Palintest

Micro 600 pH Meter

ZI INST 1200

Palintest

Preface

This manual serves to explain the use of the Micro 600 pH hand held meter.

This manual functions in two ways: first as a step by step guide to help you operate the meter; second, as a handy reference guide.

This manual is written to cover as many anticipated applications of the Micro 600 pH meter as possible. If there are doubts in the use of this meter, please contact us. Our contact details are on the last page of this manual.

Palintest will not accept any responsibility for damage or malfunction to the meter caused by improper use of the instrument.

The information presented in this manual is subject to change without notice as improvements are made. Please refer to our website for the latest version.

Contents

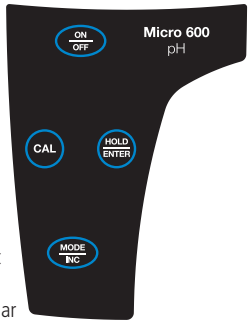
1.0 Introduction

Thank you for selecting our Micro 600 pH portable meter. This microprocessor-based handheld instrument is both economical and easy to use.

The Micro 600 pH measures pH, mV (ORP) and temperature (°C).

Each meter includes 4 x alkaline "AAA" batteries, a rubber armour/stand, pH7 buffer, pH4 buffer, Electrode Storage Solution, Deionised water, pH Electrode, Temperature Probe and instruction manual. Please refer to **Section - 7 Replacements and Accessories** for information on additional accessories and calibration solutions.

2.1 Description of Keypad Functions



The Micro 600 pH has four keys, on its splash-proof keypad as shown here:

ON/OFF Powers the meter on and off. Upon power on, the meter automatically begins in the measurement mode that was last used.

CAL Press to begin calibration of the selected mode. Press again during calibration to abort calibration and return to measurement mode without confirming any values.
During setup mode, function is similar to "escape" or "go back", returning to the previous screen.
With meter off, press and hold **CAL** to select the reset menu (rSt) while powering on.

MODE Selects measurement modes (pH, mV, & Temperature).

INC With meter off, press and hold **MODE/INC** to access the bUF (buffer), CAL (calibration), and ELE (electrode) setup menus while powering on. Press **MODE/INC** again to change setup menus.
Increment for Temperature setting and calibration.

HOLD Freezes measured reading. Press again to resume live reading.

ENTER Confirms calibration value in calibration mode and confirms selections in SETUP mode.

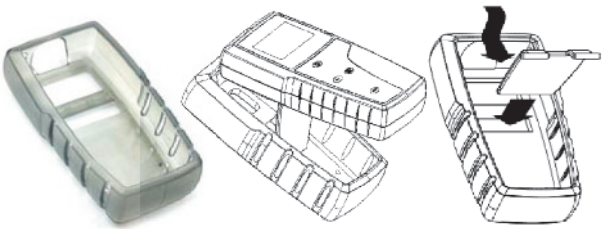
2.2 Description of LCD Annunciators

The custom LCD consists of 3½-digit segments which uses annunciators for pH, mV or °C (Temperature). No annunciator is shown in Ion mode. Other annunciators include **"HO"** (when **HOLD** function is activated) and **"LO"** (low battery condition).

2.3 Inserting & removing the rubber armour/stand

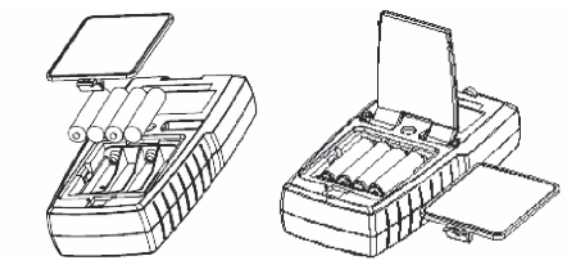
Before removing the meter from the rubber armour, disconnect any electrodes. Push out from the bottom edges of meter until it is completely out of boot.

To insert meter into the armour, slide in from the top of meter before pushing the bottom edges of meter into position. Tilt the stand at the back of meter for table top usage as desired.



