operation.
 Remember to remove the rubber cap from the electrode tip prior to measurement.



7.6 Measuring Relative mV

1. If you are not in Relative mV measuring mode, press **MODE** key until the mode annunciator at the bottom of the LCD shows that the meter is in the Relative mV mode.
2. To measure in READY mode, follow steps (2) to (3) of the steps in "Measuring in the READY Mode".
3. The primary display shows the corrected Relative mV reading and the secondary field shows the temperature. The resolution will be 0.1 mV within the +/-399.9 mV range and +/-1 mV beyond. Beyond the operation range of the meter, it shows "Ur" and "Or" in the primary display to denote under range and over range respectively.
4. The displayed value is actually the result of subtracting the base mV value (Set by yourself; see Calibrating Relative mV in Section 6.5) from the absolute mV reading. The default setting of this base value is 0 mV.

To recall the base value set, press **SHIFT** followed by **Rel mV** key.



7.7 Measuring Ion (for pH 2500 only)

If you are not in the Ion measurement mode, press **MODE** key until the mode annunciator at the bottom of the LCD shows that the meter is in the Ion mode.

To measure in READY mode, follow steps (2) to (3) of the steps in "Measuring in the READY Mode". The primary display will show the Ion reading and the secondary field will show "Ion". While measuring between samples, remember to rinse the electrode with deionized water before proceeding to the next sample, to avoid cross-contamination if any.

8 SETUP FUNCTIONS AND KEYS

The advanced SETUP mode allows user customization of the meter's operation to individual's preferences and defaults. To enter into the SETUP mode, press the **SETUP** key while in any measurement mode.

Use ▲ or ▼ key to select options if changes are required.

Press **YES** key to confirm selection in each program. The display will automatically scroll to the next program in sequence. At the last program option, pressing YES will return control to measurement mode.

To exit program at any time, press **CAL/MEAS** key.

Three types of setting/operating information for all programs:

Meter Operations :

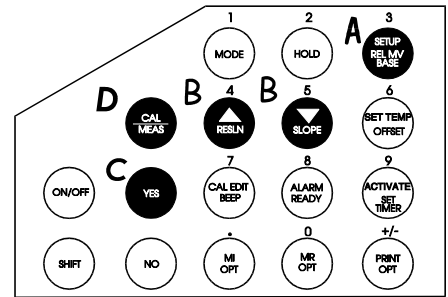
Activating Auto Off functions;
Time & Date Setting;
Memory Reset.

Diagnostic Information:

Last Calibration Date and Time;
Calibrated Buffer Points;
Last Calibrated Temperature.

Communication Data Protocol (with a printer or computer):

Baud Rate;
Parity Bit;
Stop Bit.

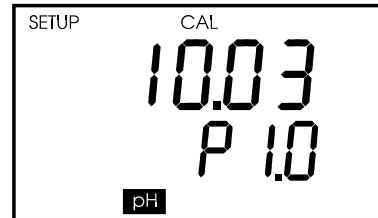


9 PROGRAM 1: LAST CALIBRATION TIME, DATE AND TEMPERATURE

This program allows you to view the last pH calibration performed - time and date (month, day and year). Calibrated pH buffer and temperature values are also available for viewing.

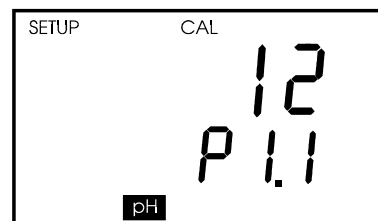
Program 1.0: Last Calibration Time

Viewing only. No options. Press **YES** to go to next program.



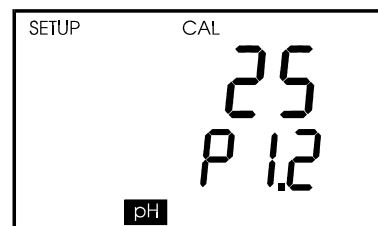
Program 1.1: Last Calibration Month

Viewing only. No options. Press **YES** to go to next program.



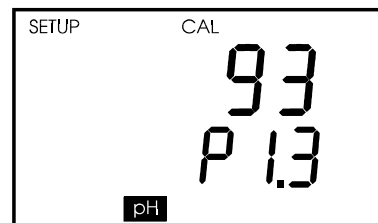
Program 1.2: Last Calibration Date

Viewing only. No options. Press **YES** to go to next program.



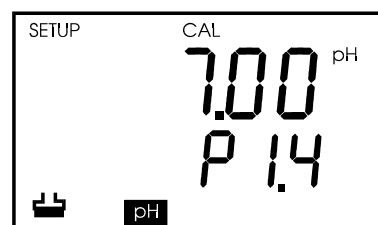
Program 1.3: Last Calibration Year

Viewing only. No options. Press **YES** to go to next program.



