

OXFORD® Adjustable Pipette

USE

The Oxford® Adjustable Pipette is a general purpose, hand-held instrument used to dispense variable volumes of liquids. The instrument may be used to dispense a variety of liquids used in many clinical and nonclinical laboratories. The system consists of an adjustable volume pipette, a maintenance kit, an instruction guide, and specially designed precision molded, non-wettable, disposable plastic tips. Use of disposable tips eliminates pipette cleaning and reduces danger of cross contamination. The disposable tips are made of a plastic material which resists build up of minor surface film far better than glass.

PRINCIPLE OF OPERATION

The Oxford® Adjustable Pipette is designed to be held in the hand with the plunger knob operated with the thumb. The plunger stroke is divided into two parts. The longer, calibrated stroke ends at the FIRST STOP; the much shorter, secondary stroke ends at the SECOND STOP when the knob contacts the pipette handle.

The instrument is also equipped with a one-handed tip ejection feature. Contaminated tips are ejected by firmly depressing the ejector knob with the thumb. **CAUTION: To prevent injury or contamination, eject tips downward into a receptacle.**

SPECIFICATIONS

Accuracy and reproducibility, specified in the following table, are guaranteed only if the instrument is used in the "REVERSE" mode and if Oxford® Tips are used. All instruments are calibrated using deionized water at an ambient temperature of $22^{\circ} \pm 3^{\circ}\text{C}$.

Product No.	Volume Range	*Accuracy	Reproducibility (@ 1 Standard Deviation)
8885-300106	2- 10 μL	$\pm 0.2 \mu\text{L}$	$\leq 0.07 \mu\text{L}$
8885-300205	10- 50 μL	$\pm 0.6 \mu\text{L}$	$\leq 0.15 \mu\text{L}$
8885-300304	40- 200 μL	$\pm 1.4 \mu\text{L}$	$\leq 0.50 \mu\text{L}$
8885-300403	200-1000 μL	$\pm 6.0 \mu\text{L}$	$\leq 2.50 \mu\text{L}$

RECOMMENDED OXFORD BRAND TIPS:

Pipette Product No.	Use With Tip Product Number
8885-300106	8885-091044 (bulk), or 8885-091333 (trays)
8885-300205	8885-091044 (bulk), or 8885-091333 (trays)
8885-300304	8885-091044 (bulk), or 8885-091333 (trays)
8885-300430	8885-091143 (bulk), or 8885-091341 (trays)

VOLUME ADJUSTMENT

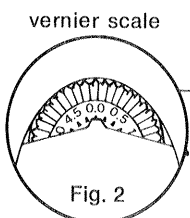
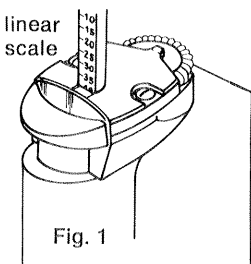
Volume is set with the aid of two scales. a linear scale is provided on the plunger (Fig. 1) with nine divisions for coarse adjustments. This scale is coupled with a vernier scale on the adjustment knob (Fig. 2) for fine adjustment in discrete increments of 0.25% of the full range of each adjustable instrument. The volume setting is simply the sum of these two readings.

Product No.	Adjustable Range	Adjustable Increments
8885-300106	2- 10 μL	0.025 μL
8885-300205	10- 50 μL	0.125 μL
8885-300304	40- 200 μL	0.500 μL
8885-300403	200-1000 μL	2.500 μL

Volume adjustment is accomplished in two simple moves.

1. Depress the plunger knob to its lowest position: "Secondary Stop" (Fig. 3). This move will release the spring force, unlocking the adjustment knob.
2. Rotate the adjustment knob (Fig. 4) with finger or thumb. The adjustment knob will automatically disengage from detents in the cover (Fig. 5) as force is applied to the adjustment knob.

When finger or thumb is removed from the adjustment knob, it will once again engage the detents in the cover and be locked in place.



