



## Tracer™ pH PockeTester

Code 1741



Do Not allow pH sensor to dry out.

- Store Upright
- Before first use, tap meter against palm to move electrolyte to tip.
- See pages 7 and 10.

Ne laissez pas le capteur sécher.

- Stockez l'instrument à la verticale.
- Avant toute utilisation, tapotez l'instrument contre la paume de votre main pour déplacer l'électrolyte vers le bout du capteur.
- Reportez-vous aux pages 22 et 26.



Water Testing Leader Since 1919!  
Leader en analyse d'eau depuis 1919!

## INTRODUCTION

Thank you for selecting the pH TRACERTM PockeTester. This instrument is designed for high accuracy pH testing. This device is shipped fully tested and calibrated and, with proper use, 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 Compensation	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, then 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	<i>BAT</i> 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]

## PARTS & ACCESSORIES

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

## CONTENTS

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

†Not sold in this quantity. See Parts & Accessories.

To order individual reagents or test kit components, use the specified code number.

## METER DESCRIPTION

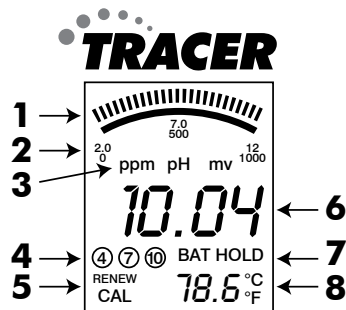
### Front Panel Description

1. Battery compartment cap
  2. LCD display
  3. MODE button
  4. CAL button
  5. ON/OFF button
  6. Electrode collar
  7. Electrode
- [Note: The Electrode cap is not shown]



### TRACER DISPLAY

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



## 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.

### Automatic 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.

### Changing the Displayed Temperature Units

Press and hold the CAL 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 calibration mode is accidentally accessed and *CAL* appears on the display, turn the TRACER off and begin again.

### Data Hold

Press the MODE button to freeze the current reading. The *HOLD* display icon will appear along with the held reading. The held reading will be stored in memory. Press the MODE 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.
6. A sponge is located in the electrode protective cap. Keep this sponge soaked with a pH 4 solution to prolong the life of the electrode during storage.

### 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. For the most accurate results, always calibrate at the sample temperature.

1. Place the electrode into a buffer solution (4, 7, or 10 pH) and press the CAL 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.

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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.

### Meter Reset

If the meter will not calibrate or displays a -1, reset the meter and attempt to re-calibrate.

1. Turn off the meter.
2. Remove the battery cartridge from the top of the meter.
3. Press the ON/OFF button for 10 seconds to bleed off all charges within the meter.
4. Re-insert the batteries and turn the meter on.
5. Follow the pH Calibration procedure.

### pH Measurement

1. Place the electrode in the test sample.
2. Record the pH after the reading becomes stable and the display stops flashing.
3. Press the ON/OFF button to turn the meter off. Rinse the electrode with distilled water. Replace cap

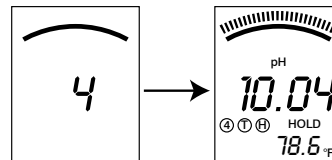
### pH Measurement of Soil

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 button to store the current reading. The storage location number will be displayed followed by the reading being stored.





2. Press the MODE 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 MODE function by pressing the MODE button.

1. Press the CAL 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 button again to exit.
2. The last stored reading taken will be displayed first. To advance through the stored readings, press the MODE button. The location number is displayed first, followed by the reading stored in that location.
3. To exit the recall mode, press the CAL button and the TRACER will return to normal operation. If the batteries are removed, any stored readings and user calibrations will be discarded.

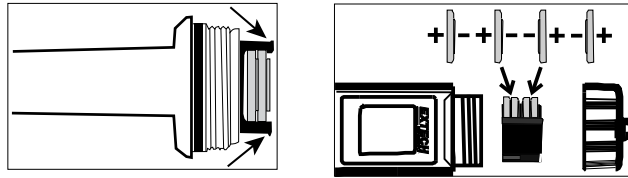
## MAINTENANCE

### Care/Storage of Electrode

1. 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.
2. 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.**
3. Do not touch the electrodes. Touching the surface of the electrodes may damage and reduce the life of the electrodes.
4. 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.



All EU users are legally bound by the Battery Ordinance to return all used batteries to community collection points or wherever batteries/accumulators are sold.

Disposal in household trash or refuse is prohibited.

DISPOSAL: Follow the valid legal stipulations in respect of the disposal of the device at the end of its life cycle

## Other Battery Safety Reminders

- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types. Always install new batteries of the same type.

## Cleaning and Conditioning the Electrode

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. 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.  
CAUTION: Take care to align pins carefully. Bent or broken pins will cause the meter to malfunction.
5. Tighten the electrode collar firmly enough to make a good seal. A rubber gasket will seal the electrode with the meter.

## TROUBLESHOOTING

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
	Electrode	Replace electrode
Slow response time or reading drift	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
	Oil, paint, dyes, suspended solids on electrode	Rinse electrode alternately with materials solvent then a buffer 7.00
Dry bulb	Dehydrated membrane, long term storage without wetting	Soak electrode tip in wetting cap filled with 1 mL 4.0 buffer for 24-48 hours
Static charge	Wiping electrode	Rinse electrode in 4.0 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 mL] 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 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

If the meter will not calibrate or displays a -1, reset the meter and attempt to re-calibrate.

1. Turn off the meter.
2. Remove the battery cartridge from the top of the meter.
3. Press the ON/OFF button for 10 seconds to bleed off all charges within the meter.
4. Re-insert the batteries and turn the meter on.
5. Follow the pH Calibration procedure.
  - If the unit appears to be locked [display frozen] it is possible that the Data Hold mode has been inadvertently accessed by pressing the MODE button. Press the MODE button again or turn the meter off and restart if the display appears frozen.
  - If the meter does freeze and no button presses revive it, remove the batteries, press the ON button for 10 seconds and then reinsert the batteries.
  - If the batteries are removed, any stored readings will be discarded and the user calibration data for pH will be cleared. New user pH calibration data is required. However, factory calibration data will be retained.

## 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.

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Total Chlorine TRACER Electrode, 0.0-10.0 ppm	Code 1732
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The Total Chlorine TRACER Electrode [Code 1732] requires the use of TRACER TCL Tablets. Order Code 7044-J [100 pack].

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ORP TRACER Electrode, $\pm 999$ mV	Code 1734
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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].

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## SAFETY

- This device is not a toy. Keep out of the hands of children. It contains hazardous objects as well as small parts that children could swallow. If a child swallows any part of this instrument, contact a physician immediately.
- Do not leave batteries and packing material unattended. They can be dangerous to children if used as toys.
- If the device is going to be unused for an extended period of time, remove the batteries to prevent draining.
- Expired or damaged batteries can cause cauterization on contact with the skin. Always use the appropriate gloves and safety precautions when handling batteries.
- Do not allow the batteries to short-circuit or throw batteries into a fire.