

UV PROCESS SUPPLY, INC.

DIGITAL pH METER OPERATING INSTRUCTIONS

PART # N018-013

Introduction

A pH meter consists of two components: the instrument and the electrode. The electrode is attached to the instrument via a cable with a connector at its end. There are various styles of connectors used with pH meters, but the two most common styles are the U.S. Standard and the BNC. Of these two, the most common is the DNC and this is the style found on the Digital pH Meter.

The pH electrode is attached to the meter by pushing the BNC connector over the metal connector on the meter and twisting the BNC to the right until it locks into place. To remove the electrode, reverse this procedure.

pH Electrode

The electrode comes from the factory already activated and ready to use. At one end of the electrode is the cable which connects to the meter. At the other end you will find a protective plastic cap.

REMOVE THE CAP! When removing the plastic cap, you will find a small amount of pH buffer 4 in the cap. The buffer is there for a reason: **TO KEEP THE ELECTRODE WET** during storage.

When you are finished using the electrode, **ALWAYS** place some buffer 4 in the cap, and replace the cap. You want to avoid letting the electrode dry-out for several reasons. First, if the electrode is dry when you go to use it, you may have to soak it in buffer 7 for as long as 24 hours to bring it back to life. Secondly, the electrode will eventually fail to be reactivated as a result of being allowed to dry out too often.

One-Point Calibration

On a daily basis, perform the following calibration. The objective is to set the meter to read 7 when the electrode is placed in buffer 7.

- A. Measure the temperature of your buffer 7 with a Celsius thermometer. If your buffer has not been exposed to extreme temperatures, consider the buffer's temperature room temperature (25°C).
- B. Remove the protective plastic cap and rinse the electrode with distilled water. Place the electrode in the buffer 7 solution and set the temperature knob to indicate the buffer's temperature.
- C. Turn the control knob to pH and make the meter display 7 by adjusting the standard knob.
- D. Rinse the electrode with distilled water. You are now ready to test your sample.

Two-Point Calibration

Periodically, you will want to perform a two-point calibration in order to make sure the meter's slope adjustment still matches that of the electrode. This calibration corrects for the natural aging of the electrode.

- A. Measure the temperature of your buffers with a Celsius thermometer. If your buffers have not been exposed to extreme temperature, consider the buffers' temperatures room temperature (25°C).
- B. Attach the pH electrode to the BNC connector on the meter. Remove the protective plastic cap from the end of the electrode. For accurate readings below pH 7, calibrate with the buffer 4 solution. For accurate readings above pH 7, calibrate with the buffer 10 solution.

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- C. Place the pH electrode in buffer 7 and set the temperature control knob to indicate the buffer's temperature.
- D. Turn the control knob to pH and adjust the standard knob until the meter reads 7 pH.
- E. Set the temperature knob to indicate the temperature of the 4 or 10 buffer solution.
- F. Rinse the electrode with distilled water and place in the 4 or 10 buffer solution.
- G. Make the instrument read 4 or 10 by adjusting the SLOPE adjust with a fine screwdriver (included with each kit). NOTE: When turning the slope pot clockwise, you increase the gain.
- H. Return the electrode to the buffer 7 and reset to 7 using the standard knob. Repeat the 7 and 4 or 10 adjustments, (Steps C - G), until your meter reads exactly 7 when you return the electrode to the buffer 7 in Step H. You now have a precisely calibrated meter and are ready to test your sample.

Testing A Sample

After performing either the one- or two-point calibration, you are now ready to test your unknown sample. Instructions for testing the PH of a soil sample are found below.

- A. Measure the temperature of your sample with a Celsius thermometer. If your sample has not been exposed to extreme temperatures, consider the sample's temperature room temperature (25oC).
- B. Switch the control knob to the pH position.
- C. Set the temperature knob to the temperature of your sample.
- D. Place the electrode in the liquid portion of your sample. Stir the sample with the electrode. The pH reading will stabilize within 15 seconds.
- E. Turn off your meter. Rinse the electrode with distilled water, place some buffer 4 in the protective cap and replace the cap.

Storage of Electrodes

Since pH measurements are dependent on a hydrated glass bulb and a free-flowing junction from the reference electrode, keeping both wet is vital.

Fast response by the pH electrode to sample measurements has been observed when the electrode is stored in a slightly acid solution. Some users store the glass bulb in distilled water. THIS STORAGE PROCEDURE SHOULD NOT BE USED! The low ionic strength of distilled water extracts the ions from the bulb, causing a much slower response.

A pH4 buffer soaking and storage solution, however, provides a fast response for most sample pH measurements. PLACING A SMALL AMOUNT OF BUFFER 7 IN THE CAP AT THE END OF THE ELECTRODE WHEN STORING THE UNIT WILL ALLOW THE ELECTRODE TO STAY WET. THIS IS THE STORING PROCEDURE WE RECOMMEND.

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In order to provide a fast-responding and low-junction potential reference electrode, the junction must remain unclogged with low resistance and with flow of filling solution. If the junction is allowed to dry, some sample particles or precipitate may be difficult to remove from the junction by soaking.

If allowed to dry out, soak electrode up to 24 hours in buffer 7 solution. **Allowing the electrode to dry out frequently will permanently damage the electrode.**

Maintenance

- DO replace the protective cap when you are finished using the electrode. Be sure to put buffer 7 in the cap to keep the electrode wet.
- DO rinse with distilled water before and after using your buffer solutions and testing your sample.
- DO NOT scratch or break the glass bulb at the end of the electrode.
- DO NOT introduce the meter to damp or wet atmospheres. Your meter is not waterproof.
- DO change the battery in your digital pH meter when the battery check shows 8.0 volts or less.

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