Operating Manual

OAKTON®

pHTestr® 5 Pocket Testers

Model pH5 — Glass bulb probe for general liquid testing

Model pH5F — Flat probe for surface or micro-volume testing

Model pH5S — Spear-tip probe for testing semisolid and solid materials

Thank you for purchasing an Oakton® pHTestr® Pocket pH Tester. Please carefully read this operating manual before using the product to obtain an accurate and reliable test result and avoid unnecessary damage to the tester or sensor/probe.

CE

Features

- Large easy-to-read LCD with 3-color backlight
- Accuracy of ±0.01 pH ± 1 digit
- 1, 2, or 3 calibration points
- Auto buffer recognition: US or NIST
- Stability and battery status icons
- Replaceable single-junction sensor saves you money
- Auto power-off function conserves battery life
- IP67 waterproof rating

Keypad Functions

Short press = <2 seconds **Long press** = >2 seconds

MEAS	1. Short press to turn on the tester and long press to turn off the tester. 2. When turned off, long press to enter parameter setting mode. 3. In measurement mode, short press to turn on backlight.
MODE △	1. In measurement mode, short press to switch parameter from **pH** to **ORP** (Oxidation Reduction Potential); ORP probe sold separately. 2. In parameter setting mode, short press to change parameter (unidirectional).
CAL ↵	1. Long press to enter calibration mode. 2. In calibration mode, short press to confirm calibration. 3. When measured value is locked (HOLD icon), short press to unlock.

Preparation Before Use

Models pH5 and pH5F: If it is first-time use or the tester hasn't been used for a long time, pour some 3M KCL solution to the Fill line in the probe cap and soak the probe for about 15 to 30 minutes. Users can store the probe in the 3M KCL solution in the probe cap when

the tester is not in use to maintain the sensor's accuracy. To achieve maximum accuracy, we recommend soaking the probe in the 3M KCL storage solution overnight (12 hours) to activate the glass membrane thoroughly.

Storing the pH5 and pH5F testers dry will NOT cause any permanent damage. It will only temporarily cause the probe to lose its sensitivity, which can always be restored by soaking in the storage solution.

Model pH5S: Never store the spear probe in a dry condition because permanent damage can be caused. The spear probe should always be stored in the 3M KCL soaking solution (potassium chloride). One 10-mL bottle of storage solution comes with the tester kit. If the soaking solution was contaminated, please replace immediately.

pH Calibration

1. Short press ⏻/MEAS key to turn on.
2. Rinse the probe in distilled water and use tissue paper to gently dab off excess water.
3. Pour certain amount (about half volume of the calibration bottles) of pH 7.00 pH and pH 4.00 buffer solutions in the corresponding calibration bottles.
4. Long press CAL/↵ key to enter calibration mode, short press ⏻/MEAS key to return to measurement mode.
5. Dip the probe in pH 7.00 buffer solution, stir gently, and allow it to stand still in the buffer solution until a stable reading is reached. When measurement stability icon (☺) appears and remains on the screen (see Fig 1); then short press CAL/↵ key to complete the one-point calibration. The tester returns to measurement mode and indication icon "**M**" will appear at the bottom left of the screen, indicating the middle point of calibration has been completed.

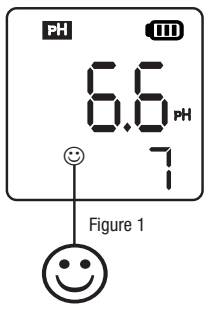


Figure 1

6. For 2-point calibration, start with pH 7.00 buffer solution; once confirmed then rinse the probe in distilled water and dry it with tissue paper. Dip the probe into pH 4.00 buffer solution, follow the steps above to complete 2-point calibration. Indication icons "**L**" and "**M**" will appear on the bottom left of the screen.
7. If necessary to perform a 3-point calibration, rinse probe with water, dip the probe into pH 10.01 buffer solution (sold separately), and follow the steps above. Indication icons "**L**", "**M**", and "**H**" will appear on the bottom left of the screen.

