

DESCRIPTION

The Micro D-Tipper™ Fixed Volume Pipettes are general purpose pipettes for sampling and dispensing liquids when accuracy, precision and convenience are required. The Micro D-Tipper pipettes are available in nine volumes ranging from 2 µL to 10 µL and use a standard MLA small tip.

Micro D-Tipper pipettes are piston stroke, air displacement instruments with tip ejection. The Micro D-Tipper is a two stroke pipette with overblow, enhancing the accuracy and precision at volumes below 10 µL. The first stop is the measuring stroke. The second stop is the dispense and blow-out stroke.

The Micro D-Tipper is factory calibrated to dispense the volume engraved on the pipette. Calibration can be verified and easy in-lab adjustment is possible. This feature is useful for compensation when samples with viscosity or specific gravity significantly different from distilled water are measured.

The standard MLA small tip is recommended for use with the Micro D-Tipper. These are available in stacked, bulk or EconoPak. Trace metal, individually wrapped sterile and pyrogen-free sterile tips are also available for special applications. Like all MLA mechanical pipettes, the Micro D-Tipper has a Lifetime Warranty.

PERFORMANCE SPECIFICATIONS

Cat. No.	Volume	Color	Accuracy	Precision
1802	2 µL	Red	2.0%	2.5%
1803	3 µL	Gray	1.5%	2.0%
1804	4 µL	White	1.5%	2.0%
1805	5 µL	Silver	1.0%	1.5%
1806	6 µL	Green	1.0%	1.5%
1807	7 µL	Purple	1.0%	1.5%
1808	8 µL	Black	1.0%	1.5%
1809	9 µL	Blue	1.0%	1.5%
1810	10 µL	Orange	1.0%	1.0%

Specifications are subject to change without notice.

Pipettes are factory calibrated and verified gravimetrically using distilled water and analytical balance. Water temperature and ambient conditions are stabilized and controlled in accordance with documented procedures. Statistical process control is used to ensure consistent lot to lot quality.

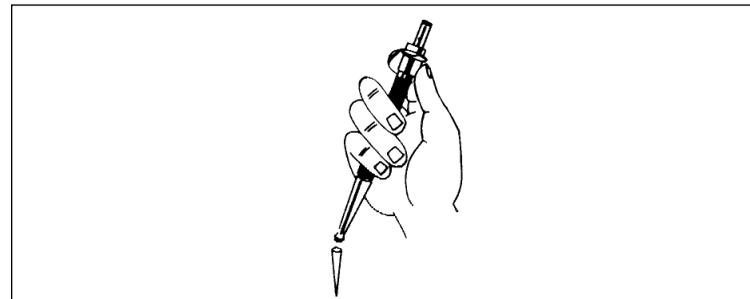


Figure 1: Automatic De-Tipping

Calibration Adjustment

In the event that adjustment of the calibration is required, we recommend the gravimetric method under controlled environment, or an authorized calibration service. Pipettes can be returned to MLA Systems for recalibration and repair as part of the Lifetime Warranty. It is highly recommended that the pipettes be returned to the manufacture for recalibration using controlled conditions and procedures consistent with ISO and NCCLS standards which are important to achieve accuracy at microvolume ranges.

Adjustment Procedure

Determine the pipette delivered volume by gravimetric test procedure. A minimum of five weighing is required. If out of specification, allow pipette and materials to equilibrate to ambient temperature, and retest. If still out of range, proceed to adjust volume. The range of adjustment is $\pm 10\%$.

1. Insert the provided allen key into the push button end of the pipette. (See Figure 4)
2. Turn the key clockwise to increase volume, or counter-clockwise to decrease volume. Hold the plunger button while turning the key. See table for volume change per turn of allen key.

For Micro D-Tipper Volume	Change in Volume per Turn
2 µL	0.15 µL per turn
3 - 4 µL	0.28 µL per turn
5 - 10 µL	1.25 µL per turn

3. Retest pipette by same method to determine volume.

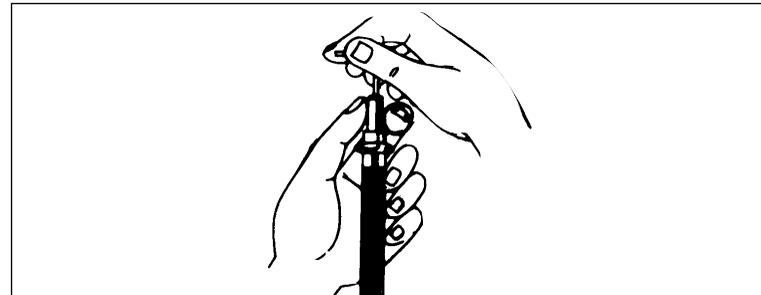


Figure 4: Pipette Volume Adjustment

WARRANTY

Your new Micro D-Tipper pipette is the only pipette available with a Lifetime Warranty. Complete the registration card enclosed to activate your new pipette warranty. Once the completed registration card has been returned, the lifetime warranty becomes effective.

