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and

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1219 Queen Street East
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and

U. S. Fish and Wildlife Service
Lake Champlain Fish and Wildlife Resources Office
11 Lincoln St.
Essex Junction, VT 05452

INSTRUMENT OPERATING PROCEDURE

INSTRUMENT:

Portable pH measurement and logging device

MODEL:

265A/266S

MANUFACTURER:

Thermo Orion

PRECAUTIONS:

POTENTIAL INTERFERENCES

Assure that the probe is clean, free from scratches or organic build-up.
Store the pH probe wet in probe storage solution for long periods.

SAFETY

No special safety precautions

PROCEDURES:

- I. Preparing the unit
 - A. Check the batteries.
 - B. Connect the pH electrode to the terminal on the pH meter.
 1. Check that all connections are tight.
- II. Calibration of pH logger with Orion 9109WL Triode probe
 - A. It is important that pH probes and buffers be at room temperature when calibrating pH meters, and to calibrate pH loggers at the same temperature as the hand-held meters are calibrated.
 - B. The model 265A and 266S pH loggers are calibrated using the three point calibration method with 4, 7, and 10 pH buffers.
 - C. Press power key to turn unit on.
 - D. Press the **cal** key to enter calibration mode. CAL 1 is displayed.
 - E. Remove protective cap from the electrode, rinse electrode with distilled water, pat off excess water with a Kim wipe, and rinse with pH 7 buffer. Do not wipe probe or glass bulb with lab wipe.
 - F. Immerse probe in pH 7 buffer, stir buffer for several seconds to remove bubbles from electrode, and wait a minimum of 5 minutes for the probe to stabilize. Press **cal** and gently stir to calibrate to pH 7 (the measured mV value is displayed). When pH 7 calibration is complete, CAL 2 is displayed.
 - G. Rinse probe with distilled water, pat off excess water, and rinse with the pH 4 buffer. Immerse probe in pH 4 buffer, stir buffer for several seconds to remove bubbles from electrode, and wait a minimum of 5 minutes for the probe to stabilize. Press **cal** and gently stir to calibrate to pH 4. When pH 4 calibration is complete, CAL 3 is displayed.
 - H. Rinse probe with distilled water, pat off excess water, and rinse with the pH 10 buffer. Immerse probe in pH 10 buffer, stir buffer for several seconds to remove bubbles from electrode, and wait a minimum of 5 minutes for the probe to stabilize. Press **cal** and gently stir to calibrate to pH 10. When calibration is complete, the calibration process is automatically terminated and the E0 and % slope is momentarily displayed. The unit automatically switches back to measure mode.

III. StatFace™ electrode monitoring

A. The StatFace symbols in the upper left corner of the display indicate the state of the electrode:

1. ☺ Electrode is calibrated and in good working order.
2. ☹ Electrode response is slow/deteriorating. Electrode should be cleaned and recalibrated.
3. ☹ Electrode response is very slow and correct measurement is no longer ensured. Clean or replace electrode

IV. Data logging mode

A. Press the **STO** key and then the clock key to access data log mode options. Press the up or down arrow key to move between options. Pressing **STO** also advances to the next menu item. Pressing the **meas** key at any time ends data logging mode.

B. To set parameters scroll to **PAR**: Press **STO** and Int (time interval between logged data points) is displayed

1. In **INT**, press **STO** to access interval range, which should be set at 60:00 (60 minutes); if not, adjust interval using up or down arrows. Press **STO** again and display returns to **Cont**.

C. Scroll to **Strt** (start): Pressing **STO** clears the logger memory and begins data logging. The first logged data point is in memory location “00”.

D. The Orion model 265A and 266S records up to 100 data points (memory locations “00” to “99”). The data log does not automatically stop after reaching 100 data points. It continues logging beginning at location “00” and overwrites previously recorded data.

V. Deployment

A. Place the unit in an inconspicuous location on the stream bank so the probe can be placed in moving water several feet from the bank.

B. Suspend the probe in the water column (e.g. drape from a tree branch, place on a forked stick stuck into the stream bed or on a stack of rocks). This minimizes interference from silt or biological accumulation on the electrode.

C. Enter data logging mode (press **STO** then **clock**), move to **Strt**, then press **STO** to begin logging. Record the time logging started, logger pH and water temperature on the pH Logger Calibration and Deployment Record form.

VI. Retrieval

B. Press **meas** to end data logging and turn the unit off.

C. Downloading pH logger data with Paraly SW109 data transfer software

1. Connect the logger to a computer with the serial interface cable. The 3-prong end is connected to the logger with the “PC” labeled side facing the front of the

- unit.
2. Launch SW109 and turn the logger on.
3. SW109 and logger are in communication when the “LOG” icon on the SW109 menu is yellow. If not, click “COM Port” on the Configuration pull down menu and make sure the appropriate COM port is selected (usually COM1) and the baud rate matches the baud rate set on the logger (4800).
4. Click the yellow “LOG” icon to download the logger data and save the file (filename.ply).

VII. Orion 9109WL Triode storage and maintenance

- A. Short-term storage (up to one week): Cover electrode with the protective cap containing a small wad of cotton saturated in ph electrode storage solution (Orion 910001) or pH 4 buffer.
- B. Long-term storage (more than one week): Rinse off any salt deposits with distilled water. Cover with protective cap containing a few drops of electrode storage solution (or pH 4 buffer).
- C. Before using after long-term storage, rinse off any salt deposits with distilled water. Immerse in electrode storage solution for at least one hour.
- D. The electrode can be cleaned by soaking in pH 4 buffer. If this does not improve performance, use the ph electrode cleaning kit (Orion 900020), following instructions in the kit.

MAINTENANCE:

All sensors are shipped with the measuring end covered with a wetting cap. Sensors are stored in a pH 4 buffer solution when not in use. Vertical storage is recommended to prevent leakage of the buffer solution from the wetting cap.

A number of other maintenance and troubleshooting procedures are described in the instrument and sensor instruction manuals: Models 265A and 266S Waterproof and Intrinsicly Safe Portable pH Meters

REFERENCE

Instruction manual for the Models 265A and 266S Waterproof and Intrinsicly Safe Portable pH Meters

This procedure has been reviewed and approved by the undersigned representative of the U.S. Fish and Wildlife Service

REVIEWED/APPROVED _____ DATE _____
Field Supervisor (U.S.)