

WHEATON | OmniSpense® ELITE Peristaltic Pump

Instruction Manual



OmniSpense® ELITE

UniSpense® Pro

Catalog Numbers:

W375030-A and W375030-B (100-120V)
And W375030-C through W375030-J (220-240V)

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1.0 Limited Warranty

All goods and materials shall conform to Wheaton Industries Inc. specifications at the time of shipment from our plant. Wheaton Industries warrants this product to be free from defects in material and workmanship for a period of 365 days from the date of shipment. If the repair or adjustment is necessary within the warranty period and has not been the result of mishandling or abuse, Wheaton will either correct the non-conforming condition, or replace any nonconforming goods or materials or issue a credit in the amount of the purchase price paid and received for such goods. All claims for product nonconformity must be made within ten (10) days of identifying such a problem by calling Customer Service at 800.225.1437 (U.S., Puerto Rico and Canada); or Internationally at 856.825.1100 and then providing the Model, Serial and Catalog Number of the product. Items returned are to be packed very carefully so as to prevent damage in transit. Wheaton will also repair or adjust any product that is beyond the warranty period for a nominal fee.

Wheaton makes no other express or implied warranty, statutory or otherwise, concerning materials or goods supplied, including without limitation, ANY WARRANTY of fitness for a particular purpose or any warranty of merchantability. The warranties given are exclusive of all other warranties expressed or implied. Wheaton shall not be liable for consequential, special or incidental damages.

To expedite any technical or service request, please have the following information available. Thank you.

Model: _____
Serial #: _____
Catalog #: _____

2.0 Safety Symbols Used in this Manual and On This Product



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.



An **ELECTRICAL DANGER** symbol indicates attention to an operation which could cause electrocution or severe injury.

General Safety Rules



WARNING. READ AND UNDERSTAND ALL INSTRUCTIONS. Failure to follow all instructions listed below may result in electrical shock, fire and / or serious personal injury.

SAVE THESE INSTRUCTIONS

1. **Know your instrument** - Read the operating manual carefully. Learn the equipment's application and limitations.
2. **Ground all equipment** - If electrical, this instrument is equipped with a grounding type plug. The green/yellow 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 electrical components or wires, fire or electrical 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 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.
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 start up** - If electrical, always make sure the switch is in the "OFF" position before plugging 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. **It is recommended that a fire extinguisher always be located in areas where electrical instruments are being used.**

Specific Safety Considerations



WARNING! IMPROPER GROUNDING CAN RESULT IN ELECTRICAL SHOCK. IN THE EVENT OF A SHORT CIRCUIT, GROUNDING REDUCES THE RISK OF SHOCK. THIS INSTRUMENT MUST BE GROUNDED.

This instrument is equipped 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.**

Do not modify the line cord that has been provided. If it does not fit the available outlet, contact your nearest Wheaton Industries distributor for the proper line cord for your geographic area.

3.0 Specifications – OmniSpense® ELITE

Operating Voltage:	Nominal 100-240 VAC 50/60 Hz
Power Consumption:	37 watts maximum
Fuses:	2.0 AT 5X20MM 250V – (100-120V) 1.0 AT 5X20MM 250V – (220-240V)
Operating Speed:	0.5 to 400 RPM
Installation Category:	Class II
Environmental:	Operating temperature: 15°C to 40°C Humidity: 80% up to 31°C. 50% at 40°C. Altitude limit 2000 meters
Overall Dimensions: (includes attached pumphead)	7" H x 8 ¾" W x 13" D (in) 17.8H x 22.3W x 33.0D (cm)
Weight:	11.8 lbs, 5.4 kg
Available Wheaton Tubing Sizes:	2,3,6,8 mm ID
Maximum Dispense Range for All Tubing Sizes:	.01 - 9999.99 ml
Approximate Flow Rate Ranges For Various Tubing Sizes, +/- 3%:	2.0mm ID: 0.1 - 2.6 ml/sec 3.0mm ID: 0.1 - 5.3 ml/sec 6.0mm ID: 0.1 - 19.0 ml/sec 8.0mm ID: 0.1 – 30.0 ml/sec
Vertical Head Height:	APPROXIMATELY 6 FT (2 METERS)
Ingress Protection Rating:	31

4.0 Introduction

The OmniSpense® ELITE is the latest generation liquid dispenser from Wheaton Industries, Inc., which features precision microprocessor control of a wide range of dispensing parameters.

4.1 The Peristaltic Pump Process

Fluid is contained within a flexible tube, which is placed in the precision pump head. The center rotor, with a number of rollers, compresses the flexible tube. As the rotor turns, the part of tube under compression closes and forces the fluid to be pumped to move through the tube. After the roller passes, the tube opens to its natural state and fluid flow is induced to the tubing. This process is called peristalsis. The pump has no contact with the fluid being transferred.

4.2 Typical Applications

Peristaltic pumps can be used with a large variety of liquids. Particularly corrosive, abrasive and suspension liquids are all good candidates for peristaltic pump applications.

Peristaltic pumps require little maintenance, are easy to install, have few moving parts, and are easy to use.

4.3 Initial Inspection

When you receive your new OmniSpense® ELITE, inspect it for any obvious damage that may have occurred during shipment. If any damage is found, notify the carrier at once. Warranty information is provided at the front of this manual. Check to confirm that there are no broken switches, displays or pump heads, and that the unit is not dented or scratched. Retain packaging until all parts and unit functionality are confirmed.

Components Supplied

- **OmniSpense® ELITE** peristaltic pump
- **Pump Head**
- **Line Cord** – supplied to fit your local electrical outlet specifications
- **Flexible Tubing Holder**
- **Operator's Manual**
- **Quick Start Card**
- **Icon Help Sticker**

5.0 Unit Features and Component Identification

Refer to **Figure A** for component identification

Power Inlet Module: Location of the line cord entry and fuse(s) compartment.

Keypad: Allows all setting and operation parameters to be entered.

Screen: A unique icon-driven display allows easy viewing of unit functions and parameters.

I/O Interface Connection: Connection for an optional footswitch. Also contains feedback outputs for remote control. Connector pin details are located in Figure F.

Pump head: Other optional pumpheads can be mounted on the unit, (see section 7.1). Tubing is loaded by simply raising the cover on the pumphead, and snapping closed

5.1 Control

The OmniSpense® ELITE can be used in both laboratory and industrial settings. In addition to the front-panel keypad, the pump can be triggered to run remotely either by the optional footswitch, or by a dry contact relay or isolated open collector transistor output as part of a more advanced automated dispensing system. The OmniSpense® ELITE is capable of sending an End of Dispense (EOD) feedback signal to a controller for remote automated operation.

5.2 User Interface

A chemical resistant membrane keypad allows direct user entry of volume, tubing size, automatic delay interval, ramp time, pump direction, pump speed, pump function and dose count. Additional user selective functions include calibration, memory functions and audible cycle alert. The self-prompting, symbolic LCD screen ensures quick setup and ease of operation.

5.3 Performance Highlights

An adjustable ramp feature allows the pump to come up to speed gradually and helps prevent foaming or splashing when dispensing into dishes or small vials. An adjustable delay can be set from 0.5 to 99.9 seconds between doses to accommodate user dexterity and work load. The pump can be activated by depressing either the front panel mounted start key, or the optional footswitch for hands-free operation.