Plunger Knob
at Bottom Position

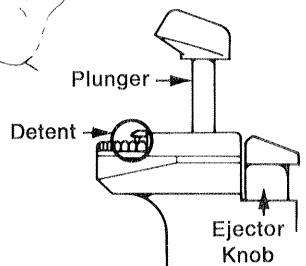
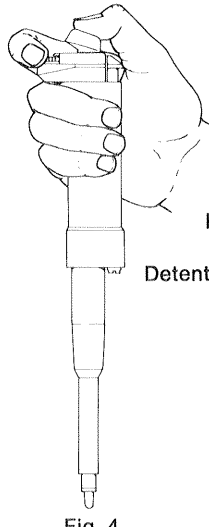
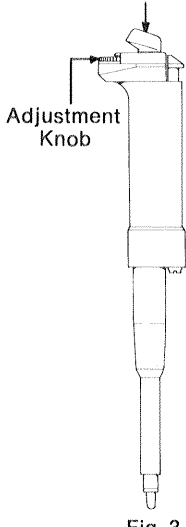


Fig. 5

The recommended method for setting the desired dispensing volume is described as follows:

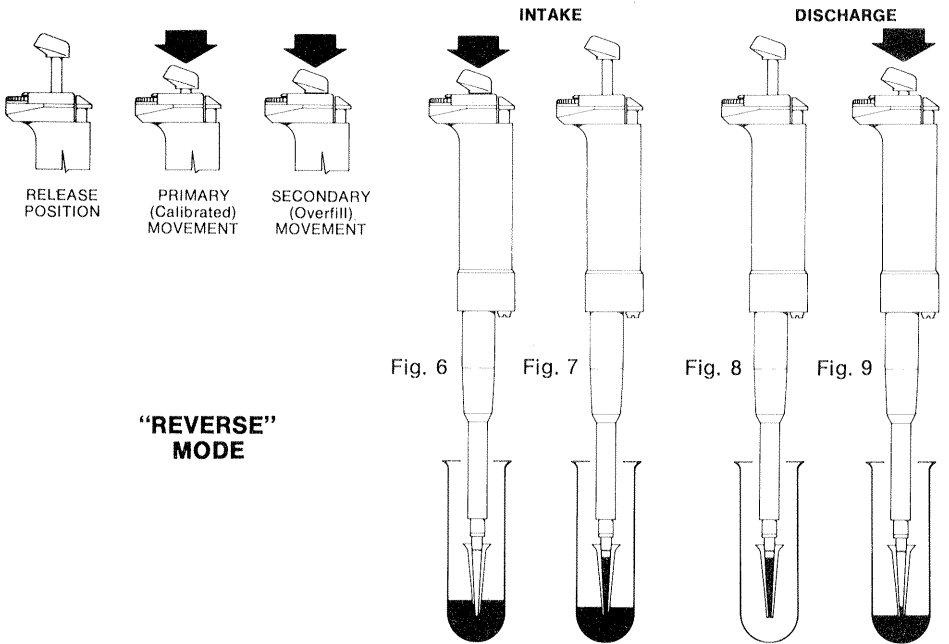
1. Depress the plunger knob to its lowest position (Ref. Fig. 3).
2. Rotate the adjustment knob until the vernier scale reads "0" (Ref. Fig. 2).
3. Release the plunger knob and read the volume setting on the linear scale located on the plunger (Ref. Fig. 1). The volume setting is the number that aligns with the plane of the handle cover.
4. From this point, the dispensing volume can be increased by rotating the adjustment knob counter-clockwise or can be decreased by rotating the adjustment knob clockwise. Each complete revolution of the adjustment knob, from "0" to "0", is equivalent to one complete division on the linear scale. For example, to adjust the linear scale three divisions, rotate the adjustment knob three revolutions.
5. As the adjustment knob is rotated counter-clockwise from "0", the numbers indicated on the circular, vernier scale are additive to the number on the linear scale that registered when the vernier scale was on "0".

NOTE: Do not adjust instrument below the lowest or above the highest linear scale division.

