

pH / Temperature Probe

GENERAL DESCRIPTION

The MVP ICON® pH / Temperature Probe is a semi-conductor designed for general purpose pH measurement of liquids or semi-solids ranging from 0 – 14 pH. Temperature measurements, ranging from 0 – 80 °C, may be taken simultaneously. The probe features a silver / silver chloride / potassium chloride reference system and a thermistor with automatic temperature compensation. Solid-state componentry built into the MVP ICON instrument controls this sensing element. The MVP ICON pH / Temperature Probe is designed for use with the MVP ICON instrument only. Any other combination might cause loss of performance or irreversible damage to both probe and instrument.

Part No: 78088-00

KIT COMPONENTS

Each kit contains one MVP ICON pH / Temperature Probe and a soft bristle brush for cleaning the sensor on the tip.

TEST PROCEDURE

A. Using the MVP ICON pH / Temperature Probe

Note: The MVP ICON pH / Temperature Probe must be calibrated for pH prior to first use. See **B. Calibration for pH** for details.

- (a) Remove and save the protection cap or tube from the probe tip prior to use.

Note: Reference gel may be observed as a viscous material on the tip of the probe. Some gel seepage from a new probe is normal and will not affect the longevity or performance of the probe.

- (b) Prior to each day of use, scrub the probe tip with a soft bristled brush (included) and deionized water to remove possible residues. Use a mild detergent if required.
- (c) If the probe has not been used for 2 or more days, clean as above, soak tip in saturated KCl (potassium chloride) solution (see **OPERATING TIPS**) for 10 - 15 min, then soak in pH 7.00 or pH 4.00 buffer for at least 10 min.
- (d) Ensure the probe is securely connected to the MVP ICON instrument by inserting the probe's connector with the arrows facing toward the back of the instrument and the white circular sticker facing the front. Insert probe into the sample. Follow instructions on the MVP ICON to complete reading. Both pH and temperature readings will be displayed on the instrument screen.

Note: To disconnect the probe, squeeze both sides of the connector while unplugging from the MVP ICON.

- (e) When using the MVP ICON pH / Temperature probe with semi-solids, insert probe so that both sensor and porous white plug on opposite side of probe tip are contacting or immersed in the sample. Rotate left to right several times and tilt to ensure constant contact with the sample.
- (f) To ensure correct measurement values, samples or buffers should be mixed well. This may be done using a magnetic stirrer or by gently stirring the probe in the sample for at least 5 sec. You may continue to stir while the reading is taking place.
- (g) The probe should be rinsed thoroughly with deionized water and blotted dry between samples.

B. Calibration for pH

The MVP ICON pH / Temperature Probe features a 3-point calibration using pH 7.00, then pH 10.00, and finally pH 4.00 buffer solutions.

Note: Use a borate-based pH 10.00 buffer (not a carbonate based buffer) to ensure a robust calibration slope for pH values above 7.00.

Note: In order to perform accurate pH measurements, the MVP ICON pH / Temperature Probe must be calibrated daily prior to use, or when using a different MVP ICON pH / Temperature Probe.

- (a) Rinse the MVP ICON pH / Temperature Probe with deionized water. Soak probe in fresh pH 7.00 buffer for at least 2 min prior to calibration.
- (b) From the MVP ICON, enter **pH** mode, press **Device**, then press **Calibration**.
- (c) Insert the probe into pH 7.00 buffer to begin. Repeat with fresh pH 10.00 and pH 4.00 buffers when prompted on the MVP ICON screen. Ensure buffers are well mixed.
- (d) Rinse probe with deionized water and blot dry between buffers.

C. Calibration for Temperature

The MVP ICON pH / Temperature Probe uses a factory-calibrated thermistor. It only needs to be re-calibrated if it has been used to measure temperatures 20 °C above or below room temperature. The probe features a single-point calibration that can be done at any known temperature within the operating range.

Note: The calibration is most accurate when using a known temperature close to the sample temperature range.

- (a) From MVP ICON, enter **TEMPERATURE** mode, press **Device** menu, then press **Calibration**.

- (b) Insert probe into a liquid of known temperature, enter value into the **Reference Value** field, then press **Calibrate**.
- (c) The date of last calibration will appear on the MVP ICON Home screen.

STORAGE

Clean probe thoroughly with water, a soft bristled brush (included), and a mild detergent solution. Rinse with deionized water. Leave 1 - 2 drops of deionized water in the black protective cap or clear protective tube, then cover probe tip to prevent dehydration of the reference electrode and allow for faster start-up times.

WARNING: DO NOT IMMERSER PROBE IN ANY SOLUTIONS WHEN STORING!