Notes

A. Tester can perform 1 to 3 points automatic calibration. Please note that pH 7.00 (USA Standard) or pH 6.86 buffer solution (NIST Standard) must be used to conduct 1st point calibration. Then use other

buffer solution to conduct 2nd or 3rd point calibration. Tester will automatically recognize five kinds of pH buffer solutions. For details, please refer to the following table:

Calibration	USA series	NIST series	Indication icons	Recommended
1-point	7.00 pH	6.86 pH	**M**	Accuracy: ≥0.1 pH
2-point	7.00 pH, 4.00 pH or 1.68 pH	6.86 pH, 4.01 pH or 1.68 pH	**L M**	Range: <7.00 pH
	7.00 pH, 10.01 pH or 12.45 pH	6.86 pH, 9.18 pH or 12.45 pH	**M H**	Range: <7.00 pH
3-point	7.00 pH, 4.00 or 1.68 pH, 10.01 or 12.45 pH	6.86 pH, 4.01 or 1.68 pH, 9.18 or 12.45 pH	**L M H**	Range: 0 to 14.00 pH

B. pH 4.00 and pH 7.00 buffer solutions are included in the pH5S test kit only but pH 10.01 is not. Users can purchase it separately if needed. The buffer solutions poured into the calibration bottles are NOT for one-time use. They can be used multiple times as long as they are not contaminated, and the bottles are covered when not in use. After that, we recommend replacing the buffer solutions in the calibration bottles with new ones that are in the buffer bottles (50 mL) to keep the accuracy of the standard buffer solutions. Do not pour used buffer solutions back into the buffer bottles in case of contamination.

C. The tester has self-diagnostic functions:

Symbol	Self-diagnostic information	Checking and how to fix
Er1	Wrong pH buffer solution or the range of calibration solution exceeds standard.	1. Check whether pH buffer solution is correct (1st point calibration must be 7.00). 2. Check whether the probe is damaged. 3. Check if there is any air bubble in the glass bulb sensor.
Er2	Press CAL/↵ key when reading is not stable during measurement.	Wait for the measurement stability icon (☺) to appear and stay, then press CAL/↵ key.

*If you find any air bubble in the glass bulb of the pH sensor, simply invert the probe for a few times to remove it. The existence of an air bubble in the glass bulb will significantly decrease the accuracy of measurement.

* The 1st point calibration must be 7.00 pH. Perform the 2nd point calibration (4.00 pH) immediately after the 1st point. Do NOT turn off the meter before you conduct 2nd point calibration. If the meter is turned off after 1st point calibration, user will need to restart the calibration process with the 7.00 pH first and the 4.00 pH following after. Calibrating directly in pH 4.00 after turning meter off and back on will cause "Er1".

pH Measurement

1. Short press ⏻/MEAS key to turn on the tester. Rinse the probe in distilled water, and gently dab off excess water with tissue paper (do not rub or wipe the glass sensor).
2. Dip the probe in sample solution, stir gently, and allow it to stand until a stable reading is reached. Take readings after stability indicator icon (☺) appears and stays on the screen.

Notes

A. Applications of each model:

Model/Probe	Application
pH5/Bulb probe	Regular water solutions' pH measurement such as hydroponics, aquaculture, pools and spas, water treatment, brewing, etc.
pH5F/Flat probe	Flat surface measurement such as skin, paper, fabric, leather and so on; micro sample testing; also works well for regular water solution.
pH5S/Spear-tip probe	Cheese, sushi rice, meat, fruit, bread, soil, solid culture medium and semisolid medium measurement; also works well for regular water solution.

B. **Model pH5F Flat probe tester** is mostly for flat surface sample testing.

- For skin test: skin should be without sweat or dirt, nor be overly cleaned (do not use facewash products before testing) to avoid affecting measurement results. Dampen skin with some distilled water, slightly force flat probe onto the skin, get readings after value stabilized.
- For paper, fabric and leather test: add 1 to 2 drops of distilled water on surface, then perform measurements.
- For micro sample testing, use a container with an inner diameter ≤19 mm and a flat bottom. The tester can test volume ≥0.5 mL.

