

 LaMotte

pH/TDS/Salt

TRACER POCKETESTER

Waterproof Series



CODE 1766

pH/Conductivity/TDS/Salinity Meter

TRACER

pH/CON POCKETESTER™ • CODE 1766

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INTRODUCTION

Congratulations on your purchase of the pH/CON (pH/Conductivity) TRACER PockeTester. The TRACER is a revolutionary, first of its kind measurement device that offers direct reading of pH, conductivity, TDS and salinity with one electrode. Careful use and maintenance will provide years of reliable service.

SPECIFICATIONS

Display	2000 count LCD with Bar Graph
pH Range	0.00 to 14.00
pH Accuracy	± 0.01 pH typical
pH ATC Range	32 to 194 °F (0 to 90 °C)
pH Measurement Storage	25 tagged (numbered) readings
pH Reference Junction	Permanent gel, non-refillable
Conductivity Range	0 to 199.9 µS 200 to 1999 µS 2.00 to 19.99 mS
TDS Range	0 to 99.9 ppm and mg/L 100 to 999 ppm and mg/L 1.00 to 9.99 ppt and g/L (At TDS ratio of 1.0)
Salinity Range	0 to 99.9 ppm S 100 to 999 ppm S 1.00 to 9.99 ppt S
TDS Ratio	0.4 to 1.0, adjustable
Salinity Ratio	0.5 fixed
Conductivity ATC	2.1% per °C
Conductivity ATC Range	32.0 to 194.0 °F (0.0 to 90.0 °C)
Accuracy	Conductivity: ±2% FS TDS: ±2% FS Salinity: ±2% FS Temperature: ±1.8°F/1°C
Measurement Storage	25 readings
Low Battery Indication	'BATT' appears on the LCD
Power	Four SR-44W button batteries
Auto Power Off	After 10 minutes of no button presses (override available)
Operating Conditions	23 to 194 °F (-5 to 50 °C)
Dimensions	1.4 X 6.8 X 1.6 inches, 36 X 173 X 41 mm
Weight	3.8 oz, 110 g

CONTENTS

pH/CON TRACER PockeTester Kit	Code 1766
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/CON Replacement Electrode	Code 1755
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
Conductivity Standard, 84 μ S, 30 mL, 500 mL	Code 6312-G, L
Conductivity Standard, 1413 μ S, 30 mL, 500 mL	Code 6354-G, L
Conductivity Standard, 12,880 μ S 30 mL, 500 mL	Code 6317-G, L

METER DESCRIPTION

Front Panel Description

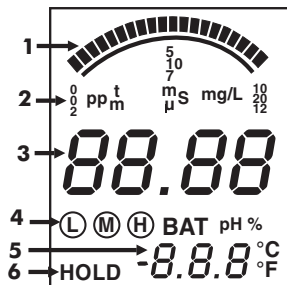
1. Battery compartment cap
2. LCD Display
3. MODE/HOLD button - change mode, hold data, store data
4. CAL/RECALL button - calibration, change temperature units, recall data
5. ON/OFF button
6. Electrode Collar
7. Electrode

(Note: The Electrode cap is not shown)



TRACER Display

1. Bar graph reading
2. Measurement reading
3. BAT (low battery) indicator
4. Temperature display
5. Measurement units
6. Calibration range indicator
7. HOLD indicator



BASIC OPERATION

Powering the TRACER

The tab located in the battery compartment must be removed before use. 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 after the last button push.

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.

Automatic Calibration

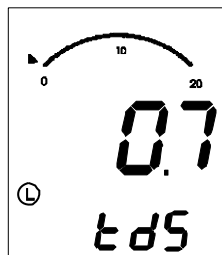
When the TRACER is turned on, it will enter the Automatic Calibration mode. SELF and CAL will appear while the calibration is in progress. After the calibration is completed, the SELF and CAL display icons will extinguish.

