



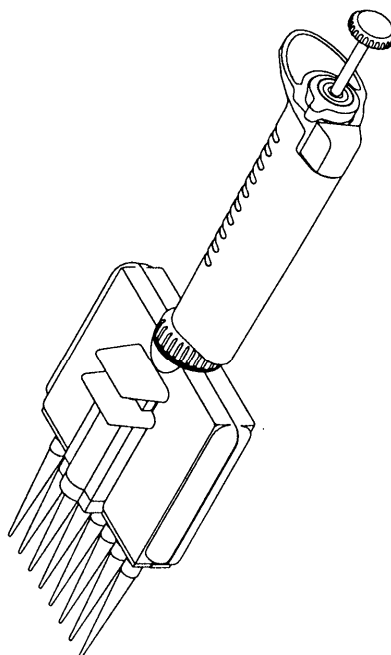
Autoclavable

UV Stable

MultiMate™

Continuously Adjustable Multi-channel pipette

User's manual



Thank you for your purchase of the Oxford Labware MultiMate™.

To ensure safe and proper use of the MultiMate™
please read this entire manual before using the instrument.

**** CAUTIONS ****

Please read and follow the following safety precautions for using your *MultiMate™* properly and safely.

If the operator uses the *MultiMate™* improperly, failing to observe the following instruction, injury to the user or other personnel may occur as well as damage to the instrument.

- 1) Do not use the instrument for any other purpose than pipetting/fractionalizing liquid.
- 2) Do not modify this unit in any way.
- 3) Do not use this pipette for injecting any liquid into a human.
- 4) Never dispense fluid in the direction of another person.
- 5) Never eject the tip in the direction of another person.
- 6) Do not eject the tip while liquid remains inside.
- 7) Handle the unit carefully when the tips are attached since some tips have sharp points.
- 8) Be sure the tips are attached firmly to the pipette or they may fall off into the sample fluid and splash the fluid.
- 9) If the instrument is contaminated with a substance that is harmful to the human body, clean it thoroughly before proceeding with any further operation.
- 10) Do not touch the tips when handling any liquid that is harmful to the human body.
- 11) Do not use the instrument for stirring.
- 12) After autoclaving, the pipette will be extremely hot. Use caution when handling the unit after autoclaving. Failure to do so may result in a severe burn.

**** RULES FOR OPERATION ****

Users are required to follow the instructions listed below in order to maintain the MultiMate's™ precision and reproducibility.

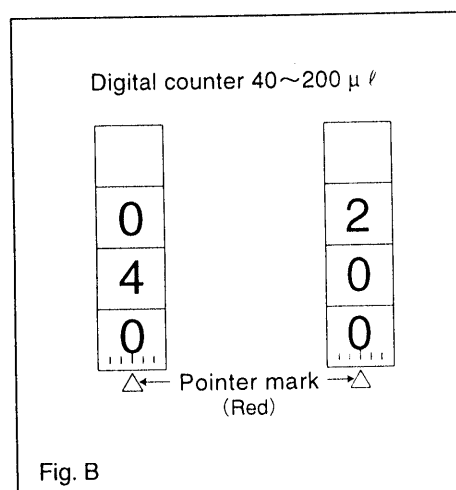
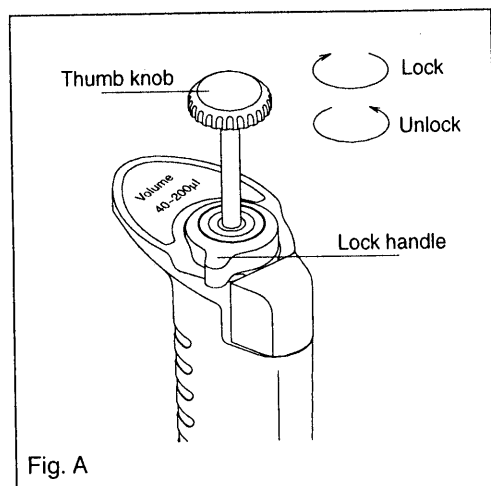
- 1) Do not expose this instrument to sunlight 2 hours prior to use or during use. Precision may be affected. Avoid using the instrument in hot or humid areas.
- 2) Prior to starting work, avoid touching the channel cylinders and tips with hands as warming could affect precision.
- 3) For Fractional Pipetting, follow the method explained in this manual. Otherwise, inaccuracies may occur.
- 4) Operate the thumb knob with a slow, smooth motion. Quick depression and release will not only result in inaccuracy, but will also damage the unit as the sample fluid will be drawn up into the instrument.
- 5) Do not use a tip more than once. Using a tip more than once will cause inaccuracy and cross contamination.
- 6) Do not hold the instrument horizontally or upside down when liquid is in the tips. This will cause fluid to enter the channel cylinders and contaminate or destroy the pipette.
- 7) After autoclaving and drying, be sure to let the pipette cool to the ambient temperature before the next use.
- 8) After autoclaving and drying, allow all components to return to the ambient temperature before re-assembling. Assembling components while they are still hot will damage the unit.
- 9) When turning the Thumb knob to adjust the sample volume, DO NOT turn it above the maximum sample volume or below the minimum sample volume as this will damage the instrument.
- 10) Do not attempt to pipette with less liquid than the set volume. If the volume of liquid is less than the set volume, it will cause liquid to spray into the barrel and damage the unit.
- 11) Use only Oxford brand tips. Accuracy may be affected if other tips are used.

