WARRANTY

Wheaton Science Products warrants this product to be free from defects in material and workmanship for a period of 365 days from the date of shipment. If repair or adjustment is necessary within the warranty period and has not been the result of mishandling or abuse, you may return the unit freight prepaid, provided that return authorization has been obtained. Wheaton Science Products will correct the defect or adjust the unit at no charge.

Items returned for repair or adjustment should be packed very carefully to prevent damage in transit and also should be insured for your protection. Should damage occur in transit, all claims should be made against the carrier. The shipping carton should not be discarded but retained until inspection by a representative of the carrier is made.

Wheaton Science Products will repair or adjust out-of-warranty products at a nominal charge.
INTRODUCTION

The Unispense is a new generation liquid dispenser from Wheaton Science Products (WSP) which features full microprocessor control of a wide range of dispensing parameters. A full featured membrane keypad allows direct user entry of volume, tubing size, automatic delay interval, and dose count. Additional user selective functions include automatic/manual operation, memory functions, calibration, and audible cycle alert. The self-prompting LCD screen and one-step volume calibration ensures quick setup and ease of operation. The pump is self-priming, and uses easily replaceable silicone tubing assemblies available in 2, 3, 6, or 8 millimeter I.D. sizes. Optional Viton tubing is available for dispensing organic solvents and strong caustics. All WSP tubing is fully autoclavable.

Two versions, a mini and a standard pump head model, are available to accommodate a wide range of laboratory and industrial filling procedures. The mini pump head version offers a volume range of 0.20 to 150 mL per dose, while the standard pump head version offers a volume range of 1.0 to 5000 mL per dose, depending on tubing size utilized. For added versatility, the user can select between automatic or manual modes. When operated in the automatic mode, an adjustable delay can be set from 0.5 to 60 seconds between doses to accommodate user dexterity and work load. When operated in the manual mode, the dispenser can be activated by depressing either the front panel mounted start key or the optional footswitch for hands free operation.

The user can expect excellent accuracy and reproducibility as high as +/-1% at midrange. Unlike conventional peristaltic pumps which rely on a "trial and error" method of volume calibration, the Unispense allows direct user entry of volume in milliliters. Up to 11 preselected set-ups can be stored in memory and quickly retrieved for later use. Selections stored in memory are preserved even after powering the unit down. An efficient cooling fan, and internal air flow arrangement, provides optimum cooling for the heavy duty drive motor. The mini pump version comes complete with two 2 mm silicone tubing assemblies, and the standard pump version includes one each 3, and 6 mm silicone tubing assemblies. An optional tubing support stand is available to facilitate hands free operation.
SAFETY SYMBOLS USED IN THIS MANUAL

⚠️

A **Warning** symbol indicates attention to an operation which can cause operator injury, improper function of, or damage to the equipment and possible problems with the process.

⚠️

A **Danger** symbol indicates attention to an operation which could cause electrocution, severe injury, or death!

SAFETY INSTRUCTIONS

**NOTE: EVEN THE SAFEST EQUIPMENT CAN CAUSE INJURY IF THE USER IS CARELESS**

1. **KNOW YOUR INSTRUMENT** - Read the operating manual carefully. Learn the equipment’s application and limitations as well as the specific potential hazards peculiar to this instrument.

2. **GROUND ALL EQUIPMENT** - If electrical, this instrument is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green conductor in the cord is the grounding wire, and should never be connected to a live terminal.

3. **AVOID DANGEROUS ENVIRONMENT** - Electrical instruments designed to process liquids must be operated with extreme caution. If liquid comes in contact with internal components or wires, fire or electric shock may occur. Adequate surrounding work space should be provided during use. Do not operate electrical instrumentation in a combustible atmosphere.

4. **WORK SURFACE** - Keep area well lighted. Be certain the work surface is clean, level, and sturdy enough to support the weight of the unit, particularly if it is to be filled with liquid.

5. **WEAR PROPER APPAREL** - Do not wear loose clothing, neckties, or jewelry that might get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.

6. **WEAR SAFETY GOGGLES** - Wear safety goggles at all times. Everyday eyeglasses only have impact resistant lenses; they are NOT safety glasses.

7. **DON'T OVERREACH** - Keep proper footing and balance at all times. Do not place instrument in an area or position that would hinder access to or proper operation of the instrument.

8. **MAINTAIN INSTRUMENT WITH CARE** - Keep screws tight and unit clean. Check periodically for worn or damaged parts. Inspect the plug and cord before each use. Do not operate this instrument if there are signs of damage.

9. **AVOID ACCIDENTAL STARTUP** - If electrical, always make sure switch is in the “OFF” position before plugging the instrument into outlet.
10. DISCONNECT INSTRUMENT - Always disconnect the instrument from the power source before servicing.

11. DO NOT BLOCK COOLING VENTS IF PROVIDED.

12. DO NOT OPERATE THIS EQUIPMENT IN ANY MANNER NOT SPECIFIED IN THIS MANUAL.

13. KEEP THE OPERATING MANUAL - Keep the operating manual for this instrument in a safe place near the instrument for quick and easy reference.

