

 LaMotte

TRACER POCKETESTER™



pH

CODE 1741

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

TABLE OF CONTENTS

Introduction	4
Specifications	4
Contents	5
Parts & Accessories	5
Meter Description	
Front Panel Description	6
TRACER Display	6
Basic Operation	
Powering the TRACER	7
Electrode Recognition	7
Automatic Calibration	7
Changing the Display Temperature Units	7
Data Hold	7
Display Messages	
CAL Reminder	7
RENEW	8
pH Testing	
Overview	8
pH Display	8
Getting Started	9
Preparation of Buffers	9
pH Calibration	9
pH Measurement	10
Storing Readings	10
Recalling Stored Readings	10-11
Maintenance	
Storage	12
Battery Replacement	12
Cleaning & Conditioning the Electrode	12
Replacing the Electrode	12
Troubleshooting	13
Expand Your TRACER	14
Warranty	15

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

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

CONTENTS

pH TRACER PockeTester Kit, 0.00-14.00 pH Range	Code 1741
Includes:	
Sample Cup w/cap	*
Tablet Crusher	Code 0175
Buffer Tablets, pH 4.0, 7.0, & 10.0	*

*Not sold in this quantity. See below.

PARTS & ACCESSORIES

pH Replacement Electrode	Code 1733
Weighted Stand w/Sample Cups (5)	Code 1746
Sample Cups w/caps (24)	Code 1745-24
pH 4.0 Mini Buffer Tablets (100)	Code 3983-J
pH 7.0 Mini Buffer Tablets (100)	Code 3984-J
pH 10.0 Mini Buffer Tablets (100)	Code 3985-J

METER DESCRIPTION

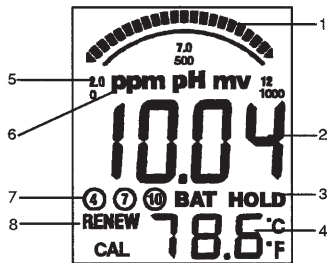
Front Panel Description

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 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 for about 10 minutes.
3. 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.
4. 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 3983
pH 7.0	Code 3984
pH 10.0	Code 3985
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

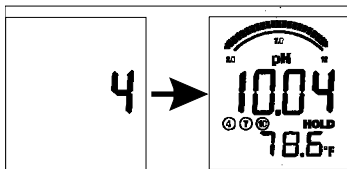
pH Measurement of Soil

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 *CAL* 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

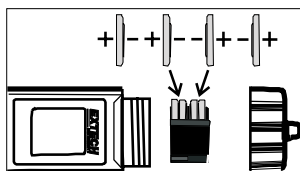
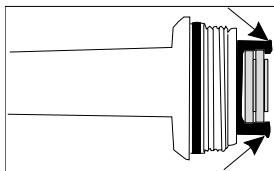
Storage

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.

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
Power on but no display	Batteries	Insert batteries
	Batteries	Verify correct polarity
	Batteries	Replace batteries
Unstable readings	Electrode	Immerse electrode more deeply in sample
	Electrode	Condition electrode before first use
	Electrode	Remove air bubbles caught under electrode
	Electrode	Clean electrode
Slow response time or reading drift	Electrode	Replace electrode
	Clogged junction	Soak in 4.07M Potassium Chloride (KCl) at 60°C for 30 minutes
	Strong alkaline measurement	Soak in 0.1M Hydrochloric acid (HCl) overnight
	Deteriorated gel layer	Replace electrode
	Protein coating on electrode surface	Soak in 1g Pepsin dissolved in 10 mL of 0.1M HCl for 30 minutes or as needed
Dry bulb	Oil, paint, dyes, suspended solids on electrode	Rinse electrode alternately with materials solvent then a buffer 7.00
	Dehydrated membrane, long term storage without wetting	Soak electrode tip in wetting cap filled with 1 mL 7.00 buffer for 24-48 hours
Static charge	Wiping electrode	Rinse electrode in 7.0 buffer and blot. Do not wipe electrode
Same readings in different buffers and samples	Cracked or broken electrode	Replace electrode. Use bulb guard. Avoid plunging electrode into bottom of container and stir bars.
Erratic LCD display	Samples have low ionic strength (lack salt); e.g. distilled, deionized, boiled, lake water (high pressure)	For each 50 mL of sample add 1 drop (50 μ L) of saturated Potassium Chloride (KCl). No alteration in pH will occur by inert KCl.
Unexpected readings	Buffers	Calibrate with fresh buffers
	Buffers	Calibrate with buffers that bracket sample pH
Display frozen	HOLD function	Press MODE/HOLD or turn meter off
	Button response	Remove batteries press ON/OFF button for 3 seconds. Reinsert batteries (stored data will be lost)
Steady “-1” display	Wait	Reading not stable yet

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, 0.0-10.0 ppm Code 1732

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 six months from 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 (800) 344-3100 for a return authorization or visit our website at www.lamotte.com. 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.



LaMOTTE COMPANY

Helping People Solve Analytical Challenges®

PO Box 329 • Chestertown • Maryland • 21620 • USA
800-344-3100 • 410-778-3100 (Outside U.S.A.) • Fax 410-778-6394
Visit us on the web at www.lamotte.com