OPERATING INSTRUCTIONS:

1. Volume Adjustment

- 1) Turn the lock lever counter-clockwise to loosen. (Fig. A)
- 2) Turn the thumb knob to set the digital counter to the desired volume. To increase the volume, turn the thumb knob counter-clockwise. To decrease the volume, turn the thumb knob clockwise. Align the number in the digital counter with the RED ARROW at the lower end of the counter. (Fig. B)
- 3) After setting the desired volume, lock the volume by turning the lock lever clockwise. (Fig. A).

- NOTE: Do not exceed the instruments minimum or maximum volume range. This could damage the unit or reduce its accuracy.
- NOTE: After adjusting the instrument's volume, perform a trial operation first.



2. Extracting (Aspirating) Liquid

- 1) Attach disposable tips to the channel cylinders. It is recommended to attach the tips from a tip rack, rather than by manual insertion.
- 2) Press the thumb knob down from point "A" to point "B" (Fig. C)
- 3) While depressing the thumb knob, immerse the tips approximately 3mm into the liquid to be extracted. (Fig. D-1)
- 4) With the tips immersed in the liquid, allow the thumb knob to return to point "A" with a slow, gentle and smooth motion. Once the thumb knob has completely returned, keep the tips immersed in the liquid for approximately 1 second to be sure the liquid has completely drawn into the tips. (Fig. D-2)
- 5) Gently extract the instrument from the liquid so there are no drops of liquid left on the end of the tip.

- NOTE: Do not extract liquid with the thumb knob depressed at point "C" (Fig. C).
- NOTE: Be sure to operate the thumb knob with a smooth and gentle motion. Rapidly releasing the thumb knob may cause fluid to be drawn into the main body of the pipette which will contaminate and damage the instrument.

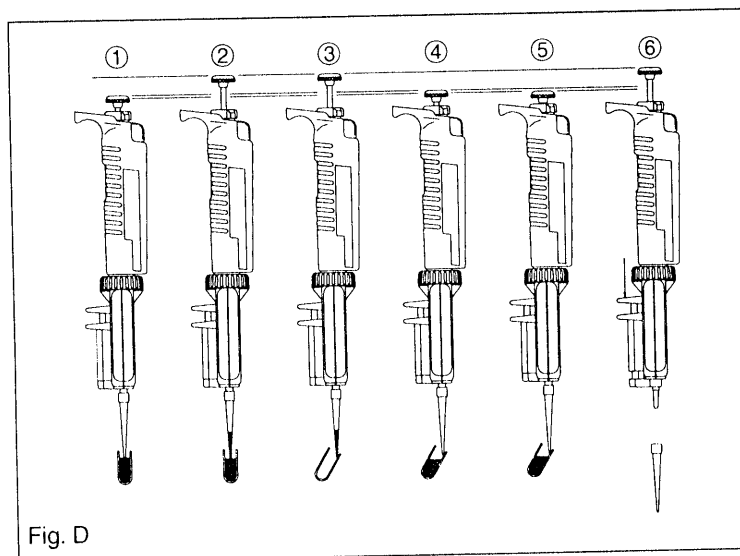
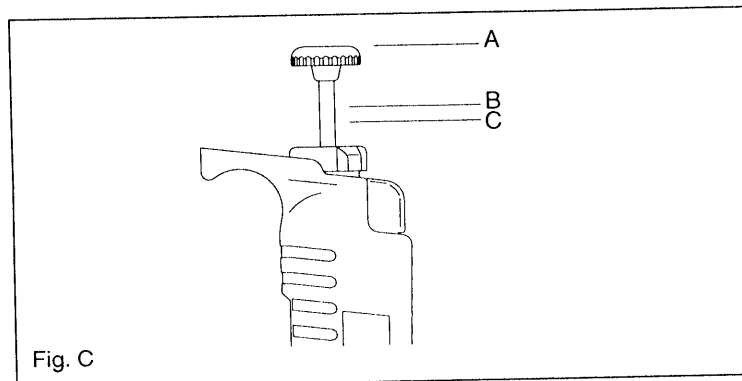
3. Dispensing Liquid

- 1) Gently place the tips on the inner wall of a proper vessel.
- 2) Gently press the thumb knob down from point "A" to point "B". One second later, press the thumb knob down again from point "B" to point "C" (Fig. D-4, D-5) to discharge all the fluid.