C. **Model pH5S Spear-tip probe tester** is widely used for solids containing water or semisolid medium. When conducting such tests, pay attention to insert probe evenly and be careful to prevent probe from damage. If the medium is too hard (such as meat or fruits), please bore a small hole with a knife before inserting the probe. For pH measurement of any food (such as meat, cheese, sushi, etc.), it should be a sampling test. That means test samples should no longer be edible.

Special Notes

- The pH probe must be rinsed thoroughly after each use. Soap water should be used to clean off any grease or other contaminants.
- These pH testers will **NOT** give accurate or stable pH readings when testing distilled or deionized water. This is because distilled or deionized water do not have enough ions present for the electrode to function properly. To measure distilled or deionized water's pH, users need to use a specialized instrument technique. When

testing purified water like spring water or drinking water, it will take longer for the readings to get stabilized (typically 3 to 5 minutes) because there are very few ions left to be detected by the sensor in those purified water.

- Do **NOT** store probe in distilled or deionized purified water because that will cause permanent damage to the pH probe. Purified water is only recommended for rinsing the probe. The probe should be stored in 3M KCL pH electrode storage solution (SKU 00653-04) for best accuracy.

Setting the Parameters

When tester is turned off, long press ⏻/MEAS key to enter parameter setting. Short press MODE/△ key to switch from P1 to P2…P7. Short press CAL/↵ key and parameter will flash, then short press MODE/△ key to choose desired parameter. Short press CAL/↵ key to confirm parameter selection. Long press ⏻/MEAS key to return to measurement mode.

Symbol	Menu setting	Selection	Factory default
P1	Select pH buffer solution	USA – NIST	USA
P2	Set low measurement alarm	0 to 14.00 pH	0
P3	Set high measurement alarm	0 to 14.00 pH	14.00
P4	Select Automatic Lock (HOLD)	Off – On	Off
P5	Select backlight	Off – 1 – On	1
P6	Select temperature unit	°C – °F	°C
P7	Restore to factory default	No – Yes	No

Notes

A. Select standard pH buffer solution (P1)

There are two options of standard buffer solutions: USA series and NIST series.

B. High and Low Measurement Heads-Up Examples (P1 and P2)

Alert when measured value ≤3.20 pH: Preset lowest value (P2) = 3.20 pH, highest value (P3) = 14.00 pH, when measured value is ≤3.20 pH (stability icon (☺) displays on LCD), the red backlight appears on display.

Alert when measured value ≥8.60 pH: Preset highest value (P3) = 8.60 pH, lowest value (P2) = 0.00 pH, when measured value is ≥8.60 pH (stability icon (☺) displays on LCD), the red backlight appears on display.

Alert when measured value ≤3.20 pH or ≥8.60 pH: Preset lowest value (P2) = 3.20 pH, highest value (P3) = 8.60 pH, when measured value is lower than 3.20 pH or higher than 8.60 pH (stability icon (☺) displays on LCD), the red backlight appears on display.

C. Automatic Lock (P4)

Select "On" to activate auto lock function. When reading is stable for more than 10 seconds, the tester will lock the value automatically, and "**HOLD**" icon will appear on the bottom left of the screen. Press CAL/↵ key to cancel HOLD on reading.

D. Backlight (P5)

Select "Off" to turn off backlight function, "On" to turn on backlight function, or "1" to have backlight last for 1 minute.

E. Temperature Unit (P6)

Select °C or °F; the factory default is °C.

F. Factory Default Setting (P7)

Select "Yes" to recover instrument calibration to the theoretical value (pH value in zero potential is 7.00 pH, slope is 100%), parameter setting returns to initial value. This function can be used when instrument does not work properly in calibration or measurement. Calibrate and measure again after resetting the unit to factory default status.

ORP Measurement

ORP stands for Oxidation-Reduction Potential. ORP is a measure of the cleanliness of the water and its ability to break down contaminants. Note that ORP sensor module 35634-58 must be purchased separately (see *Ordering Information*).

Once ORP sensor probe is attached to tester, press MODE/△ key to enter ORP mode. Rinse the probe in distilled water and dry it. Dip the probe in sample solution, stir gently, and allow it to stand still until a stable reading is reached. Get readings after measurement stability icon (☺) appears and remains on the screen.