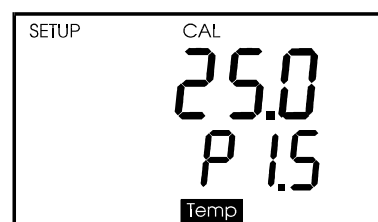
Program 1.4: Calibrated Buffers

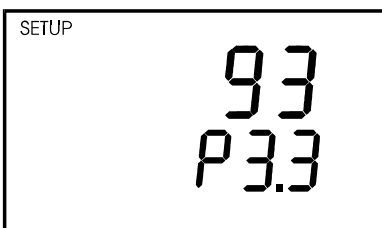
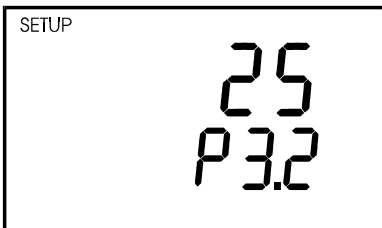
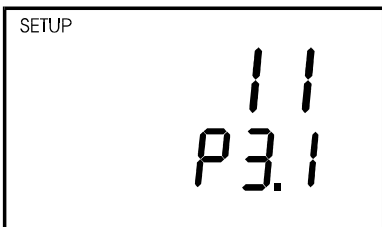
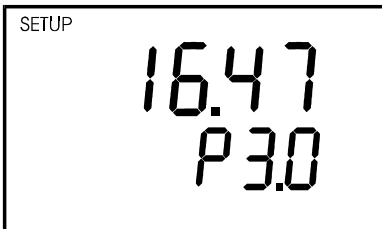
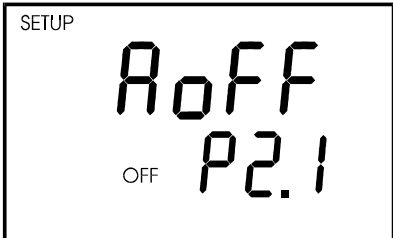
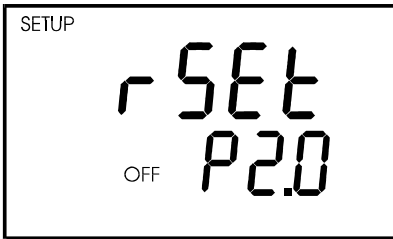
Viewing only. Displays all buffer values which have been calibrated at. Use ▲ or ▼ key to scroll through values. If no buffers were calibrated, the display shows " - - - ". No options. Press **YES** to go to next program.



Program 1.5: Last Calibration Temperature

Viewing only. Displays the temperature at which the meter was calibrating. Default setting is 25 °C. No options. Press **YES** to go to next program.





10 PROGRAM 2: MEMORY RESET AND AUTO-OFF FUNCTION

This program allows you to clear all the memory stored and to activate the Auto-Off function.

Program 2.0: Memory Reset

Selecting ON clears all data in memory including pH calibration data and also Relative mV calibration data. The meter automatically switches off and the clock appears. To proceed, switch the meter on again. If reset is required, press ▲ or ▼ to select the ON option and confirm by pressing YES.

Program 2.1: Auto Off

This function is present to conserve energy by shutting off the meter after 30 minutes from the last key is pressed. Factory default sets this option to ON. Press ▲ or ▼ key to select option and confirm by pressing YES.

11 PROGRAM 3: SET CURRENT TIME AND DATE

This program is used to set the current date and time of the meter. The values will be stored and displayed once it is entered into memory, unless the meter is set to default settings.

Program 3.0: Display and set time

Use **numeric keys** to set time. Press **YES** to confirm.

Program 3.1: Display and set month

Use **numeric keys** to set time. Press **YES** to confirm.

Program 3.2: Display and set date

Use **numeric keys** to set time. Press **YES** to confirm.

Program 3.3: Display and set year

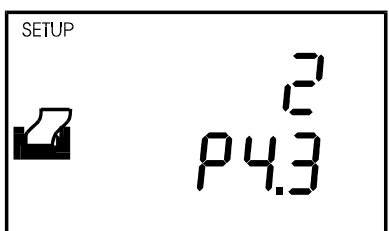
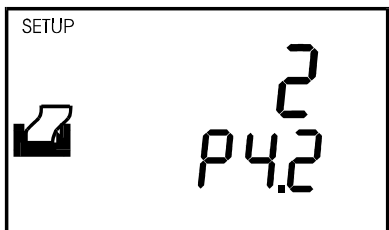
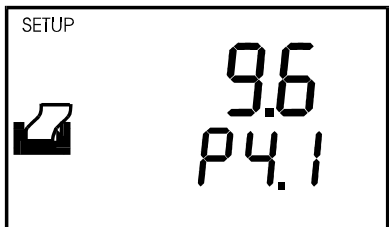
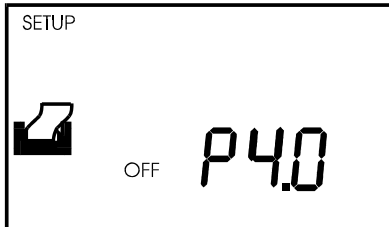
Use **numeric keys** to set time. Press **YES** to confirm.

12 PROGRAM 4: COMMUNICATION SETUP

Program 4 allows you to retrieve **SETUP** settings as well as to set up communication parameters for connection to external devices such as the printer or PC. Set the options to match with other optional devices.