4. Tip Ejection

- 1) When you have completed the pipette operation or series of pipettes, eject the tips by pressing the tip ejection button. Properly dispose of the tips.

- NOTE: DO NOT EXTRACT (ASPIRATE) FROM THE "C" POSITION (Fig. C). This will cause liquid to be drawn into the chamber and damage the unit.
- NOTE: Be sure to operate the thumb knob with a smooth, gentle motion. Releasing the thumb knob quickly will cause fluid to be drawn into the chamber of the unit and result in loss of accuracy.



• **Disassembling / Reassembling:**

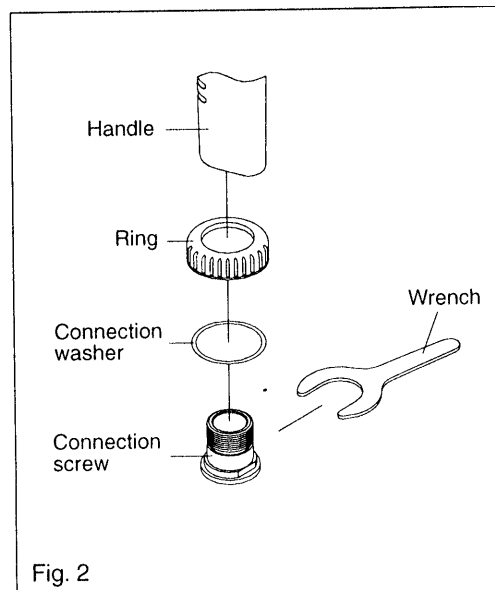
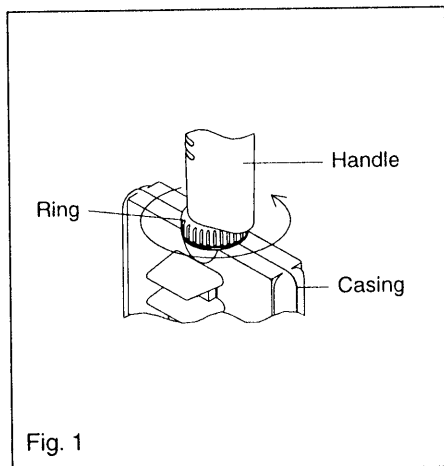
If issues occur as described in the "Troubleshooting" section of this manual, disassemble the instrument according to the following procedure and inspect the components.