14. FIRE EXTINGUISHER - It is recommended that a fire extinguisher always be located in areas where electrical instruments are being used.

GROUNDING INSTRUCTIONS

WARNING! IMPROPER GROUNDING CAN RESULT IN ELECTRICAL SHOCK. IN THE EVENT OF A SHORT CIRCUIT, GROUNDING REDUCES THE RISK OF SHOCK BY PROVIDING AN ESCAPE PATH FOR THE ELECTRIC CURRENT. THIS INSTRUMENT MUST BE GROUNDED.

1. This instrument is provided with a cord having a grounding wire and an appropriate grounding plug. The plug must be used with an outlet that has been installed and grounded in accordance with all local codes and ordinances. The outlet must have the same configuration as the plug. DO NOT USE AN ADAPTER.

2. Do not modify the plug that has been provided. If it does not fit the available outlet, the correct outlet should be installed by a qualified electrician.

3. The plug provided with 220 vac units may not match the users electrical outlet due to the wide variety of 220 vac outlet configurations. If this is the case, the proper plug must be obtained locally and connected to the line cord. For European wiring, the brown wire must be connected to the HOT terminal, the blue wire to the NEUTRAL terminal, and the green wire with yellow stripe to the earth/ground.

4. Inspect the plug and cord before each use. Do not operate this instrument if there are signs of damage.

DANGER! ELECTRICAL SHOCK HAZARD. WHEN REPAIRING OR REPLACING THE CORD OR PLUG, KEEP THE GROUNDING WIRE SEPARATE FROM THE CURRENT CARRYING WIRES. NEVER CONNECT THE GROUNDING WIRE TO ONE OF THE FLAT BLADE PLUG TERMINALS. THE GROUNDING WIRE HAS GREEN INSULATION AROUND IT.

If these grounding instructions are not completely understood or if you are not sure your instrument is properly grounded have the installation checked by a qualified electrician.
SET UP

PRELIMINARY SET- UP

WARNING! DO NOT CONNECT THE UNIT TO A SOURCE OF AC POWER AT THIS TIME.

1. Carefully unpack unit, being sure to save the box and packing materials to facilitate returning the unit in the event it should require servicing.

2. Place the dispenser on a clean, level surface. Make certain the work surface is sturdy enough to support the weight of the unit.

3. The dispenser should be located in an area where AC power is conveniently available. Avoid placing the dispenser in a high traffic area where frequent liquid spills are likely to occur.

TUBING SELECTION

The Unispense standard pump model comes complete with a three, and six millimeter silicone tubing assembly, while the mini pump model includes only two millimeter tubing. Each size will provide a different liquid delivery range when used in conjunction with the dispenser. The user must determine which size tubing is suitable for their particular dispensing requirements (except mini pump model).

Optional eight millimeter tubing is available from WSP, which will accommodate larger doses, and provide a higher rate of flow for the standard pump model. The specification page of this manual gives the dispensing range of each tubing size. WSP tubing is specially made for use with our pumps & dispensers. Use of other brands will reduce accuracy, and may fail to pump at all.

TUBING CHARACTERISTICS

Silicone tubing exhibits a wide range of chemical resistivity and should be suitable for most general dispensing applications. However, there are a few organic substances which cannot be dispensed accurately due to their effects on silicone tubing. These substances include hydrocarbons, acids, and halogenated hydrocarbons. To determine if a particular tubing-chemical combination is compatible, immerse a 100 mm length of tubing in the chemical in question for 72 hours at room temperature. If after this time period the tubing has increased or decreased in length by less than 3%, the combination is compatible. Length changes of 3% to 8% are worth trying, but will not produce the most accurate results. Changes in length over 8% are considered to be unsatisfactory. It should also be noted that a new tubing assembly may cause slight filling variations for the first one to two hours of operation.

MINI PUMP HEAD CONSIDERATIONS

The mini pump head models (374307 & 374309) are designed for use with 2mm WSP silicone tubing only. After installing 2mm tubing in a mini pump head, the tubing must be stretched prior to tightening the tubing clamp bar. This will help prevent the tubing from “bunching up” within the pump head cavity during operation. This is best accomplished by pulling both ends of the tubing straight out of the pump head, then tightening the tubing clamp bar.
TUBING INSTALLATION (refer to fig. A)

WARNING! DO NOT CONNECT THE UNIT TO A SOURCE OF AC POWER AT THIS TIME. NEVER ATTEMPT TO INSTALL OR REMOVE TUBING FROM THE DISPENSER WHEN IT IS PLUGGED IN. SERIOUS INJURY MAY RESULT IF FINGERS ARE INSERTED INTO THE PUMP ROTOR DURING OPERATION!