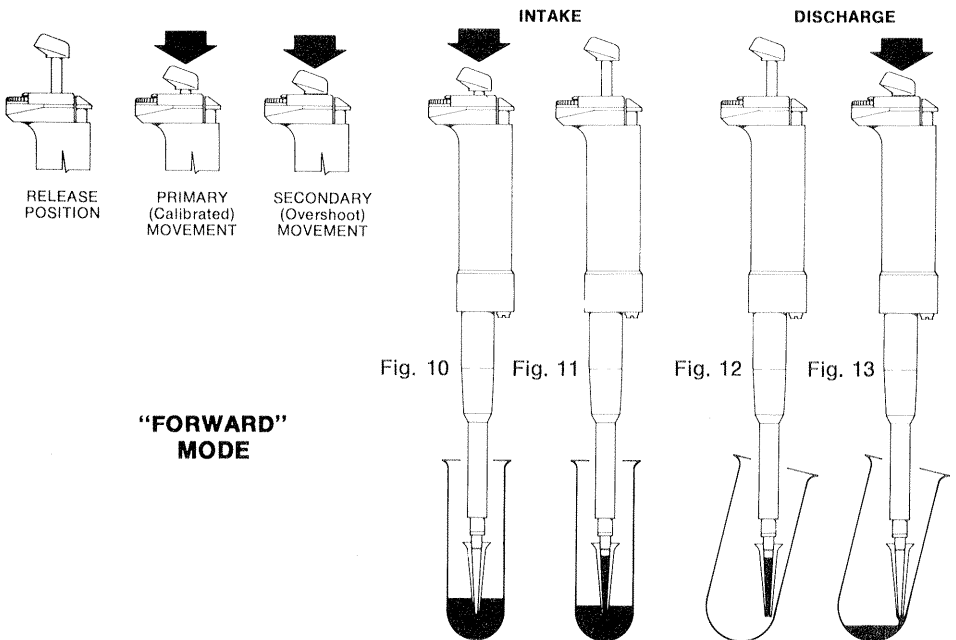
OPERATING INSTRUCTIONS "REVERSE" MODE

(This is the recommended mode of operation for optimum performance.)

1. Before each day's use, vigorously operate the plunger approximately ten times. This will redistribute the lubricant and ensure a smooth, positive action.
2. Apply a clean tip to the instrument.
3. **Before entering the tip into a sample solution, depress the plunger knob to its lowest position at the top surface of the cover..** This position is called the "secondary stop."
4. Now immerse the tip 2 mm $\frac{1}{4}$ 1 mm into the sample solution (Fig. 6).
5. **Smoothly return the plunger knob to the release position, allowing sample to enter (Fig. 7).** Do not allow the knob to "snap" back to the released position.
6. Withdraw the tip from the sample solution. **Do not** wipe the tip.



"REVERSE" MODE



"FORWARD" MODE

7. Place the tip against the bottom of an empty receiving vessel or directly into the fluid in the receiving vessel (immerse up to 3 mm) (Fig. 8).
8. Smoothly depress the plunger knob to the first stop. This position is called the "primary stop" (Fig. 9).
9. With the knob held in the primary stop position, withdraw the tip directly away from the dispensed fluid. The correct amount of fluid has now been delivered. Do not touch the tip to the walls of the vessel or into the fluid again. The small amount of fluid left in the tip will be discarded with the tip.
10. Smoothly return the knob to the release position. Do not allow the knob to "snap" back to the release position.
11. Remove the used tip by firmly depressing the tip ejector knob. (This is the knob nearest to the hand.)

OPERATING INSTRUCTIONS ("FORWARD" MODE)

(This mode of operation may be used, however, optimum performance is achieved with the "Reverse" mode.)

1. Apply a clean tip to the instrument.
2. Before entry into the sample solution, depress the plunger knob to the "Primary Stop."
3. Now immerse the tip approximately 3 mm into the sample solution (Fig. 10).
4. Smoothly return the plunger knob to the release position allowing sample to enter tip (Fig. 11). Do not allow the knob to "snap" back to release position.
5. Withdraw the tip from the sample solution. Do not wipe the tip.
6. Place tip against the side wall of receiving vessel (Fig. 12).
7. Smoothly depress the plunger knob to the primary stop. Pause; then depress the knob to the secondary stop. (Fig. 13).

NOTE: When dispensing serum and other viscous fluids, it is necessary to pause about two seconds before moving to the secondary stop.

8. With the knob still held in its lowest position, slowly withdraw the tip while sliding it against the wall of the receiving vessel.
9. Return the knob to the release position. Do not allow the knob to "snap" back.
10. Remove the disposable tip by firmly depressing the tip ejector knob.

