

- ★ After removing the tip cone, wipe the piston, the O-ring and the tip cone with ethanol and a lint-free cloth.

Note : Models up to 10 μ l have a fixed O-ring location inside the tip cone, so do not remove or maintain it.

- ★ Before replacing tip cone, it is recommended to grease the piston slightly using the silicone grease provided.

After reassembling, use the pipettor (without

- ★ liquid) several times to make sure that the grease is spread evenly.

Check the pipettor calibration.

- ★ **Note :** Never disassemble the upper part of the pipette. To avoid losing or damaging fragile parts, reassemble the pipette immediately.

CALIBRATION

Each pipette has been checked & calibrated at factory with procedure conforming to DIN 12650 standards. It is recommended to check the calibration at least once a year, for regularly used pipette.

Checking calibration

- (1) Fit the new tip onto the tip cone.
- (2) Pipette distilled water in to a preweighed beaker at least five times & record the weight each time.
- (3) Compare the results with the permitted variation chart given below. The calibration of the pipette must be set even if only one of the results falls outside the permitted range.

| Volume | Variation permitted | Volume | Variation permitted |
|------------|---------------------|--------------|---------------------|
| 1 μ l | $\pm 0.15 \mu$ l | 50 μ l | $\pm 0.80 \mu$ l |
| 2 μ l | $\pm 0.20 \mu$ l | 100 μ l | $\pm 1.50 \mu$ l |
| 5 μ l | $\pm 0.30 \mu$ l | 200 μ l | $\pm 2.00 \mu$ l |
| 10 μ l | $\pm 0.30 \mu$ l | 500 μ l | $\pm 5.00 \mu$ l |
| 20 μ l | $\pm 0.40 \mu$ l | 1000 μ l | $\pm 10.00 \mu$ l |

For user in a normal lab environment, the limits may be doubled.

Important Notes

1. Procedure should take place at 20 $^{\circ}$ (± 0.5) $^{\circ}$ C. constant temperature.
2. The weighing beaker, distilled water, pipettor & tips must be at the same temperature.
3. Use an analytical balance with 0.01 mgs readability.
4. Prerinse the tip 3 to 5 times before pipetting.
5. Divide the weight of the water by its density (at 20 $^{\circ}$ C, 0.9982) to get the volume.

Recalibration

- (1) Place the service tool in to the holes at the base of the Push button as shown below. Turn it clockwise to increase & anticlockwise to decrease the volume.
- (2) Repeat the 'Checking calibration' procedure.



STORAGE

When not in use it is recommended that your pipettor is stored in a vertical position.

Leaving pipette on it side can cause liquids to leak in to the body of the pipette and cause corrosion.

TROUBLE SHOOTING

| Trouble | Possible Reason | Correction |
|---|---|---|
| Droplets left inside the tip | Unsuitable tip, Non-Uniform wetting of the plastic | Use new tip |
| | Tip holder (cone) scratched or damaged | Change the tip cone |
| | Organic Solvent as liquid. | Aspirate & discard the organic solvent several times before actual pipetting by the same tip. |
| Leakage or Pipetted volume too small | Tip incorrectly attached | Attach firmly. |
| | Unsuitable tip. | Use new tip. |
| | Foreign particles between tip and tip cone. | Clean the tip cone. |
| | Insufficient amount of grease on piston and O-ring. | Clean & grease O-ring and piston. |
| | O-ring not correctly positioned or damaged. | Change the O-ring. |
| Inaccuracies | Incorrect operation. | Follow instructions carefully. |
| | Calibration altered. | Recalibrate according to instruction. |
| | Unsuitable for the particular liquid pipetting technique. | Use correct pipetting technique. |
| | Instrument damaged. | Send for repair. |
| Push button jammed or moves erratically | Piston contaminated. | Clean & grease O-ring and piston |
| | Penetration of solvent vapours. | |
| Tip Ejector jammed or moves erratically. | Tip cone contaminated from outside. | Remove ejector collar and clean tip cone's outer surface with ethanol. |
| Volume setting is not properly click stopped. | Click stop mechanism damaged. | Send for repair. |
| Push Button dose not turn for volume setting. | Use of excessive force beyond the range of pipette | Send for repair. |

DiamondPRO
SINGLE CHANNEL PIPETTOR

Research Micro Pipette with Smart Grip

INSTRUCTION MANUAL



GLOBE SCIENTIFIC INC.
610 Winters Avenue
Paramus, NJ 07652 U.S.A.
800-394-4562 or 201-599-1400

PIPETTE DESCRIPTION

These PIPETTES are available as fixed or variable, general purpose micropipettes for sampling and dispensing accurate amounts of liquid in micro volumes.

These pipettes operate on the air displacement principle and use disposable tips.

All models are equipped with a built-in Tip Ejector

They cover the volume range of 0.5 μl to 5000 μl .