For older probes that use the protective tube, slide the screw cap onto the probe body followed by the sealing O-ring. Insert probe tip into protective tube, then slide screw cap and O-ring down onto the rim of the protective tube. Slightly press the cap down and only then tighten the screw cap.

Store probe in original packaging when not in use.

PRECAUTIONS

- The MVP ICON pH / Temperature Probe is rugged and durable and requires little maintenance. To ensure lasting performance, read and follow all operating guidelines.
- Avoid prolonged exposure in samples containing Tris or proteins. Tris buffers and samples containing proteins should be read quickly and the probe should be rinsed thoroughly with deionized water between samples. When testing is complete, clean with water and a laboratory detergent and rinse with deionized water.
- Avoid prolonged exposure in samples at either end of the pH range. When unavoidable, rinse with ample water between samples. Rinse with neutralizing agents and deionized water after completion and prior to storage.
- Avoid prolonged exposure to extreme temperatures. Above 50 °C, limit probe exposure to the minimum time needed to obtain a stable reading. Do not use the probe outside the specified temperature range (see **SPECIFICATIONS**) as this might result in probe performance failure or irreversible damage.
- Samples must be aqueous liquids or semi-solids and compatible with the probe's wetted materials.
- The useful life of the MVP ICON pH / Temperature Probe is determined by the frequency and type of samples tested and the level of cleaning between uses.

- If information is required regarding the chemical resistance of the probe, contact BioControl.

OPERATING TIPS

To prepare saturated KCl (potassium chloride) solution, add KCl granules to distilled water until no more will dissolve. Adding 38 g of KCl to 100 mL water is sufficient. Let solution stand for at least 2 hrs and decant the clear solution. Use as described above.

To ensure correct measurement values, mix samples or buffers well.

Proteins, fats, and oils may be removed by gently scrubbing in a solution of Terg-A-Zyme (Alconox Company), a pepsin solution, or similar product. Afterwards, rinse thoroughly with deionized water. Cleaning agents are available from your laboratory supply vendor.

When testing in direct sunlight or on a bright reflecting surface, use brown, opaque, or shielded-sample containers. Very bright light may affect sensor performance.

For best results, use buffers that have already been reconstituted (not powdered tablets or packets). Also use buffers with specified values of 4.00, 7.00, and 10.00 (each ± 0.02) at 25 °C. Use a borate-based pH 10.00 buffer.

Buffer-handling: pH 7.00 buffers (phosphate-based) and pH 4.00 buffers (biphthalate-based) are less susceptible to carbon dioxide contamination (from exposure to air) than pH 10.00 buffers (borate or carbonate-based). Keep buffers sealed when not in use. Inability to calibrate probe usually indicates a failing probe or a contaminated buffer. Try calibrating with fresh buffers first.

Best results are obtained by stirring the probe in the solution for 1 min before calibrating or taking a reading, then continuing to stir while reading is being taken.

SPECIFICATIONS

Sensor:	pH: Semi-conductor Ion Sensitive Field Effect Transistor (ISFET) sensor with patented ESD protection circuit Temperature: Thermistor	
Operating range:	pH: 0.00 – 14.00	Temperature: 0.0 – 80.0 °C
Resolution	pH: 0.01	Temperature: 0.1 °C
Accuracy	pH: ± 0.02	Temperature: ± 0.5 °C
Reference compartment	Saturated KCl gel, non-refillable	
Wetted materials:	Barrel and tip: PEI	Packaging material: Epoxy-resin
	Reference liquid: Gelled KCl	Diaphragm: Porous PTFE

TROUBLE SHOOTING

If any of the following are observed—drift and/or instability of the reading, slow calibration, probe will not calibrate, or pH value doesn't change as expected when changing sample— clean probe (see **STORAGE**), soak tip in hot (40 °C) tap water for 5 – 10 min, blot dry, then soak tip in a saturated KCl (potassium chloride) solution (see **OPERATING TIPS**) at room temperature for 10 - 15 min.

Contact BioControl Technical Support at 800.245.0113 for more information.

WARRANTY

BioControl Systems, Inc. (BCS) warrants this product to be free from defects in materials and workmanship, when stored under labeled conditions and used as intended, for 6 months from date of purchase. BCS agrees during the applicable warranty period to replace all defective products after return to BCS. BCS shall not have obligation under this Limited Warranty to make replacements which result, in whole or in part, from negligence of the Buyer, or from improper use of the products, or use of the product in a manner for which it was not indicated. Buyer shall notify BCS of any products which it believes to be defective during the warranty period. At BCS option, such products shall be returned to BCS, transportation and insurance prepaid. BCS shall replace any such product found to be defective at no charge. Should BCS examination not disclose any defect covered by the foregoing warranty, BCS shall so advise Buyers and dispose of the product in accordance with Buyer's instructions.

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