

## Interchangeable Liquid Ends EDP1 Models up to 2000 µL

9920-315 Rev A

The liquid ends for models up to 2000 µL are interchangeable. When changing a liquid end, you must also change the encoder plug on the control module, to signal the liquid end volume to the software.

### CONTENTS OF KIT

The Interchangeable Liquid End kit contains the following items in two clear plastic tubes:

- Replacement Liquid End
- Replacement Tip Ejector
- Replacement Encoder Plug
- This Instruction Sheet.

(Save the tubes for storing removed components)

Both the encoder plug and the shaft are marked with the nominal volume. LTS shafts are used with encoder plugs marked LTS and the nominal volume. Traditional shafts are used with encoder plugs marked with the nominal volume only.

### REMOVING THE TIP EJECTOR ARM

The tip ejector arm should be removed to change the liquid end. Press in the quick-release tabs on the ejector arm and pull the ejector arm down. See Figure 2.

Put the tip ejector arm aside: it should be stored with the liquid end and encoder plug that you are removing.

### REMOVING THE LIQUID END

Before removing the liquid end, bring the piston to HOME by pressing **F 0**. The letters **KB** should appear on the display as shown in Figure 3. If the keyboard is locked, unlock it (press **F 9**).

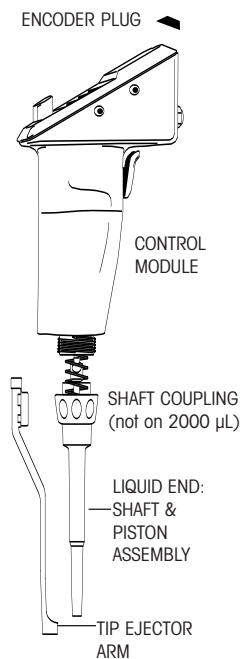


FIGURE 1

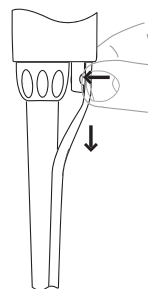


FIGURE 2



FIGURE 3

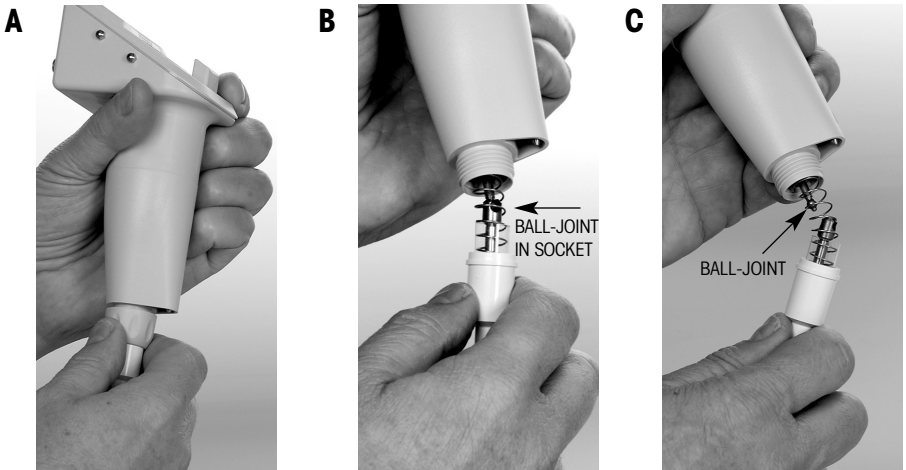


FIGURE 4 REMOVING THE LIQUID END (NOTE THE BALL-JOINT CONNECTION IN B & C)

1. Referring to Figure 4A, loosen the shaft coupling by rotating it counter-clockwise.
2. When the shaft coupling is free of the threads, remove the shaft coupling. The motor shaft is connected to the piston assembly by a ball-joint. This ball-joint must be disconnected before proceeding, as follows:
  - a. pull the liquid end away from the control module enough to reveal the end of the motor shaft – see Figure 4B. The spring and clear plastic spring holder can be left in place: they will not interfere with this procedure.
  - b. angle the liquid end and ease the ball-joint out of the socket – see Figure 4C.
3. Remove the encoder plug from the control module (see Figure 5) and store it with its matching liquid end. Liquid measurements made with the EDP1 will be accurate and precise ONLY when the correct liquid end/encoder plug combination is used.