Up to 9 pre-selected setups can be stored in memory and quickly retrieved for later use. Selections stored in memory are preserved even after powering the unit down. Pump speed is variable from .5 to 400 RPM, which facilitates usage where flow rate control is critical. A flexible tubing support stand is included to facilitate hands-free operation.

6.0 Installation

Install the unit where there will be adequate room for the unit to operate. Provide enough clearance around the unit to keep items away from the rotating pumps and tubing.

6.1 Input Power Requirements

This equipment is designed to operate from a 100-120V single-phase AC power source at 47 to 63 Hz. The line voltage / fuse label located on the lower rear of the unit shows the nominal input voltage set for the unit at the factory.

6.2 Power Cord Set

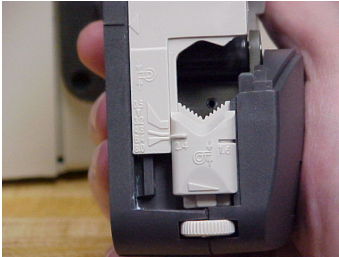
This unit has been shipped from the factory with a power line cord that has a plug appropriate for your area. If the wrong power cord has been shipped for your particular application, contact your nearest Wheaton Industries dealer for the proper cord. The OmniSpense® ELITE has been equipped with a 3-wire grounding type power cord. The unit is only grounded when it is plugged into an appropriate receptacle. **Do not operate the unit without adequate grounding protection.**

7.0 Initial Startup and Operation

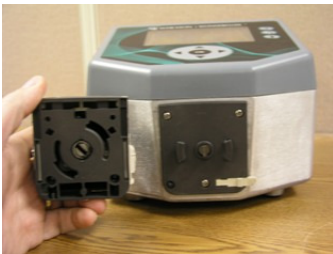


CAUTION: Keep hands and fingers away from rotating parts of the machine. Make sure tubing is secured and clamped properly before running pump. Pump should be turned off and unplugged while loading tubing into pump head.

7.1 Pump Head Attachment and Tubing Installation



Pump Head Setup - Raise the cover on the pump head so that the arrow (upper left) points to the mark on the pump frame. Identify the tubing bore diameter from the tubing manufacturer's packaging. Using the graduations on the side of the head, adjust the tubing clamps on both sides via the thumbscrews at the bottom of the pump head to the proper tubing bore size.



Pump Head Attachment - Align the pump drive shaft tang with the drive rotor slot on the back of the head. Align the slots on the back of the head with the ears on the pump head mounting plate. Place the pump head on the mounting plate and twist the pump head clockwise until it clicks into place.



Tubing Installation – Insert Tubing into the pump head between the pump head cover and the rollers. Close the pump head cover to secure the tubing. Make sure tubing is not twisted and has no kinks.



CAUTION! Improper adjustment of the tubing clamps may result in improper performance of tubing, or premature wear and failure of tubing. **DOUBLE CHECK** clamp settings before proceeding.

Make note of which end of the tubing will be the inlet and which end of the tubing will be the outlet (left or right).



To Remove Pump Head – Press the release tab at the lower right of the pump head. While holding the release tab, rotate the pump head counterclockwise and pull off.

7.2 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 100mm 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.

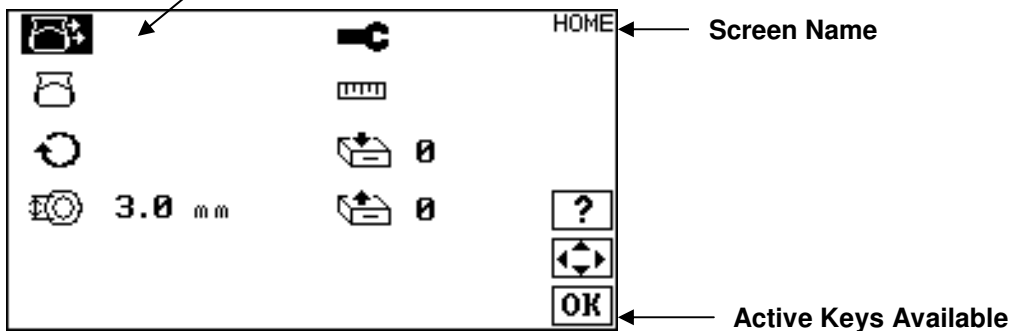
7.3 Switching the Unit ON

Switch the pump ON via the power switch on the rear panel. The main screen displays the Wheaton Industries logo and the firmware version level.








The pump will automatically transition to the **HOME** screen. Additional screens feature a similar layout:

Function Icons (Highlighted)



7.4 Keypad Functions and Icons

Icons on the right of each screen show the user which keys will be active during function and setup navigation. A brief explanation of active keys is listed:

-  **Help** – Pushing the help button will show icon explanations in several languages
-  **Run/Stop** – Starts and stops the pump
-  **Prime** – Push and hold the button to run the pump at a fixed speed to purge air from the tubing
-  **Arrow Keys** – Used to navigate menu items, and adjust parameters and values
-  **OK** – Confirms an entry of a parameter or value and returns unit to home screen

7.5 Footswitch Operation and Connector Functions

Plug the optional footswitch into the Interface Connector found at the rear of the unit. If the unit is at idle, pressing the footswitch once, will initiate a pump dispensing sequence, as defined by the entries made by the user via the main front panel keypad. If the unit is running, pressing the footswitch once will stop the pump.



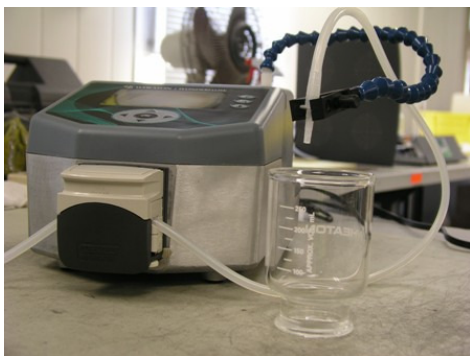
In addition to connections for the above footswitch, the interface Connector contains feedback pinouts for a Pump Running / Pump Stopped indicator.

Pins 1 (footswitch +) and 2 (footswitch GND) are +5V TTL compatible inputs with pull up resistors, and can be driven by an isolated open collector device or dry contact relay, to start and stop the unit.

Pins 3 and 5 are an isolated transistor output capable of driving a TTL load with pull up resistor. When the pump is **running**, the transistor is **ON**, and when the pump is **stopped**, the transistor is **OFF**.

See Figure F for connector pin out details.

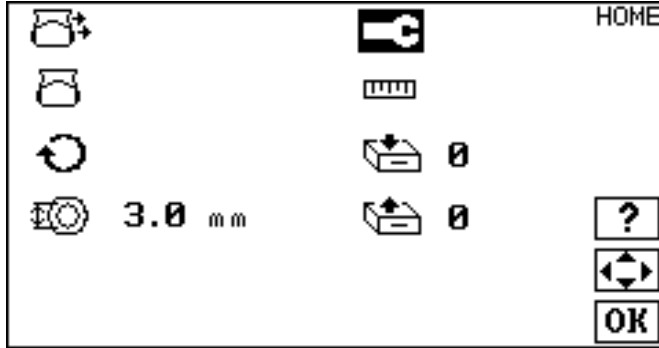
7.6 Flexible Tubing Holder



An included flexible tubing holder mounts to either side of the unit, and can be flexed to the desired position, for hands-free operation of unit.

