

## pH Electrodes

Designed with  
Sealed and Refillable Silver/  
Silver Chloride (Ag/AgCl)  
Reference Half-Cell

### Instruction Sheet

How to use and maintain a pH electrode.  
For use in all conventional laboratory and  
industrial pH measurement applications.

#### Order Desk and Technical Support

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### Electrode Specifications

pH Range with least Na <sup>+</sup> Error Bulb Glass	0–14 pH 1–10 pH GP (general purpose) HT-3 (industrial grade) HT-4 (high pH > 12.0)
Temperature Range Polymer Body Glass Body	-5–80° C -5–110° C
Cable	Low Noise Coax Dual shielded

### Electrode Instructions

1. Wet the lower portion of electrode in tap water to remove excess salt crystals from storage solution. Carefully remove the lower plastic sleeve or boot. The sleeve or boot with KCl storage solution is only used for storage or shipping.

**Note:** Do not wet the cable or cap of the electrode.

#### For Refillable Style Electrodes

Slide (do not twist) the rubber sleeve down or remove the septum cap from the fillhole. Leave fillhole exposed to atmosphere during use.

2. For first-time usage or after long-term storage, soak the lower end of the electrode, including the bulb and wick, in 3.8 M KCl for 10 minutes. This will hydrate the pH bulb and allow the wick liquid junction to commence flowing.
3. If air bubbles are present inside the pH bulb area, shake downwards until the bulb is full of solution.

4. Thoroughly rinse the electrode tip with distilled or DI water to remove all traces of storage solution, pH buffer, process medium, or previous test solution.
5. Perform a two-point pH buffer calibration with the host pH meter. Follow manufacturer's instructions for calibration of the host pH meter.
6. Thoroughly rinse the electrode with distilled or DI water. Then, insert electrode into solution to be tested.

**Note:** The wetted portion of the electrode should be rinsed with distilled or DI water after each measurement to prevent carryover contamination.

## Care and Maintenance

1. If necessary, clean the wick and bulb area thoroughly before using the electrode. Improper cleaning may produce drift or slow response.

Refill Solutions for Refillable Style Electrodes
<b>Single junction electrodes:</b> 3.8 M Ag/AgCl solution BJC P/N: AS-3110-C20-0500
<b>Double junction electrodes:</b> <b>Upper Chamber:</b> 3.8 M Ag/AgCl solution BJC P/N: AS-3110-C20-0500 <b>Lower Chamber:</b> 3.8 M KCl solution BJC P/N: AS-3120-C20-0500

2. For storage, fill the storage sleeve or boot with 3.8 M KCl and insert electrode. The electrode should be stored in an upright (vertical) position.

Use 3.8 M KCl solution, BJC P/N: AS-3120-C20-0500. For best results, use an electrode storage boot sized for the electrode's OD.

## Cleaning the Electrode

1. Initial Cleaning: Wash with a solution of liquid detergent and warm water and gently scrub with a soft toothbrush or wet tissue. Follow with thorough rinse in DI water or clean tap water.
2. Inorganic Scale Deposits: Dissolve the deposit by immersing the electrode bulb in diluted HCl for a few minutes. Make sure no HCl comes in contact with the wick junction.

After dissolving the deposits, repeat step #1 above.

3. Organic Oil or Grease Films: If the film is known to be soluble in a particular organic solvent, wash with this solvent. Make sure no solvent comes in contact with the wick junction or polymer body. Repeat step #1 above. Follow with a 10–30 minute soak in 3.8 M KCl solution.
4. Plugged or Dry Ceramic Wick: Remove contaminant with one of the above procedures. Soak in 80° C, 3.8 M KCl solution for 30 minutes. Allow electrode to cool in same solution to promote flow of internal electrolyte through the liquid junction (wick).

## Recommended Calibration Procedures

1. Rinse the electrode thoroughly with DI water to remove all traces of storage solution, process medium, or previous test solution and to prevent carryover contamination of the pH buffer test solutions. Be certain to thoroughly rinse the electrode with DI water after each buffer test.
2. Insert the electrode in 7.0 pH buffer solution and stir to ensure proper contact. Allow a minimum of 30 seconds for the electrode to thermally equilibrate with the buffer solution before taking a pH reading. The pH reading should be 7.0 pH  $\pm$  0.33 pH ( $\pm$ 20 mV) at 25° C. Make any necessary adjustments to the pH meter with the standardize or zero control for a pH indication = 7.0 pH.

3. Rinse the electrode with DI water and insert it into a 4.01 pH buffer solution. Stir to ensure proper contact. Allow a minimum of 30 seconds for proper electrode/solution equilibration before taking a pH reading. Make any necessary adjustments to the pH meter with the slope or span control for a reading = 4.01 pH units.

## Notice:

- a. Always use fresh pH buffer solutions kept at 25° C for best results.
- b. pH buffer solutions above 7.0 pH are less stable and have a limited lifespan. High pH buffers will more readily absorb CO<sub>2</sub> from the atmosphere and will typically change to a lower pH value when left open.
- c. As the electrode becomes older, it will exhibit slower response times and will become less efficient in its ability to span several pH units with the same repeatability.
- d. pH electrodes are imperfect devices and require occasional calibration to characterize the electrode to its host pH meter.