IMPORTANT! WHEN INSTALLING 2mm TUBING IN A MINI PUMP HEAD, THE TUBING MUST BE STRETCHED BEFORE TIGHTENING THE TUBING CLAMP BAR. FAILURE TO DO THIS WILL CAUSE PROBLEMS DURING OPERATION SUCH AS BUNCHING, AND PREMATURE WEAR OF THE TUBING.

1. The unit should be turned off and disconnected from the AC power source at this time. Loosen the two pump cover retaining nuts, and remove the clear plastic pump cover by sliding it toward the rear of the dispenser.

2. Remove the tubing clamp bar by turning the red plastic retaining nut in the center of the clamp bar counterclockwise.

3. The standard WSP tubing assembly consists of a five foot length of tubing with a borosilicate glass sinker attached to one end, and a polypropylene dispensing nozzle at the other end. The tubing must be positioned into the pump, such that the end fitted with the sinker exits the bottom, and the end fitted with the nozzle exits the top of the pump.

4. Carefully insert the tubing into the pump as shown in the illustration. Work from the bottom around to the top, allowing the tubing to follow the inner contour of the pump housing. The pump rotor must be turned by hand to accomplish tubing installation. The tubing must not be twisted or bunched as it enters or exits the pump.

   NOTE! TUBING ADJUSTMENT IS NOT EXTREMELY CRITICAL, AS THE TUBING TENDS TO BE SELF-ADJUSTING AS THE DISPENSER IS OPERATED.

5. An ample length of tubing should be allowed to exit the bottom of the pump to comfortably reach the container being pumped from. The sinker should rest at the bottom of the container during operation. For special applications requiring a longer tubing assembly, bulk silicone tubing and fittings may be ordered from WSP.

6. Replace the clear plastic pump cover removed in step 1, and tighten the two pump cover retaining nuts finger tight only.

7. Replace the tubing clamp bar removed in step 2, being sure the tubing is positioned in the recessed grooves of the clamp. Tighten the red plastic retaining nut finger tight only.
OPERATION

PRELIMINARY OPERATION (refer to figs. A and C)

WARNING! EXTREME CARE MUST BE TAKEN WHEN PLUGGING EQUIPMENT INTO LIVE AC POWER OUTLETS. NEVER TOUCH BARE, EXPOSED PLUG BLADES AS THEY ARE BEING INSERTED INTO THE OUTLET, AS SEVERE ELECTRIC SHOCK WILL RESULT. DANGER! GROUNDING INSTRUCTIONS AT THE BEGINNING OF THIS MANUAL MUST BE FOLLOWED EXPLICITLY. FAILURE TO DO SO MAY RESULT IN SEVERE ELECTRIC SHOCK OR ELECTROCUTION.

1. Connect the unit to a suitable source of AC power. Catalog #374301 and #374307 are designed for operation on 110-120 volts, 60 Hz. Catalog #374302 and #374309 are designed for operation on 220-240 volts, 50 Hz. Due to the large variety of 220 volt outlet configurations in use, the plug provided with #374302 and #374309 may not match the user's outlet configuration. If this is the case, the proper plug must be obtained locally and connected to the line cord.

2. Turn the unit on by depressing the upper portion of the power switch (6). If the unit is connected and operating properly, the cooling fan will start, the dispenser will beep once, and the WSP Logo will appear on the LCD display. The logo will shortly be replaced by the word "AUTOMATIC" or "MANUAL", and the number 0 below.

3. Insert the glass sinker on the inlet side of the installed tubing assembly into the container of liquid being dispensed from. For maximum efficiency, the sinker should rest at the bottom of the container.

4. Wheaton offers an optional tubing support stand (#054106) which supports the dispensing nozzle above the work surface for hands free operation. An optional footswitch (#050694) is available which facilitates hands free operation when operating the dispenser in the manual mode. See ACCESSORIES at the back of this manual for more details on these and other fine Wheaton accessories which complement your new Unispense dispenser.

SETTING VOLUME (refer to fig. B)

1. Depress the SEL key on the keypad; the message "Volume (ml)" appears on the LCD display. A value will appear below the message which represents the last volume setting input by the user.

NOTE! NEW DISPENSERS ARE THOROUGHLY TESTED AT THE FACTORY PRIOR TO SHIPPING. THE LAST SETTINGS ENTERED DURING FACTORY TESTING WILL APPEAR ON THE LCD DISPLAY OF ALL NEW DISPENSERS WHEN INITIALLY OPERATED.

2. Enter the desired volume by depressing the appropriate number keys as shown in the illustration. Fractional volume amounts may be entered in increments of 1/10 mL. The volume entered will appear on the LCD display.

3. Depress the ENTER key on the keypad; the dispenser will beep once, and the selected volume will remain on the LCD display.
4. The volume range for each tubing size is listed on the specification page at the back of this manual. If the user attempts to input a volume setting outside the range of the tubing size selected, the message "INVALID VOLUME" will appear on the LCD display. The valid range for the currently selected tubing size will appear below the message. Press any key to clear the message, and re-enter a valid volume setting. See SELECTING TUBE SIZE for more details on selecting tubing size.

