

Conductivity Probe

GENERAL DESCRIPTION

The MVP ICON Conductivity Probe is designed for general purpose measurements of Conductivity ($\mu\text{S}/\text{cm}$), Concentration (ppm), and Temperature ($^{\circ}\text{C}$ or $^{\circ}\text{F}$) in water-based liquids. Temperature may be read simultaneously with conductivity or concentration readings, or by itself. The Conductivity Probe uses a 4-graphite electrode cell design ($K=0.45$) with a 1 cm cell length featuring a thermistor to provide temperature readings, ranging from 0 – 80 $^{\circ}\text{C}$, with automatic temperature compensation. Solid-state componentry built into the MVP ICON instrument controls this sensing element. The MVP ICON Conductivity 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: 78089-00

KIT COMPONENTS

Each kit contains one MVP ICON Conductivity Probe.

TEST PROCEDURE

A. Using the MVP ICON Conductivity Probe

Note: The MVP ICON Conductivity Probe must be calibrated for Conductivity and Concentration prior to first use. In order for the MVP ICON Conductivity Probe to be properly calibrated, **there must be a 10% difference in conductivity between the source water and the chemical standard.** See **B. Calibration for Conductivity** for details.

- Prior to each day of use, rinse briefly with deionized water.
- 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 conductivity and temperature, or concentration and temperature, readings will be displayed on the instrument screen.

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

- The probe is usable only with water-based liquids. It is necessary to immerse tip to a depth where the fluid is above the open cell chamber.
- To ensure correct measurement values, samples or standards need to 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.

- The probe should be rinsed thoroughly with deionized water and blotted dry between samples.

B. Calibration for Conductivity

The MVP ICON Conductivity Probe features a single-point calibration.

Note: For calibration, it is important use a conductivity standard solution that is within $\pm 10 - 50\%$ of the sample. Solutions of 500 or 1,000 $\mu\text{S}/\text{cm}$ are recommended.

- Rinse the MVP ICON Conductivity Probe with deionized water, then blot the tip dry.
- Insert probe tip into the conductivity standard to begin. Ensure that the standard is mixed well. Soak probe **for at least 2 minutes.**
- From the MVP ICON, enter **Conductivity** mode, press **Device**, then press **Calibration**.
- Enter the **Reference Value** (the μS value of the conductivity standard used) and press **Calibrate**.

Note: The Reference Value format is XXXX.X, so for 500 $\mu\text{S}/\text{cm}$, press **5, 0, 0, 0**.

- After completion, rinse probe tip in deionized water and blot dry.

C. Calibration for Concentration

After the probe has been calibrated for conductivity ($\mu\text{S}/\text{cm}$), it may then be calibrated for concentration (ppm). Chemical Standards will first need to be created in the MVP ICON Dashboard software and synchronized to the MVP ICON instrument. For more information on creating chemical standards, please refer to the MVP ICON User Guide.

- From the MVP ICON, enter **Concentration** mode, press **Device**, press **Calibration**, then select the corresponding standard from the list displayed.
- Insert the probe into a source water sample and press **Calibrate**. After completion, rinse probe tip in deionized water and blot dry.
- Insert the probe into the chemical standard and press **Calibrate**. After completion, rinse probe tip in deionized water and blot dry.
- The MVP ICON will either display **Calibration Successful** or **Calibration Failed**. If the calibration fails, remix the standard and try again. If still unable to calibrate, contact BioControl Technical Support at 800.245.0113.

D. Calibration for Temperature

The MVP ICON Conductivity Probe uses a factory-calibrated temperature sensor. 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 and a mild detergent solution. Rinse with deionized water. Store probe in original packaging when not in use.

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

PRECAUTIONS

The MVP ICON Conductivity 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 fats or proteins. Samples containing fats or 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 expected to have pH values at the ends of the pH range (0 and 14) or containing corrosive substances. When unavoidable, rinse with ample water between samples. Rinse with deionized water when the measurement is complete and prior to storage.

Avoid prolonged exposure to extreme temperatures. Above 50 °C, limit the probe exposure to the minimum time needed to obtain a stable reading.

Note: 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.

The useful life of the MVP ICON Conductivity Probe is determined by the frequency and type of samples tested and level of cleaning between uses.

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

OPERATING TIPS

For best performance, use freshly mixed standards.

Proteins, fats, and oils may be removed by gentle 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.

Keep conductivity standards sealed when not in use. Inability to calibrate probe usually indicates a failing probe or contaminated standards. Try calibrating with fresh standards first.

For best results, use conductivity standards that have already been reconstituted (not powdered tablets or packets). Also use standards with specified $\mu\text{S}/\text{cm}$ values at 25 °C.

Best results are obtained by stirring the probe in the standard for 5 - 10 sec before calibrating or taking a reading, then continuing to stir while reading is being taken.

For optimal accuracy, it is recommended to calibrate at the temperature of the samples being measured.

SPECIFICATIONS

Probe Technology	4-electrode cell design
Probe Type	Graphite electrodes; epoxy body
Concentration Range	10 - 200,000 ppm
Concentration Accuracy	$\pm 5\%$ Full Scale
Concentration Resolution	1 ppm
Conductivity Range	0 - 100,000 $\mu\text{S}/\text{cm}$
Conductivity Accuracy	$\pm 1\%$ Full Scale
Conductivity Resolution	0.1 $\mu\text{S}/\text{cm}$
Temperature Range	0.0 – 80.0 °C
Temperature Accuracy	± 0.5 °C
Temperature Resolution	0.1 °C
Temperature Compensation	Automatic across entire range
Temperature Coefficient	2.5% / °C Non-selectable
Cell Constant	0.45 Non-selectable

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TROUBLESHOOTING

If any of the following are observed—drift and/or instability of the reading, slow calibration, probe will not calibrate, or values don't change as expected when changing samples—clean probe (see **STORAGE**) using a soft bristled brush or Q-tip, soak tip in hot (40 °C) tap water for 5 - 10 min, blot dry, then soak tip in a conductivity standard 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 12 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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