

Digital pH Meter

User Manual

Model: PHS-3C

pH Range: 0.00-14.00 pH

pH Resolution: 0.01 pH



FRISTADEN LAB

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Summary

IMPORTANT!

Thank you for purchasing the Fristaden Lab Digital pH Meter. Please read the User Manual carefully before use and follow all operating and safety instructions!

SPECIFICATIONS

Model	PHS-3C pH Meter
Display	LCD
pH Range	0.00 to 14.00 pH
pH Resolution	0.01 pH
pH Accuracy	Meter: ± 0.01 pH Electrode: ± 0.02 pH
mV Range	± 1999 mV
mV Resolution	1 mV
mV Accuracy	$\pm 0.1\%$ F.S ± 1 digit
Input Resistance	$\geq 1 \times 10^{12} \Omega$
Stability	$\leq \pm 0.01$ pH ± 1 digit/3h
Operation Functions	Auto Calibration Data Storage Record max/min Value
Power	110V 50/60hz DC9V power adapter
Dimensions	160 x 190 x 70mm
Weight	750g
Operation Conditions	5-35°C Temperature $\leq 85\%$ Relative Humidity
pH Buffer Powder	pH 4.01 (Potassium hydrogen phthalate (KHP)), pH 7.00 (mixed phosphate), pH 10.01 (sodium tetraborate)

Safety

WARNING!

Ensure everyone operating the machine reads the user manual and understands the operating instructions, cautions and dangers associated with the machine. Only trained staff should operate the machine.

Safety

IMPORTANT!

WARNING: The pH buffer powders may be harmful if swallowed. If swallowed, immediately seek professional medical assistance.

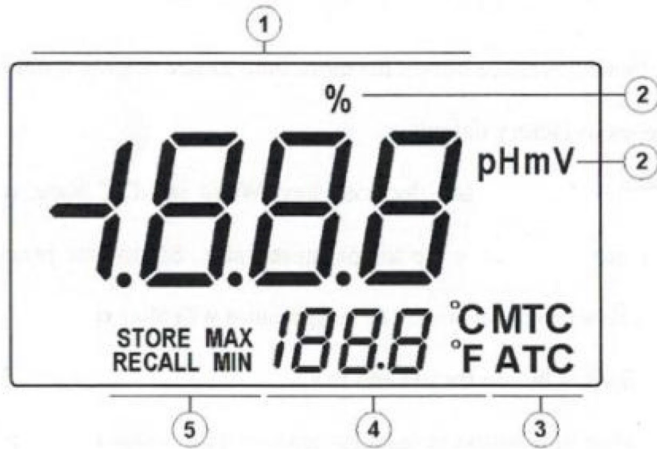
WARNING: The pH buffer powders can cause eye irritation. If the powder comes in contact with a person's eyes, immediately flush with water and seek professional medical assistance.

WARNING: The pH buffer powders can cause skin irritation. If irritation occurs, immediately seek professional medical assistance.

- Operate the machine in a safe environment away from hazards. Do not operate in a flammable or dangerous environment.
- Keep the machine away from magnetic parts (e.g. watches, pacemakers, etc.)
- Check the machine and accessories prior to each use for damage. Do not use if the machine or parts are damaged. Contact the manufacturer.
- Before plugging the machine into an electrical outlet, make sure the voltage and frequency matches that of the machine.
- Place the machine on a flat and spacious work surface.
- Operate the machine in a safe, dry and well ventilated environment. The environment temperature should not exceed 5-35°C.
- Always power off and unplug the machine when not in use. Store it in a safe place away from hazards
- DAMAGE: Do not use the machine if the device or any parts are broken. Contact the manufacturer and do not attempt to repair it yourself.
- DAMAGE: Do not replace power cables, plugs or other parts unless they are directly from the manufacturer.