Program 4.0: Meter Setup Printing

Select the **ON** option using **▲** or **▼** key if you want the settings as well as all calibration data to be printed out via the RS232C port. This is useful for you to see all setup functions at a glance.



Program 4.1: Baud Rate

Press **YES**. Default is 9.6 Kbps.

Program 4.2: Parity Bit

Press **YES**. Default is 2 (even).

Program 4.3: Stop Bit

Press **YES**. Default is 2.

The meter then automatically returns to the measurement mode.

SUMMARY OF SETUP OPTIONS

Program	Function	Active Keys	Options	Factory Defaults
Last pH Calibration Information				
P1.0	Last Calibration Time	-	-	-
P1.1	Last Calibration Month	-	-	-
P1.2	Last Calibration Date	-	-	-
P1.3	Last Calibration Year	-	-	-
P1.4	Last Calibration Temperature	-	-	-
P1.5	Display Calibrated Points	▲ or ▼	Only calibrated points will be displayed.	"- - - -" No Calibration.
Memory Reset, General Meter Operation				
P2.0	Auto-Off	▲ or ▼	ON/OFF	ON
P2.1	Reset Meter	▲ or ▼	ON/OFF	OFF
Current Date & Time Setting				
P3.0	Set Current Time	Numeric Keys	-	08.30
P3.1	Set Current Month	Numeric Keys	-	11
P3.2	Set Current Date	Numeric Keys	-	10
P3.3	Set Current Year	Numeric Keys	-	93
Communication Setup				
P4.0	Print SETUP options	▲ or ▼	ON/OFF	OFF
P4.1	Select Baud Rate	▲ or ▼	-	9.6
P4.2	Select Parity	▲ or ▼	-	2
P4.3	Select Stop Bits	▲ or ▼	-	2

When using the Setup Functions:

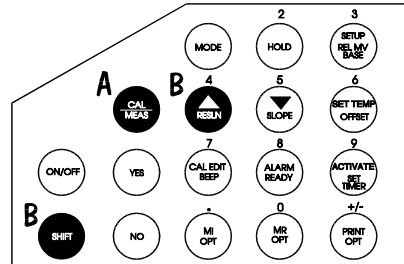
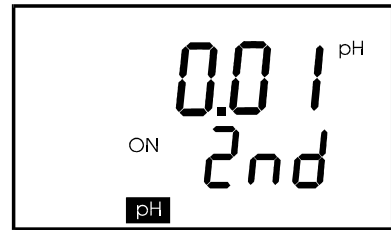
Use ▲ or ▼ key to toggle between options; or use the numeric keys to input numbers. Note that certain setup functions provide information only, and have no customizing options.

12.1 Switching pH Resolution

Ensure that you are in the pH measurement mode. It does not matter which measurement mode you are in as the meter only toggles the pH resolution (as the resolution of mV and Relative mV settings is automatically set).

Press SHIFT and then RESLN key. The LCD shows the resolution to be set. After two seconds the meter reverts to its normal operation.

Each time this function is activated, the meter automatically switches between the two resolution options provided (0.01 and 0.1).

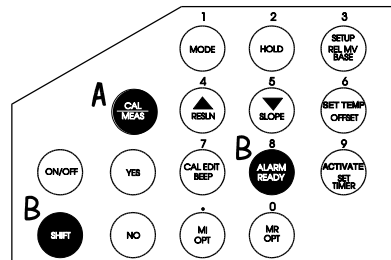
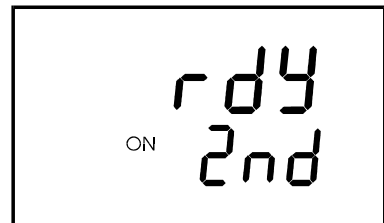


12.2 Setting the READY Indicator

The READY indicator is displayed whenever the readings stabilize to within +/-0.02 pH tolerance (for pH measurements) or a tolerance mV level of +/- 0.8 mV for < +/-400 mV and +/- 1.2 mV > +/-400 mV (for mV and Relative mV measurements).

Ensure that you are in the any measurement mode. Press SHIFT and then READY key. The LCD will show the READY option to be set.

Each time this function is activated, the meter automatically switches between READY ON and READY OFF. After two seconds the meter will revert to normal operation.

