

## GENERAL DESCRIPTION

The MVP ICON pH/Temperature Probe is designed for general purpose measurements in a temperature range from - 5 °C to 105 °C. The MVP ICON pH/Temperature Probe is an ISFET (Ion Sensitive Field Effect Transistor) semi-conductor. It features a silver/silver chloride/potassium chloride reference system and a thermistor to allow for automatic temperature compensation and temperature readings. Temperature and pH measurements may be taken simultaneously. Solid-state componentry built into the LIGHTNING MVP ICON™ instrument controls this sensing element. The MVP ICON pH /Temperature Probe can only be used in combination with the MVP ICON instrument. Any other combination might cause loss of performance or irreversible damage to both probe and meter.

Part No: 78088-00

## KIT COMPONENTS

Each MVP ICON pH/Temperature Probe kit contains one probe.

## TEST PROCEDURE

### A. Using the MVP ICON pH/Temperature Probe

- Remove and save the protection tube from the probe prior to use.
- 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. Prior to daily use, scrub the probe tip with a soft bristled brush and water to remove possible residues. Use a mild detergent, if required.
- The MVP ICON pH/Temperature Probe must be calibrated prior to its first use. See **B. Calibration for pH** for details.
- If the probe has not been used for two or more days, clean as above, place in saturated KCl (potassium chloride) solution (see **OPERATING TIPS**) for 10 to 15 minutes, then in pH 7.00 or pH 4.00 buffer for at least 10 minutes.
- Ensure the MVP ICON pH/Temperature Probe is securely connected to the MVP ICON instrument. Insert probe into sample. Follow instructions on the MVP ICON instrument to complete reading. Both pH and temperature readings will be displayed on the MVP ICON.
- When using the MVP ICON pH/Temperature probe with semi-solids, insert probe to desired depth then rotate left to right several times and tilt to ensure sample contact.
- To ensure correct measurement values, samples or buffers need to be mixed well. This may be done by a magnetic stirrer or by gentle stirring with the probe for

at least 5 seconds. You may continue to stir while the reading is taking place.

- The MVP ICON pH/Temperature Probe should be rinsed thoroughly with deionized or distilled water and blotted dry between samples.

### B. Calibration for pH

The MVP ICON pH/Temperature Probe features a three-point calibration at pH 7.00, 10.00, and 4.00.

**Note:** It is important that the buffer 10.00 solution is borate-based.

- Rinse the MVP ICON pH/Temperature Probe with deionized or distilled water. Soak probe in fresh pH 7.00 buffer for at least 10 minutes prior to calibration.
- From the MVP ICON device menu, select “Calibration,” ensuring the device is in pH mode.
- Insert the probe into pH 7.00 buffer to begin. Ensure that the buffer is well mixed. Follow calibration instructions on the MVP ICON.
- Repeat with fresh pH 10.00 and 4.00 buffers when prompted.
- Rinse probe with distilled or deionized water and blot dry between buffers.

### C. Calibration for Temperature

The temperature sensor within the pH/Temperature probe is factory calibrated. It only needs calibration if being used at temperatures 20 °C above or below room temperature. The probe features single-point calibration at a known temperature.

Any known temperature within the operating range may be selected for calibration. Note that calibration is most accurate when a temperature point close to the sample temperature is selected.

- From the MVP ICON “Device” menu, select “Calibration,” ensuring the instrument is in Temperature mode.
- Insert the probe into a liquid of desired temperature, enter the known calibration temperature when prompted, and press “Calibrate.”

## STORAGE

To store the probe, clean it thoroughly with water and a soft bristled brush (again a mild detergent may be used) and rinse with deionized or distilled water. **DO NOT IMMERSE PROBE IN ANY SOLUTIONS WHEN STORING!** Leave one or two drops of deionized or distilled water in the protective tube to prevent dehydration of the reference electrode. This allows for faster start-up times. Replace the protective tube. When doing so, slide the screw cap onto the probe body followed by the sealing O-ring. Slide cap and ring onto the rim of the protective tube, slightly press the cap down and only then tighten the screw cap.

## 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 immersion 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 or distilled water.

Avoid prolonged immersion in samples expected to have pH values at the ends of the pH range of 0 to 14. When unavoidable, rinse with ample water between samples. Rinse with neutralizing agents and distilled water when the measurement is complete and prior to storage.

Avoid prolonged exposure to extreme temperatures. Above 50 °C, limit the immersion of probe to the 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 to the probe.

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. Contact BioControl Technical Support at 800.245.0113 for more information.

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 gram of KCl to 100 mL water is sufficient. Let solution stand for at least two hours 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 scrubbing in a solution of Terg-A-Zyme (Alconox Company), a pepsin solution, or similar product. Afterwards, rinse thoroughly with deionized or distilled water. Cleaning agents are available from your laboratory supply vendor. Contact BioControl for additional information.

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

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 (borax or carbonate-based). Keep buffers sealed when not in use. If probe will not calibrate, it usually indicates a failing probe or a contaminated buffer. Try calibrating with fresh buffers.

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  $\pm 0.02$ ) at 25 °C. Borate-based pH 10.00 buffers also give better calibration slopes than carbonate buffers. Contact BioControl Technical Support for more information.

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

## TROUBLE SHOOTING

If the following are observed: drift and/or instability of the reading, slow calibration, probe will not calibrate, pH value doesn't change as expected when changing sample, clean probe with tap water and a soft bristled brush. Use a mild detergent (e.g. a non-abrasive soft soap).

Soak the probe in warm (40 °C/104 °F) tap water for 5 to 10 minutes, and then place in a saturated KCl (potassium chloride) solution (see **OPERATING TIPS**) at room temperature for 10 to 15 minutes.

## SPECIFICATIONS

Sensor:	Semi-conductor Ion Sensitive Field Effect Transistor (ISFET) sensor with patented ESD protection circuit
Operating temperature	-5 °C to 105 °C
pH range	pH 0 to pH 14
Resolution	0.01
Accuracy	$\pm 0.02$
Reference compartment	Saturated KCl gel, non-refillable
Wetted materials:	Barrel and tip: PEI Packaging material: epoxy-resin Reference liquid: gelled KCl Diaphragm: porous PTFE

## 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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IF YOU REQUIRE MORE INFORMATION ABOUT THE MVP ICON  
pH/TEMPERATURE PROBE, ITS USE OR OTHER BIOCONTROL  
PRODUCTS, PLEASE CONTACT:

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