MLA Systems guarantees that your new pipette will be free from defects in materials and workmanship.

Should the pipette be received in any other condition, please contact MLA Systems Technical Services at 1-888-652-6520 immediately for Return Authorization and replacement.

Should the pipette fail to operate or require repair, for any reason, return your pipette to MLA Systems Pipette Repair Department. See enclosed warranty card for details.

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MLA Micro D-Tipper™ Fixed Volume Pipette

Operating Instructions



PIPETTE OPERATION

PIPETTE TIP

The pipette is a precision instrument. System performance depends on the pipette and tip system used. Using tips which were not used to calibrate the pipette may effect accuracy and precision. For best results, use the manufacturer recommended tips.

ASPIRATING/FILLING

1. Securely attach the appropriate, unused pipette tip.
2. Press plunger button down to the first stop.
3. Hold pipette vertically and immerse the tip approximately 3 mm into the sample solution.
4. Gently and slowly return the plunger button to up position. Do not let it snap back.
5. Withdraw the tip from the liquid so that no drops remain attached on the outside of the tip. Should any liquid remain, wipe the outside of the tip with a lint-free tissue, taking special care not to touch the tip opening.

DISPENSING/EMPTYING

6. Place the tip against the side wall of the receiving vessel.
7. Depress the plunger slowly to the first stop. Pause.
8. Depress the plunger further to the second stop (blow out) or bottom of stroke, dispensing all liquid from tip.
9. With the plunger still fully depressed, slowly withdraw the tip while sliding along the wall of the vessel. Release plunger to up position.
10. Eject tip by lifting the tip ejector bonnet.

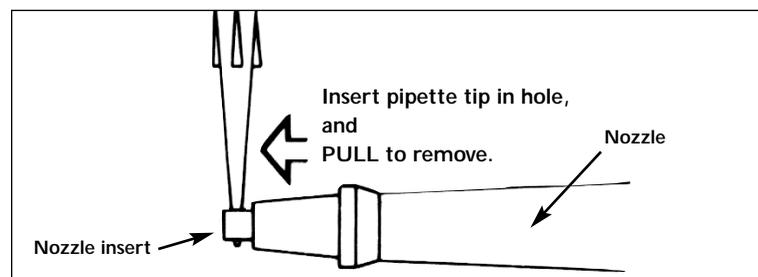


Figure 2: Nozzle Insert Removal and Replacement

SPECIAL NOTES

- Do Not pre-wet tips.
- Use a new tip for each aspirate/dispense.
- Dispensing must be performed along the vessel wall or directly into liquid. Perform blow-out stroke, hold plunger down, and withdraw pipette from vessel.
- With small sample volumes, results can be optimized by rinsing the tip after dispensing. After the first dispense is performed, keep the tip in the receiving vessel and aspirate and dispense several times. Perform blow-out and slide tip out along the vessel wall.

OPERATIONAL LIMITATIONS AND PRECAUTIONS

- Consistent technique and smooth, steady movements are key to precision.
- Keep the pipette in a vertical position at all times when in use.
- Always depress the plunger to the proper stop before putting the tip into liquid to avoid air and incorrect volume intake.
- Differences in the temperature of the pipette and solution can result in inaccurate dispensing.

RECOMMENDED MLA PIPETTE TIPS

Cat. No.	Description	U/M
9025	Stacked Dense Pack, 5 trays; 200 tips per tray	1000 tips
4025	Protectainer Bulk Pack	1000 tips
4225	Econo-Pak	1000 tips
2025	Sterile, Individually wrapped	200 tips
2027	Pyrogen-free Sterile, Individually wrapped	200 tips
9022	Trace Metal Certified, Stacked Dense Pack	1000 tips

SERVICE AND MAINTENANCE INFORMATION

During factory assembly, the internal parts of the pipette (plunger, seals, etc.) are lubricated with a silicone grease. Normally, cleaning, replacement of seals and nozzle inserts, and lubrication should be necessary only every 6 months. If the pipette is used with corrosive chemicals or solvents, or roughness in the plunger movement is observed, cleaning and lubrication may be necessary more often.

Cleaning

The pipette should be checked each day of use for dirt and dried liquids on the outside surfaces of the pipette. Wipe clean with soapy water and lint-free cloth. If stronger cleaning agents are used, rinse well with water and wipe dry.

Inspect the nozzle insert for cleanliness. Remove and rinse clean if debris is seen. Dry with jet of air.

Maintenance

Every six months, or as required, replace seals and lubricate. Refer to Maintenance and Repair Kits for proper replacement parts to have on hand.