Specifications

pH	Range	–2.00 to 16.00 pH
	Resolution	0.01 pH
	Accuracy	±0.01 pH ±1 digit
	Calibration points	1, 2, or 3 points; auto buffer recognition
	Automatic temperature compensation (ATC)	32 to 122°F (0 to 50°C)
ORP (mV)*	Range	±1000 mV
	Resolution	1 mV
	Accuracy	±0.2% full-scale
Temperature	Range	32 to 122°F (0 to 50°C)
	Resolution	0.1°F/°C
	Accuracy	±0.9°F (0.5°C)

* Note that the ORP probe 35634-58 must be purchased separately (see *Ordering Information*).

Display: LCD with three-color backlight. Blue = measurement; Green = calibration; Red = alarm

Reading lock: HOLD icon

Power: four AAA batteries (included); >400 hours of continuous operation

Low-voltage warning: battery status icon flashes

Auto power-off: tester automatically turns off after 8 minutes of nonuse

IP rating: IP67 (waterproof), floats on water when sensor cap is on

Dimensions (L x W x H):

Models pH5 and pH5F: 7" x 1.5" x 1. 5" (17.8 x 4 x 4 cm)

Model pH5S: 8.5" x 1.5" x 1. 5" (21.6 x 4 x 4 cm)

Weight: 4.7 oz (133 g)

Ordering Information

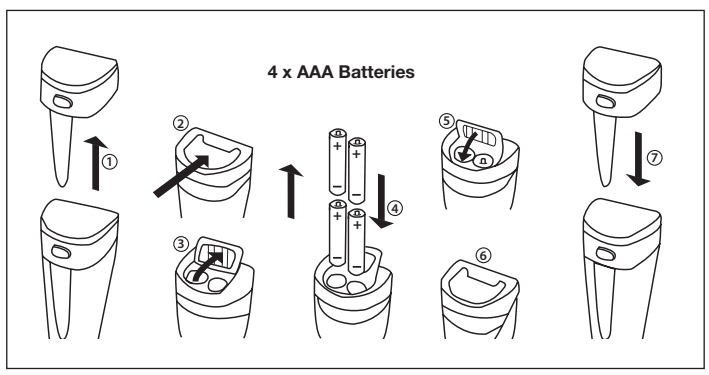
Model	Product description	Catalog number
pH5	pHTestr 5 pocket pH tester	35634-16
pH5F	pHTestr 5F flat-probe pocket pH tester	35634-46
pH5S	pHTestr 5S spear-tip pocket pH tester	35634-52
—	Replacement probe for pHTestr 5	35634-18
—	Replacement flat probe for pHTestr 5F	35634-48
—	Replacement spear-tip probe for pHTestr 5S	35634-56
—	Optional probe/sensor for ORP testing	35634-58

Probe Replacement

Screw off the probe/sensor ring, unplug the probe, plug in the new replacement probe (pay attention to the probe's position), and rescrew on the sensor ring.

Battery Installation

The tester uses four AAA batteries. Please install batteries according to the following steps. Note the correct direction of battery installation: the positive side (+) of every single battery must face up. Incorrect installation of batteries will cause damage to the tester and create a potential hazard.



1. Pull the battery cap up.
2. Slide the battery cap along the direction of arrow.
3. Open the battery cap.
4. Insert the batteries **(ALL POSITIVE SIDES FACING UP)**.
5. Close the battery cap.
6. Slide and lock the battery cap along the direction of arrow.
7. Fit the tester's cap while making sure to push all the way down. The tester's waterproof design may be compromised if the cap is not fitted correctly.

Warranty

We warrant this instrument to be free from defects in material and workmanship and agrees to repair or replace free of charge, at option of Oakton Instruments, any malfunctioned or damaged product attributable to responsibility of Oakton Instruments, for a period of **two years** from the delivery (a **six-month** limited warranty applies to sensors). This warranty does not apply to defects resulting from actions such as misuse (violation of the instructions in this manual or operations in the manner not specified in this manual), improper maintenance, and unauthorized repairs. Warranty period is the time limit to provide free service for the products purchased by customers, not the service life of the tester or probe.

Oakton Instruments reserves the right to update the information in this manual without giving notice in advance.

OAKTON® INSTRUMENTS

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