

TRACER POCKETESTER™

Do Not allow
pH sensor to dry out.

- Store Upright
- Before first use, tap meter against palm to move electrolyte to tip.

See pages 8 and 11.



pH

WARNING! This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

TRACER

pH POCKETESTER™

CODE 1741

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INTRODUCTION

Congratulations on your purchase of the TRACER pH PockeTester. The TRACER is a revolutionary, first of its kind measurement device that offers direct reading of pH from 0.01 to 14.00 pH. The advantages of the TRACER to the user include ease of use and maintenance, high accuracy, automatic calibration, and fast response. The TRACER offers simultaneous pH and Temperature displays and a 15-reading memory storage. Careful use and maintenance will provide years of reliable service.

SPECIFICATIONS

<i>Display</i>	<i>Multifunction LCD with Bar graph</i>
<i>Operating Conditions</i>	<i>32 to 122°F (0 to 50°C) and < 80% RH</i>
<i>pH Range & Accuracy</i>	<i>0.01 to 14.00/±0.01 pH typical</i>
<i>Temperature Comp</i>	<i>Automatic from 32 to 194°F (0 to 90°C)</i>
<i>Temperature Range</i>	<i>23 to 194°F (-5 to 90°C)</i>
<i>Temperature Resolution</i>	<i>0.1° up to 99.9, then 1° thereafter</i>
<i>Temperature Accuracy</i>	<i>±1.8°F/1°C [from 23 to 122°F (-5 to 50°C)] ±5.4°F/3°C [from 122 to 194°F (50 to 90°C)]</i>
<i>Measurement storage</i>	<i>15 tagged (numbered) readings</i>
<i>Power</i>	<i>Four CR2032 button batteries (see Page 6)</i>
<i>Low battery indication</i>	<i>'BAT' appears on the LCD</i>
<i>Auto power off</i>	<i>After 10 minutes of inactivity</i>
<i>Dimensions</i>	<i>1.4 x 6.8 x 1.6" (35.6 x 172.7 x 40.6 mm), 3.85 oz (110g)</i>

PARTS & ACCESSORIES

<i>pH Replacement Electrode</i>	<i>Code 1733</i>
<i>Weighted Stand w/Sample Cups (5)</i>	<i>Code 1746</i>
<i>Sample Cups w/caps (24)</i>	<i>Code 1745-24</i>
<i>pH 4.01 Mini Buffer Tablets (100)</i>	<i>Code 3983A-J</i>
<i>pH 7.01 Mini Buffer Tablets (100)</i>	<i>Code 3984A-J</i>
<i>pH 10.0 Mini Buffer Tablets (100)</i>	<i>Code 3985A-J</i>

CONTENTS

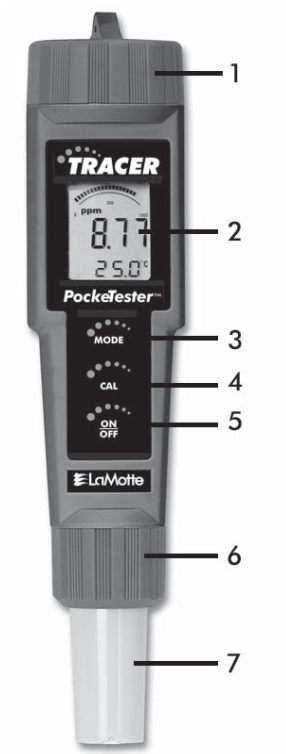
<i>pH TRACER PockeTester Kit, 0.00-14.00 pH Range</i>	<i>Code 1741</i>
<i>Includes:</i>	
<i>Sample Cup w/cap</i>	<i>*</i>
<i>Tablet Crusher</i>	<i>Code 0175</i>
<i>Buffer Tablets, pH 4.0, 7.0, & 10.0</i>	<i>*</i>
<i>*Not sold in this quantity. See Parts & Accessories.</i>	

METER DESCRIPTION

Front Panel Description

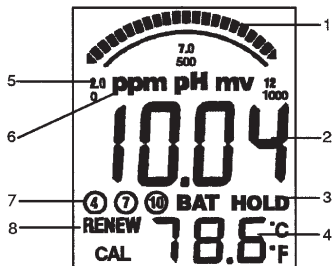
1. Battery compartment cap
2. LCD Display
3. MODE/HOLD button
4. CAL/RECALL button
5. ON/OFF button
6. Electrode Collar
7. Electrode

(Note: The Electrode cap is not shown)



TRACER DISPLAY

1. Bar graph reading
2. Measurement reading
3. *BAT* (low battery) and *HOLD* (data hold) indicators
4. Temperature display
5. Bar graph scale designations
6. Units of measure
7. Calibration indicators
8. *RENEW* and *CAL* indicators



BASIC OPERATION

Powering the TRACER

If the batteries are weak, the *BAT* indicator will appear on the display. Press the ON/OFF button to turn the TRACER on or off. The auto power off feature will shut the TRACER off automatically after 10 minutes of inactivity.