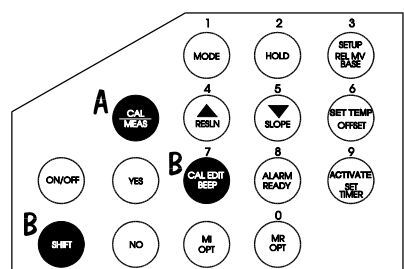
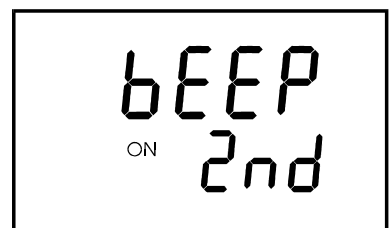


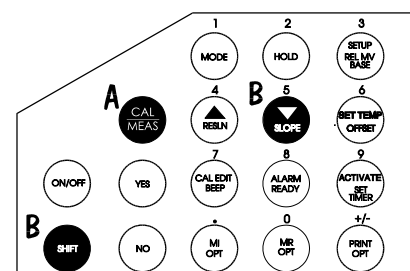
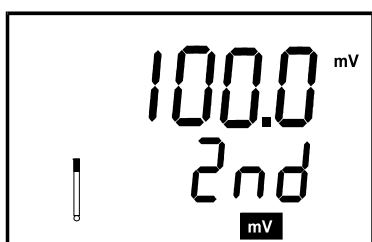
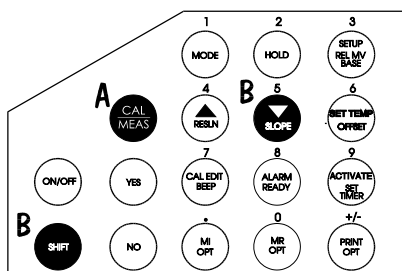
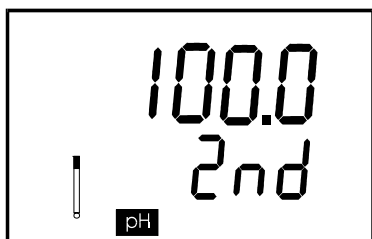
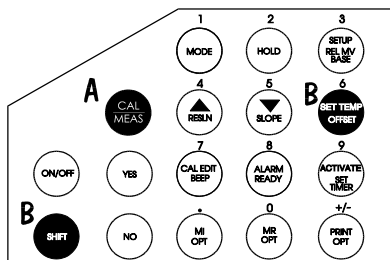
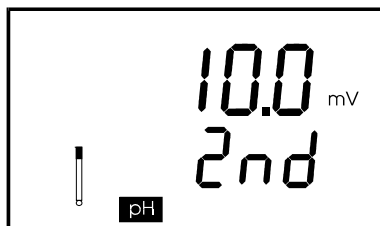
12.3 Setting the Audible BEEP

If the BEEP function is ON, the meter beeps every time a key is pressed. The beep can also be turned off using this function.

1. Ensure that the meter is in any measurement mode.
2. Press **SHIFT** and **BEEP**. The LCD shows the BEEP option to be set (ON or OFF).
3. Each time this function is activated, the meter automatically switches between BEEP ON and BEEP OFF. After two seconds the display then reverts to its normal operation.

NOTE:
The meter will automatically toggle between BEEP ON and BEEP OFF every time this function is accessed.





12.4 Viewing pH Electrode Offset

This function is diagnostic in nature and allows you to view the offset of the pH electrode in mV. The offset is based on the pH 7.00 buffer calibration. If the calibration has yet to be performed at this pH, the meter shows 00.0 mV (which is the ideal). The mV shows the efficiency of the electrode and how much the meter has to compensate for it. Generally a value of +/- 15 mV is acceptable with the ideal being 0.0 mV.

1. Ensure that you are in the pH measurement mode.
2. Press **SHIFT** and **OFFSET**. The LCD shows the offset of the pH electrode.

12.5 Viewing pH Electrode Slope

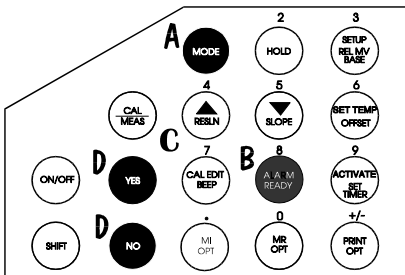
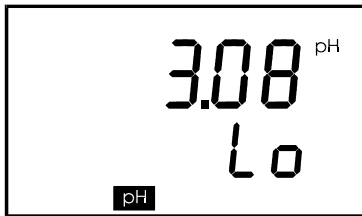
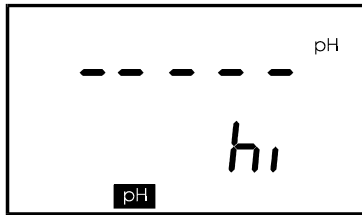
This diagnostic function allows you to view the slope of the pH electrode based on the Nerstian equation. Slope displayed is the average slope based on calibrations. If no calibration has been performed or if the meter has been reset in the SETUP function, the meter shows the default value of 100.0%.

1. Ensure that the meter is in the pH measurement mode.
2. Press **SHIFT** and then **SLOPE** key. The LCD shows the slope percentage of the pH electrode. After two seconds the display then reverts to its normal operation.

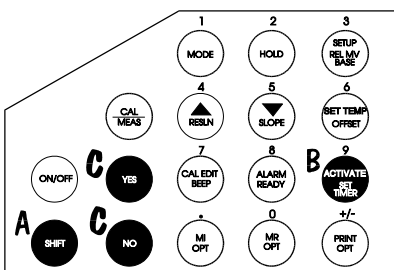
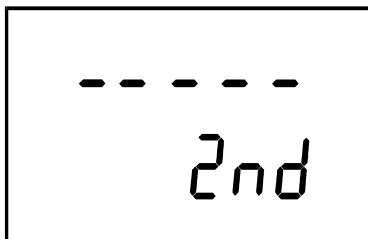
12.6 Viewing Ion Electrode Slope (for pH2500 only)

Similarly, in the Ion mode, you can view the slope of Ion electrode. Slope is displayed as mV per decade. If no calibration has been performed or if the meter has been reset in the SETUP function, the meter shows the default value of "- - -".