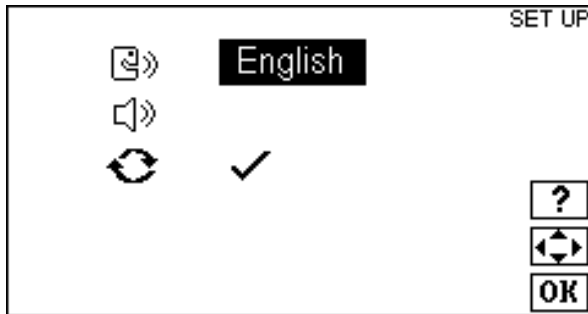
8.0 Unit Setup

The setup menu contains a collection of lesser used functions of the unit. From the **HOME** screen, use the **UP** and **DOWN** keys to navigate to the **SETUP** icon, and then press **OK**.



8.1 Language Selection

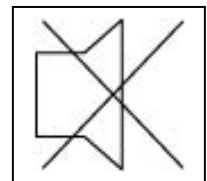
Press the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to access the **Language Selection**. Help screens are available in the following languages: English, French, German, Spanish, Japanese, Chinese, and Korean. Press **OK** when done.



8.2 Buzzer Function

Press the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to access the **Buzzer Function**.

Turning the buzzer function **ON** will cause the unit to sound an end-of-dispense alert. Turning the buzzer function **OFF** (shown) will disable the buzzer during the dispense cycle.



8.3 Unit Reset

Press the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to access the **Unit Reset Function**.



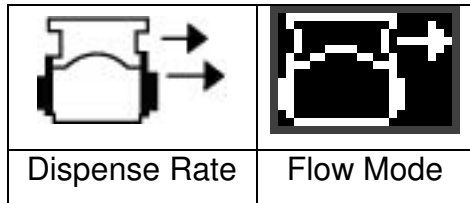


WARNING! – Resetting the unit will return the unit to factory setup parameters. It will **NOT** clear any settings stored in the save and recall user settings.

To reset the unit, highlight the 'check' mark, and press **OK**. A special tone will sound when the unit resets. Press OK again to return to the HOME screen.

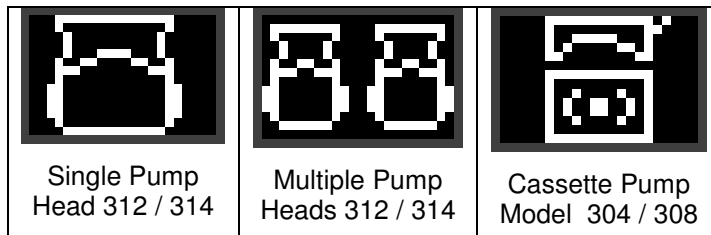
9.0 Preparing for Batch and Single Dose Dispensing

Use the **LEFT** and **RIGHT** arrow keys to set the unit to dispense mode:



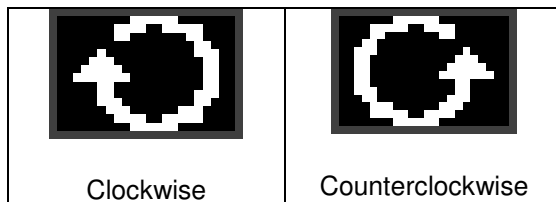
9.1 Pump Head Selection

Use the **UP** and **DOWN** to move to the pump head icon and select pump head. Use the **LEFT** and **RIGHT** arrow keys to select pump head:



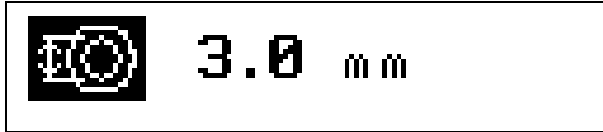
9.2 Pump Direction

Use the **UP** and **DOWN** keys to move to the pump direction icon. Use the **LEFT** and **RIGHT** arrow keys to select either **clockwise** or **counterclockwise** direction:



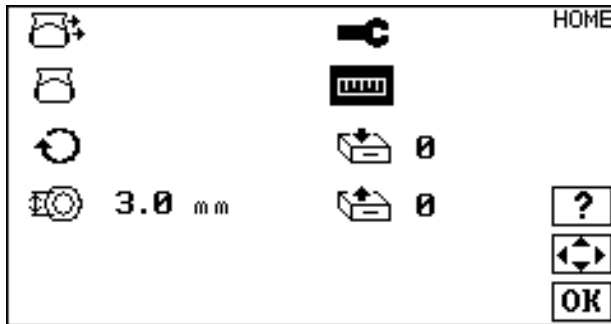
9.3 Tubing Size

Use the **UP** and **DOWN** keys to move to the tubing icon. Use the **LEFT** and **RIGHT** arrows to navigate the number fields, and the **UP** and **DOWN** icons to adjust the number fields. Press the **OK** button when done.

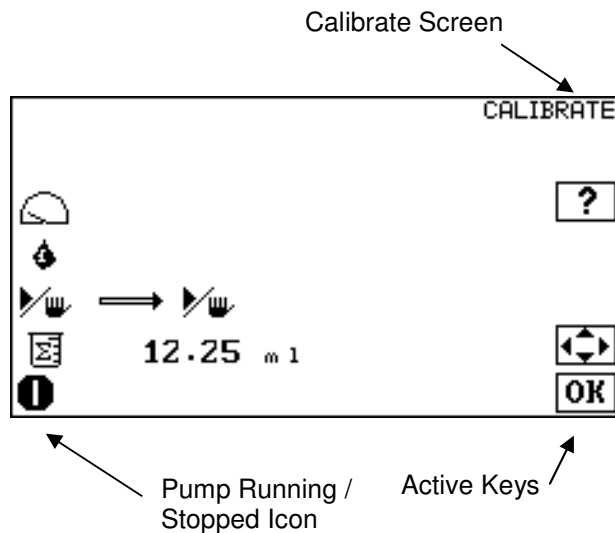


10.0 Making a Calibration

Use the **UP** and **DOWN** arrows in the **HOME** screen to navigate to the calibration icon.

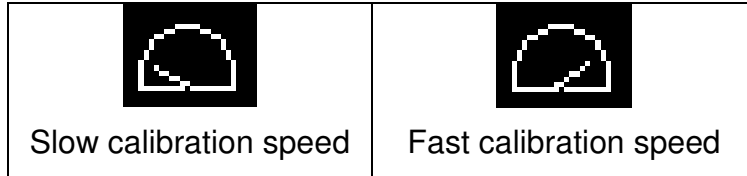


Press **OK** to navigate to the **CALIBRATE** screen.



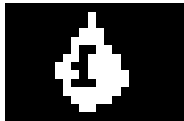
10.1 Setting Calibration Speed

Use the **LEFT** and **RIGHT** buttons to select the calibration speed. Set the Calibration Speed so that the pump runs for at least 15 seconds during the calibration run. This may require some trial and error. The longer the pump runs the more accurate the calibration.