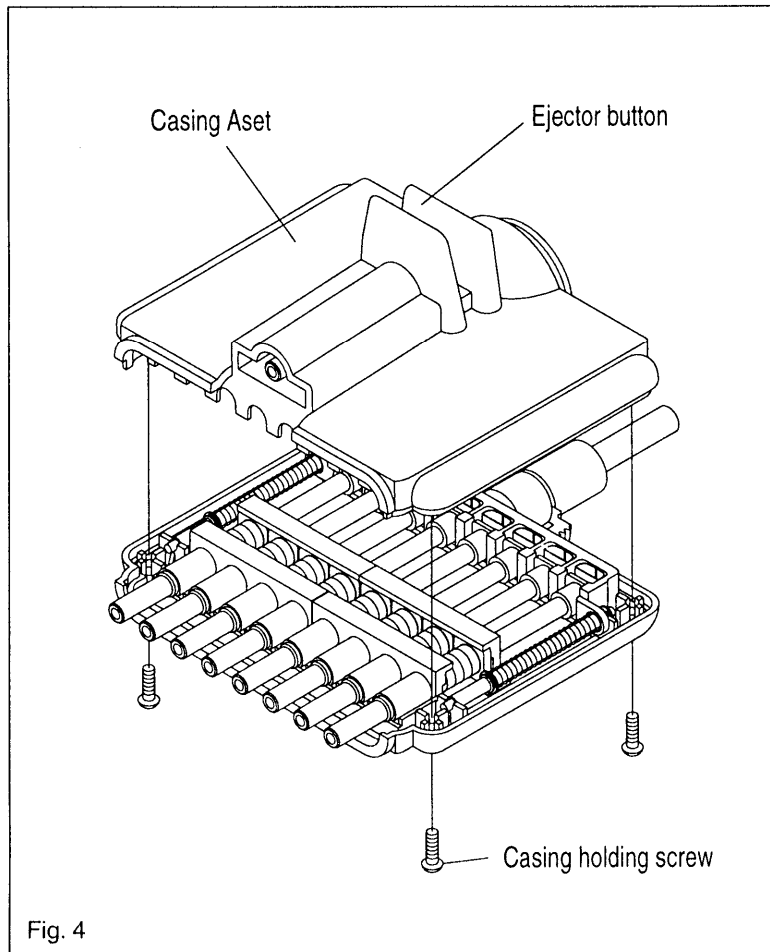
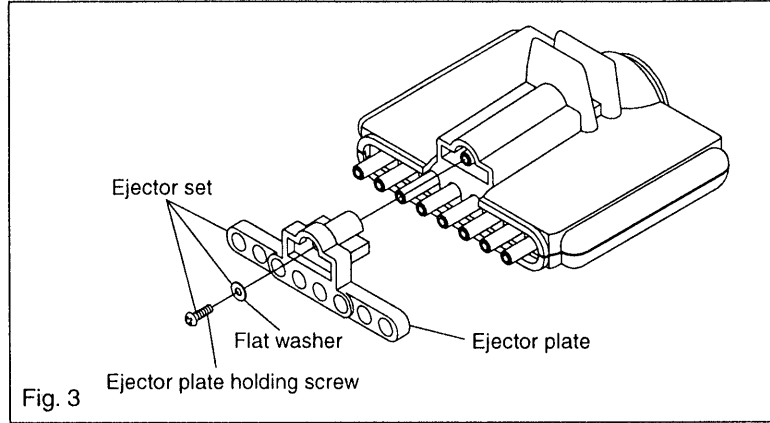
1. **Disassembling:**

- 1) Turn the ring counter-clockwise and remove the casing from the handle. (Fig. 1)
 - **Note: If the connection screw is loose, tighten it with the provided wrench. (Fig. 2)**
- 2) Remove the screw that holds the ejector plate and remove the ejector plate from the casing. (Fig. 3)
- 3) Remove the screws that hold the casing. (Fig. 4)
- 4) Lightly hold the channel cylinder and remove Casing A. (Fig. 4)
- 5) Remove each part. (Fig. 5)

2. **Reassembling:**

- 1) Attach each part to Casing B. (Fig. 5)
- 2) Assemble and attach Casing A. (Fig. 4)
- 3) Assemble and attach the ejector to the assembled casing. (Fig. 3)
- 4) Attach the assembled casing to the handle. (Fig. 1)
 - **NOTE: When assembling the instrument, be sure to set the counter to the maximum volume range. Otherwise, the parts will not align properly.**
 - **NOTE: If the connection screw is loose, tighten it with the wrench provided.**