Electrode Recognition

When the TRACER is turned on, it will recognize the type of electrode that is connected and will display the appropriate unit of measure. An electrode must be attached before turning the meter on.

Automatic Calibration

When the TRACER is turned on, it will enter the Automatic Calibration mode. *SELF* and *CAL* will appear while calibration is in progress. After the calibration is completed, the *SELF* and *CAL* display icons will extinguish and both the main display and the bar graph will read in pH units. The readings will flash on the display until they have stabilized.

Changing the Displayed Temperature Units

Press and hold the CAL/RECALL button for approximately 3 seconds. The °C or °F icon will change first and the numerical temperature value will change only after the button is released.

NOTE: If the CAL/RECALL button is accidentally accessed *CAL* will appear on the display. If this occurs, turn the meter off and then turn the meter on and begin again.

Data Hold

Press the MODE/HOLD button to freeze the current reading. The *HOLD* display icon will appear along with the held reading. The held reading will be stored in the next 15-reading storage location. Press the MODE/HOLD button to return to normal operation.

DISPLAY MESSAGES

CAL Reminder

When the TRACER is turned on for the 15th time, without recalibration the *CAL* icon will appear on the display indicating the the TRACER may require calibration. Some applications may require recalibration of the electrode sooner than others. The *CAL* display is a reminder and will turn off when the pH electrode is recalibrated.

RENEW

A flashing "RENEW" warning indicates that the probe may be nearing the end of its useful life. If cleaning or recalibration does not cause the *RENEW* icon to disappear, replace the electrode (see optional accessories). The *RENEW* display appears when the output of the pH electrode fails a diagnostic test.

pH TESTING

Overview

pH is a unit of measure (ranging from 0 to 14 pH) indicating the degree of acidity or alkalinity of a solution. pH tests are the most commonly performed measurements in water analysis, using the negative log of the hydrogen ion activity of a solution which is an indicator of acidity or alkalinity. Solutions with a pH of less than 7 are considered acidic, solutions with a pH of higher than 7 are known as bases, and solutions with a pH of exactly 7 are considered neutral.

The pH scale is logarithmic, so, for example, if Sample A is 1 pH less than Sample B, this means that sample A is 10 times more acidic than Sample B. A difference of 1 pH represents a ten-fold increase or decrease in acidity.

pH Display

When the electrode is placed in a solution, the main display and bar graph will indicate the pH reading while the lower display will read temperature. Readings flash until they have stabilized. The bar graph is 'center zero', i.e. at pH 7 there is no display. As the pH rises, the bar will move from the center to the right. If the pH drops, the bar will move from the center to the left.

Getting Started

1. Remove the cap from the bottom of the TRACER to expose the electrode glass surface and reference junction.
2. Before first use or after storage, soak the electrode (with cap removed) in a pH 4 buffer or tap water for 10 minutes.
3. Before first use, hold the meter by the top battery compartment and swiftly tap the back of the meter downward into your palm (not a hard surface). This assures that the internal electrolyte solution moves to the very tip of the electrode. The electrolyte should fill the circular junction window at the tip of the electrode.
4. White KCl crystals may be present in the cap. These crystals will dissolve in the soak or they can be rinsed off with tap water.
5. Always calibrate close to the expected measurement value.

Preparation of Buffers

1. Fill a sample cup with 20 mL of distilled or deionized water.
2. Add one buffer tablet:

pH 4.0	Code 3983A
pH 7.0	Code 3984A
pH 10.0	Code 3985A
3. Use the tablet crusher (0175) to crush the tablet. Stir until the tablet has disintegrated.

NOTE: Buffers should be prepared fresh daily.

pH Calibration

The TRACER can be calibrated at 1, 2 or 3 points. For the most accurate results with a two point calibration, calibrate the TRACER with a pH 7 buffer first, then calibrate with either a pH 4 or pH 10 buffer whichever is closest to the pH value of the sample to be tested. When performing a three point calibration, calibrate with the pH 7 buffer first, followed with the pH 4 buffer and then the pH 10 buffer.

1. Place the electrode into a buffer solution (4, 7, or 10 pH) and press the CAL/RECALL button. Typically, pH 7 is calibrated first, then 4 or 10, depending on the measurement range. If readings are going to be made over the entire range, calibrate with 4, 7 and 10 buffers.
2. The TRACER will automatically recognize the solution and calibrate itself to that value. The circled number on the display will match the pH of the buffer. Note that if the buffer is more than 1 pH unit off from the 4, 7, or 10 pH buffer, the TRACER will assume an error and abort the calibration. *CAL* and *END* will be displayed.
3. During calibration, the pH reading will flash on the main display.
4. When calibration is complete, the TRACER will automatically display *END* and return to the pH measurement mode.
5. Rinse the electrode with distilled water.
6. The appropriate circled indicator (4, 7, or 10) will appear on the display when a calibration has been completed. The calibration will be stored until a new calibration is performed.
7. For a two- or three-point calibration, repeat Steps 1-5.
8. The meter should be calibrated before each use to obtain the most accurate results.