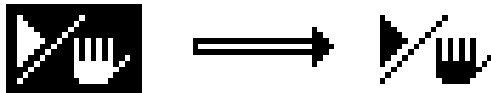
10.2 Priming the Tubing

Use the **UP** and **DOWN** buttons to select the **PRIME** icon. The PRIME button on the keypad now becomes active. Push and HOLD the prime button on the keypad to run the pump motor and purge any air from the tubing. RELEASE the prime button to stop the motor.



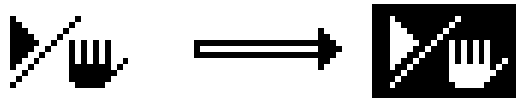
10.3 Calibration Dispense

Use the **UP** and **DOWN** button to navigate the **Calibration Dispense** icon:



Prepare to measure a dispense by using a graduated cylinder, electronic scale, or other device that can accurately measure volume. Press the **START / STOP** button to begin a calibration dispense. **For best results, the pump should run for a minimum of 15 seconds. The longer the run time the more accurate the calibration.**

Press the **START / STOP** button to end the calibration dispense.



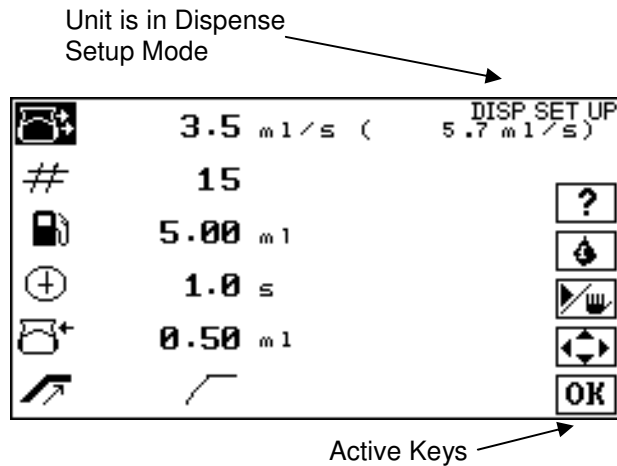
Use the **UP** and **DOWN** buttons and the **LEFT** and **RIGHT** buttons to enter the measured volume:



Press **OK** to enter the volume and complete the calibration procedure. Press **OK** again, to return to the **HOME** screen.

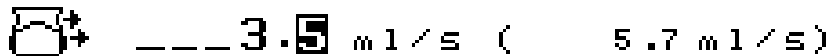
11.0 Making Batch and Single Dose Dispenses

From the **HOME** screen, press **OK** to navigate to the DISPENSE SETUP screen:



11.1 Flow Rate

Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the desired flow rate for the dispense. Press **OK** when done.



The maximum attainable flow rate, which is based on tubing size, number of heads and calibration will be displayed within the parentheses.

11.2 Batch Count

Use the **UP** and **DOWN** keys to navigate to the batch count. The allowable range is 1 – 99999:



Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the batch count. Press **OK** when done. Entering 1 will provide a single dispense.

11.3 Volume per Dispense

Use the **UP** and **DOWN** keys to navigate to the Volume per Dispense icon:



Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter volume per dispense. Press **OK** when done.

11.4 Delay Between Dispenses

Use the **UP** and **DOWN** keys to navigate to the Delay icon. The available range is 0.5 – 9.99 seconds:



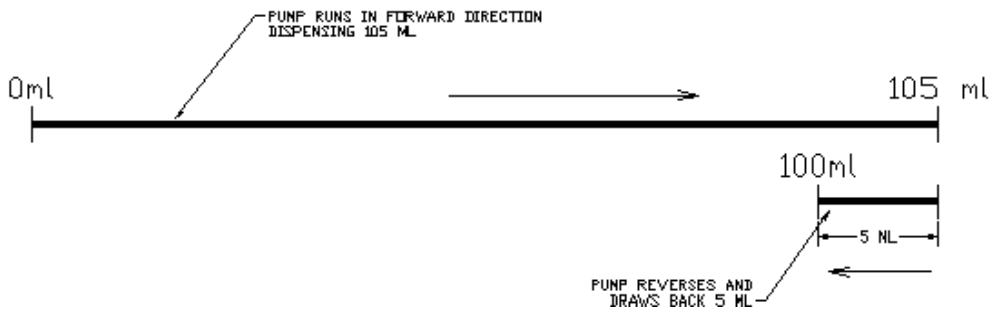
Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the delay in seconds between dispenses. Press **OK** when done.

11.5 Drawback Function

Use the **UP** and **DOWN** keys to navigate to the Drawback icon. The allowable range is 0.01 – 9.99 mL:



The drawback feature will make the pump **over-dispense** the volume set for the drawback volume, then **reverse** and draw back the same volume set for the drawback. This feature is typically used to fill intravenous bags, or other unvented vessels. See the example below for a dispense set at 100mL and a drawback of 5mL:

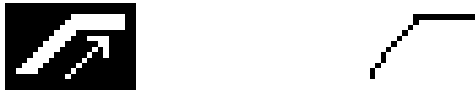


Example 1: Dispense Volume set to 100 mL, Drawback Volume set to 5 mL

Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the drawback volume. Press **OK** when done.

11.6 Soft Start / Ramping

Use the **UP** and **DOWN** keys to navigate to the Ramp icon:



Press the **RIGHT** key then use the **UP** and **DOWN** keys to set the starting ramp:



Press **OK** when done.

11.7 Making a Dispense

Press the **START / STOP** button to start a batch dispense:



DISP SET UP		
	3.5 ml/s	← Flow Rate
	5.00 ml	← Volume
	25.00 ml	← Accumulated Volume
	5	← # of Dispenses
	15	← Total # of Dispenses

The pump will make dispenses with the settings programmed, and stop when the total number of dispenses are made.

11.8 To Adjust the Volume During a Batch Dispense

The dispensed volume can be adjusted during a batch dispense, by pressing the **Start / Stop** button, and then using the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the dispense volume. Press **OK** when done. Press the **Start / Stop** button to resume batch dispensing.

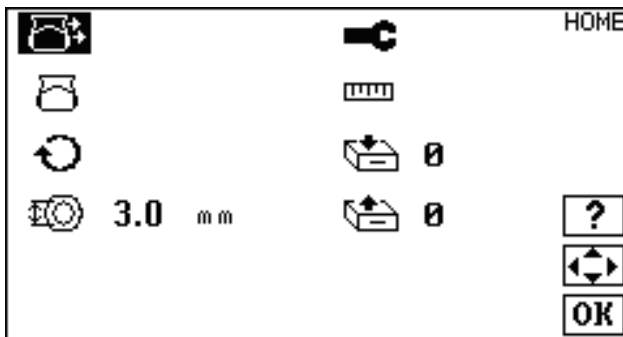


11.9 To Run Additional Batches with the Same Settings

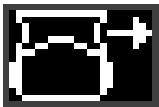
Press the **Start / Stop** button or optional footswitch to start a fresh dispense batch.

12.0 Constant Flow Rate Dispensing

Press **OK** to navigate to the **HOME** screen.