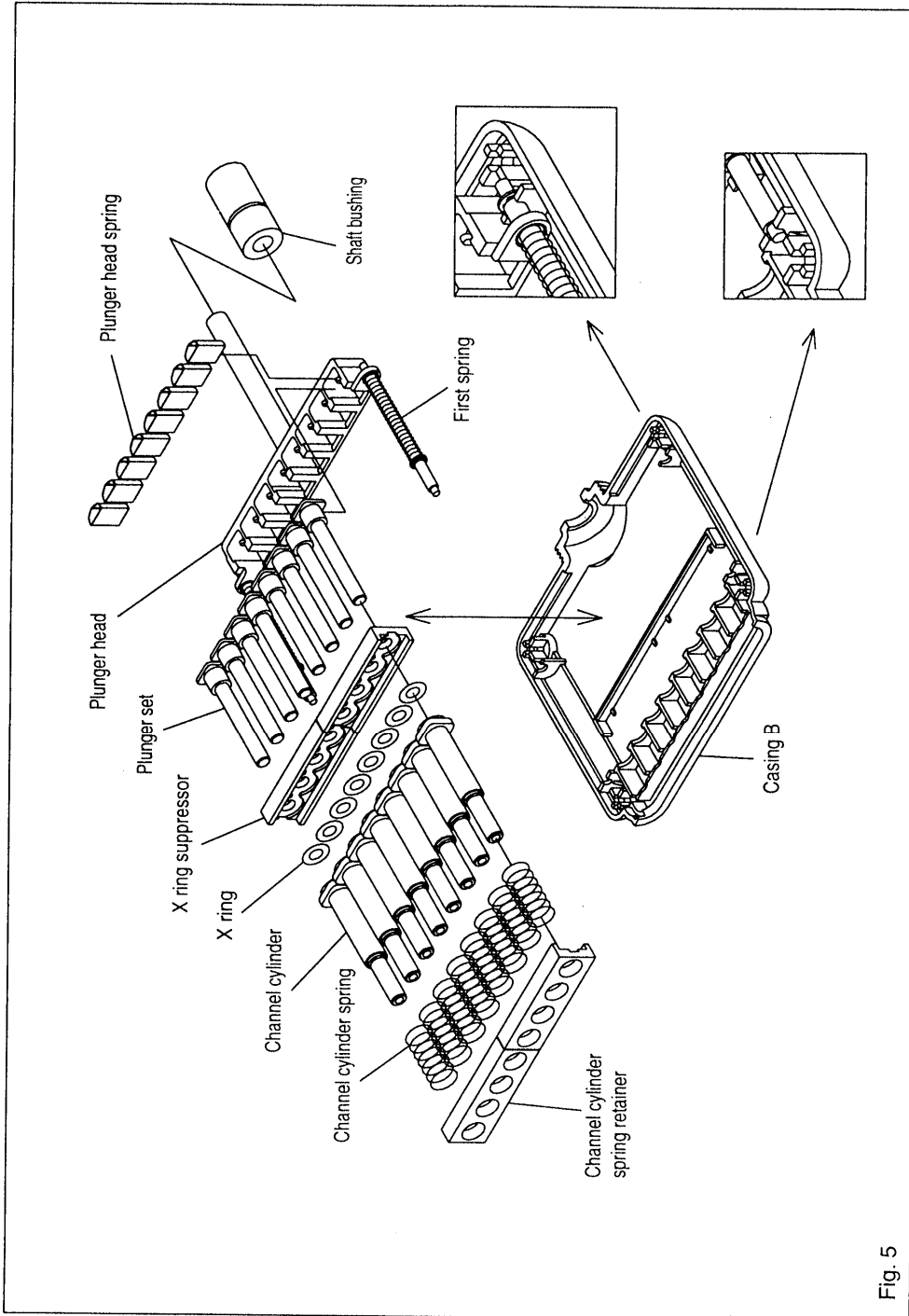


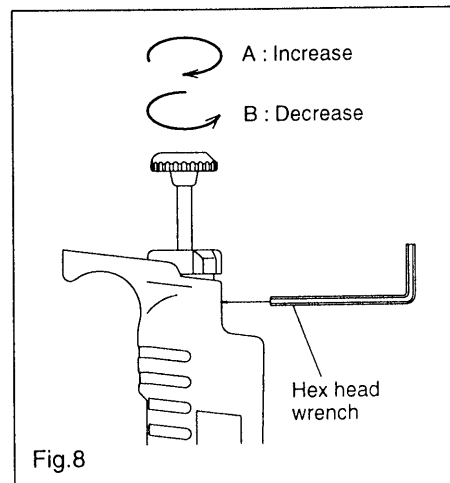
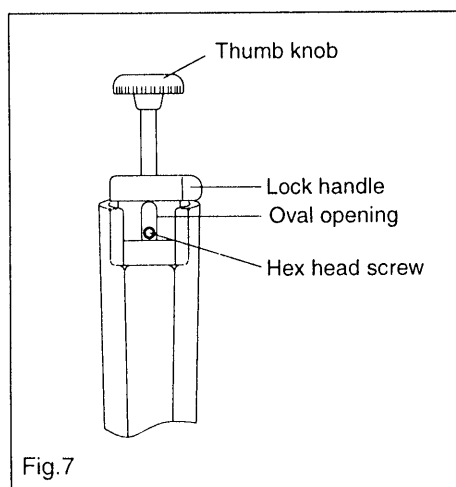
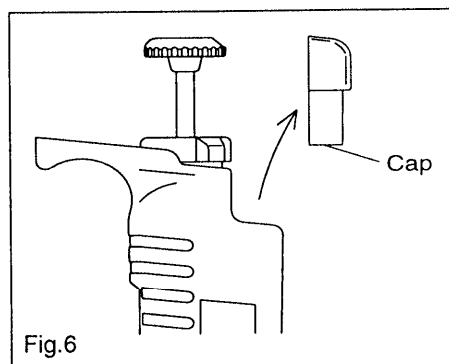
Fig. 5

