Electron
Microscopy
Sciences

INSTRUCTIONAL MANUAL
CAT. #70693-01, #70693-02, #70693-03

Large Display pH Pens

Electron Microscopy Sciences
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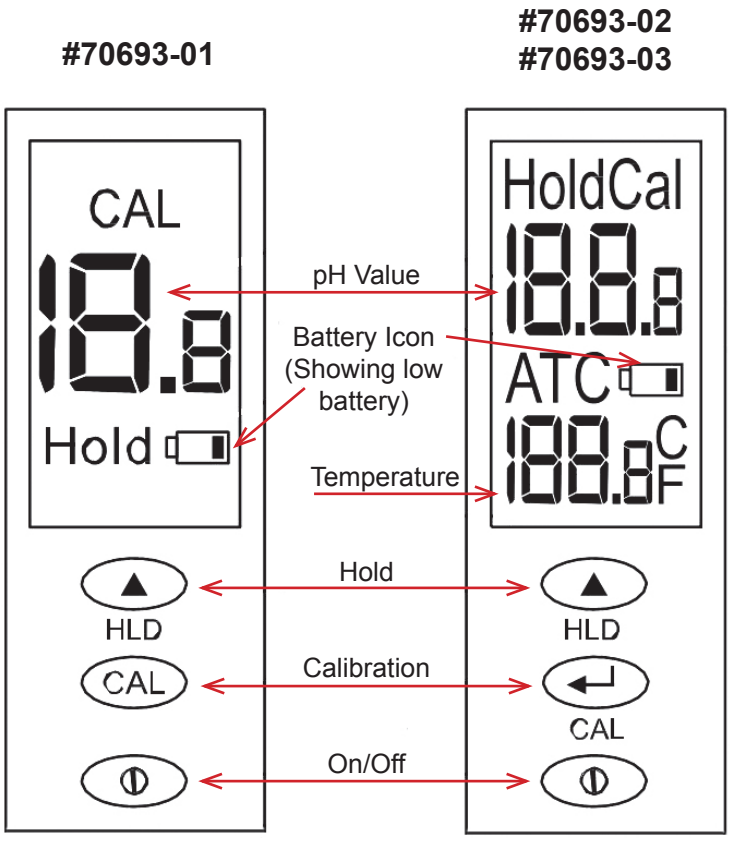
Introduction

These Large Display pH Pens are easy to carry, simple to operate and sufficient for most field pH tests. They have highly stable and accurate readings with a large LCD display. Designed for simple one-hand operation. Automatically calibrates to pH 4, 7, 10 buffers and can be adjusted to recognize non-standard buffers as well. These pH pens offer unbeatable solutions for applications such as waste-water, surface water, aquaculture, hydroponics, pools, and education. They each feature hold function, and auto power off with low battery indicator. The cases are IP65 waterproof, and will float if accidentally dropped into the water. They come with 4 button-cell batteries and a built-in electrode kept moist with a protective cap.

Removing Protective Cap

1. Hold the blue ring firmly in place with one hand.
2. Rotate the semi-transparent bottle 180° to 360° clockwise. *This will loosen the gasket to allow you to pull the cap off.*
3. Reverse the procedure to put the cap back on.

Display Features



Operating Instructions

Calibration Directions

NOTE: For first use, if the unit fails to turn on, check that the batteries are properly installed and working.
NOTE: Calibrate routinely before use, anytime the readings seem erratic, and whenever the batteries are replaced.

1. Remove the protective cap.
2. Clean the electrode with de-ionized/distilled water. **NOTE:** Crystals may form in the cap and these can be soaked or rinsed away. **NOTE:** Do not touch or rub the glass bulb.
3. Before first use or after extended storage, soak the electrode in KCl (potassium chloride) solution for 10 to 30 minutes.
4. Press ◐ for approximately 1 – 2 seconds to turn on the unit.
5. For 1-point calibration, dip/stir the electrode into pH 7 buffer solution and press the CAL button. If the probe is damaged or cannot detect the buffer, the unit automatically exits calibration mode after 10 seconds.
6. During calibration, “CA” flashes on the display. Then, “CAL” and the pH value are shown. In models 70693-02 & 70693-03, the ATC value is also shown.
7. “SA” (save) is displayed as the calibration point is saved.
8. “En” (end) (70693-01, 70693-02), or “End” (70693-03) displays when the calibration ends.
9. For 2 or 3 point calibration, start with pH 7, then repeat the above steps for pH 4 and/or pH 10.
10. The temperature of the sample and calibration solutions should be similar for the most accurate readings.
11. Repeat the above procedures until readings stabilize.
12. NOTE: If the buffer needs to be adjusted, press ▲ to adjust the displayed value. “SA” (save) is displayed, followed by “En” (70693-01, 70693-02), or “End” (70693-03).