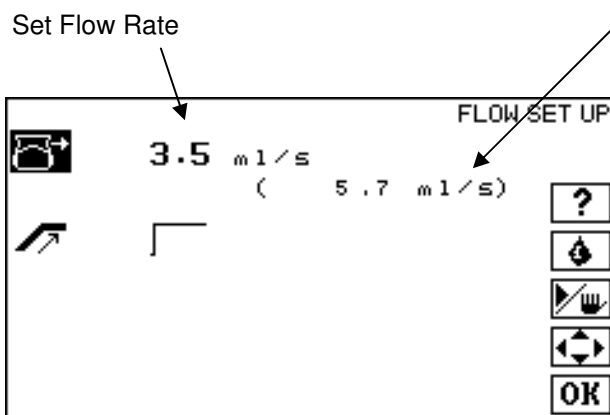
Use the **LEFT** and **RIGHT** keys to change the pump function to **FLOW MODE**.



Flow Mode

Press **OK** to navigate to the **FLOW SET UP** screen.

Maximum attainable flow rate based on tubing size, number of heads and calibration.



Constant Flow Rate

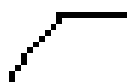
Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the flow rate. Press **OK** when done. The maximum available flow rate is based on tubing size, number of pump heads and calibration.




 ____ 3.5 ml / s
 (5.7 ml / s)

12.1 Soft Start / Ramping

Use the **UP** and **DOWN** keys to navigate to the Ramp icon:



Press the **RIGHT** key then use the **UP** and **DOWN** keys to set the starting ramp:



No ramping



Maximum ramping

Press **OK** when done.

The pump is now ready to run at a constant flow rate. Press the **Start / Stop** button to start or stop the unit.

12.2 Changing Flow Rate On-The-Fly

The flow rate can be changed while the unit is running by using the **LEFT** and **RIGHT** keys to navigate to the running flow rate, then using the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to enter the flow rate. Press **OK** when done to adjust the running flow rate.




 ____ 3.5 ml / s
 (5.7 ml / s)

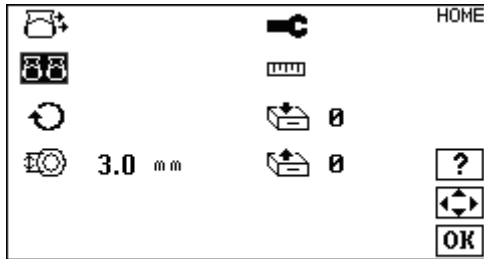
13.0 Working with Alternate Pump Head Setups

Successful use of multiple pump heads depends on several factors, including, unit settings, tubing size and wall weight, and liquid viscosity. Adding a small startup ramp rate to the process can improve unit performance with multiple pump heads over starting the process with no ramp.

13.1 Multiple Pump Heads

An optional stacking pumphead must be purchased to use multiple pumpheads on the unit. Stacking two pump heads will double the flow rate.

From the **HOME** screen, use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to change the pump icon from single to multiple heads:



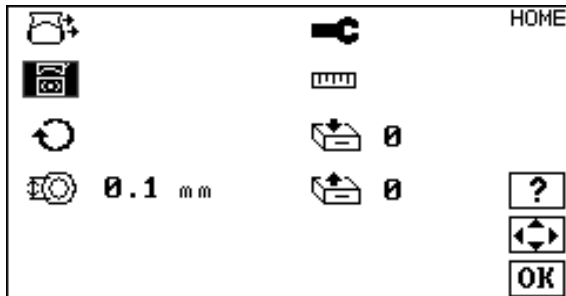
Two pump heads are shown. The first pump head is an extended shaft version, the second pump head is the normal head supplied with the unit.

Continue on the **HOME** screen, and perform a calibration with the two pump heads attached. It is recommended that the pump head tubes be connected with 'Y' couplers into a single outlet. The combined volume of the two pump heads is used in the calibration number.

Running two pump heads as two independent processes is not recommended, as a single calibration cannot be made for both processes.

13.2 Working with the Microcassette Pump Head

From the **HOME** screen, use the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to change the pump icon to a microcassette pump head:



To use the microcassette pump head, the standard pump mounting plate must be replaced with the special microcassette pump mounting plate. Remove the screws holding the standard pump mounting plate to the unit, and use the same screws to attach the microcassette pump mounting plate.

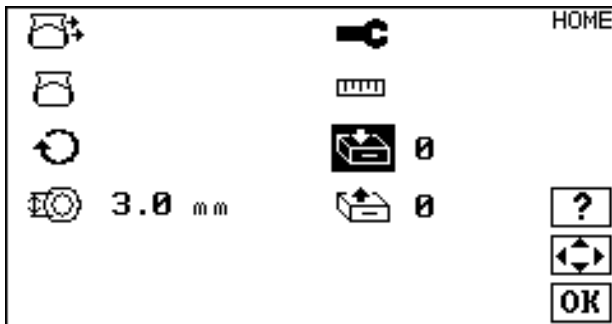
Continue on the HOME screen, and perform a calibration with the microcassette pump head attached. The running speed of the microcassette is approximately half of the speed of the standard pump head.

14.0 Memory Storage and Recall Available Registers: (1-9)

All set parameters, including set volume, delay interval, pressure release, dispense count, calibration, pump speed, ramp time, pump direction, etc. can be stored in non-volatile memory, and easily recalled. This is especially useful when the pump is used in several applications, each requiring its own particular setup parameters. Stored parameters can be quickly recalled, and the pump made ready for a particular operation.

14.1 To Store a Parameter

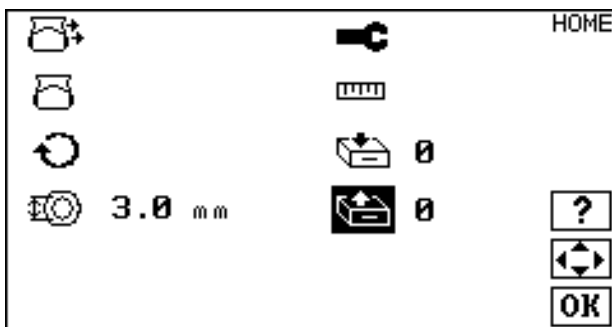
Set all pump parameters to desired settings. Navigate to the **HOME** screen and select the storage icon:



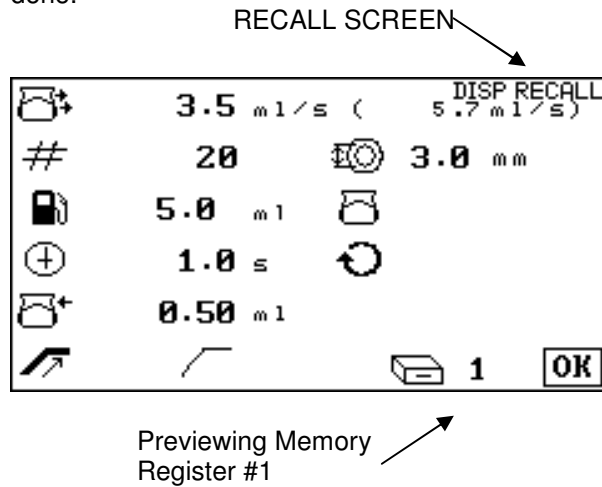
Use the **UP** and **DOWN** and the **LEFT** and **RIGHT** to select a storage register (1-9). Press the **OK** key to store parameters in non-volatile memory. A special tone will sound to confirm storage of parameters. If parameters are stored in a register already containing data, the old data will be overwritten with the new parameters.

14.2 To Recall a Parameter

Press the **UP** and **DOWN** and the **LEFT** and **RIGHT** keys to recall a storage register (1-9), and then press **OK**. A special tone will sound to confirm recall of parameters. If the unit appears to skip over certain registers when recalling a parameter, it means that the register skipped is empty. An empty storage register will not be accessible.