1. Ensure that the meter is in the Ion measurement mode.
2. Press **SHIFT** and **SLOPE**. The LCD shows the slope of the Ion electrode in mV/decade. After two seconds the display then reverts to its normal operation.



If you wish to skip input for either the High/Low setpoint, press YES key. Meter automatically exits to measurement mode.



12.7 Setting the High and Low Setpoint Alarm (pH/mV/Relative mV)

An alarm can be set to give an audible warning to you whenever the set limits for pH, Relative mV or mV has been exceeded.

Hint: You can set individual high and low setpoints for each of the measurement modes of pH, Relative mV and mV. The individual setpoint alarms will be automatically activated whenever the measurement mode of the set alarm is entered.

1. Press **ALARM**. The meter will prompt for the setting or changing of the setpoint. If no setpoint is set, the meter displays "- - - -". Otherwise the old setting is shown.
2. Enter the high setpoint using the **numeric keys**. To erase a setpoint, press +/- key twice.
3. Confirm using **YES** key. To cancel and re-enter press **NO**. Meter will advance to low setpoint upon confirmation of value.
4. Repeat steps 2 and 3 for the low setpoint setting. Meter then reverts to the measurement mode.

Hint: To shut off an alarm, go back into the ALARM function and press +/- key twice at the setpoint options. The alarm will then shut off.

12.8 Setting & Activating the Timer

The meter can be set to hold a reading at a particular time until it is read. This is done by first setting the timer countdown and activating it using the ACTIVATE key. At the time set, the meter holds the reading (until any key is pressed and gives a continuous beep to signal to you that the time set is reached.

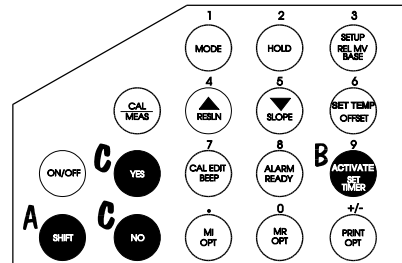
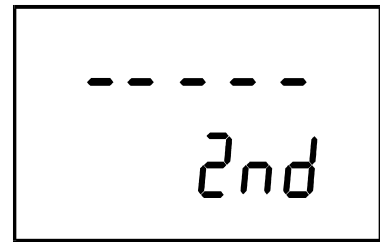
12.9 Setting the Timer

From the MEAS mode, press the SHIFT followed by SET TIMER key. The meter shows that the secondary function is on. If no time has been set, the LCD displays “- - - -”.

Use the numeric keys to enter the time required. Press YES to confirm or NO to re-enter value.

Upon confirmation, the meter returns to the measurement mode.

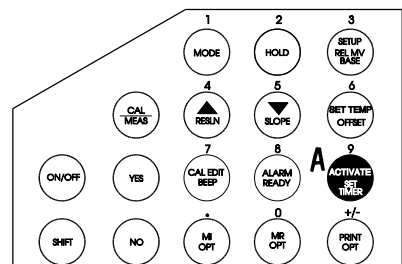
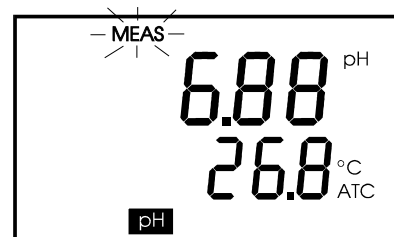
Note: The timer is NOT activated until you press the ACTIVATE key on the keypad.

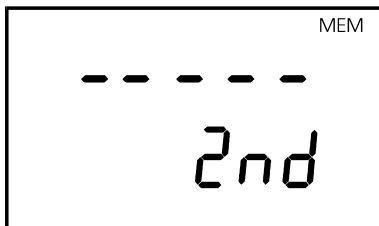
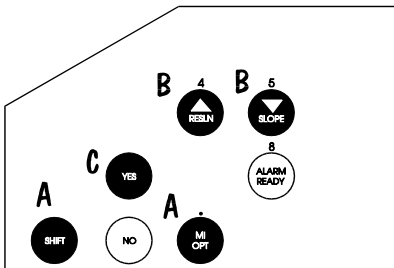
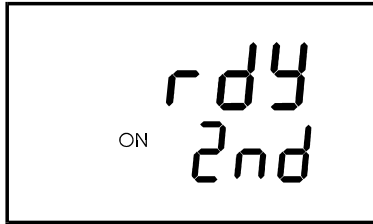
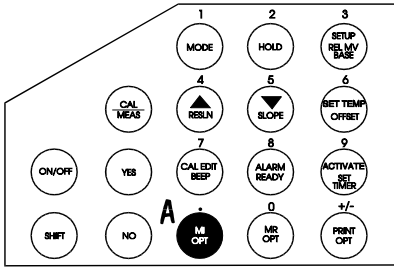


12.10 Activating the Timer

1. From the MEAS mode, press the **ACTIVATE** key to start timer countdown. The [MEAS] indicator flashes to indicate that the timer is on.
2. At the end of the time period, the alarm beeps to indicate that time is up. Press any key to switch off alarm.