Variable volume pipettes

| Volume Range | Increment |
|------------------------|--------------------|
| 0.5-10 μl | 0.1 μl |
| 5-50 μl | 0.5 μl |
| 50-200 μl | 1.0 μl |
| 200-1000 μl | 5.0 μl |
| 10-100 μl | 0.5 μl |
| 100-1000 μl | 5.0 μl |
| 2-20 μl | 0.1 μl |
| 20-200 μl | 1.0 μl |
| 500-5000 μl | 50.0 μl |

Fix volume pipettes

| Volume |
|--------------------|
| 5 μl |
| 10 μl |
| 20 μl |
| 25 μl |
| 50 μl |
| 100 μl |
| 200 μl |
| 250 μl |
| 500 μl |
| 1000 μl |
| 5000 μl |

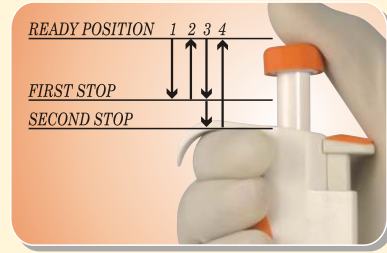
Note: Special volume pipettes other than specified above may be supplied on demand.

Multi(8) Channel pipettes

| Volume Range | Increment |
|----------------------|-------------------|
| 0.5-10 μl | 0.1 μl |
| 5-50 μl | 0.5 μl |
| 30-300 μl | 1.0 μl |

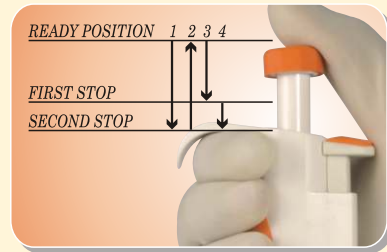
PIPETTING TECHNIQUE

A. Forward Pipetting



1. Press the operating button to the first stop.
2. Dip the tip attached to the pipettes into the solution to a depth of about 1cm, and slowly release the operating button. Wait for a while then withdraw it from the liquid touching it against the edge of the reservoir to remove excess liquid adhering to outer surface of the tip.
3. Dispense the liquid into the receiving vessel by gently pressing the operating button to the first stop. After a second, press the operating button to the second stop. This will empty the tip completely. Remove the pipette from the vessel sliding it up the wall of the vessel.
4. Release the operating button to the ready position.

B. Reverse Pipetting



1. Press the operating button to the second stop.
2. Dip the tip attached to the pipette into the solution to a depth of about 1cm, and slowly release the operating button. This action will fill the tip with a volume that is larger than the set volume. Wait 1-2 seconds and withdraw the tip from the liquid touching it against the edge of the reservoir to remove excess liquid.
3. Dispense the liquid into the receiving vessel by pressing the operating button gently and steadily to the first stop. This volume is equal to the set volume. Hold button in this position. Some liquid will remain in the tip, which should not be dispensed.
4. The liquid remaining in the tip can be pipetted back into the original solution or disposed together with the tip.
5. Release the operating button to the ready position.

Note: Reverse pipetting technique is recommended for viscous solutions, solution having tendency to foam or dispensing very small volumes.

PIPETTING RECOMMENDATIONS

- Aspirate liquid into the pipette only when a tip is attached to its tipcone.
- While pipetting, the pipettor should be vertically straight and tip should be dipped only a few millimeters into the liquid.
- Prerinsing of tip 5 times with the liquid to be dispensed is recommended. This is important especially when dispensing liquids which have a viscosity and density different from water.
- Always control the push button movements with the thumb for consistency.
- Allow liquids, Tips, and pipettes to equilibrate to the ambient temperature.
- Prerinse the tip several times before use when pipetting liquids at temperature different from ambient.
- Wipe the tip only if there is liquid on the outside of the tip, being careful to avoid touching tip's orifice.
- Don't keep pipette in your hand while not working to avoid transferring body heat.
- Use the correct pipette tip designed for use with the particular pipette
- Select the correct pipetting technique (e.g. Reverse, forward etc.) depending on the nature of the liquid.
- Using excessive force to turn the push button outside the range specified for it may jam the mechanism and damage the pipettor.

MAINTENANCE

To maintain the best results from your pipettor, each unit should be checked every day for cleanliness. Particular attention should be paid to the tip cone(s).

This pipettor has been designed for easy in-house service. However, also provides complete repair and calibration service. Please return your pipettor to your local distributor for repair or calibration. Before returning please make sure that it is free from all contamination.

Check the performance of your pipettor regularly e.g every 3 months and always after in-house service or maintenance.

Cleaning Your Pipettor

To clean your pipettor use ethanol and a soft cloth or lint-free tissue. It is recommended to clean the tip cone regularly.

In-House Maintenance



- ★ Hold down the tip ejector.
- ★ Place the tooth of the opening tool between the tip ejector and the tip ejector collar to release the locking mechanism.
- ★ Carefully release the tip ejector and remove the ejector collar.
- ★ Place the wrench end of the opening tool over the tip cone and turn it anti-clockwise.