Display and Controls

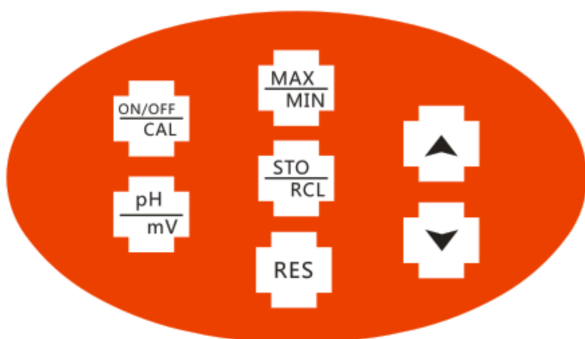
DISPLAY



1. Measuring Value
2. Measuring Unit
3. Temperature Compensation State
 - a. MTC: Manual Temperature Control
 - b. ATC: Automatic Temperature Control
4. Temperature Value and Unit
5. STORE/RECALL and MAX/MIN

Display and Controls

CONTROLS



ON/OFF | CAL

pH | mV

MAX | MIN

STO | RCL

RES

UP | DOWN

Turn device ON or OFF. | Calibrate the device.

Change the unit between pH and mV.

View the max and min values.

Store and recall past values.

Select Resolution. Hold for 1.5 seconds to switch between 0.01 and 0.1 pH.

Increase or decrease a value. This is normally used for recording the input temperature.

Operation

PACKING LIST

- Fristaden Lab Digital pH meter
- pH Electrode
- Electrode Arm
- 3x Buffer Powders (pH 4.01, 7.00, 10.01)
- Power Cord
- User Manual

Operation

INSTALLATION

CHECK FOR DAMAGE - Open the package and ensure no parts were damaged during delivery. Make sure all parts shown in the packing list are included.

1. Place pH meter on a flat, stable working platform.
2. Connect the electrode arm to the base of the pH meter.
3. Remove the cap from the port on the rear of the pH meter, then plug the electrode into the pH meter.
4. Attach the power cord and plug in the device.
5. The instrument accepts 110V. Confirm the voltage before using the meter.
6. Press the ON/OFF | CAL button to turn the instrument on.

CALIBRATION

NOTE: For high accuracy measurements ($\leq \pm 0.02$ pH), the pH meter should be calibrated immediately before use. For general use ($\leq \pm 0.1$ pH) the instrument can be used for one week after calibration.

NOTE: The pH meter needs to be recalibrated in the following situations:

- Using a new electrode.
- The meter has not been used for some time.
- After measuring a highly acidic or alkaline (pH <2.00, >12.00) solution.
- After using a sample that contains fluoride.
- After using a sample that contains a concentrated organic solution.
- The sample solution's temperature is much different than the calibration solution's temperature.

Manual Temperature Control

- A solution's pH will change based on the temperature. To account for this you need to enter the temperature into the pH meter.
 - NOTE: The meter is capable of ATC (automatic temperature control), but does not include a thermometer or a 3 in 1 electrode. The meter will automatically use ATC if one of these is installed.
- To change the input temperature, adjust using the up and down arrows.
- The temperature can be switched between °F and °C by using holding the pH | mV button.

Operation

CALIBRATION (CONTINUED)

Single Position Calibration

1. Turn on the pH meter..
2. Fill a small beaker with deionized water.
 - a. NOTE: Deionized water should have a pH of 7.00. Tap water can have a much higher pH and will affect the accuracy of the readings.
3. Add the 7.00 pH solution to the water and mix thoroughly.
4. Uncap the pH electrode and place the cap to the side.
5. Lower the pH electrode (supported by the electrode arm) into the solution.
6. Wait until the display is stable, then press ON/OFF | CAL and hold it until CAL displays on the LCD display. The display will then read "pH 7.00".
7. The pH (at this temperature) is stored.
8. Remove the electrode from the solution and rinse with purified water.

Slope Calibration

NOTE: For more accurate results calibrate using all three buffer solutions. If the device has been calibrated recently and you are measuring pH's below 7.00, use the 4.01 pH solution. For measuring pH's above 7.00 use the 10.01 pH solution. If you expect pH's to range between acidic and alkaline calibrate using both solutions.

1. Conduct the single point calibration (above).
2. Remove the electrode from the solution and rinse with purified water.
3. Fill a small beaker with deionized water.
4. Add the 4.01 or 10.01 pH solution (depending on if you will measure acidic or alkaline solutions) to the water and mix thoroughly.
5. Lower the pH electrode (supported by the electrode arm) into the solution.
6. Wait until the display is stable, then press ON/OFF | CAL and hold it until CAL displays on the LCD display. The display will then read "pH 4.01" or "pH 10.01".
7. The pH (at this temperature) is stored.