5. To change a currently selected volume setting, simply enter the new volume setting and depress the ENTER key.

6. To cancel a volume setting during entry, depress the CLEAR key and the previously selected volume will appear on the LCD display. The CLEAR key must be used before the ENTER key is pressed.

**SETTING DELAY INTERVAL (refer to fig. B)**

1. After entering the volume, depress the SEL key on the keypad. The message "Delay (s)" appears on the LCD display. A value will appear below the message which represents the last delay setting input.

2. The Unispense allows direct user entry of a delay interval from 0.5 to 60 seconds. When operated in the automatic mode, the dispenser will provide a delay between doses defined by the user selected delay interval.

3. Enter the desired delay interval by depressing the appropriate number keys as shown in the illustration. Fractional delay values may be entered in increments of 1/10 sec. The delay value entered will appear on the LCD display.

4. Depress the ENTER key on the keypad; the dispenser will beep once, and the selected delay interval will remain on the LCD display.

5. The valid delay interval range is from 0.5 to 60 seconds, in 1/10 second increments. If the user attempts to enter a value above or below the valid delay interval range, the dispenser will beep once, and the message "INVALID DELAY" will appear on the LCD display. The valid delay range will appear below the message. Press any key to clear the message, and re-enter a valid delay setting.

6. To change a currently selected delay setting, simply enter the new delay setting and depress the ENTER key.

7. To cancel a delay setting during entry, depress the CLEAR key and the previously selected delay setting will appear on the LCD display. The CLEAR key must be used before the ENTER key is pressed.

**SELECTING TUBE SIZE (refer to fig. B)**

1. After entering the delay interval, depress the SEL key on the keypad. The message "Tube Size (mm)" appears on the LCD display. A value will appear below the message which represents the last tube size setting input.

2. The Unispense requires the user to enter the I.D. size of the tubing currently installed in the pump. Valid entries of 2, 3, 6, or 8 mm I.D. tubing sizes are permissible.

3. Enter the tubing size by depressing the appropriate number key as shown in the illustration. The tubing size entered will appear on the LCD display. Fractional tubing size entries are not permitted.
DANGER! GROUNDING INSTRUCTIONS AT THE BEGINNING OF THIS MANUAL MUST BE FOLLOWED EXPLICITLY. FAILURE TO DO SO MAY RESULT IN SEVERE ELECTRIC SHOCK OR ELECTROCUTION.

4. Depress the ENTER key on the keypad; the dispenser will beep once, and the selected tubing size will remain on the LCD display.

5. Valid entries of 2, 3, 6, or 8 mm I.D. tubing sizes are permissible. If the user attempts to enter an invalid tubing size, the dispenser will beep once, and the message "BAD TUBE SIZE" will appear on the LCD display. Valid tubing sizes will appear below the message. Press any key to clear the message, and re-enter a valid tubing size.

6. To change a currently selected tubing size, simply enter the new tubing size and depress the ENTER key.

7. If the current volume setting is outside the volume range of the tubing size selected, the message "VOLUME ADJUSTED TO" will appear on the LCD display. The upper or lower volume limit of the selected tubing size will be displayed after the message. Press any key to clear the message, re-enter volume and tubing size, and install the next size larger or smaller tubing assembly if necessary.

8. To cancel a selected tubing size during entry, depress the CLEAR key and the previously selected tubing size will appear on the LCD display. The CLEAR key must be used before the ENTER key is pressed.

ENTERING DOSE COUNT (refer to fig. B)

1. After entering the tubing size, depress the SEL key on the keypad. The message "Count" appears on the LCD display, with the number 0 below.

2. The Unispense allows the user to enter the number of doses to be delivered when operated in the automatic mode. The valid range is 0 to 65,535 doses. When a number greater than 0 is entered, the dispenser will count down from that number, displaying the number of doses remaining in the current program; the dispenser will automatically stop after the last dose is delivered. If a count of 0 is initially entered, the dispenser will continuously deliver doses until the STOP key is pressed; the number of doses currently delivered will be displayed.

3. Enter the desired dose count by depressing the appropriate number keys as shown in the illustration. The dose count entered will appear on the LCD display.

4. Depress the ENTER key on the keypad; the dispenser will beep once, and the selected dose count will remain on the LCD display.

5. The valid dose count range is from 0 to 65,535 doses. If the user attempts to enter a dose count above the valid range, the dispenser will beep once, and the message "INVALID COUNT" will appear on the LCD display. The valid dose count range will appear below the message. Press any key to clear the message, and re-enter a valid dose count.

6. To change a currently selected dose count, simply enter the new dose count and depress the ENTER key.
7. To cancel a dose count during selection, depress the CLEAR key and the previously entered dose count will appear on the LCD display. The CLEAR key must be used before the ENTER key is pressed.