AIDS TO REPRODUCIBILITY AND ACCURACY

Listed below are some techniques found to improve sampling precision. READ THIS SECTION CAREFULLY.

1. Try to effect the same speed of intake and delivery for all samples. Smooth depression and release of the plunger knob will give the most consistent results. Never allow the plunger to "snap" back. Consistency of techniques is a key to precision.
2. Always depress the plunger knob to the proper stop before insertion of the tip into the solution. Depression of the plunger knob after insertion may cause the formation of an air bubble in the tip and result in a filling error.
3. Try to insert the tip to approximately the same depth into the sample each time, never going deeper than 3 mm. Hold the instrument as vertically as possible (10° maximum from vertical).
4. When sampling hot or cold material, the tip's temperature should be equalized to that of the solution to prevent contraction or expansion of sample.
5. The plastic tip filler inserted in the end of the instrument (sizes 10 to 50 μL , 40 to 200 μL , and 200 to 1000 μL) must be in place or the device will dispense low quantities.

SERVICE AND MAINTENANCE INFORMATION

It is recommended that the following servicing procedure be performed at regular intervals. Heavy usage or usage with corrosive fluids will require more frequent servicing.

Disassembly (Reference Fig. 14).

1. Depress the tip ejector plunger and unscrew the plastic cap.
2. Slip the tip ejector sleeve off the end of the instrument.
3. Unscrew the barrel assembly from the handle and carefully pull directly away from the handle. Take care not to bend the fragile piston rod on instrument size 2 to 10 μL .
(NOTE: DO NOT UNSCREW HEX SCREWS AT TOP OF HANDLE OR ATTEMPT TO DISASSEMBLE ANY INTERNAL HANDLE PARTS. THIS WILL DESTROY FACTORY CALIBRATION AND VOID THE WARRANTY.)
4. Remove the seal compression spring and seal compressor. It may be necessary to tap the open end of the barrel on a table to dislodge the compressor.
5. Piston Rod Seal Removal (Use the seal removal rod found in the maintenance kit for this operation):

Instrument Sizes	Procedure
200 to 1000 μL	Insert the grooved end of the seal removal rod into the large end of the barrel and pull the seal out with the edge of the groove on the rod.
40 to 200 μL	

10 to 50 μL	Pull the tip filler out of the tip end of the barrel. Insert the seal removal rod into the tip-end of the barrel and push out the seal and seal retainer. Note the orientation of the seal retainer on 10 to 50 μL devices for proper reassembly.
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2 to 10 μL	The seal is contained in the end of the seal compressor.
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6. Pull the tip filler out of the tip end of the barrel on instrument sizes 10 to 50 μL , 40 to 200 μL and 200 to 1000 μL .