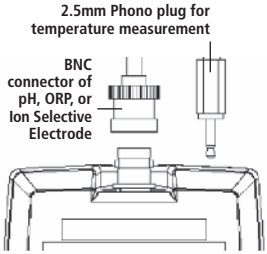
2.4 Inserting New Batteries

The **"LO"** annunciator alerts you when battery power is running low. Power off the meter before removing the batteries. After removing the rubber armour, push the battery cover in the direction of the arrow and lift up - no screwdriver is required. Note the polarity of batteries before inserting into position.



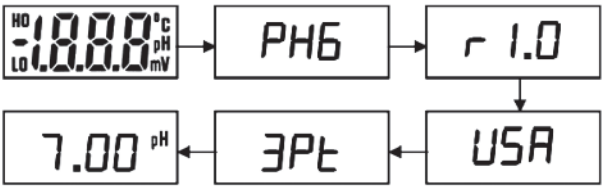
2.5 Connecting Electrodes and Temperature Sensor

Align the BNC connector slots with the posts of meter's socket and rotate connector clockwise until it locks - do not force. To remove, rotate the connector in counter-clockwise direction until it unlocks, and slide the connector off the socket. Insert the mini phono jack of temperature sensor into the socket on the meter. Unplug the phono jack to perform measurements without temperature compensation (25°C default).



2.6 Powering the Meter On

Press **ON/OFF**. All LCD segments will display momentarily during the self-diagnostic test, before scrolling the model number, software revision, pH buffer group, and number of pH calibration points selected before returning to the measurement mode:



If a temperature probe is not connected, either 25.0°C (factory default) or the last calibrated temperature value is used. If a temperature probe is connected, the current measured temperature is used.

"Or" (Over range) and "Ur" (Under range) indicates the reading exceeds the maximum or minimum measurement range. See **Section 6 - Specifications**. However, the most likely reason for these error messages is that the electrode is not connected or broken.

3.1 pH Calibration

The Micro 600 pH meter is capable of up to three-point calibration with standard pH buffer values at pH 4.01, 7.00 and 10.01 to ensure accuracy across the entire range of the meter. It also allows offset adjustment in mV and Temperature modes. All new calibration values will automatically override existing data.

It is recommended that you perform at least two-point calibration at room temperature using standard buffers. For a one-point calibration, calibration should be performed with a pH buffer value closest to expected sample value being measured. Otherwise calibrating at pH 7.00 is advisable.

Ensure that you use fresh pH buffer solutions as they may be contaminated and affect the calibration and accuracy of measurements.

Before use, remove the plastic protective cap of pH electrode and condition the glass bulb by soaking it in tap water for 1 - 2 hours. This hydrates the glass bulb if electrode is too dry or has been used for a long period of time.

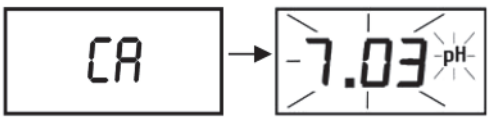
Always rinse the probes with tap water or rinse solution before and after each calibration/sample measurement to avoid cross-contamination. For details please refer to section on Electrode Care and Maintenance.

Note: Always use fresh pH buffer solutions for calibration. Do not reuse buffer solutions as they change with prolonged exposure to air (especially pH 10 buffer) resulting in decreased measurement accuracy. Promptly seal containers and store solutions in a dark, dry, cool environment.

pH Calibration Procedure

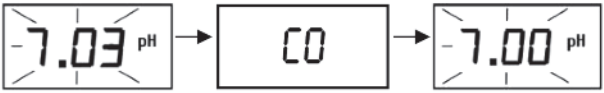
1 Turn on the meter and select pH mode by pressing **MODE** if necessary.

2 Press **CAL** to begin pH calibration mode. "CA" (calibrate) will display briefly. Notice that the pH reading and "pH" annunciator will both blink.