RECALIBRATION PROCEDURE

1. Remove the cap by pulling it out with your fingers. (Fig.6)
2. Loosen the lock handle by turning it counter clockwise and stop when the oval opening on the lock handle faces you. (Fig.7)
3. Rotate the thumb knob until one of two hex head screws can be seen through the oval opening. (Fig.7)
4. Loosen both hex head screws with a hex head wrench (1.5 mm) by turning them counter-clockwise one by one. (Fig.8)
5. Keeping the hex head wrench inserted into one hex head screw, turn the thumb knob to calibrate the pipette. (Fig.8)
6. The pipetting volume can be adjusted by rotating the thumb knob clockwise to increase and counter-clockwise to decrease. Please refer to the table for standard volume adjustments.

| Degree of Rotation | 0.5 μl ~ 10 μl | 5 μl ~ 50 μl | 40 μl ~ 200 μl | 50 μl ~ 300 μl |
|--------------------|--------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|
| 360° | 0.31 μl | 1.6 μl | 6.5 μl | 9.6 μl |
| 720° | 0.63 μl | 3.2 μl | 13 μl | 19.2 μl |

7. Tighten the both hex head screws after adjusting the thumb knob and measure the accuracy of the pipette.
8. Repeat the above procedures until the pipette is calibrated within the specified accuracy. An accuracy test should be made at the specified minimum and maximum volume of each pipette.
9. Return the cap to its original position.



Autoclaving

Autoclaving of this complete unit is possible. Follow the procedure below at a temperature of 121° C for 20 minutes.

- 1) Be sure to loosen the lock handle and set the counter to the maximum volume number of the volume range. (Fig. A)
- 2) Loosen the ring shown in the Disassembling/Reassembling procedure diagram (Fig. 1) by turning it approximately half a revolution.
- 3) Loosen a connecting screw in the Fig. 2 by 180 degree.
- 4) Loosen four screws on the casing in the Fig. 4 by 180 degree.
- 5) When placing inside the autoclaving unit, be careful not to damage the channel cylinders. Also, place in a position that does not put any weight on the channel cylinders.
- 6) After autoclaving, be sure to dry the unit thoroughly.

Drying

Carry out drying immediately after autoclaving. Dry the unit thoroughly in a constant temperature air-drier at 60° C for over 60 minutes.

- 1) Dry the product in the same condition as when it was autoclaved.
- 2) Be careful not to damage the channel cylinders when placing the unit in the dryer. Also make sure that the unit is placed in a position that does not place any weight on the channel cylinders.
- 3) After confirming that the unit has returned to normal temperature after drying, tighten the ring shown in the disassembly/assembly diagram (Fig. 1). Also, as the screw that holds the casing may have loosened, be sure to make sure that it is tightened.

Note: After drying, if the unit is assembled while it is still warm, screw head damage etc., may occur causing damage to the product or loss of product performance. Be sure to reassemble the unit after it has completely cooled down. Also, using the product while it is warm may result in loss of accuracy.



Do not touch the unit directly with your hand just after autoclaving and drying, because the unit is extremely hot. Directly touching the hot unit may cause an accident.

| Catalog No. | Channel | Variable range (μl) | Measured volume (μl) | Accuracy (%) | Precision (%) |
|-------------|---------|-------------------------------------|--------------------------------------|-----------------|------------------|
| 8885-500167 | 8 | .5~10 | 1 | ± 8.0 | <4.0 |
| 8885-500183 | 12 | | 10 | ± 2.0 | <1.0 |
| 8885-500169 | 8 | 5~50 | 5 | ± 3.0 | <1.5 |
| 8885-500185 | 12 | | 50 | ± 1.0 | <0.5 |
| 8885-500177 | 8 | 40~200 | 40 | ± 1.4 | <0.5 |
| 8885-500193 | 12 | | 200 | ± 0.9 | <0.3 |
| 8885-500175 | 8 | 50~300 | 50 | ± 1.4 | <0.7 |
| 8885-500191 | 12 | | 300 | ± 0.6 | <0.2 |

Troubleshooting

| Problem | Probable cause | Solution |
|-------------------------------|---|--|
| Liquid is not sucked in. | Foreign matter in the channel cylinders. | Remove foreign matter with provided cleaning wire. |
| | X ring is worn or damaged. | Replace the X ring set with the new set. |
| Liquid leakage from tip. | Plunger is damaged or rusty. | Replace the X ring set and Plunger set with the new sets. |
| | Channel cylinders are damaged. | Replace the channel cylinder with a new set. |
| | Attached tips are loose. | Attach the tips firmly. |
| | | |
| Thumb knob movement is poor. | Plunger has shifted. | Press the thumb knob a few times. |
| | X ring is damaged. | Replace the X ring set with the new set. |
| | No grease on the plungers and/or X rings. | Coat the plungers and/or X rings lightly with the provided grease. |
| | Liquid in the channel cylinder. | Disassemble and clean appropriate parts. |
| Looseness of body and casing. | Ring is loose. | Tighten the ring. |
| | Connection screw is loose. | Tighten the connection screw with the provided wrench. |

If the problem persists even after the above points have been checked, stop usage of the unit immediately and consult with the sales outlet where the unit was purchased.

