

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

and

U.S. Fish and Wildlife Service
Lake Champlain Fish and Wildlife Resource Office
11 Lincoln St.
Essex Junction, Vermont 05452
U.S.A.

INSTRUMENT OPERATING PROCEDURE

INSTRUMENT:

Digiflex automatic pipettor

MODEL:

33010S

MANUFACTURER:

Titertek

PRECAUTIONS:

POTENTIAL INTERFERENCES

Ensure that the valve is working correctly when dispensing is occurring. The valves have a tendency to not

work properly. Particulate matter may clog the delivery tip.

SAFETY

Protective latex gloves and safety glasses should be worn during disassembly to avoid exposure to lampricide stock solution.

PROCEDURE:

I. Preparation

- A. Select 10-200 μL or 10-2000 μL dispensing syringe. For most applications, the 10-200 μL dispensing syringe is used.
1. For the 10-200 syringe, the TFM diluter concentration range is 5.0 - 13.0 mg/L with 22,500 mg/L stock solution and 2.5 - 6.5 mg/L with 11,250 mg/L stock solution.
 2. For the 10-2000 syringe, the TFM diluter concentration range is 1.0 - 20 mg/L with 11,250 mg/L stock solution.

- B. The required pipettor TFM feed rate is calculated by the formula:

$$\text{Pipettor Feed Rate } (\mu\text{L/minute}) = \left(\frac{Q_w * C_d}{C_s} \right) \div 1.0 \times 10^{-6}$$

Where: Q_w = flow of water into cell 10 (3.75 L/minute)
 C_d = desired concentration (mg/L) in cell 10 - use Table 1
 C_s = concentration of lampricide stock solution (11,250 or 22,500 mg/L)

- C. The resultant pipettor feed rate in $\mu\text{L/minute}$ is compared to the Table 2 (for 10-200 syringe) or Table 3 (10-2000 syringe) nomographs to determine the required pipettor setting. The feed rate ($\mu\text{L/minute}$) is matched with the closest value in the appropriate nomograph and the pump setting is determined from the left and header columns (e.g., if the pipettor feed rate is 1424 $\mu\text{L/minute}$, the pipettor setting would be 54.0).
- D. Determine the settings for a 1% Bayluscide test by multiplying the highest TFM concentration in cell 10 by 0.01 (e.g., 5 mg/L TFM x 0.01 (1.0%) = 50 $\mu\text{g/L}$ Bayluscide). The Bayluscide stock solution is prepared by diluting a pre-weighed vial (0.305 grams) of 70% wettable powder Bayluscide in two liters of acetone, mixed with stir bar or shaking, and allowed to settle overnight (0.305 grams = 189 mg/2L A.I. niclosamide = 0.0945 mg/mL or 9.45×10^{-5} $\mu\text{g/mL}$). **Safety Note: Wear goggles, gloves, and do not breathe powder.**

1. The $\mu\text{L/minute}$ feed rate for the pipettor is determined with the formula:

$$\text{Bayluscide feed rate } (\mu\text{L/min}) = \frac{Q_w \times C_b}{C_s}$$

Where: Q_w = flow of water into cell 10 (3.75 L/minute)
 C_b = concentration of Bayluscide in Cell 10 (mg/L)
 C_s = concentration of A.I. Bayluscide in stock solution (in $\mu\text{g/mL}$) (0.305 G 70% wettable powder diluted in 2L acetone).

2. Determine the pipettor settings from Table 2 or 3.

3. Example: TFM concentration in Cell 10 is 3.5 mg/L

Concentration of Bayluscide is $3.5 \text{ mg/L} \times 0.01 = 0.035 \text{ mg/L A.I.}$
 $3.75 * 0.035 / 9.45 \times 10^{-5} = 1,389 \mu\text{L/minute Feed Rate}$
Pipettor Setting = 51.0 (from Table 2 with 10-200 syringe)

II. Startup

- A. Turn POWER switch to the ON position.
- B. Press the **INSTALL SYRINGE** button on the keypad.
- C. Install the dispensing syringe block assembly (dispensing syringe screws onto dispensing block) and lock in place with the two black toggles located above the syringe head. Screw in dispensing syringe at bottom.
- D. **NOTE:** Dispensing syringe blocks for the Digiflex pipettor can be used on either channel, but the Titertek pipettor dispensing syringe blocks are clearly marked for LEFT and RIGHT channels.
- E. Press the **START** button on the keypad.
- F. Connect tubing to syringe block and lock with the lock rings.
- G. Prime the Pump
 1. Place the suction side Teflon tubing in the stock solution and the discharge tubing into cell 10 of the diluter. To ensure proper mixing of the stock solution with the diluter water, the tip of the tubing is placed to deliver the stock solution into the water stream from the head box. **If animals are present in tanks,** prime into a beaker, and position discharge tubing to Cell 10 before test initiation.
 2. Press the **SAMPLE/DISPENSE** button on the keypad.
 3. Press the **PRIME** button on the keypad.
 4. Press the **START** button on the keypad.
 5. Press the **STOP** button when the pump and tubing are primed.
- H. Pipettor Routine operation

1. Enter the pump setting
 - a. Refer to Sections A.1 - A.4 to select appropriate pump setting.
 - b. Press the **LEFT** or **RIGHT SYRINGE** button on the keypad (the side on which the syringe block assembly is installed).
 - c. Enter the desired pump setting using the keypad.
 - d. Press the **ENTER** button.

2. Chemical delivery
 - a. Press **CONTINUOUS RUN** on the keypad.
 - b. Press the **START** button to dispense stock solution.
 - c. Press the **STOP** button to terminate chemical delivery.

III. Shutdown

- A. Place the suction tube into distilled water to flush the system.
- B. Press the **PRIME** button on the keypad.
- C. Press the **START** button.
- D. Allow the unit to flush for 5 minutes.
- E. Press the **STOP** button.
- F. Press the **INSTALL SYRINGE** button and remove the syringe block assembly.
- G. Turn **POWER** switch to the **OFF** position.

MAINTENANCE:


Clean syringe and block assembly after each use. Replace seals as needed according to Digiflex or Titertek Operating and Service Manuals.

Lubricate drive screws annually or when they squeak, and perform other maintenance according to Digiflex or Titertek Operating and Service Manuals.

REFERENCES:

Digiflex Pippetor Operating Manual

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

REVIEWED/APPROVED  DATE 2-9-12
Field Supervisor (U.S.)