Measurement Directions for 70693-01

NOTES:
- Calibrate routinely before use.
- Remove the protective cap and clean the electrode with de-ionized/distilled water.
- Do not touch the glass bulb.

1. Press ◐ for approximately 1 – 2 seconds to turn on the unit.
2. Dip/stir the electrode into the sample.
3. The pH value is displayed.
4. “- - -” is displayed when the pH sample is out of range.
5. During measurement, press ▲ to freeze the reading on the LCD. “Hold” is displayed. Press ▲ again to return to normal measurement.
6. The pH Pen automatically shuts off after 20 minutes of inactivity. To disable this feature, start with the unit off, then simultaneously press the CAL and ▲ buttons. Release both buttons when “n” is displayed. The unit returns to measurement mode.
7. After use, turn off the unit and rinse the electrode.
8. Protect the electrode’s lifespan by adding a few drops of KCl (potassium chloride) solution into the protective cap before storage.

NOTE: Always keep the protective cap on when the unit is not in use.

Measurement Directions for 70693-02 and 70693-03

NOTES
- Calibrate routinely before use.
- Remove the protective cap and clean the electrode with de-ionized/distilled water.
- Do not touch the glass bulb.

1. Press ⏻ for approximately 1 – 2 seconds to turn on the unit.
2. Dip/stir the electrode into the sample.
3. The pH value is displayed.
4. "- - -" is displayed when the pH sample is out of range.
5. "H" or "L" is displayed when the temperature is out of range.
6. To switch between °F and °C, start with the unit of, then simultaneously press CAL and ⏻
7. Release both buttons when "C" or "F" is shown.
8. Press ▲ to select the preferred unit, then press CAL to save.
9. "SA" (save) is displayed and the unit returns to measurement mode.
10. During measurement, press ▲ to freeze the reading on the LCD. "Hold" is displayed.
11. Press ▲ again to return to normal measurement.

NOTE: The pH Pen automatically shuts off after 20 minutes of inactivity. To disable this feature, start with the unit off, then simultaneously press the ⏻ and ▲ buttons. Release both buttons when "n" is displayed. The unit returns to measurement mode.

Maintenance

- After each use, turn off the unit and rinse the electrode.
- Protect the electrode's lifespan by adding a few drops of KCl (potassium chloride) solution into the protective cap before storage.
- Always keep the protective cap on when the unit is not in use.

Battery Replacement

NOTE: Replace all 4 LR44 batteries when the low battery icon is flashing, or when troubleshooting fails.

1. Unscrew the cover and install the batteries with the flat positive (+) side facing the springs.
2. Do not remove the O-ring.
3. Remove the batteries when the unit is not in use for an extended period.

TROUBLESHOOTING

Issue	Action
No display/erratic readings after soaking electrode in KCl (potassium chloride) solution for at least 1 hour prior to calibration.	Check continuity of the batteries by removing them for 1 minute, then reinsert.
Slow Response	Soak the electrode in KCl (potassium chloride) solution for 10-15 minutes, then rinse with distilled/de-ionized water.
No Display	Be sure to press  for at least one second. If the problem persists, replace battery.
"- - -" is displayed	pH sample is too acidic or too alkaline.
Readings are still erratic after calibration	Soak the electrode for 10 to 30 minutes in KCl (potassium chloride) solution.
pH value fluctuates quickly when the electrode is exposed to air.	This is normal when the electrode is not immersed in solution.

Specifications

Specification	Cat. #70693-01 Large Display	Cat. #70693-02 Large Display ATC	Cat. #70693-03 Large Display ATC 0.01
Range	2 to 12 pH	0 to 14 pH	0 to 14 pH
Resolution	0.1 pH	0.1 pH 0.5°F/°C	0.01 pH 0.1°F/°C
Accuracy	±0.3 pH	±0.2 pH	±0.05 pH
Auto 3 pt Calibration	3 pt	3 pt	3 pt
Adjustable Calibration Points	pH 4 3.5 to 4.5 pH 7 6.5 to 7.5 pH 10 9.5 to 10.5		
Waterproof	YES	YES	YES
Indicates Low Battery	YES	YES	YES
Auto Power Off	YES	YES	YES
Auto Buffer Recognition	YES	YES	YES
Hold	YES	YES	YES
Auto Temp Compensation	No	YES	YES
°C & °F Display	No	YES	YES
Special Features	Floats		
Operating Environment	31 to 122°F / 0 to 50°C & >80 RH		
Dimensions	6½" x 1½" x 1½" (165 x 38 x 38 mm)		
Weight	2.3 oz (65 g)		

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For any questions or for ordering information,
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