The contents of a **RECALL** register can be previewed by pressing the ? (info) key and pressing **OK** when done.



15.0 Tips on Maintaining Maximum Accuracy

Several operating variables must be considered in obtaining maximum dispense accuracy, such as tubing size, pump speed, and applied ramping. In addition other variables such as tubing characteristics (material, age, chemical compatibility) and pumped – medium characteristics (viscosity, chemical makeup, temperature) must also be considered in obtaining best dispensing results.

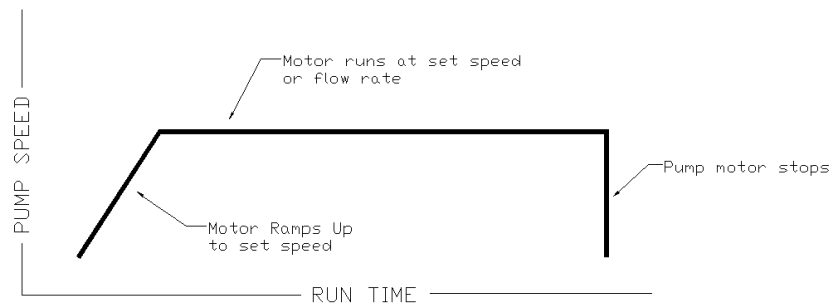
15.1 Proper Tubing Selection

Each different tubing size will provide a different liquid delivery range when used in conjunction with the pump unit. Accuracy is increased as the number of pump head revolutions required per dispense is increased. Tubing size should be selected so the pump head makes at least 3 complete revolutions, with ramp rates at zero. Additional revolutions are necessary for accurate results if ramp rates are employed.

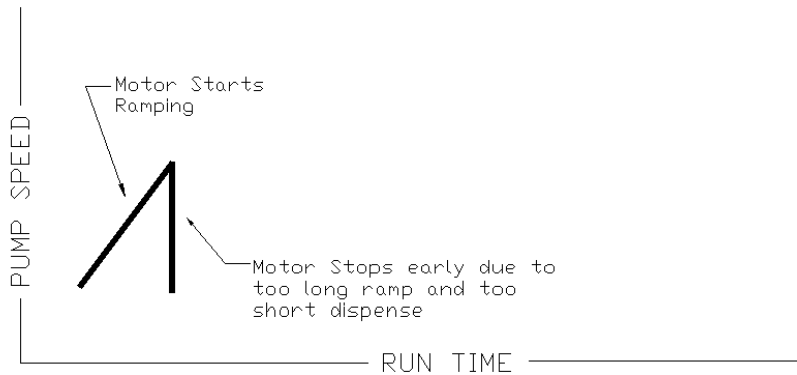
15.2 Selection of Ramp Rates

Proper selection of ramping rates must be carefully considered when calibrating and operating. Maximum accuracy is obtained when the effects of pump head and liquid inertia are minimized during pump startup and braking. The following examples show two scenarios:

Example A: Shows the pump in proper operation, with ramping applied and rates properly set. The pump ramps up to running speed, continues at the set running speed, then stops at the end of the dispense.



Example B: Dispense is so short that the pump prematurely terminates ramping cycle because the dispense volume was too small for the unit to reach the proper set speed.



Remedy: At this point, selecting a smaller tubing size to increase number of pump head revolutions vs. volume is the only option.

Applying a ramp rate to a dispense cycle, effectively slows the pumphead / dispensed liquid inertia, which will increase accuracy. For highest accuracy, ramp rates should be set to as long as can be tolerated, as a long ramp rate will naturally lengthen the dispense cycle time.

15.3 Using Multiple Pump Heads

Successful use of multiple pump heads depends on several factors including unit settings, tubing size and wall weight, and liquid viscosity. Adding a small startup ramp rate to the process can improve unit performance with multiple pump heads over starting the process with no ramp.

16.0 Maintenance and Troubleshooting



DANGER! NEVER ATTEMPT TO PERFORM REPAIRS IF THIS INSTRUMENT IS PLUGGED IN! TO AVOID SERIOUS ELECTRIC SHOCK OR ELECTROCUTION, THIS INSTRUMENT MUST BE DISCONNECTED FROM THE SOURCE OF AC POWER BEFORE REMOVAL OF ANY PROTECTIVE COVERS.

16.1 Maintenance

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 clamping mechanics of the pumphead should be kept as clean as possible at all times.

The unit cabinetry has been designed to an IP31 rating. The plastic top is mineral filled polypropylene and the base is painted cast aluminum. The pumphead and outer cabinet may be wiped down with warm water and any mild household cleaning solution. Never use abrasive cleaners or strong acids as cleaning solutions. Never place liquid containers on top of the OmniSpense® ELITE 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 OmniSpense® ELITE is designed for easy service, it is highly recommended that the instrument be returned to Wheaton Industries should any major repairs be needed.

Pump rollers can be occasionally lubricated with Teflon lubricating oil.

16.2 Troubleshooting – For Qualified Maintenance Personnel Only!



DANGER! NEVER ATTEMPT TO PERFORM REPAIRS IF THIS INSTRUMENT IS PLUGGED IN! TO AVOID SERIOUS ELECTRIC SHOCK OR ELECTROCUTION, THIS INSTRUMENT MUST BE DISCONNECTED FROM THE SOURCE OF AC POWER BEFORE REMOVAL OF ANY PROTECTIVE COVERS.

Unit will not operate:

- Cause:** Fuse blown.
- Remedy:** Replace fuse with proper size and type. (see 'Fuse Replacement')
- Cause:** Supply voltage low or at zero.
- Remedy:** Check house receptacle with a voltmeter.
- Cause:** On/Off power switch in "off" position.
- Remedy:** Switch power switch to "on" position.

Motor runs but pump head(s) will not turn;

- Cause:** Pump head not properly engaged with drive shaft.
- Remedy:** Realign pump head with drive shaft. (see 'Initial Startup and Operation')

Switch on but motor fails to rotate;

- Cause:** Pump Speed set too low.
- Remedy:** Increase pump motor speed as required.
- Cause:** Motor control board defective.
- Remedy:** Replace defective board.
- Cause:** START Key not pressed.
- Remedy:** See 'Unit Features and Component Identification' for keypad and display operation.

Unit will not cycle automatically:

- Cause:** Multiple doses are not entered.
- Remedy:** See 'Preparing for Batch and Single Dose Dispensing'.
- Cause:** Dispense cycle not initiated.
- Remedy:** START key must be pressed to initiate the dispense cycle.

Pump head turns, but unit will not pump;

- Cause:** Tubing assembly incorrectly installed.
- Remedy:** Tubing must be installed as described in section 'Initial Startup and Operation'
- Cause:** Tubing assembly worn or split.
- Remedy:** Replace tubing assembly.

Motor fails to maintain constant rotation speed;

Cause: Motor control board defective.
Remedy: Have defective control board replaced.

Cause: Drive motor defective.
Remedy: Have defective motor replaced.

Liquid continues to drip from tubing even after pump has stopped;

Cause: Tubing is worn.
Remedy: Replace with fresh tubing.