TDS Conversion Ratio

The TDS value is determined by multiplying the conductivity measurement by a known conversion ratio factor. The meter allows the selection of a conversion ratio factor in the range of 0.4 to 1.0. The selected ratio will vary with application but is typically set between 0.5 and 0.7. In the salinity mode, the ratio is fixed at 0.5. The stored ratio factor will briefly appear in the lower temperature display when the meter is first turned on.

To change the ratio while in the TDS measurement mode:

1. Turn the TRACER on.
2. Press and release the CAL/RECALL button twice. The stored ratio will appear in the display.
3. Press the MODE/HOLD button to change the ratio value in steps of 0.1.
4. When the desired ratio is displayed, press and release the CAL/RECALL button to store the value and return to the normal mode.



Changing the Displayed Temperature Units

To change the displayed temperature units between °C or °F:

1. With the TRACER off, press and hold the CAL/RECALL button.
2. With the CAL/RECALL button pressed, momentarily press the ON/OFF button. When SELF CAL appears in the display, release the CAL/RECALL button. The TRACER will return to the operational mode with the temperature displayed in the new units.

Data Hold

Press the MODE/HOLD button to freeze the current reading. The HOLD icon will appear. Press the MODE/HOLD key to return to normal operation.

Auto-Power Off

The auto-power off feature will automatically shut the meter off 10 minutes after the last button was pressed. To disable the auto-power off feature:

1. Turn the TRACER on.
2. Press the CAL/RECALL button briefly. Then press and hold the MODE/HOLD and ON/OFF buttons for 2 seconds. The meter will briefly display “oFF”. To restore the auto-power off feature, turn the TRACER off with the ON/OFF button.

Low Battery Indicator

The “BAT” indicator will be displayed when the batteries become weak. Refer to the Maintenance section for battery replacement information.

TESTING

Getting Started

1. Twist off the battery compartment cap to access the battery compartment. . Remove the plastic tab before first use.
2. Remove the cap from the bottom of the TRACER to expose the pH electrode, reference junction and the conductivity electrodes.
3. Before the first use or after storage, soak the electrode in tap water or pH 4 buffer for 10 minutes.
4. White KCL crystals may be present in the cap or on the electrode. This is to be expected if the TRACER has been stored for any length of time. The crystals will dissolve with soaking or they can be rinsed off with tap water.
5. Calibrate with pH 7 buffer prior to the first use or after prolonged storage.

Changing the Measurement Function

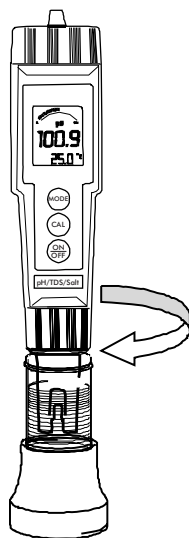
The meter can be set to measure Conductivity, pH, Salinity (ppm), TDS(ppm), or TDS (mg/L). To change the mode:

1. Turn the TRACER on.
2. Press and hold the MODE/HOLD button for 3 seconds. The display will begin to scroll through the units.
 - μS or mS (Conductivity)
 - pH
 - ppm S (Salinity)
 - ppm (TDS)
 - mg/L (TDS)
3. Release the MODE/HOLD key when the desired mode is displayed.

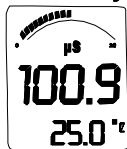
NOTE: The “HOLD” function can not be used when changing the measurement function. If “HOLD” is displayed in the lower left corner of the display, briefly press the MODE/HOLD button to turn it off.

