**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. |  |
| **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. |  |
| **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. |  |
| **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. |  |
| **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:  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **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 |  |  |  | | --- | --- | | **Model** | **Rainin Tip No.** | | L-100XLS | RT-L250 | | L-1000XLS | RT-L1000 | |  |
| **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 Maintenance  TSL Pipette Calibration Worksheet |
| **STORAGE** | |  |
|  | * After use, store the pipette in a clean safe place. |  |

**References:**

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

Rainin Pipet-Lite™ XLS User Manual