9. Always turn the meter off and then on before calibrating to allow sufficient time to complete the calibrations during one power cycle. If the meter auto powers off during calibration the calibrations remain valid, but new calibrations will turn the circled indicators off.

pH Measurement

1. Place the electrode in the test sample.
2. Record the pH after the reading becomes stable and the display stops flashing.
The main display will indicate the pH in numeric units from 0.00 to 14.00. The bar graph will also display the pH value. The center of the bar graph is 7.00. As the pH increases, the bar graph will move from the center to the right. If the pH is less than 7.00, the bar graph will move from the center to the left.
3. Press the ON/OFF button to turn the meter off. Rinse the electrode with distilled water. Replace cap

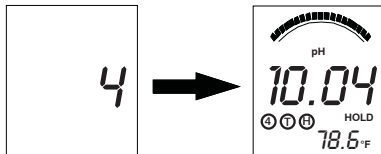
pH Measurement of Soil

1. Place a 1:1 ratio of soil and distilled water in a small beaker. For most analyses, 20 grams of soil and 20 grams distilled water are sufficient.
2. Wait 15 minutes. Stir occasionally with a stirring rod.
3. Stir the sample. Immediately place the electrode in the sample.
4. Wait until the display stabilizes. Record the pH.
5. Rinse the electrode in distilled water. Replace cap.

NOTE: The flat surface electrode will allow for readings directly from the soil if there is enough moisture present in the soil.

Storing Readings

1. After the reading is made press the MODE/HOLD button to store the current reading. The storage location number will be displayed followed by the reading being stored.
2. Press the MODE/HOLD button to return to normal operation.



3. Repeat step 1 to store the next reading.
4. If an attempt is made to store more than 15 readings, the stored readings (starting with the first reading) will be overwritten.

Recalling Stored Readings

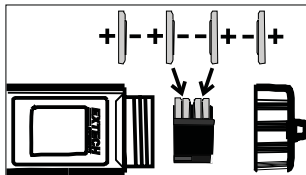
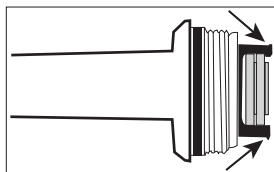
NOTE: First ensure that the *HOLD* symbol is not displayed. If it is, exit the HOLD function by pressing the MODE/HOLD button.

1. Press the CAL/RECALL button once and then press the MODE button *immediately* after *CALL* is displayed; the location number (1 through 15) will flash. If the CAL mode is accidentally accessed (display flashing), press the CAL/RECALL button again to exit.
2. The last stored reading taken will be displayed first. To advance through the stored readings, press the MODE/HOLD button. The location number is displayed first, followed by the reading stored in that location.
3. To exit the recall mode, press the CAL/RECALL button and the TRACER will return to normal operation. If the batteries are removed, any stored readings and user calibrations will be discarded.

MAINTENANCE

Care/Storage of Electrode

4. Always rinse the electrode in tap, distilled or deionized water between measurements to avoid cross-contamination of the samples. Double rinsing is recommended when high accuracy is required.
5. To preserve electrode life **keep the sponge in the protective cap soaked with a pH 4 buffer**. Cap TRACER when not in use. **Store vertically**. **Do Not allow sensor to dry out**.
6. Do not touch the electrodes. Touching the surface of the electrodes may damage and reduce the life of the electrodes.
7. Salt deposits may build up in the storage cap and should periodically be rinsed away. These deposits could affect measurements at low conductivity.



Battery Replacement

1. Twist off the battery compartment cap.
2. Hold the battery housing in place with one finger. Remove the battery carrier by pulling on the small tabs.
3. Replace the four CR2032 batteries. Observe polarity.
4. Replace the battery compartment cap.
NOTE: If the batteries are removed, stored data and user calibrations will be cleared. A new user calibration will be required. Factory calibrations will be retained.

Cleaning and Conditioning the Electrode

The TRACER will arrive in a factory-cleaned condition and is ready to be used. A separate preconditioning method is not required.

Surface Cleaning – Only in case of visible surface contamination or if readings should become erratic, use a disposable laboratory towel wetted with ethanol or isopropyl alcohol and gently rub the surface, until no more residue is visible.