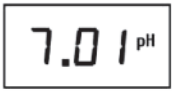


3 Pour pH buffer calibration standard solution into a clean, dry container and dip your pH electrode and temperature probe in the solution. Swirl gently or stir and wait for reading to stabilise (approx. 30 seconds depending on your electrode condition).

4 When the pH reading has stabilised, the pH annunciator will stop blinking. Press **HOLD/ENTER** to confirm the value. "CO" (confirm) will display briefly. The pH value is automatically adjusted to the buffer value shown from your selected buffer group. The example below shows a successful pH 7.00 calibration at 25°C.



5 For a one-point calibration with pH 7.00 only, press **CAL** to return to measurement mode. However for highest accuracy - perform a multiple-point calibration. Repeat steps 3 & 4 with additional pH buffer calibration standards. When you have completed the preset number of calibration points, the meter will automatically save the calibration, cease blinking, and begin pH measurement.



Q: My meter, electrode & buffers are new - why does my pH 10 buffer read "10.06"?

A: Temperature influences pH. While pH 10 buffer is 10.00 at 25°C / 77°F, at 20°C / 68°F it is actually 10.06! This is why it is always best to record the temperature as well as the pH reading!

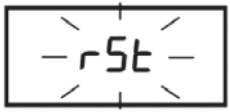
Resetting User Calibrated Values

The meter can be completely reset to factory default values, or partially reset for calibration values only using the procedure below.

Reset Type	Description
No (no)	No reset is performed; meter returns to measurement
Calibration (CAL)	Reset of either pH, mV, or Temperature calibration depending on the selected mode*
Factory (FCt)	Reset of all calibration values and user settings to factory default settings

*For calibration reset, measure in the mode that you want to reset prior to step 1 below.

1 Power off the meter. Press and hold **CAL** then press **ON/OFF**. If successful, "rSt" will blink on the display. Release both keys.



2 Press **HOLD/ENTER** to enter the reset menu.

3 Press **MODE** to toggle between No Reset (n0), Calibration Reset (CAL), or Factory Reset (FCt). Press **CAL** to cancel.

4 Press **HOLD/ENTER** to confirm the selected reset type. The meter will automatically begin measurement mode.

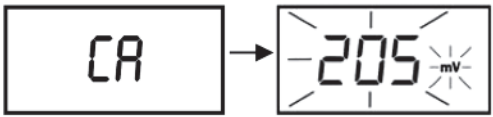
3.2 Millivolt (mV) Calibration

Oxidisation Reduction Potential (ORP or Redox) as measured by an ORP electrode in mV units is not a precise measurement, but is useful as a relative indicator. As such, mV offset adjustment is not meant to enhance accuracy, but rather to make readings comparable to a reference.

Commercial ORP solutions are commonly used as a check standard - a meter/electrode system is verified to be close to a given value although adjustments are not made. These solutions can be used as a calibration standard in which adjustments are made in an attempt to match the ORP value, however results are often difficult to reproduce.

1 Turn on the meter and select mV mode by pressing **MODE** if necessary. Dip the ORP electrode into a solution with a known mV value (e.g. Zobel, Light's, quinhydrone, or iodidetriiodide) and provide brief or slow stirring.

2 Press **CAL** to begin mV calibration mode. "CA" (calibrate) will display briefly. The un-adjusted mV value will blink.



3 Use **MODE/INC** to adjust the reading to the desired value. The maximum adjustment is ± 50 mV.

4 When the reading has stabilised, the mV annunciator will stop blinking. Press **HOLD/ENTER** to confirm the value. "CO" (confirm) will display briefly. The meter will automatically save the calibration, cease blinking, and begin mV measurement.

3.3 Temperature Calibration

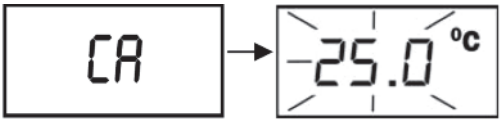
With Temperature Probe (Automatic Temperature Compensation)

The thermistor sensor used for temperature measurement is accurate and stable, so frequent calibration isn't required. Temperature calibration is recommended upon electrode replacement, whenever the temperature reading is suspect, or if matching against a certified thermometer is desired.