Measurement

1. Fill a sample cup to the 20 mL line with the test sample. Sample depth must be greater than or equal to 1.5 inches.
2. Immerse the TRACER electrode in the sample. Make sure the electrode is completely submersed.
3. Press the ON/OFF button. (8888 and then SELF CAL will appear in the display during the initial diagnostics).
4. Slowly stir the sample with the TRACER to remove air bubbles if in the Conductivity, TDS or Salinity mode.
5. If the TRACER is in the Conductivity, TDS, or Salinity mode, the meter will automatically auto-range to the proper range and then display the reading. The display will flash "0000" while autoranging.
6. If the TRACER is in the pH mode, the reading will flash until it has stabilized. This may take several seconds depending on the buffer capacity of the sample.
7. Rinse the electrode in distilled water. Replace the cap.



Conductivity



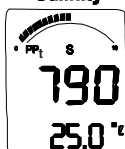
TDS(ppm)



TDS(mg/L)



Salinity

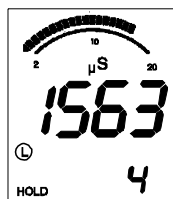


Measuring the TDS of Soil

1. Fill a 50 mL beaker with the soil sample. Tap the beaker lightly on a hard surface to remove trapped air. Remove excess soil from the surface.
2. Empty the soil into a 250 mL wide-mouth flask.
3. Add 100 mL of distilled water. Stopper and shake vigorously.
4. Wait 30 minute. (Shake the flask vigorously three or four times during this period.)
5. Filter the contents of the flask. Collect the filtrate in a beaker.
6. Rinse the electrode with distilled or deionized water to remove impurities.
7. Press the ON/OFF button to turn the TRACER on. Make sure the meter is in the TDS mode.
8. Immerse the electrode in the filtrate. Make sure the tip of the electrode is completely immersed.
9. Stir the filtrate with the electrode to create a homogeneous solution.
10. Gently stir the filtrate with the electrode. Read the TDS value of the filtrate from the display.
11. Rinse the electrode in distilled water. Replace the cap.

Storing Readings

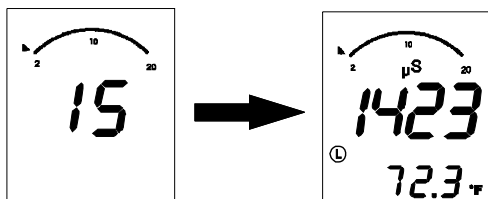
1. After the reading is displayed press and hold the MODE/HOLD button to store the current reading. The meter will enter the HOLD mode and HOLD will be displayed. The storage location number will be displayed on the lower display followed by the reading being stored.
2. Press the MODE/HOLD button to exit the HOLD mode and return to normal operation.
3. If an attempt is made to store more than 25 readings, the stored readings will be overwritten starting with the first reading.



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/HOLD button immediately after CAL is displayed; the location number (1 through 25) will briefly appear and then the value stored in that location will appear. The displayed units will flash, indicating that the storage recall mode is active.



2. The last stored reading taken will be displayed first. To advance to the previously 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 storage mode, press the CAL/RECALL button and the TRACER will return to normal operation after displaying "END".

Clearing Stored Memory

Turn the TRACER on. Press and hold the ON/OFF button for 4 seconds. The display will briefly display "clr" when the memory is cleared.

CALIBRATION

pH

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.

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.

Calibration

1. Fill a sample cup to the 20 mL line with a buffer solution.
2. Press the ON/OFF button to turn the TRACER ON.
3. Place the electrode in the buffer solution. The meter will automatically recognize the buffer and calibrate itself to that value. The circled number on the display will match the value of the buffer.
NOTE: If the buffer solution is more than 1 pH unit off from 4, 7, or 10 the meter will assume that there is an error and the calibration will be terminated. CAL: and END will be displayed.
4. During the calibration the pH value on the display will flash. When the calibration is complete, the TRACER will display "END" and return to normal operation.
5. The appropriately circled indicator (4, 7 or 10) will appear on the display when a calibration has been completed.
6. For a two or three point calibration, repeat steps 1 – 3 with the remaining buffers.
7. When the TRACER is turned off, the circled indicator configuration and the calibration data will be memorized.
NOTE: If the batteries are removed, any stored readings and the pH calibration will be lost and the meter will have to be recalibrated.