**MEMORY STORE (refer to fig. B)**

1. After entering the dose count, depress the SEL key on the keypad. The message "Store" appears on the LCD display, with a number from 1 to 11 below. The number displayed is the number of the program currently in memory. When the dispenser is initially powered up, the number 1 is displayed.

2. The Unispense allows the user to store, and quickly retrieve up to 11 pre-programmed procedures. Volume, delay interval, and tubing size parameters are preserved in memory even after powering down or unplugging the dispenser.

3. Enter a number from 1 to 11 by depressing the appropriate number keys as shown in the illustration. The number entered will be assigned to the current set-up, and will be used to later retrieve the set-up. The number entered will appear on the LCD display.

**NOTE! IF A NEW SET-UP IS ASSIGNED A NUMBER ALREADY USED TO STORE A PREVIOUS SET-UP, THE PRIOR SET-UP WILL BE OVER-WRITTEN BY THE NEW SET-UP.**

4. Depress the ENTER key on the keypad; the dispenser will beep once, and the selected memory store number will remain on the LCD display.

5. Valid memory storage numbers are from 1 to 11. If the user attempts to enter a memory number above or below the valid range, the dispenser will beep once, and the message "INVALID REGISTER" will appear on the LCD display. The valid memory number range will appear below the message. Press any key to clear the message, and re-enter a valid memory number.

6. To change a currently selected memory number, simply enter the new memory number, and depress the ENTER key.

7. To cancel a memory number during selection, depress the CLEAR key and the previously entered memory number will appear on the LCD display. The CLEAR key must be used before the ENTER key is pressed.

**MEMORY RECALL (refer to fig. B)**

1. After entering the memory store number, depress the SEL key on the keypad. The message "Recall" appears on the LCD display, with a number from 1 to 11 below the message. The number displayed is the number of the program currently in use.

2. The Unispense allows the user to quickly recall and utilize up to 11 pre-programmed procedures. Volume, delay interval, and tubing size parameters are preserved in memory even after powering down or unplugging the dispenser.

3. When entering a new set-up, the memory store number assigned to the set-up will be displayed below the "Recall" message. In this case, the recall number must not be changed to a number different from the memory store number. Make a note of the recall number as it applies to the current set-up parameters.

4. Depress the ENTER key on the keypad; the dispenser will beep once, and the volume, delay, and tubing size parameters for the new set-up will be displayed. Press any key to clear the message, and resume operation.
5. To recall a previously stored set-up, enter the number (1 to 11) which was assigned to the desired set-up. The number entered will appear on the LCD display.

6. Depress the ENTER key on the keypad; the dispenser will beep once, and the volume, delay, and tubing size parameters for the recalled set-up will be displayed. Press any key to clear the message.

**NOTE! DOSE COUNTS ARE NOT PRESERVED IN MEMORY, AND MUST BE ENTERED PRIOR TO DISPENSING IN AUTOMATIC MODE. THE DEFAULT DOSE COUNT SETTING IS ZERO, WHICH WILL PROVIDE CONTINUOUS DOSE DELIVERY IN AUTOMATIC MODE.**

7. Valid memory recall numbers are from 1 to 11. If the user attempts to recall a memory number above or below the valid range, the dispenser will beep once, and the message "INVALID REGISTER" will appear on the LCD display. The valid memory recall number range will appear below the message. Press any key to clear the message, and re-enter a valid recall number.

**AUTOMATIC OPERATION (refer to figs. A & B)**

![WARNING! NEVER ATTEMPT TO INSTALL OR REMOVE TUBING FROM THE DISPENSER WHEN IT IS PLUGGED IN. SERIOUS INJURY MAY RESULT IF FINGERS ARE INSERTED INTO THE PUMP ROTOR DURING OPERATION!](image)

**NOTE! FACTORS SUCH AS TUBING SIZE, TUBING AGE, VISCOSITY, VOLUME AND TEMPERATURE WILL AFFECT PUMP PRIMING. GENERALLY, THE PUMP WILL PRIME AFTER 3 TO 4 DISPENSE CYCLES. TO ACHIEVE MAXIMUM ACCURACY, IT IS RECOMMENDED THAT 8 DISPENSE CYCLES BE RUN INITIALLY PRIOR TO AN ACTUAL FILLING OPERATION.**

1. After the desired set-up parameters are entered or recalled from memory, depress the AUTO/MAN key on the keypad.

2. A review screen will appear on the LCD display, showing all currently selected operating parameters. Depress the AUTO/MAN key two more times, and the message "AUTOMATIC" will appear on the LCD display. The current dose count number is displayed below the message.

3. Make certain the glass sinker attached to the inlet side of the tubing is inserted into the container being dispensed from, and fully immersed in the liquid being dispensed.

4. Insert the polypropylene nozzle attached to the outlet side of the tubing into the container to be filled.

5. Depress the START key on the keypad; the pump rotor will begin turning, and liquid will be dispensed from the outlet nozzle. At the end of the dispense cycle, the dispenser will beep once and stop. After the preselected delay interval has expired, the dispenser will begin another dispense cycle.