Caution: At this time please confirm that there has been no contamination by chemicals that are harmful to the human body.

Recommended Oxford® Brand Pipette Tips

The following pipette tips can be used on both the MultiMate™ 8 and MultiMate™ 12 channel pipette:

| Catalog No. | Description |
|--------------|--|
| 8885-119456 | .5~10µl Universal Pipette Tips. 960 tips in 10 hinged racks of 96 |
| 8885-119134 | 1~200µl Universal Pipette Tips. 960 tips in 10 hinged racks of 96 |
| 8885-119266 | 1~200µl Sterile Universal Pipette Tips. 960 tips in 10 hinged racks of 96 |
| 8885-119282 | 1~200µl Pyrogen Free/Trace Metal Certified Tips. 960 tips in 10 hinged racks of 96 |
| 8885-119555 | 1~200µl Calibrated Universal Pipette Tips. 960 tips in 10 hinged racks of 96 |
| 000-0300-096 | 5~300µl Pipette Tips. 960tips in 10hinged racks of 96 |
| 000-0300-S96 | 5~300µl Sterile Pipette Tips. 960tips in 10hinged racks of 96 |

REPLACEMENT PARTS LIST

| Catalog No. | Description | Qty |
|-------------|---|-----|
| 8885-504000 | Connection Screw | 1 |
| 8885-504002 | Connection Washer | 1 |
| 8885-047000 | Ring | 1 |
| 8885-600010 | Casing Set w/ insert nuts, 8CH | 1 |
| 8885-600012 | Casing Set w/ insert nuts, 12CH | 1 |
| 8885-600016 | Ejector Button w/ insert nut | 1 |
| 8885-600020 | Ejector Shaft Set | 1 |
| 8885-600024 | Ejector Spring | 1 |
| 8885-600032 | Plunger Fixing Unit Set for 8 CH | 1 |
| 8885-600036 | Plunger Fixing Unit Set, 12 CH, 0.5-10 μ l | 1 |
| 8885-600037 | Plunger Fixing Unit Set, 12 CH, 5-50 μ l, 40-200 μ l & 50-300 μ l | 1 |
| 8885-600038 | Guide Shaft, 8 CH & 12 CH, 0.5-10 μ l | 2 |
| 8885-600039 | Guide Shaft, 12 CH 5-50 μ l, 40-200 μ l & 50-300 μ l | 2 |
| 8885-600040 | Guide Tube, 8 CH & 12 CH, 0.5-10 μ l | 2 |
| 8885-600041 | Guide Tube, 12 CH 5-50 μ l, 40-200 μ l & 50-300 μ l | 2 |
| 8885-600044 | E-ring Set | 4 |
| 8885-501002 | First Spring, 8 CH, 0.5-10 μ l & 5-50 μ l | 2 |
| 8885-501003 | First Spring, 8 CH, 40-200 μ l & 50-300 μ l, 12CH 0.5-10 μ l | 2 |
| 8885-501005 | First Spring, 12 CH 5-50 μ l, 40-200 μ l & 50-300 μ l | 2 |
| 8885-501004 | Plunger Head Spring | 4 |
| 8885-501006 | Plunger Set for 0.5-10 μ l | 1 |
| 8885-501008 | Plunger Set for 5-50 μ l | 1 |
| 8885-501010 | Plunger Set for 40-200 μ l | 1 |
| 8885-501012 | Plunger Set for 50-300 μ l | 1 |
| 8885-505000 | O-Ring Suppressor for 0.5-10 μ l | 4 |
| 8885-505002 | X-Ring Suppressor for 5-50 μ l | 4 |
| 8885-505006 | X-Ring Suppressor for 40-200 μ l | 4 |
| 8885-505008 | X-Ring Suppressor for 50-300 μ l | 4 |
| 8885-505010 | O-Ring for 0.5-10UL | 4 |
| 8885-505014 | X-Ring for 5-50UL | 4 |
| 8885-505016 | X-Ring for 40-200UL | 4 |
| 8885-505018 | X-Ring for 50-300UL | 4 |
| 8885-505022 | Channel Cylinder Set for 0.5-10 μ l (4per set) | 1 |
| 8885-505024 | Channel Cylinder Set for 5-50 μ l (4 per set) | 1 |
| 8885-505026 | Channel Cylinder Set for 40-200 μ l (4 per set) | 1 |
| 8885-505028 | Channel Cylinder Set for 50-300 μ l (4 per set) | 1 |
| 8885-505044 | Ejector Plate, 8 CH 5-50 μ l, 40-200 μ l & 50-300 μ l | 1 |
| 8885-505046 | Ejector Plate, 8 CH, 0.5-10 μ l | 1 |
| 8885-505048 | Ejector Plate, 12 CH 5-50 μ l, 40-200 μ l & 50-300 μ l | 1 |
| 8885-505052 | Ejector Plate, 12 CH 0.5-10 μ l | 1 |
| 8885-505054 | Ejector Plate/ Casing Holding Screw | 1 |
| 8885-505057 | Channel Cylinder Spring | 1 |
| 8885-505058 | 2nd Spring | 1 |
| 8885-505059 | 2nd Spring Holder | 1 |
| 8885-505020 | Thumb Knob White for 0.5-10 μ l & 50-300 μ l | 1 |
| 8885-505021 | Thumb Knob Yellow for 5-50 μ l & 40-200 μ l | 1 |
| 8885-505029 | Body | 1 |
| 8885-505031 | Cap | 1 |
| 8885-505062 | Flat Washer | 1 |
| 8885-600046 | Wrench | 1 |
| 8885-745500 | Maintenance Kit (Cleaning Wire & Silicone Grease) | 1 |

