

IOP 013A.8
Effective Date: 1/09/2017
Replaces IOP 013A.7
Page 1 of 4

U.S. Fish and Wildlife Service
Marquette Biological Station
3090 Wright Street
Marquette, Michigan 49855
U.S.A.

and

U.S. Fish and Wildlife Service
Ludington Biological Station
5050 Commerce Drive
Ludington, Michigan 49431
U.S.A.

and

Department of Fisheries and Oceans
Sea Lamprey Control Centre
1219 Queen Street East
Sault Ste. Marie, Ontario P6A 2E5
Canada

INSTRUMENT OPERATING PROCEDURE

INSTRUMENT:

Micromedic automatic pipettor

MODEL:

#25000, #25004, #25004FW

MANUFACTURER:

ICN Biomedicals, Inc.

PRECAUTIONS:

POTENTIAL INTERFERENCES

Particulate matter in the lampricide stock solution may obstruct the tip of the delivery tube.

SAFETY

Protective latex gloves and safety glasses are worn when disassembling the pump for cleaning.

PROCEDURES:

I. Preparation

- A. The pipettor is situated on a shelf near the source of affluent water for the system diluter box. The pipettor is located;
1. Near an electric outlet
 2. On the same shelf or below the shelf on which the toxicant solution is situated
 3. Close to the affluent water source to minimize the length of tubing necessary to deliver the toxicant solution.
- B. Prepare the toxicant pumps;
1. Dispense a small volume of water into the barrel of each pump. This will serve to prime the pump.
 2. Insert the plunger into the pump barrel. The fit must be snug to prevent leaks of toxicant solution. If the fit is not snug replace the Teflon seal.
 3. Adjust the position of the piston drive levers by placing the selector switches in the SET position (SET switch down and lighted).
 4. Install the pump(s);
 - a. Push the piston of the pump all the way into the barrel of the pump.
 - b. Rotate the valve pins so the forward valve pin is on the same side as its corresponding valve position indicator on the pipettor.
 - c. Pull out the pump latching pin and hold.
 - d. Insert the central pivot pin on the head of the pump into the mating hole on the pipettor.
 - e. Guide the valve pins on the pump into the matching holes on the pipettor.
 - f. Release the pump latching pin. Gently pull the pump downward to ensure that the pump is locked into position.
 - g. Pull the piston downward until the slot in the lower end straddles the ruby ball on the end of the drive lever, then snap the latch spring of the piston under the ruby ball.
- C. Prepare toxicant delivery tube system;
1. Toxicant source tubes
 - a. Connect a source tube to an intake port on each pump. The ports are identified as intake or delivery by trial-and-error.
 - b. Insert the other end of the toxicant source tube into the toxicant reservoir.

2. Toxicant delivery tubes
 - a. Connect a toxicant delivery tube to a delivery port on each pump. The ports are identified as intake or delivery by trial-and-error.
 - b. Connect the toxicant delivery tubes to the ports on the pumps. Procedure varies with the configuration used.
 - (1) If the tubes deliver through separate tips, pass the tips through the tube support and adjust the position so the toxicant is delivered into the stream water flow into the diluter box.
 - (2) If the tubes deliver through a common tip, connect the tubes at the manifold connector and pass the single tip through the tube support and adjust.

II. Operation

A. Calculate delivery rate;

1. The rate at which toxicant solution is delivered is determined by the pumping rate (20 strokes/minute, high speed; 10 strokes/minute, slow speed), the volume of the pump in use (100 uL or 1.0 mL), the pipettor setting (percent full stroke delivery) and the number of pumps used (1 or 2).
2. The volume of toxicant (mL) delivered per minute is calculated by multiplying the volume of the pump by the pipette setting, the pumping rate, and the number of pumps in use (example: 0.1 mL (pump volume) X .50 (pipette setting) X 20 (high speed pumping rate) X 2 (number of pumps in use) = 2.0 mL/minute delivery rate).

B. Function

1. Priming
 - a. All air must be removed from the pumps and tubes for the pipettor to function properly.
 - b. Place the toxicant source tubes in deionized water.
 - c. Place the **SET** and **RUN** switches in the PRIME position (both down and lighted) and allow the pipettor to run until the tubes are clear of bubbles and water is being delivered.
 - d. If water is not drawn through the tubes:
 - (1) Remove the pump, remove the piston from the pump, run water into the barrel, and reassemble.
 - (2) Maximize the setting for the pump (99.9) and retry.
 - e. Inspect each pump for bubbles in the barrel. If bubbles are seen through the glass window:
 - (1) Maximize the delivery for the pump (99.9).
 - (2) Tap the barrel of the pump as it operates until the bubbles are passed out through the delivery tube.
2. Toxicant delivery
 - a. Place the toxicant source tubes into the toxicant reservoir.
 - b. Turn the pipettor on (the **SET** and **RUN** switches are in the PRIME

- c. position; both down and lighted).
- c. Run the pipettor until the toxicant nears the delivery tips. This usually is indicated by a change of color in the delivery tubes.
- d. Place the **SET** and **RUN** switches in the OFF position.
- e. Turn the index counter to the desired delivery setting.
- f. To begin delivery place the **SET** and **RUN** switches in the PRIME position.
- g. Periodically check the delivery to assure proper function.

III. Post-operation

- A. Move the tip of each toxicant delivery tube so it delivers into a beaker rather than the diluter box.
- B. Lift each toxicant source tube above the level of the toxicant in the reservoir.
- C. Operate the pump for about one minute (until several inches of tube is void of toxicant).
- D. Wipe each toxicant source tube clean as it is moved into a vessel of deionized water (not stream water).
- E. Allow the pipettor to operate about 15 minutes (Switches in PRIME position; both lighted). The tubes will appear clean, but the solution in the pumps may yet be yellow.
- F. Remove the pumps from the pipettor, remove the plungers, and soak or rinse in deionized water until clean.
- G. Wrap the pumps in paper towels and store.

MAINTENANCE:

Teflon pump seals: Teflon seals or "O" rings are replaced when leaks appear around the plunger. Pumps are removed from the pipettor and disassembled according to instrument instructions.

Cleaning: After each use the pumps are purged for 10 - 15 minutes with deionized water, disassembled, and soaked to remove lampricide residue.

REFERENCE:

Micromedic Automatic Pipette Operating Manual

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.)