**Purpose:**

This procedure describes the operation, maintenance and calibration of the Rainin Pipet-Lite™ XLS single channel manual pipettes (Models L-100 XLS and L-1000 XLS).

**Procedure:**

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| --- | --- | --- |
| **Step** | **Action** | **Related Documents** |
| **SETTING VOLUME** |  |
|  | * Turn the volume lock lever to the UNLOCK position. See Figure 1.

Figure 1* Rotate the plunger button to change volume – counter-clockwise to increase, and clockwise to decrease volume.
* Read the volume indicator from the top down:
* Model L-100 XLS: All digits black - µL.
* Model L-1000 XLS: Red digit – mL. Black digits – tenths, hundredths of mL.
* See Figure 2.

 Figure 2* When setting the volume, first turn the knob 1/3 turn above the desired volume. Then turn the knob clockwise until the desired volume is displayed.
* **Always dial down to the desired volume.**
* After selecting the volume, turn the volume lock lever to the LOCK position (see Figure 1) to prevent changes to the volume setting.
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| **TIP SELECTION AND MOUNTING** |  |
|  | * To mount a tip, press the shaft into the end of the tip with light force.
* Do not use more force than is required. The tip will seal properly with minimal force.
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| **TIP IMMERSION DEPTH** |  |
|  | * Tip immersion depth is critical and should not be exceeded, or the volume measurement may be inaccurate.
* Model L-100 XLS: 2-3 mm
* Model L-1000 XLS: 3-6 mm
* The tip angle is also important – the pipette should be used in a position within 20 degrees of vertical.
* See Figure 3.

Figure 3 |  |
| **ASPIRATION** |  |
|  | * Press the plunger button to the first stop, and hold in this position.
* Holding the pipette vertically (or within 20° of vertical), place the tip into the sample to the proper depth.
* Relax thumb pressure on the plunger but do not let go of the plunger button. The piston spring will move the piston upward, aspirating the sample.
* **Note:** Do not let the piston snap up quickly. This may cause sample splash inside the mechanism.
* Withdraw the tip from the sample.
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| **DISPENSING** |  |
|  | * Touch the tip end against the side wall of the receiving vessel and press the plunger slowly past the first stop, to blowout.
* Withdraw the tip, sliding it along the wall of the vessel.
* Release the plunger.
* Press the tip ejector button lightly to discard the tip.
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| **MAINTENANCE** |  |
|  | * After each use, clean the shaft with distilled water and dry with lint-free tissue.
* Annually, or as needed:
* Remove the tip ejector arm by pressing the quick-release tabs and pulling the ejector arm down. See Figure 4.

Figure 4* Unscrew the shaft coupling and remove the shaft. When removing the shaft from the pipette body, make sure the spring, seal and o-ring do not fall off the piston and note the way they fit on the piston.
* Inspect the piston assembly. The piston should be shiny and free of corrosion. Clean with distilled water or isopropyl alcohol and dry with lint-free tissue. Notify lead tech if corrosion or staining is present.
* **Note:** Do not lubricate any component. Pipet-Lite uses a dry sealing system.
* Inspect the seal and o-ring. Replace if necessary. Pull off the old seal and o-ring. Position the new seal and o-ring on the piston as shown in Figure 5.

Figure 5* Inspect the interior of the shaft for contamination.
* Re-assemble the pipette.
* To replace the ejector arm, insert the shaft through the large opening, align the top with the tip ejector pushrod, and push until the arm snaps in place.
* Clean the shaft and inspect for splits and scratches.
* Inspect and clean the tip ejector mechanism.
* Recalibration is not necessary after seal and o-ring replacement.
* Replacement parts:

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| --- | --- | --- | --- | --- |
| **Model** | **Seal** | **O-Ring** | **Shaft** | **Tip Ejector Arm** |
| L-100XLS | 6200-150 | 6200-151 | 6202-066 | 6202-073 |
| L-1000XLS | 6200-161 | 6200-162 | 6202-068 | 6202-074 |

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| --- | --- |
| **Model** | **Rainin Tip No.** |
| L-100XLS | RT-L250 |
| L-1000XLS | RT-L1000 |

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| **CALIBRATION** |  |
|  | * Each pipette is calibrated prior to being placed into use, and quarterly thereafter.
* The L-100XLS pipette volume setting for calibration is 100 µL. The L-1000XLS pipette will be calibrated at 500 µL and 1000 µL.
* Calibration is performed using deionized water at room temperature. Use the FLUKE 52II thermometer to take the temperature of the water.
* The Mettler 163A balance must be calibrated daily.
* Place a weigh boat on the pan.
* Tare the weigh boat.
* Take 5 sequential weighings. Re-zero the balance after each weighing.
* Change the pipette tip after 2 weighings.
* Calculate the % Error.
* To calculate using program in the computer:
* Access the TSL Pipette Calibration Worksheet for Rainin pipettes in the Equipment Folder on Lilith2.
* Enter the temperature of the water.
* The theoretical volume will be calculated using the density of the water.
* Enter the 5 weights taken.
* The computer will automatically calculate the measured volume and % Error when all 5 values are entered.
* Complete the worksheet by filling in the appropriate sections.
* Print the worksheet and sign off in the appropriate sections’
* Submit to manager for review.
* If computer is not available, calculate measured volume and % Error as follows:

Measured volume = Sum of observed final weights Number of weighings% Error = (Measured volume) – (Theoretical volume) X 100 Theoretical volume* % Error and CV must be less than 3%. Repeat calibration if either value is higher than 3%.
* If % Error and CV remain high after repeat calibration, maintenance may be required to obtain acceptable results.
* Notify lead tech if results are still not acceptable after maintenance is performed.
 | Mettler 163A Balance Operation and MaintenanceTSL Pipette Calibration Worksheet |
| **STORAGE** |  |
|  | * After use, store the pipette in a clean safe place.
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**References:**

Standards for Blood Banks and Transfusion Services, Current Edition: AABB Press, Bethesda, MD.

Rainin Pipet-Lite™ XLS User Manual