To restart timer, press the **ACTIVATE** key again. To clear the timer, go to “Setting the Timer” and clear the time by pressing +/- key twice and confirming with **YES**.





12.11 Memory Input Functions and Options

The meters can store up to 16 sets of values (pH/mV/Relative mV together with temperature). The Last-In-First-Out (LIFO) method of the memory management is used. When the memory is full, the value stored in the first memory location will be erased to create space for the new input value.

1. During any measurement operation, press **MI**.
2. The MEM annunciator flashes to indicate that the data has already been stored into memory.

Memory Options

To access two MI options, press **SHIFT** followed by **MI/OPT**.

1st Option: Memory Input When Ready

The factory default setting is OFF. When turned ON, the meter automatically stores the reading into memory when the READY indicator is displayed.

Use ▲ or ▼ key to turn on or off the MI READY option. Press **YES** to confirm. Meter advances to the second option.

NOTE : To activate the MI READY option successfully, the READY mode must be ON prior to setting MI READY (See switching on READY mode). If not, go back to setting the READY on before returning to this option.

2nd Option: Input Time Interval

This option allows you to input readings into the memory at a user selected time interval (between 1 minute to 23 hours 59 minutes). Default is "-----".

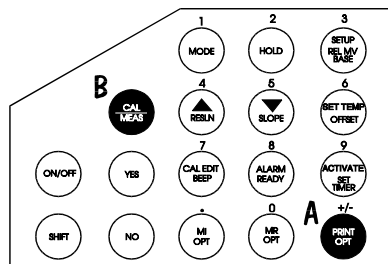
To access memory input on time interval function:

1. Press **SHIFT** and then **MI**. The first option READY appears.
2. Press **YES** to proceed to the next option - time interval function.
3. Enter the desired time interval using the **numeric keys** followed by **YES** to confirm. To cancel an entry before confirming, press **NO** and re-enter value before confirming. Meter will return to the measurement mode.
4. To remove a previously set time interval, press the **+/-** key twice before confirming.

12.12 Print Functions and Options

This function allows the printing of measurements directly to a peripheral device via the RS232C port of the meter.

1. Set the mode to the parameter that you wish to print, in the MEAS mode.
2. Press **PRINT** key to send the displayed reading. The printer indicator will flash to show that data is being sent.
3. 'ERR' symbol blinks if the cable is not connected properly or setup does not match PC requirements.
4. Press **CAL/MEAS** to exit error situation.



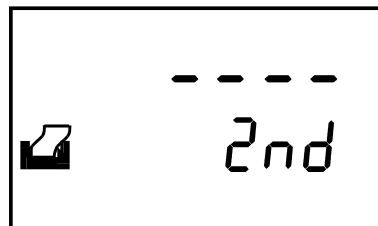
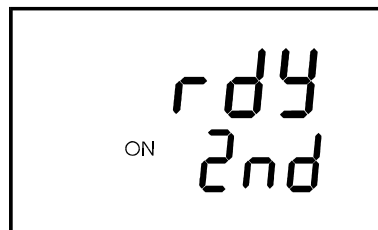
12.12.1 Print Function Options

To access Print function options, press the **SHIFT** key and then the **PRINT/OPT** key. Option 1 will appear.

1st Option: Print on READY

Default is OFF. Setting the option to ON will cause data to be sent to the RS232C port whenever the READY indicator appears.

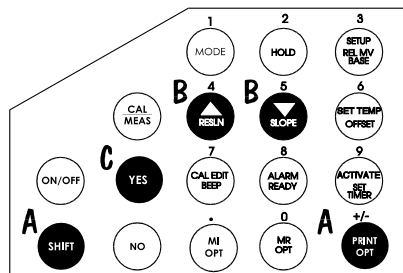
1. Press **SHIFT** key followed by the **PRINT/OPT** key.
2. First option - print on READY - appears. Use ▲ or ▼ to set to ON.
3. Press **YES** to confirm and proceed to the next option.



2nd Option: Print at Time Interval

If no interval is set, the "- - -" display is shown. Enter the desired time interval using the numeric keypad. The meter sends the data to the RS232C port at the specified time interval. Press **YES** to confirm.

1. Press **SHIFT** key followed by the **PRINT/OPT** key.
2. First option - print on READY - appears. Use ▲ or ▼ to select the Print on Time Interval option.
3. Press **YES** to confirm and use **numeric keypad** to set time (between 00.01 to 23.59).
4. Press **YES** to confirm and meter will then return to the measurement mode and automatically starts printing data.



Note: Cable connection and meter protocol setup parameters must be correct before sending data.