Note: If temperature calibration will be performed, be sure that the thermometry source being used as a reference is accurate!

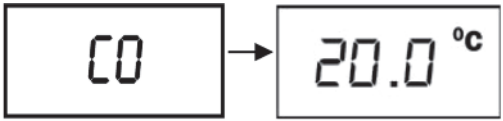
1 Turn on the meter and select °C mode by pressing **MODE** if necessary. Connect the temperature probe and place it into a solution with a known accurate temperature such as a constant temperature bath or NIST-traceable thermometer. Allow adequate time to stabilise.

2 Press **CAL** to begin temperature calibration mode. "CA" (calibrate) will display briefly. The un-adjusted °C value will blink.



3 Compare the measured value of the temperature probe with the reference thermometer. Use **MODE/INC** to adjust the reading to the desired value. The maximum adjustment is ± 5°C.

4 Press **HOLD/ENTER** to confirm the value. "CO" (confirm) will display briefly. The meter will automatically save the calibration, cease blinking, and begin °C measurement.



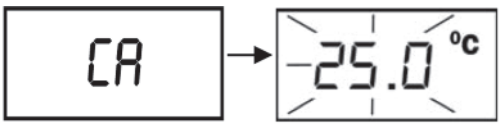
Without Temperature Probe (Manual Temperature Compensation)

If a temperature probe is not connected, the meter compensates for pH response based on the factory default value at 25.0°C. This default temperature can be manually adjusted using the procedure below.

For nearly all applications however, Automatic Temperature Compensation (ATC) is recommended for best accuracy.

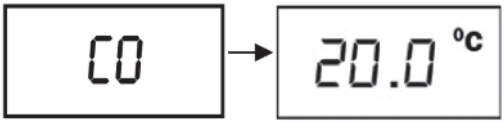
1 Turn on the meter and select °C mode by pressing **MODE** if necessary. Disconnect the temperature probe.

2 Press **CAL** to begin temperature calibration mode. "CA" (calibrate) will display briefly. The factory default temperature 25.0°C value will blink.



3 Use **MODE/INC** to adjust the reading to the desired value. The maximum adjustment is ± 0 to 100°C.

4 Press **HOLD/ENTER** to confirm the value. "CO" (confirm) will display briefly. The meter will automatically save the calibration, cease blinking, and begin °C measurement with the new default temperature.

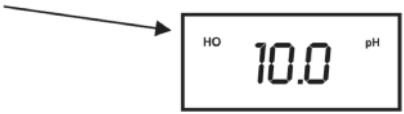


Taking Measurements

1. Before measurement, rinse the pH/ORP electrode and temperature probe with clean water.
2. Power on the meter. Press **MODE** key to select your desired mode of operation (pH, mV, Ion, or Temperature).
3. Dip both probes gently into an aqueous test sample, swirl or stir gently and allow the reading to stabilise.

Holding & Releasing a Reading

To freeze or hold a displayed reading, press **HOLD/ENTER**. The "**HO**" annunciator indicates that the **HOLD** function is activated. Press **HOLD/ENTER** again to deactivate the **HOLD** function. The meter reverts to current measurement mode, and the "**HO**" annunciator will disappear.



Electrode Care and Maintenance

For best results, always keep the pH electrode bulb wet. Store the pH bulb with electrode storage solution. Electrode storage solution is available as part of the Palintest Electrode Care Pack (see Accessories Section). If electrode storage solution is not available, use tap water or buffer solution.

NEVER use deionised water for storage.

Wash the probes thoroughly with tap or deionised water after each use.

Your pH electrode is susceptible to contamination or dirt and, therefore, requires cleaning every one to three months depending on extent and condition of use.

Clean the electrode in a mild detergent solution. Wipe the probe with a soft tissue paper. Avoid touching the glass membrane with your fingers. Wash thoroughly in tap water and then in deionised water. Recalibrate the meter after cleaning the electrode.