Calibration Reminder

The “CAL” indicator will appear when the TRACER is in the pH mode and a calibration is required. The “CAL” indicator will appear if the meter has not been calibrated after 15 on/off cycles of the meter. Some applications may require more frequent calibrations than others. The “CAL” indicator is only a reminder and will no longer be displayed when the pH electrode is recalibrated.

RENEW Indicator

A flashing “RENEW” indicator will appear on the display to warn that the electrode may need to be replaced. If cleaning or recalibration does not cause the RENEW indicator to disappear, the electrode should be replaced. The RENEW indicator will appear when the pH electrode slope falls below 75% of a nominal slope.

Conductivity

Meter accuracy verification should be performed on a periodic basis as needed. If calibration is required, the meter must be in the conductivity mode to perform the calibration. The meter can perform a calibration and store the data for each of the three ranges – low, medium and high. The automatic calibration recognition procedure will recognize conductivity standards of 84 μ S (Low), 1413 μ S (Medium) or 12,880 μ S (12.88mS) (High). (See Page 6). Always calibrate in the range closest to the expected measurement value. For salinity samples within the range of 1.00 to 9.99 ppt salinity, calibrate with a 12,880 μ S calibration standard.

1. Fill a sample cup to 20 mL line with a conductivity standard.
NOTE: The meter allows for a 1, 2, or 3 point calibration. If calibration is done for more than one point, the lowest concentration should be done first to obtain the best accuracy. Calibrate the ranges from low to high
2. Press the ON/OFF button to turn the TRACER on. Insert the electrode into the standard
3. Press and hold the CAL/RECALL button for approximately 2 seconds until the display begins to flash.
4. The meter will automatically recognize and calibrate to the conductivity standard. The display will briefly indicate “SA”, END and then return to the measurement mode.
NOTE: “SA” will not appear if the calibration fails.

5. The calibration range indicator will appear on the display for each range that is calibrated during a power on cycle.

Ⓛ Low Range, 84 μ S

Ⓜ Medium Range, 1413 μ S

ⓗ High Range, 12.88 mS (12,880 μ S)

NOTE: Each time the calibration mode is entered all calibration range indicators will be cleared, but only the calibration data for the currently selected range will be replaced. The calibrations for the other two ranges will be saved even though the indicators for those ranges are no longer displayed. Calibration of all three ranges must be performed during one power on period for all three calibration range indicators to be displayed.

OPERATIONAL MATRIX

Function/Resulting Action	Power	Mode	Key Press Sequence
On/Off	On or Off	Any	Momentary press of ON/OFF button
Calibration	On	pH or Con	Press & hold CAL/RECALL button for 2 seconds
Store Reading	On	Any	Momentary press of MODE/HOLD button
Hold Release	On	Hold	Momentary press of MODE/HOLD button
Enter Memory Retrieval	On	Any	Momentary press of CAL/RECALL button followed by a momentary press of MODE/HOLD button within 4 seconds.
Scroll Stored Readings	On	Memory Recall	Momentary press of MODE/HOLD button Displays last in first out.
Exit Memory Retrieval	On	Memory Recall	Momentary press of MODE/RECALL button
Clear Stored Memory	On	Any Memory Mode	Press and hold the ON/OFF button for 4 seconds.

Function/Resulting Action	Power	Mode	Key Press Sequence
Change Measurement Mode	On	Any	Press and hold the MODE/HOLD button for at least 2 seconds. Modes will scroll by until button is released.
Enter CON/TDS Ratio	On	TDS (ppm or mg/L)	Press and release the CAL/RECALL button twice in succession.
Change CON/TDS Ratio	On	TDS (ppm or mg/L)	Momentary press of MODE/HOLD button. Each press increases ratio by 0.1 from 0.4 to 1.0.
Exit CON/TDS Ratio	On	TDS (ppm or mg/L)	Momentary press of CAL/RECALL button followed by momentary press of MODE/HOLD button.
Change Temperature Units	On	Off	Press and hold CAL/RECALL button then momentarily press ON/OFF button. Release CAL/RECALL button after "Self Cal" is displayed.
Override Auto Power Off	On	Any	Momentarily press CAL/RECALL button then simultaneously press and hold ON/OFF and MODE/HOLD buttons for 2 seconds.