**IMPORTANT! UNTIL THE USER BECOMES FAMILIAR WITH OPERATION, SEVERAL PRACTICE RUNS SHOULD BE MADE USING ONLY DISTILLED WATER. EXTREME CARE SHOULD BE TAKEN TO AVOID LIQUID SPILLS ON OR AROUND THE DISPENSER. IF A LIQUID SPILL SHOULD OCCUR, THE DISPENSER SHOULD BE DISCONNECTED FROM THE AC POWER AND REMOVED FROM THE AREA OF THE SPILL. ANY LIQUID CONTACTING THE DISPENSER SHOULD BE IMMEDIATELY ATTENDED TO WITH ABSORBENT TOWELS.**
6. If a dose count of 0 was entered, the number of doses currently delivered will appear on the LCD display in ascending fashion. The dispenser will continue to deliver doses until it is stopped by the user.

7. If a dose count greater than 0 was entered, the number of doses currently remaining will appear on the LCD display in descending fashion. The dispenser will stop when the number of doses remaining equals 0.

8. The dispenser may be stopped at any time by simply depressing the STOP key on the keypad. If the stop key is depressed during a dispense cycle, dispensing will be interrupted, and an incomplete dose will be delivered. The dose count will remain, unaffected, on the LCD display. To resume dispensing, simply depress the START key.

9. To reset the dose count to zero, depress the CLEAR key on the keypad. To change any currently selected parameter, stop the dispenser and depress the SEL key as many times as required to reach the desired parameter. Enter the new setting, and depress the ENTER key. To resume automatic dispensing, depress the AUTO/MAN key and then press START.

10. If the volume delivered by the dispenser deviates from the volume selected, it will be necessary to calibrate the dispenser. Refer to the section entitled CALIBRATION later in this manual.

MANUAL OPERATION (refer to figs. A & B)

WARNING! NEVER ATTEMPT TO INSTALL OR REMOVE TUBING FROM THE DISPENSER WHEN IT IS PLUGGED IN. SERIOUS INJURY MAY RESULT IF FINGERS ARE INSERTED INTO THE PUMP ROTOR DURING OPERATION!

NOTE! FACTORS SUCH AS TUBING SIZE, TUBING AGE, VISCOSITY, VOLUME AND TEMPERATURE WILL AFFECT PUMP PRIMING. GENERALLY, THE PUMP WILL PRIME AFTER 3 TO 4 DISPENSE CYCLES. TO ACHIEVE MAXIMUM ACCURACY, IT IS RECOMMENDED THAT 8 DISPENSE CYCLES BE RUN INITIALLY PRIOR TO AN ACTUAL FILLING OPERATION.

1. After the desired set-up parameters are entered or recalled from memory, depress the AUTO/MAN key to display the review screen. Depress the AUTO/MAN key a second time, and the message "MANUAL" appears on the LCD display, with the current dose count number displayed below the message.

2. Make certain the glass sinker attached to the inlet side of the tubing is inserted into the container being dispensed from, and fully immersed in the liquid being dispensed.

3. Insert the polypropylene nozzle attached to the outlet side of the tubing into the container to be filled.

4. Depress the START key on the keypad; the pump rotor will begin turning, and liquid will be dispensed from the outlet nozzle. At the end of the dispense cycle, the dispenser will beep once and stop. When operating in the manual mode, the delay interval parameter is disabled. This mode allows the dispense cycle to be initiated at the users convenience.

5. To initiate another dispense cycle, depress the START key, or the optional footswitch. The number of doses currently delivered will appear on the LCD display in ascending fashion.

6. The dispenser may be stopped during a dispense cycle by depressing the STOP key on the keypad. When a dispense cycle is interrupted in this fashion, an incomplete dose will be
delivered. The dose count will remain on the LCD display. To resume dispensing, simply depress the START key.

7. To reset the dose count to zero, depress the CLEAR key on the keypad. To change any currently selected parameter, stop the dispenser and depress the SEL key as many times as required to reach the desired parameter. Enter the new setting, and depress the ENTER key. To resume manual dispensing, depress the AUTO/MAN key and then press START.

8. If the volume delivered by the dispenser deviates from the volume selected, it will be necessary to calibrate the dispenser. Refer to the section entitled CALIBRATION.

**IMPORTANT! UNTIL THE USER BECOMES FAMILIAR WITH OPERATION, SEVERAL PRACTICE RUNS SHOULD BE MADE USING ONLY DISTILLED WATER. EXTREME CARE SHOULD BE TAKEN TO AVOID LIQUID SPILLS ON OR AROUND THE DISPENSER. IF A LIQUID SPILL SHOULD OCCUR, THE DISPENSER SHOULD BE DISCONNECTED FROM THE AC POWER AND REMOVED FROM THE AREA OF THE SPILL. ANY LIQUID CONTACTING THE DISPENSER SHOULD BE IMMEDIATELY ATTENDED TO WITH ABSORBENT TOWELS.