1. Hold the pipette around the sleeve and pull the nozzle away from the sleeve to expose the spring cap assembly.
2. Grasp the spring cap with your thumb and forefinger and unscrew the nozzle. Remove the nozzle and sleeve.
3. Unscrew and remove the spring cap assembly.
4. Remove and discard old seals. **Note:** The 2 μ L, 3 μ L and 4 μ L pipette models includes a separate part, a metering seal housing, with two small "O" rings. This housing should stay on the plunger when the nozzle assembly is removed. If metering seal housing remains in the spring cap assembly, remove it, the two "O" rings and the quad ring from the spring cap assembly, using a small straight pin. Remove the two "O" rings from the seal housing and discard seals.
5. Depress and hold the button plunger to advance the plunger mechanism. Wipe exposed surface with soft clean cloth. Lubricate with a thin film of grease from kit.
6. Apply grease to the new seals and carefully place on plunger. Use only the silicone grease supplied in the Seal Maintenance Kit. **Note:** When replacing the "O" rings for 2 μ L, 3 μ L and 4 μ L pipette models assemble both "O" rings, then the metering seal housing and then the quad ring onto plunger.
7. Reassemble pipette being careful while inserting plunger and seals into seals in nozzle assembly.

MAINTENANCE AND REPAIR KITS

For Micro D-Tipper Volume	Seal Kits Cat. No.	Nozzle Insert Cat. No.
2 μ L	9075	8066
3 - 4 μ L	9076	8066
5 - 10 μ L	9077	8066

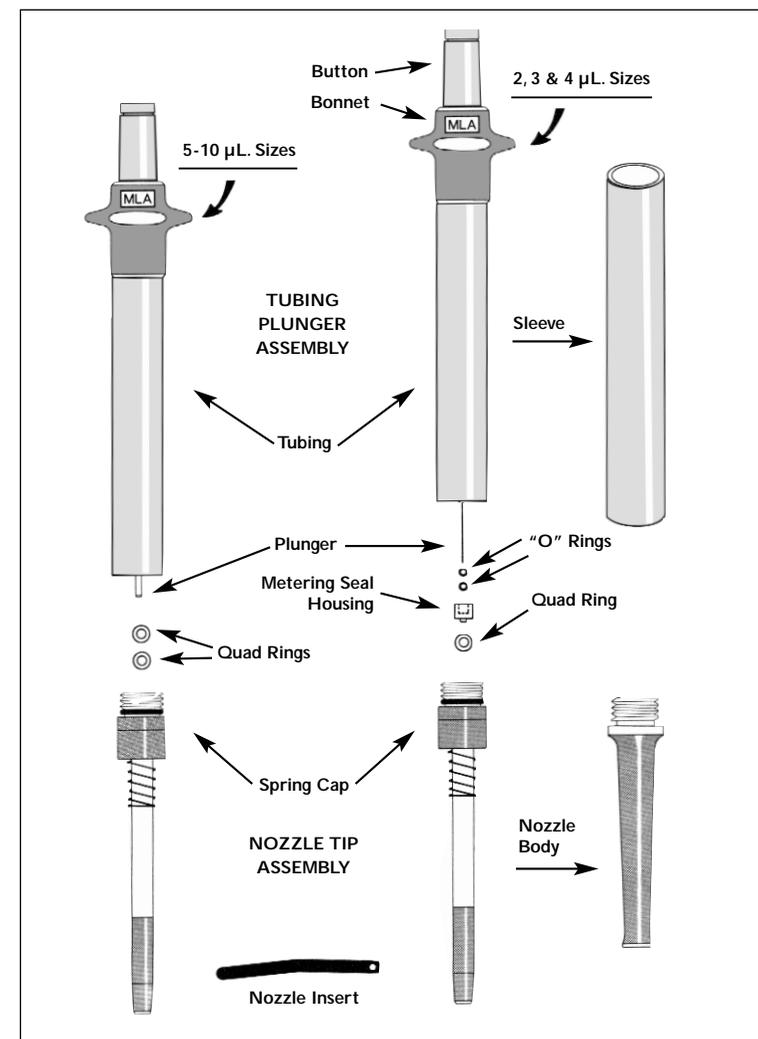


Figure 3: Pipette Disassembly and Seal Replacement

CALIBRATION

The pipettes have been calibrated at the factory to perform within the specifications in table. Ordinarily the pipettes do not need to be calibrated but they are designed to permit easy in-lab calibration. (**Warning:** Experienced and proper training is required to accurately perform calibration using gravimetric method. All procedures are to be performed under controlled environment conditions.)

Calibration Verification

Verification of pipette calibration is recommended every six months. This should be performed after the routine maintenance is completed.

Some laboratories may not have access to facilities capable of performing the gravimetric method. In these instances, you may consider using the MLA Pipette Verification Calibration Kit or returning the pipettes to MLA Systems for calibration and/or repair.