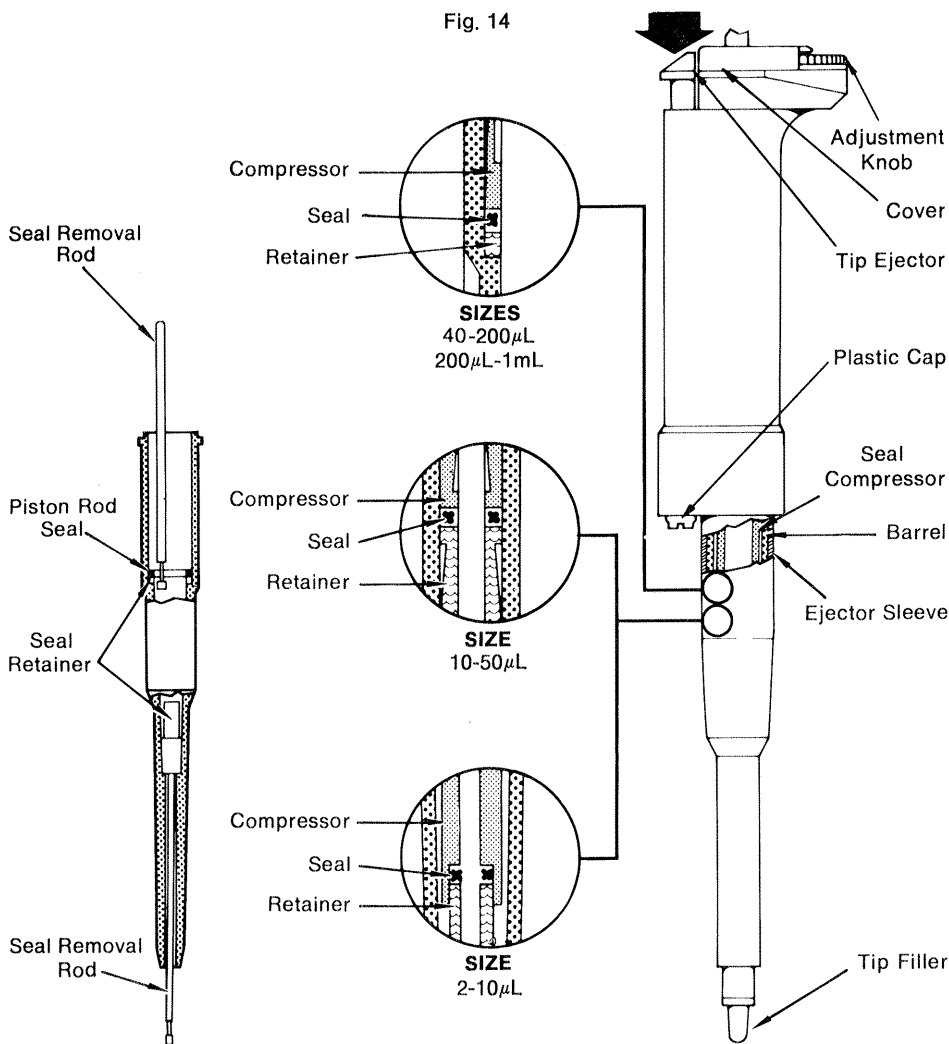
If fluid has been accidentally drawn inside the instrument, all of the contaminated surfaces should be cleaned with alcohol and then thoroughly dried, preferably by blowing air through the barrel. Insert the cleaning wire (provided in the maintenance kit) through the small orifice in the end of the barrel tip on instrument size 2 to 10 μL . This should remove deposits.

Clean the piston rod seal and relubricate by rubbing a small amount of lubricant (supplied in the maintenance kit) into the seal. Wipe off excess lubricant with a tissue. Smear a thin film of lubricant on the end section of the piston rod protruding from the handle. Reassemble the instrument by reversing the preceding disassembly procedure.

Make sure the seal retainers are properly located before reassembly (reference Fig. 14). Make sure the piston rod seals are firmly located in their respective sealing pockets before the seal compressors are reassembled. The seal removal rod may be used to position the seals (reference Fig. 14). The piston rod seals should be replaced every three to six months, depending upon usage. A maintenance kit is supplied with each instrument and contains new seals, cleaning wire or seal removal rod, replacement tip fillers (where appropriate), and a vial of lubricant. Replacement kits can be ordered from your distributor using the following Product Numbers:

2-10 μL kit	8885-728801	40-200 μL kit	8885-768807
10-50 μL kit	8885-748809	200-1000 μL kit	8885-798804

Fig. 14



WARRANTY INFORMATION

All Oxford® Pipettes bear a one-year guarantee against defects in material and workmanship. This guarantee becomes effective when the ultimate user receives the product. If within this one-year period the instrument is found to have such defects, repair or replacement will be made without charge by Oxford Labware (transportation to the point of repair to be assumed by the purchaser).

Should damage to the instrument occur due to improper use or improper maintenance (failure to provide reasonable and necessary maintenance), this guarantee written or implied is void.

Instrument Out-of-Warranty— Return the instrument to Oxford Labware. For a reduced price, the customer requesting replacement will receive a new instrument with a new one-year guarantee.

In-Warranty and Out-of-Warranty Returns (U.S. and Canada):

Instruments returned without prior authorization will not be accepted. For return authorization contact Oxford Labware's Product Assurance Department at: (800) 325-8668.

International Customers— All in-warranty claims as well as out-of-warranty repairs and replacements must be handled by the dealer from whom the instrument was purchased.

To Order: Contact your local authorized distributor of Oxford products.

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