**WARNING! AS WITH ANY PIECE OF ELECTRICAL EQUIPMENT, WATER MUST NEVER BE ALLOWED TO ENTER THE DISPENSER CABINET. IN THE EVENT WATER DOES ENTER THE DISPENSER, DISCONNECT THE UNIT FROM THE AC POWER SOURCE AT ONCE. THE CABINET SHOULD BE OPENED AS SOON AS POSSIBLE, AND ALL INTERNAL SURFACES AND COMPONENTS THOROUGHLY DRIED WITH ABSORBENT TOWELS.

**CALIBRATION (refer to fig. B)**

**NOTE! RE-CALIBRATION IS RECOMMENDED AFTER ANY VOLUME CHANGE.**

**NOTE! UNTIL NEW TUBING ASSEMBLIES ARE FULLY BROKEN-IN, IT MAY BE NECESSARY TO PERIODICALLY RE-CALIBRATE THE DISPENSER.**

1. The Unispense features a quick, easy, one-step calibration procedure. If the volume delivered by the dispenser deviates by more than +/- 1% from the volume entered, it will be necessary to calibrate the unit as described below.

2. In automatic or manual mode, dispense a single dose into a graduated cylinder. An electronic scale may also be used for calibration purposes. Depress the VOL CALB key on the keypad; the message "Actual Vol (ml)" appears on the LCD display. A number will appear below the message, which is the volume setting currently selected. Using the appropriate number keys, as shown in the illustration, enter the actual volume delivered by the dispenser as read on a graduated cylinder or electronic scale.

3. Depress the ENTER key to exit calibration mode, and return to automatic or manual operation. The volume will automatically be adjusted when operation is resumed.

**CYCLE ALERT (refer to fig. B)**

1. The Unispense provides an audible beep at the end of each dispense cycle. Many users find this helpful, especially when operating in the automatic mode employing short delay intervals. If desired, the cycle alert may be disabled.
2. To toggle the cycle alert on or off, the dispenser must be in automatic or manual mode, with the message AUTOMATIC or MANUAL appearing on the display. It is not necessary to stop the dispenser.

3. To toggle the cycle alert off, depress the BEEP key; the cycle alert is now disabled.

4. To toggle the cycle alert back on, depress the BEEP KEY again; the cycle alert is now enabled.

5. The default status for the cycle alert is the on state. Therefore, when the dispenser is first turned on, the cycle alert will always be enabled.

**MAINTENANCE**

DANGER! NEVER ATTEMPT TO PERFORM REPAIRS IF THIS INSTRUMENT IS PLUGGED IN! IN ORDER TO AVOID SERIOUS ELECTRIC SHOCK OR ELECTROCUTION, THIS INSTRUMENT MUST BE DISCONNECTED FROM THE SOURCE OF AC POWER BEFORE IT IS WORKED ON.

Routine user maintenance should include a regular inspection of the tubing assembly for excessive wear and leaks. Many service problems can often be cured by simply replacing a worn tubing assembly. To insure high accuracy, the pump rotor and tubing clamp bar should be kept as clean as possible at all times.

The pump head and outer cabinet may be cleaned with warm water and any mild household cleaning solution. Never place liquid containers on top of the Unispense, as a spill could result in liquid entering the dispenser. If liquid should accidentally contact the front panel, the unit should be disconnected from the AC power source immediately, and carefully dried with towels and warm air. Although the Unispense is designed for easy service, it is highly recommended that the instrument be returned to Wheaton Science Products should any major repairs be needed.
TROUBLE SHOOTING

DANGER! NEVER ATTEMPT TO PERFORM REPAIRS IF THIS INSTRUMENT IS PLUGGED IN!

1. Unit will not operate;

   Cause: Circuit breaker/switch tripped.
   Remedy: Turn power switch on to reset.

   Cause: Supply voltage low or at zero.
   Remedy: Have an electrician check mains supply

   Cause: On/Off power switch in "off" position.
   Remedy: Switch power switch to "on" position.

2. Unit will not pump;

   Cause: Automatic or manual operation not selected.
   Remedy: Depress AUTO/MAN key to select between modes; press START key.

   Cause: Incorrect tubing or tubing incorrectly installed.
   Remedy: Tubing must be proper size and wall weight and installed as described in "TUBING INSTALLATION".

   Cause: Tubing assembly worn or split.
   Remedy: Replace tubing assembly.

   Cause: Motor or circuitry defective.
   Remedy: Refer unit to a qualified service technician or contact WSP.

   Cause: Dispense cycle not initiated.
   Remedy: Start key must be depressed to initiate dispense cycle.

3. Unit will not cycle automatically;

   Cause: Manual mode selected.
   Remedy: Depress AUTO/MAN key to select automatic operation.

   Cause: Dispense cycle not initiated.
   Remedy: Start key must be depressed to initiate dispense cycle.

4. Inaccurate volume delivery;

   Cause: Incorrect tubing size or wall or tubing assembly worn.
   Remedy: Replace tubing assembly.