Operation

CALIBRATION (CONTINUED)

Slope Calibration (Continued)

8. Remove the electrode from the solution and rinse with purified water.
9. The display will automatically show the slope percentage of the electrode.
10. IMPORTANT: If the slope percentage is greater than 105% or less than 95% the calibration is inaccurate and you will need to recalibrate the device.
11. Repeat with the unused (pH 10.01 or pH 4.01) buffer solution if necessary.

pH SAMPLE TESTING

1. Remove the cap (if applicable) and rinse the electrode with purified water.
2. Place the electrode in the sample solution.
3. Wait until the display is steady before recording your measurement.
4. IMPORTANT: pH is affected by temperature. The results will be more accurate if the sample solution is at the same temperature as the calibration solution.
5. IMPORTANT: If the calibration or the display is abnormal hold the RES button until it makes a “ding” sound, then release it. Then recalibrate the device.

mV TEST

1. Press the pH | mV button.
2. Connect the ORP or ion electrode (not included).
3. Wait until the display is steady before recording your measurement.

USE °F or °C

1. Press and hold the pH | mV button to switch between °F and °C.

Operation

MAX/MIN FUNCTION

1. Hold the MAX | MIN button until the device displays “MAX” and “MIN”.
2. The device will now save the maximum and minimum values of the following measurements..
3. Once you have measured a batch of data, press the MAX | MIN button. It will alternate between the maximum and minimum values in the previous sample.
4. Press MAX | MIN to return to the measuring (standard) mode.
5. To exit this function, hold the MAX | MIN button until the display no longer shows MAX | MIN.

STORAGE/RECALL FUNCTION

STORAGE

1. To store a value, press STO | RCL.
2. The display will show “STORE” and a number (1 through 25). The value will be cataloged under this number for future recall.
3. This feature can store 25 values. Once all these values have been used, it will start over from 1.

RECALL

1. Hold the STO | RCL button until the display shows “STORAGE” and a recall number.
2. The displayed number will be the last stored value.
3. Press the down button to display past stored values.
4. Hold the STO | RCL button to exit this feature.
5. Clear all values by entering the recall mode (hold STO | RCL) and then hold both the up and down buttons.

Maintenance

ELECTRODE MAINTENANCE

ELECTRODE SOLUTION

The electrode is soaked in a solution when stored. If the solution becomes thick or moldy, it should be replaced immediately. Replace the solution with 30g pure KCL dissolved in 100mL of purified water.

ELECTRODE MAINTENANCE

1. **WARNING:** Do not touch the sensitive electrode tip with any hard or sharp object.
2. Thoroughly clean the electrode with purified water after every use. If a sample is stuck to the electrode, it can reduce the accuracy.
3. The electrode can be used for one year. If you have problems with the electrode, please contact Fristaden Lab for troubleshooting tips.

CLEANING & STORAGE

1. Always power off and unplug the balance before cleaning or storing it.
2. Do not clean the machine with elements that may corrode the machine.
3. Do not immerse the machine in water or other liquids.
4. Use proper safety gear (e.g. gloves, eyewear, etc.) when cleaning the machine to avoid injury.

Company Information

WARRANTY

The Fristaden Lab Digital pH Meter has a 1 Year Manufacturer's Warranty. Please contact Fristaden Lab's customer service at support@fristadenllc.com for more information.

ABOUT US

Fristaden Lab is a lab and scientific equipment retailer established in 2013 in Chicago, Illinois.

We sell an array of popular products, including analytical balances, centrifuges, glassware, hematology counters, hot plates, magnetic stirrers, pH meters, pipettes and pressure pumps.

We stand behind all of our products, offering a 1-2 year warranty, 30-day returns, and a responsive customer service team committed to solving any questions or issues you may have.

CONTACT

FristadenLab.com
support@fristadenllc.com

Owned and operated by
Fristaden & Company, LLC
401 Ryland Street, Suite 200-A
Reno NV, 89502 USA