13 TROUBLESHOOTING AND ERROR MESSAGES

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Power ON but no display.	AC adapter not connected properly.	Connect AC adapter properly.
Unstable Reading.	Electrode submersion in sample is insufficient.	Place electrode deeper into sample.
	Broken electrode.	Replace electrode.
	External noise causing instability in reading.	Remove or switch off interfering motor.
	Dirty electrode.	Clean Electrode. Reactivate if necessary.
Slow response.	Dirty electrode.	Clean Electrode. Reactivate if necessary.

ERROR MESSAGES

LCD Display	Indicates	Cause	Solution
Err 1 (On primary display) + 2 short beeps.	Memory write error.	Unit is too old (> 10 years).	Turn meter off and then on. Return if necessary.
Err 2 (On primary display) + 2 short beeps.	Memory checksum error.	Hardware failure.	Turn meter off and then on. Return if necessary.
Err 3 (On primary display) + 2 short beeps.	ADC error.	Hardware fault.	Turn meter off and then on. Return if necessary.
Err 4 (On primary display) + 2 short beeps.	Keypad error.	One or more keypads are stuck.	Turn meter off and then on. Return if necessary.
Err 5 (On primary display) + 2 short beeps.	Real time clock failure.	Unit is too old (> 10 years).	Turn meter off and then on. Return if necessary.
No display + 2 short beeps.	ADC error.	Hardware fault.	Turn meter off and then on. Return if necessary.
Err annunciator + 2 short beeps.	Wrong keypad.	Wrong key pressed.	Release key and select correct key.

14 ELECTRODE CARE

14.1 Electrode Activation

DO NOT touch or rub the glass bulb. If you follow the strong and maintenance procedure, you can use your electrode immediately. If the electrode responds sluggishly or drifts, the bulb may be dehydrated. Immerse the electrode in an ideal storage solution such as electrode storage solution or pH 4 buffer solution for 1-2 hours to hydrate it. See **Storing pH/ORP electrodes** below.

If this procedure does not hydrate the electrode, reactivate or replace it.

Use 2 or 3 point calibration to test your electrode performance. If you do not get good readings, use a different pH electrode to confirm the meter is working properly. If the results are still not satisfactory, consult your distributor/dealer.

14.2 Electrode Maintenance

pH electrodes are susceptible to dirt, dehydration and contamination. Clean them regularly depending on the extent and condition of use.

14.3 Storing pH/ORP electrodes

For best results, always keep the bulb wet, preferably in pH storage solution. Other pH buffers or tap water are also acceptable. Do not store in de-ionized water. Eutech offers a complete range of electrode storage and cleaning solutions.

After Use

1. After each series of measurements, wash the electrode and reference junction in de-ionized water.
2. If using a refillable electrode, close the refilling hole by placing its rubber sleeve or stopper plug into its position.
3. Store the electrodes as mentioned above.

Electrode Cleaning

Electrodes that are mechanically intact can often be restored to normal performance by one or a combination of the following options.

Some suggestions for:

a. Salt deposits which are normal on all electrodes

Dissolve the deposit by immersing the electrode in tap water for 10 to 15 minutes. Thoroughly rinse with de-ionized water.

b. General dirt and protein coatings

Soak the electrode for several hours in the general-purpose electrode cleaning solutions. Rinse in de-ionized or tap water.

c. Oil/Grease Films

Wash the electrode pH bulb in a little dish washing detergent and water. Rinse the electrode tip with de-ionized water.

15 METER SPECIFICATIONS

Model	pH 1000	pH 2500
pH Range	-2.00 to 19.99 pH	
Resolution	0.01 / 0.1 pH (user-selectable)	
Relative Accuracy	± 0.01 / 0.1 pH	
mV Range	± 1999 mV	
Resolution	0.1 mV within ± 399.9, 1 mV beyond ± 1000 mV	
Accuracy	± 0.2 mV within ± 399.9, ± 2 mV beyond ± 1000 mV	
Relative mV Range	± 1999 mV	
Resolution	0.1 mV within ± 399.9, 1 mV beyond ± 1000 mV	
Accuracy	± 0.2 mV within ± 399.9, ± 2 mV beyond ± 1000 mV	
Ion Concentration Range	-	0 to 9999
Resolution	-	± 1 least significant digit
Accuracy	-	± 0.5% of reading
No. of Ion Calibration Points	-	Up to 5 points (min. 2 points)
Temperature Range	-5.0 to 105.0 °C	
Resolution	0.1 °C	
Accuracy	± 0.5 °C	
Temperature Compensation	Automatic / Manual (reference at 25 °C)	
No. of pH Calibration Points	5 (Standard & non-standard)	
Standard pH Buffer Options	pH 1.68, 4.01, 7.00, 10.01, 12.45	
Inputs	BNC, Phono (ATC), Reference, Ground	
RS232C Output	Yes	
Recorder Output	± 2000 mV, 1 mV/mV unit	
Power Requirements	AC/DC 9V Adapter (110 VAC/220 VAC)	
Display	Custom Dual LCD (1 x 4 digit, 1 x 3.5 digit, 24 annunciators)	
Dimensions (L x W x H)	230 x 180 x 63 mm (meter only); 395 x 260 x 90 mm (boxed)	
Weight	750 gm (unit); 1250 gm (boxed)	

16 ACCESSORIES

Consult your Authorized Distributors for these items and other range of specialized pH electrodes or Ion Selective Electrodes.