Replacing the Electrode

The TRACER is shipped with an electrode attached. Electrode life is limited and is dependant on the frequency of use and care, among other factors. If the electrode needs to be replaced, follow these steps for removing and connecting electrodes.

1. Turn meter off.
2. To remove the electrode, turn the collar counter-clockwise and remove it.
3. Gently rock the electrode from side to side, pulling it downwards, until it disconnects from the meter.
4. To attach an electrode, carefully plug the electrode into the meter socket. Note that the electrode connector is keyed to ensure a proper connection.
5. Tighten the electrode collar firmly enough to make a good seal. A rubber gasket will seal the electrode with the meter.

TROUBLESHOOTING

Problem	Cause	Action
<i>Power on but no display</i>	<i>Batteries</i>	<i>Insert batteries</i>
	<i>Batteries</i>	<i>Verify correct polarity</i>
	<i>Batteries</i>	<i>Replace batteries</i>
<i>Unstable readings</i>	<i>Electrode</i>	<i>Immerse electrode more deeply in sample</i>
	<i>Electrode</i>	<i>Condition electrode before first use</i>
	<i>Electrode</i>	<i>Remove air bubbles caught under electrode</i>
	<i>Electrode</i>	<i>Clean electrode</i>
	<i>Electrode</i>	<i>Replace electrode</i>
<i>Slow response time or reading drift</i>	<i>Clogged junction</i>	<i>Soak in 4.07M Potassium Chloride (KCl) at 60°C for 30 minutes</i>
	<i>Strong alkaline measurement</i>	<i>Soak in 0.1M Hydrochloric acid (HCl) overnight</i>
	<i>Deteriorated gel layer</i>	<i>Replace electrode</i>
	<i>Protein coating on electrode surface</i>	<i>Soak in 1g Pepsin dissolved in 10 mL of 0.1M HCl for 30 minutes or as needed</i>
	<i>Oil, paint, dyes, suspended solids on electrode</i>	<i>Rinse electrode alternately with materials solvent then a buffer 7.00</i>
<i>Dry bulb</i>	<i>Dehydrated membrane, long term storage without wetting</i>	<i>Soak electrode tip in wetting cap filled with 1 mL 7.00 buffer for 24-48 hours</i>
<i>Static charge</i>	<i>Wiping electrode</i>	<i>Rinse electrode in 7.0 buffer and blot. Do not wipe electrode</i>
<i>Same readings in different buffers and samples</i>	<i>Cracked or broken electrode</i>	<i>Replace electrode. Use bulb guard. Avoid plunging electrode into bottom of container and stir bars.</i>

Problem	Cause	Action
<i>Erratic LCD display</i>	<i>Samples have low ionic strength (lack salt); e.g. distilled, deionized, boiled, lake water (high pressure)</i>	<i>For each 50 mL of sample add 1 drop (50 mL) of saturated Potassium Chloride (KCl). No alteration in pH will occur by inert KCl.</i>
<i>Unexpected readings</i>	<i>Buffers</i>	<i>Calibrate with fresh buffers</i>
	<i>Buffers</i>	<i>Calibrate with buffers that bracket sample pH</i>
<i>Display frozen</i>	<i>HOLD function</i>	<i>Press MODE/HOLD or turn meter off</i>
	<i>Button response</i>	<i>Remove batteries press ON/OFF button for 3 seconds. Reinsert batteries (stored data will be lost)</i>
<i>Steady “-1 ” display</i>	<i>Wait</i>	<i>Reading not stable yet</i>

EXPAND YOUR TRACER

Interchangeable electrodes are available to convert the pH TRACER to a Total Chlorine TRACER or an ORP TRACER.

Remember to ask for instructions and appropriate reagents or buffer tablets when ordering the Total Chlorine or ORP electrodes.

Total Chlorine TRACER Electrode, *Code 1732*
0.0-10.0 ppm

The Total Chlorine TRACER Electrode (Code 1732) requires the use of TRACER TCL Tablets. Order Code 7044-J (100 pack).

ORP TRACER Electrode, ± 999 mV *Code 1734*

The ORP TRACER Electrode (Code 1734) requires an initial soaking in a pH 4.0 buffer solution. Order pH 4.0 Mini Buffer Tablets/100 pack (Code 3893-J).

WARRANTY

LaMotte Company warrants this instrument to be free of defects in parts and workmanship for 1 year from the date of shipment and warrants this probe to be free of defects in parts and workmanship for 6 months from the date of shipment. If it should become necessary to return the instrument for service during or beyond the warranty period, contact our Technical Service Department at 1-800-344-3100 or tech@lamotte.com for a return authorization number or visit www.lamotte.com for troubleshooting help. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. LaMotte Company specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. LaMotte Company's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

To register your meter with the LaMotte Service Department, go to www.lamotte.com and choose SUPPORT on the top navigation bar.



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