Troubleshooting

Problem	Cause	Solution
No display	Batteries absent or installed incorrectly	Insert batteries using correct polarity
"**LO**"	Low battery	Replace batteries
"---" on display	Ion 6+ requires calibration	Perform either 2 or 3 point ion calibration
Unstable reading	a) Dry electrode b) Dirty electrode c) Temperature changing	a) Hydrate/soak pH electrode b) Clean electrode c) Allow time for electrodes and solution to stabilise
Not able to calibrate	a) Display freezes b) Faulty electrode c) Inaccurate buffer	a) Release reading by pressing **HOLD/ENTER** b) Replace electrode c) Use fresh buffer solutions
Err	mV out of range	Check the probe/solution
Er1	Buffer value is out of tolerance	Use new calibration solution & recalibrate. Ensure correct pH buffer group was selected.
Er5	Upon exit of calibration mode, a 1-point calibration was attempted with a pH buffer other than 7.00.	Repeat pH calibration using one or more points which include 7.00 standard.
Or	Over range: reading exceeds maximum value	Ensure that the value being measured is within the range of the selected mode. Confirm that electrode(s) are connected and working properly.
Ur	Under range: reading exceeds minimum value	

Specifications

Calibration Points	2 or 3 consecutive points; (0.1, 1.0, 10.0, 100.0, 1000)
pH Range	0.00 to 14.00 pH
Resolution	0.01 pH
Accuracy	± 0.01 pH
Slope Range	80 to 120%
Buffer	4.01, 7.00, 10.01
Temperature Range	0.0 to 100.0ºC
Resolution	0.1ºC
Accuracy	± 0.5ºC
Compensation	Automatic/Manual (0 to 100ºC)
Millivolt Range	-1000 to +1000 mV
Resolution	± 1 mV; ± 0.1 mV between -200 to 200 mV
Accuracy	± 2 mV; ± 0.2 mV between -200 to 200 mV

Features

Auto-Buffer Recognition	Yes
Hold Function	"**HO**"
Auto Shut Off	After 17 minutes
Low Battery Indication	"**LO**"
Operating Temperature	0 to 50ºC
Power Requirements	(4) x 1.5V AAA Alkaline Batteries (included)
Battery Life	Up to 500 hours
Meter Dim./Weight	15.7 x 8.5 x 4.2cm/255g

Replacements and Accessories

Description	Product Code
Buffer Tablet Pack pH 4/7/10.01	PT 105/5
pH Buffer Solution pH 4.01 (500ml)	PT 105/1
pH Buffer Solution pH 10.01 (500ml)	PT 105/2
pH Buffer Solution pH 7.00 (500ml)	PT 105/3
Electrode Care Pack (incl Electrode Storage Solution)	PT 105/4
Replacement pH Electrode	PT 110/1B
Replacement Temperature Probe	PT 140/4
Replacement ORP Electrode	PT 110/3B
ORP Calibration Solution 255mV (500ml)	PT 1252
Deionised Water Wash Solution, 500ml	PT 1250
Micro 600 pH Complete Kit	PT 1200

Warranty

The Palintest Micro 600 pH Meter is guaranteed for a period of **three years** from date of purchase - its associated pH electrode is guaranteed for a period of **six months** from date of purchase. This guarantee excludes accidental damage, or damage caused by unauthorised repair or misuse.

Should repair be necessary, please contact Palintest or your local distributor quoting the serial number on the base of the instrument. This guarantee does not affect your statutory rights.

Certificate of Conformity

Palintest Ltd certify this instrument, PT1200 has been tested and calibrated to meet all performance specifications.

It is recommended that regular calibration of the probe is carried out in accordance with the instruction manual to ensure correct operation.

The process used to verify this product is carried out in accordance with procedures contained within Palintest's certified ISO 9001 Business Management System.

For more information on Palintest products, contact your nearest Palintest office or visit our website

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