

## Analytical Probes

- 1. Pretreatment Procedure
- 2. Troubleshooting Common Problems
- 3. Troubleshooting Difficult Problems



### PRETREATMENT PROCEDURES

#### INTRODUCTION

These instructions apply to measuring pH or ORP sensors.

Each sensor has a bulb protector boot filled with a membrane junction agent which provides an ideal storage for long periods.

NOTE: Sensors should NOT be stored for more than 6 months.

#### PREPARATION

Remove the bulb protector boot and immerse the lower end of the electrode into distilled water or pH buffer for 30 minutes. This operation hydrates the pH bulb and/or the reference junction for optimum performance. (Not applicable for ORP sensors.)

#### PH STANDARDIZATION

Two fresh buffers are required: (For high accuracy, set the buffer temperature to 25°C) pH 7.00 for initial standardization, followed by pH 4.01 or pH 10.0 (choose the one nearest to the pH sample) to span the sensor. (Do not forget to rinse the sensor(s) between the two measurements.)

#### ORP STANDARDIZATION

One or two ORP standards are recommended to check that the sensor is working properly.

#### SENSOR CLEANING

Sensors are susceptible to coating by many substances and the response time can deteriorate dramatically. If they are mechanically intact they can often be restored to normal performance by dipping the sensor tip in a solution of 4 parts water and one part Muratic acid. Then soak the tip in distilled water for 10 minutes.

## TROUBLESHOOTING COMMON PROBLEMS

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### READINGS ARE NOT REPRODUCIBLE

- Is there a sample carryover?
  - Are there sample interferences or complexing agents present?
  - Is the reference electrode junction contaminated?
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### SLOW RESPONSE (READINGS SLOWLY CHANGING)

Was the electrode stored in the wrong solution?  
Was the electrode poisoned by the sample?

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### OUT OF RANGE READING

- Is the electrode plugged into the controller properly?
  - Is the electrode placed in the sample solution?
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### LOW SLOPE OR NO SLOPE

- Are the standards too old, contaminated or made wrong?
  - Has the sample pH been adjusted properly to the operating range of the electrode?
  - Is there an air bubble on the sensor surface?
  - Is the controller okay?
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### NOISY RESPONSE (READINGS RANDOMLY CHANGING)

- Is the controller grounded?
  - Is there an air bubble on the sensor surface?
  - Is the controller working properly?
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### DRIFTY RESPONSE (READINGS CONTINUOUSLY CHANGING)

- Was the sensing membrane poisoned by the sample?
  - Are there temperature problems?
  - Is the sample too concentrated?
  - Does the sensing membrane need conditioning?
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### INACCURATE (BUT CALIBRATION IS OKAY)

- Are the standards correct?
- Was the sample pH adjusted properly?
- Is there sample carryover?
- Are there sample interferences or complexing agents present?

## TROUBLESHOOTING DIFFICULT PROBLEMS

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### COMPONENTS OF THE ELECTRODE SYSTEM

#### CONTROLLER

- Perform the checkout procedures as described in the instruction manual.

#### ELECTRODE

Perform an electrode slope check and inspect the electrode for physical damage. Polish, soak or rebuild the sensing membrane. Monitor the leak rate on the reference.

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### PROPER CALIBRATION

#### STANDARDS

- Prepare fresh standards by serial dilution.

#### PH ADJUSTMENTS

- Adjust pH to operational range of the electrode.
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### SAMPLE VARIABLES

#### CONCENTRATION RANGE

- Is the sample out of range?

#### PRESSURE

- Is the sample pressure incorrect?

#### TEMPERATURE

- Is the sample temperature incorrect?

#### PH

- Is the sample pH incorrect?

#### INTERFERENCES

- Are there interferences in the sample?

#### COMPLEXATION

- Are there complexing agents in the sample?

#### PH ADJUSTMENTS

- Adjust pH to operational range of the electrode.