FIGURE 5 REMOVING THE ENCODER PLUG

**NOTE:** Before storage, disassemble the liquid end (see Section 10 in the EDP1 Manual) and inspect for salts or residues. Clean the liquid end and store it with its encoder plug and tip ejector arm in the two tubes provided.

Do not touch the underside of the plug; skin oils can contaminate it, causing poor electrical contact and erratic performance. The plug can be cleaned with isopropanol.

## INSTALLING THE REPLACEMENT LIQUID END

**Always attach the replacement liquid end BEFORE inserting the encoder plug.**

1. The replacement liquid end is supplied in a clear plastic tube together with a second tube holding the matching tip ejector and encoder plug. Make sure you have all three components. The spring and spring guide extend from the liquid end as shown in Figure 6A. It is a good idea to pull back the spring and spring guide so that the ball-joint and socket connection area is clear, to help in reattaching the ball-joint to the piston shaft.

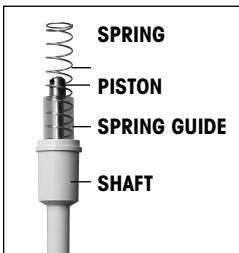


FIGURE 6A REPLACING THE LIQUID END (1)

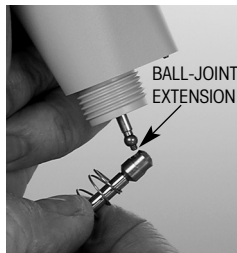


FIGURE 6B REPLACING THE LIQUID END (2)



FIGURE 6C REPLACING THE LIQUID END (3)

2. Bring the liquid end and the control module together so that the ball-joint aligns with the socket in the top of the piston shaft as shown in Figure 6B. Note the extension at the end of the ball-joint – see arrow.
3. Carefully connect the ball-joint on the motor drive into the socket on the piston shaft. You may need to maneuver the small extension downward to fully engage the two pieces, shown connected in Figure 6C. Once the angle is correct, the ball and socket will join together easily. **DO NOT USE FORCE**. Once the joint is made straighten the liquid end and control module then release the spring and spring guide.
4. Hold the liquid end and control module together and thread the shaft coupling onto the control module. Ensure the threads engage properly, and hand-tighten the shaft coupling onto the control module.
5. Take the replacement encoder plug. Ensure the labels on the plug and liquid end match.
6. Align the encoder plug with its slot in the head of the control module (avoid touching the bottom of the plug) and insert the plug squarely – see Figure 5. If power is supplied to the EDP1 and the keyboard is unlocked, the initialization sequence begins when the encoder plug is in place.

7. After the initialization sequence, look at the display. The EDP1 pipette should be in PIPETTE mode with the display reading PICKUP. The nominal volume of the liquid end is also displayed, as shown in Figure 7. (If your display does not show the proper nominal volume, check that the correct encoder plug is installed.)



FIGURE 7  
DISPLAY AFTER INITIALIZATION SEQUENCE  
(E1-1000 SHOWN)

## REPLACING THE TIP EJECTOR ARM

To replace the ejector arm, insert the shaft through the large opening, align the top with the tip ejector pushrod, and push until the ejector arm snaps in place.

Liquid end replacement is now complete. It is suggested that you keep these instructions together with the liquid end, encoder plug, and tip ejector that you removed.

If you have questions about this procedure, call Technical Support at 800-543-4030.

This instruction sheet is also available, as are all manuals for Rainin products, on the Rainin website: [www.rainin.com/lit\\_manuals.pdf](http://www.rainin.com/lit_manuals.pdf)