Replacement meters & accessories

Item	Eutech Instruments Ordering Code	Oakton Instruments Ordering Code
pH 1000 meter with 110 V adapter (EC-110-ADA / 35615-07)	~	35616-02
pH 1000 meter with 220 V adapter (EC-220-ADA / 35615-08)	~	35616-07
pH 2500 meter with 110 V adapter (EC-110-ADA / 35615-07)	~	35620-12
pH 2500 meter with 220 V adapter (EC-220-ADA / 35615-08)	~	35620-17
pH 1000 meter with temperature probe (EC-PH-TEMB01P).	EC-PH1000/01N	~
pH 2500 meter with temperature probe (EC-PH-TEMB01P).	EC-PH2500/01	~
Glass-body combination pH electrode (refillable)	EC-FG73504-01B	35805-04
Plastic-body combination double junction pH electrode	EC-FC72522-01B	35641-51
Plastic-body combination double junction ORP electrode	EC-FC79602-01B	35649-51
Temperature probe (for ATC)	EC-PH-TEMB01P	35615-05
Meter to PC communication cable 9-pin (F) to 9-pin (M)	ECCA01M09F09	35615-09
Meter to PC communication cable 9-pin (M) to 25-pin (F)	ECCA01M09F25	~
Printer cable, 25-pin (M) to 9-pin (M), connects meter to printer	~	35622-59
Serial Impact Dot-matrix Micro-printer; paper-roll portable printer with 25-pin female connector, with a roll of paper and 120VAC power adapter provided	EC-MICROPRNTR01	35622-00
Serial Impact Dot-matrix Micro-printer; paper-roll portable printer with 25-pin female connector, with a roll of paper and 220VAC power adapter provided	EC-MICROPRNTR02	35622-05
110/120V AC/ 9V DC power adapter	EC-110-ADA	35615-07
220/240V AC/ 9V DC power adapter	EC-220-ADA	35615-08

Calibration Solutions

Item	Eutech Instruments Ordering Code	Oakton Instruments Ordering Code
pH 4.01 calibration buffer (480 mL) (1 pint)	EC-BU-4BT	00654-00
pH 7.01 calibration buffer (480 mL) (1 pint)	EC-BU-7BT	00654-04
pH 10.01 calibration buffer (480 mL) (1 pint)	EC-BU-10BT	00654-08
Protein Cleaning Solution for pH electrode (480 mL) (1 pint)	EC-DPC-BT	00653-06
Storage Solution for pH electrode (480 mL) (1 pint)	EC-RE-005	00653-04
pH pouch assortment pack; 5 each of pH4.01, 7.00, 10.01 and deionized water (20 x 20 mL per box)	EC-AST-PK	35653-04
pH 4.01 buffer pouches (20 x 20 mL per box)	EC-BU-4BS	35653-01
pH 7.00 buffer pouches (20 x 20 mL per box)	EC-BU-7BS	35653-02
pH 10.01 buffer pouches(20 x 20 mL per box)	EC-BU-10BS	35653-03
Deionized water rinse pouches (20 x 20 mL per box)	EC-RIN-WT	35653-00

17 WARRANTY

The pH 1000/ 2500 bench meter is supplied with a **3-year** warranty from manufacturing defects and electrodes for **6 months** from the date of purchase.

If repair or adjustment is necessary and has not been the result of abuse or misuse within the designated period, please return – freight pre-paid – and correction will be made without charge. Eutech Instruments/ Oakton Instruments will determine if the product problem is due to deviations or customer misuse.

Out of warranty products will be repaired on a charged basis.

Exclusions

The warranty on your instrument shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the products

18 RETURN OF ITEMS

Authorization must be obtained from our Customer Service Department or authorized distributor before returning items for any reason. A “Return Goods Authorization” (RGA) form is available through our Authorized Distributor. Please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Eutech Instruments/ Oakton Instruments will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorized returns.

NOTE: Eutech Instruments Pte Ltd/ Oakton Instruments reserves the right to make improvements in design, construction, and appearance of products without notice.

NOTES

For more information on Eutech Instruments/ Oakton Instruments' products, contact your nearest distributor or visit our website listed below:

<p>Oakton Instruments P.O Box 5136, Vernon Hills, IL60061, USA Tel: (1) 888-462-5866 Fax: (1) 847-247-2984 E-mail: info@4oakton.com Web-sites: www.4oakton.com</p>	<p>Eutech Instruments Pte Ltd Blk 55, Ayer Rajah Crescent, #04-16/24 Singapore 139949 Tel: (65) 6778 6876 Fax: (65) 6773 0836 E-mail: marketing@eutechinst.com Web-site: www.eutechinst.com</p>	<p>Distributed by:</p>
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