WARRANTY POLICY

Your new Oxford MultiMate™ is guaranteed for two (2) years against defects in material and workmanship. This warranty becomes effective when the ultimate user receives the product and returns the warranty card. Any defects in the pipette will be replaced or repaired (at our option) and defective parts will be replaced without cost within the two (2) year period, provided the Oxford MultiMate™ has not been abused, altered contrary to instructions.

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

Manufactured in Japan for



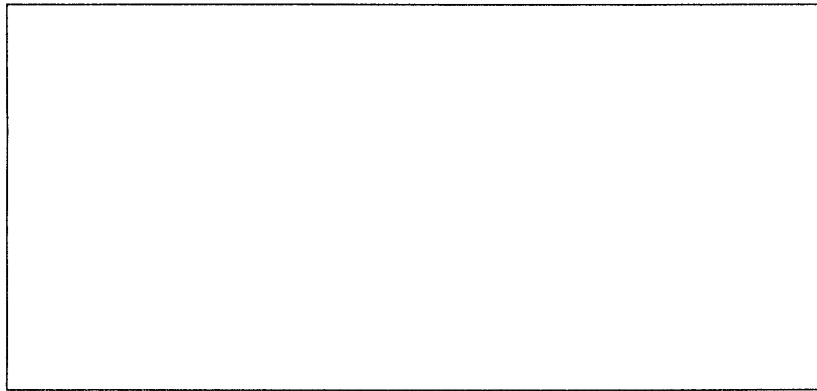
The **KENDALL** Company

A DIVISION OF TYCO HEALTHCARE GROUP LP

15 Hampshire Street
Mansfield, MA 02048



For repair or service, please contact your local distributor :



The **KENDALL** Company

A DIVISION OF TYCO HEALTHCARE GROUP LP
Mansfield, MA 02048

Manufactured by



Artwork No.:620595

FEATURES:

- The main body of the *MultiMate™* is totally autoclavable: 121 °C for 20 minutes.
- The *MultiMate™* is suitable for liquid handling on a clean bench because it is designed to be usable in irradiation of ultraviolet rays. (If Ultraviolet rays are applied to the unit for a considerably long time, it may discolor but this will not affect its performance.
- The handle is ergonomically designed to reduce fatigue from repetitive use.
- The sample volume is easily adjusted by turning the thumb knob and observing the digital indicator.
- Sample volume is easily locked with the "One-Touch" lock mechanism.
- The units are capable of sampling a wide volume range: 0.5 μl to 300 μl .
- The instrument is designed so that as it is warmed by your hand, precision is minimally affected.
- PTFE (fluoroplastic) seals are used to seal the piston which enables the pipette to withstand long periods of operation while maintaining accuracy and reproducibility.
- Organic solvents can be pipetted with this instrument if the "O-Ring for Organic Solvents" (Optional) is installed.
- The tip can be removed without touching it with your hands because of the tip ejector mechanism.

ACCESSORIES INCLUDED:

- Silicone Grease
- Cleaning Wire
- Wrench

Please make sure that all of the above listed accessories are included before using this instrument.