MAINTENANCE

Storage

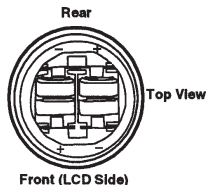
1. Rinse the electrode in distilled or deionized water.
2. Store the electrode with the cap on. Keep the sponge in the cap soaked with tap water or pH 4 buffer solution.
3. Always rinse the electrode in deionized water between measurements to avoid cross contamination. Double rinsing is recommended when high accuracy is required.

Battery Replacement

For maximum battery life, use battery style SR-44 (Silver Oxide) such as Energizer™ No. 356 or Duracell™ No. 303/357.

1. Twist off the battery compartment cap.
2. Replace the four (4) SR-44 button batteries. Observe polarity.
3. Replace battery compartment cap.

NOTE: If the batteries are removed, any stored readings and calibrations will be lost and the meter will have to be recalibrated.



Electrode Care

1. Always rinse the electrode in distilled or deionized water between measurements to avoid cross-contamination of the samples. Double rinsing is recommended when high accuracy is required.
2. Do not touch the electrodes. Touching the surface of the platinized electrodes may damage and reduce the life of the electrodes.

Electrode Cleaning Recommendations

Do not soak the electrode in the solutions for longer than the recommended length of time. To do so may cause a reference potential shift which will cause a degradation in performance or failure

Contaminant	Cleaning Solution	Procedure
Water soluble	Deionized water	Soak or scrub with a soft brush. Recondition in pH 4 or 7 buffer for 1 hour.
Grease and oil	Warm water and household detergent	Soak or scrub with a soft brush, maximum 10 minutes. Rinse thoroughly with DI water. Recondition in pH 4 or 7 buffer for 1 hour.
Heavy grease	Alcohol	Soak for a maximum of 5 minutes. Scrub with a soft brush. Rinse thoroughly with DI water. Recondition in pH 4 or 7 buffer for 1 hour.
Lime and hydroxide coatings	10% Acetic acid	Soak until coating dissolves, maximum 5 minutes. Rinse thoroughly with DI water. Recondition in pH 4 or 7 buffer for 1 hour.

TROUBLESHOOTING

Problem	Cause	Action
Power on but no display	Batteries	Insert batteries or remove tab
	Batteries	Verify correct polarity
	Batteries	Replace low or dead batteries
“BAT” message	Batteries	Replace batteries
Unstable readings	Electrode	Immerse electrode more deeply in sample
	Electrode	Remove air bubbles caught under electrode (Con, TDS Sal)
	Electrode	Replace electrode
Unexpected results	Standards	Calibrate with fresh standards
	Standards	Calibrate with standard in range similar to sample
Display frozen	HOLD function	Press MODE/HOLD button or turn meter off
	Button response	Remove then reinsert batteries (stored data will be lost)
“RENEW” message	pH sensor	Recalibrate meter
“RENEW” message	pH sensor	Replace electrode

REPLACING THE ELECTRODE

1. Unscrew and remove the electrode collar. Turn collar counter-clockwise.
2. Gently rock the electrode side to side, while pulling it away from the meter, until it disconnects from the electrode socket.
3. To attach an electrode, align the slots and carefully plug the electrode into the meter socket.
4. Firmly tighten the electrode collar to create a seal with the rubber gasket between the electrode and the meter.

WARRANTY

LaMotte Company warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on electrodes and cables). 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®

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