Cause: Tubing wall thickness is mismatched with the pump head used.
Remedy: Tubing wall weight should match pump head specifications. See 'Accessories' section.

Inaccurate Volume Delivery

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

Cause: Pump not calibrated properly.
Remedy: Calibrate unit as described in 'Making a Calibration' section.

Cause: Defective electronics.
Remedy: Refer problem to authorized repair agent.

Cause: Side clamps on pump head not adjusted properly.
Remedy: Adjust per instructions in 'Initial Startup and Operation'.

16.3 Fuse Replacement



DANGER! BE CERTAIN THE UNIT IS DISCONNECTED FROM THE AC POWER SOURCE.



1. Disconnect the cord-set from the AC power source.



2. Remove the fuse drawer from the unit.



3. Replace with new fuses:

108 - 120 vac unit use (2) 5x20mm, 250V, 2.0 AT fuses, be sure the correct cord set is used.

220-240 vac unit use (2) 5x20 mm 240V 1.0 AT fuses, be sure the correct cord set is used.

17.0 Illustrations and Diagrams

FIGURE A – Major Component Identification

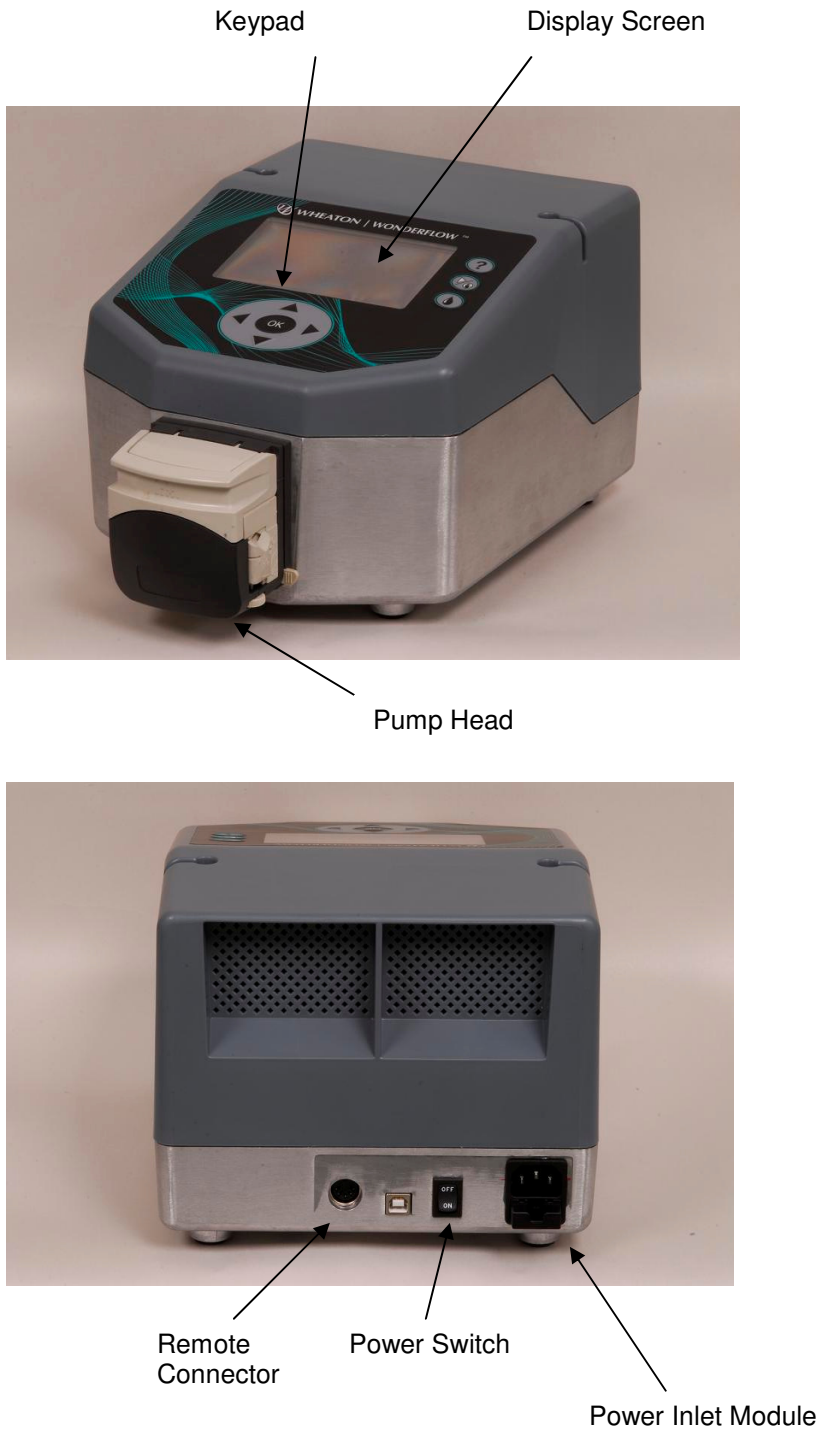


FIGURE B – Lower Housing Assembly

ITEM	USE QTY.	WHEATON NO.	DESCRIPTION
1	1	50099004	ALUMINUM BASE CABINET
2	1	WI056857	PCBA, REMOTE I/O
3	1	WI056858	MOTOR, STEPPER
4	1	WI056859	UNIVERSAL POWER SUPPLY, 48V, 3.2A
5	1	50099058	POWER SUPPLY STABILIZER BRACKET
6	1	WI056856	PCBA, CPU, OMNISPENSE ELITE
7	1	WI056863	POWER INLET
8	1	WI056860	POWER SWITCH
9	4	50099059	ADHESIVE RUBBER FEET
10	1	50099060	PUMP HEAD DRIVE ADAPTER
11	2	50029991	SCW, SET, 8-32 X 3/16" LG
12	4	50099061	SCW, SET, 10-32 X 1/2" LG
13	4	50099062	SCW, M4X8, SS, PPHM
14	1	I052239	SCW, 6-32 X 1/4 PPHM
15	1	50029919	NUT, HEX, 6-32
16	1	I052273	WASHER, STAR, #6, INT TOOTH
17	1	50099063	STF, 6-32 X 1/4, ALUMINUM
18	2	WI056864	FUSE, 5X20MM, 2.0AT, 250V (120V)
18	2	WI056862	FUSE, 5X20MM, 1.0AT, 250V

FIGURES C THRU E – Upper Housing Assembly, Main Assembly and Wiring Diagram

ITEM	USE QTY.	WHEATON NO.	DESCRIPTION
19	1	50099005	PLASTIC UPPER HOUSING, CABINET
20	1	WI056861	LCD, DISPLAY, 240 X 128, BACKLIT CONTROL KEYPAD OVERLAY, OMNISPENSE ELITE
21	1	50099069	ELITE
22	4	50099068	SCW, PLASTITE 48, TRILOBE, #4 X 0.250
23	1	50099006	SCREEN, VENT, PLASTIC SCW, PLASTITE, 48 TRILOBE, #8 X .750, PPH, STEEL/ ZINC
24	4	50099070	STEEL/ ZINC
25	1	50099065	ASS'Y, WIRE HNS, OMNI ELITE
26	1	50028826	LABEL, LINE VOLTAGE
27	1	50027794	LABEL, UL APPROVED, SERIAL #
28	1	50028394	LABEL, MET NRTL LISTED, OMNI / FLOW
29	1	50028414	LABEL, CAUTION
30	1	50028416	LABEL, CE (MARK) (230V)