   Cause: Dispenser not calibrated properly.
   Remedy: Calibrate unit as described in "CALIBRATION" of this manual.
SPECIFICATIONS

OPERATING VOLTAGE: catalog #374301/307 110-120 vac, 60 Hz
catalog #374302/309 220-240 vac, 50 Hz

POWER CONSUMPTION: 140 watts

OVERLOAD PROTECTION: 5 amp circuit breaker/power switch

ELECTRONICS: microprocessor based

PUMP TYPE: single speed rotary peristaltic

PUMP SPEED: 100 rpm, approx.

AVAILABLE TUBING: #374301/302 - 3, 6, 8 mm silicone or viton
#374307/309 - 2 mm silicone or viton

INTERVAL TIME: adjustable from 0.5 to 60 seconds

MODES OF OPERATION: automatic and manual operation

ACCURACY: as high as +/- 1.0% midrange

REPEATABILITY: as high as +/- 1.0% midrange

VISUAL DISPLAY: digital LCD display

DISPENSING RANGE:
2 mm tubing - 0.20 mL to 150 mL
3 mm tubing - 1.00 mL to 900 mL
6 mm tubing - 2.5 mL to 3000 mL
8 mm tubing - 4.0 mL to 5000 mL

FLOW RATE:
2 mm tubing - 0.45 mL/sec.
3 mm tubing - 2.00 mL/sec.
6 mm tubing - 9.00 mL/sec.
8 mm tubing - 18.0 mL/sec.

VOLUME CONTROL: direct keypad entry

DIMENSIONS: 13"w X 9 1/2"d X 6 1/2"h
(33 X 24.1 X 16.5 cm)

WEIGHT: 11 lbs. (5 kg)

INCLUDED ACCESSORIES: std. pump - one ea. 3 and 6 mm tubing sets
mini pump - two ea. 2 mm tubing sets

OPTIONAL ACCESSORIES: footswitch, tubing support stand,
## WHEATON UNISPENSE CAT. #374301/302/307/309 - PARTS LIST (FIG. C)

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
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<th>WHEATON NO.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>STANDARD PUMP HEAD</td>
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<tr>
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<td>MINI PUMP HEAD</td>
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<td>I050130</td>
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<tr>
<td>*</td>
<td>MINI PUMP HEAD SPACER</td>
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<td>2</td>
<td>SCREW, #10-32 X 5/8&quot; LG PFHM</td>
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<td>6</td>
<td>POWER SWITCH/CIRCUIT BREAKER</td>
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<td>I054113</td>
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<td>7</td>
<td>FAN SPACER</td>
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<td>8</td>
<td>WASHER, STAR, #8, INT TOOTH</td>
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<td>9</td>
<td>CORDSET, 120 VAC</td>
<td>1</td>
<td>WI056782</td>
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<td>CORDSET, 230 VAC</td>
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<td>PAD, FOAM (STD PUMP HEAD ONLY)</td>
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* not shown on illustration
**WHEATON UNISPENSE CAT. #374301/302/307/309 - PARTS LIST (FIG. D)**

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* NOT SHOWN ON ILLUSTRATION
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<th>WHEATON NO.</th>
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### WHEATON UNISPENSE CAT. #374301/302/307/309 - PARTS LIST (FIG. F)

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<td>9</td>
<td>CORDSET 120 VAC</td>
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<td>LINE CORD, 230 VAC</td>
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<tr>
<td>11</td>
<td>COOLING FAN</td>
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* not shown on illustration
FIG. G
### WHEATON UNISPENSE CAT. #374301/302/307/309 - ACCESSORIES

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<thead>
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<th>CATALOG NO.</th>
<th>DESCRIPTION</th>
<th>CASE PACK</th>
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<tbody>
<tr>
<td>374301</td>
<td>UNISPENSE DISPENSER WITH STANDARD PUMP HEAD, COMPLETE WITH ONE EACH 3 AND 6 mm SILICONE TUBING SETS, 110-120 VAC, 60 HZ.</td>
<td>1</td>
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<tr>
<td>374302</td>
<td>UNISPENSE DISPENSER WITH STANDARD PUMP HEAD, COMPLETE WITH ONE EACH 3 AND 6 mm SILICONE TUBING SETS, 220-240 VAC, 50 HZ.</td>
<td>1</td>
</tr>
<tr>
<td>374307</td>
<td>UNISPENSE DISPENSER WITH MINI PUMP HEAD, COMPLETE WITH TWO EACH 2 mm SILICONE TUBING SETS, 110-120 VAC, 60 HZ.</td>
<td>1</td>
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<tr>
<td>374309</td>
<td>UNISPENSE DISPENSER WITH MINI PUMP HEAD, COMPLETE WITH TWO EACH 2 mm SILICONE TUBING SETS, 220-240 VAC, 50 HZ.</td>
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<td>374311</td>
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<td>TUBING SUPPORT STAND</td>
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