

# PHE-921

## pH/ATC Waterproof Combination Electrode



### INSTRUCTION SHEET

**M2893/1208**

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### Specifications

<b>Range</b>	0 - 14 pH
<b>Isopotential Point</b>	0 ± 30 mV
<b>Temperature Range</b>	0 to 100°C
<b>Reference Element</b>	Silver/Silver Chloride
<b>Junction</b>	Ceramic
<b>Filling Solution</b>	4M KCl saturated with AgCl
<b>Storage Solution</b>	4M KCl
<b>Electrode Diameter</b>	12mm
<b>Body Length</b>	108mm
<b>Cable Length</b>	1 meter
<b>Connector Type</b>	BNC and 2.5mm phone plug
<b>Response Time</b>	95% in 10 seconds
<b>Sodium Error</b>	<0.2 pH at pH 14 with 1M sodium

### Electrode Preparation

1. Remove the electrode from Storage Vial.
2. Clean any salt deposits from the electrode body by rinsing with deionized (DI) or distilled water.
3. Verify that the Electrode Filling Solution is at least 2.5" (64mm) high. Must keep Filling Solution above the Fill Mark. If not, slide the electrode Fill Cap down to uncover the Fill Holes, and using the plastic dropper fill the inner chamber with Filling Solution.
4. Connect the electrode to the meter as described in the meter's manual.
5. During use leave the Fill Cap in the open position.

### Measuring Techniques

- Standardize at least daily for the most accurate readings.
- Always use fresh buffers.
- Stir all buffers and samples.
- During standardization, allow time for the electrode to stabilize before entering the buffer into the meter.
- Rinse the electrode with DI water between samples.
- Blot the electrode dry (do NOT rub or wipe).

### Storage

Place the electrode in its Storage Vial containing Electrode Storage Solution. Electrode Storage Solution (4M KCl) can be purchased or made. Make 4M KCl solution by dissolving 7.45 grams of potassium chloride into 100 mL of DI or distilled water. Do NOT store the electrode in deionized water.

### Troubleshooting

1. Connect the pH electrode to the BNC connector.
  2. Place the meter into absolute (*not* relative) mV mode.
  3. Rinse and place the clean electrode into a pH 7 buffer:  
The mV reading should be 0 ± 30 mV.  
Outside of this range indicates a problem.  
See below for solutions.\*
  4. Rinse and place the clean electrode into a pH 4 buffer:  
The mV reading should be 159 to 186 mV more than value in pH 7.  
*Example:* pH 7 buffer is 10 mV; pH 4 buffer should read 169 to 196 mV.  
Outside of this range indicates a problem.  
See below for solutions.\*
  5. Optionally, rinse and place the clean electrode into a pH 10 buffer:  
The mV reading should be -159 to -186 mV less than value in pH 7.  
*Example:* pH 7 buffer is 10 mV; pH 10 buffer should read -149 to -176 mV.  
Outside of this range indicates a problem.  
See below for solutions.\*
- \* Ensure that buffers are fresh and not contaminated. If readings are still outside of this range, clean the electrode and repeat test.

### Cleaning Procedures

If the electrode becomes sluggish, or has been determined to be bad, clean the electrode by following the directions below.

#### General

- Soak in 0.1M HCl or 0.1M HNO<sub>3</sub> for half an hour.
- Drain and refill the Electrode Filling Solution.
- Soak the electrode in Filling or Storage Solution for 1 hour.

#### Inorganic

- Soak in 0.1M tetrasodium EDTA solution 15 minutes.
- Drain and refill the Electrode Filling Solution.
- Soak the electrode in Filling or Storage Solution for 1 hour.

#### Protein

- Soak in 1% pepsin in 0.1M HCl for 15 minutes.
- Drain and refill the Electrode Filling Solution.
- Soak the electrode in Filling or Storage Solution for 1 hour.

#### Grease and Oil

- Rinse with mild detergent or methanol solution.
- Drain and refill the Electrode Filling Solution.
- Soak the electrode in Filling or Storage Solution for 1 hour.



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