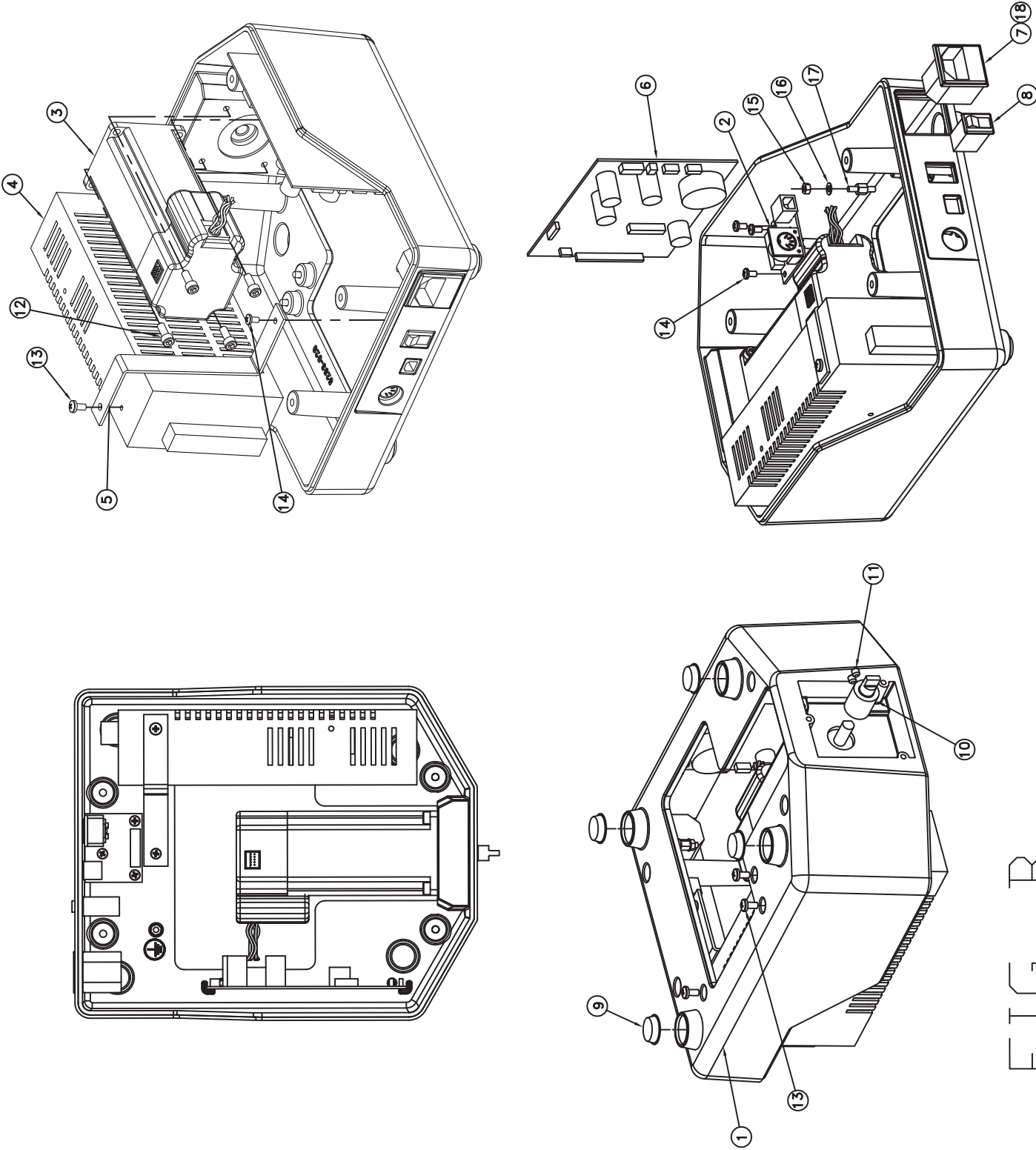


FIG. B

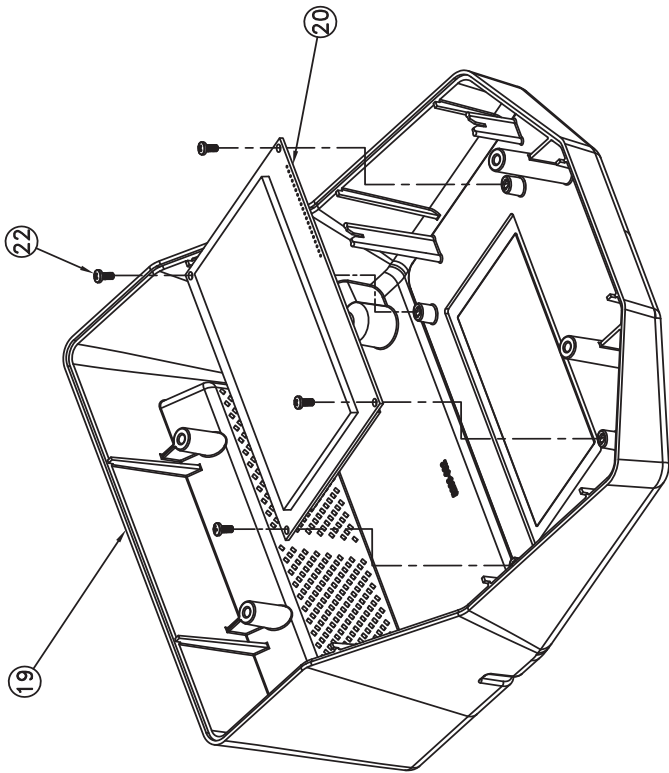
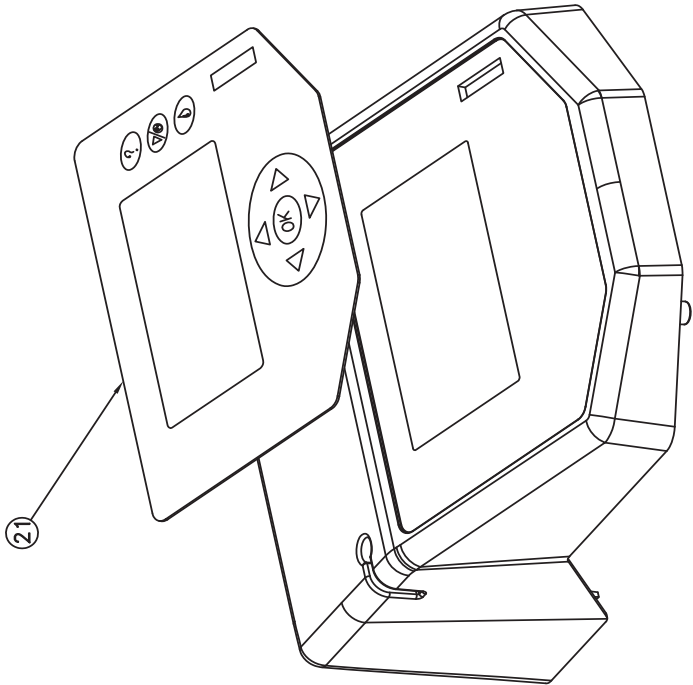
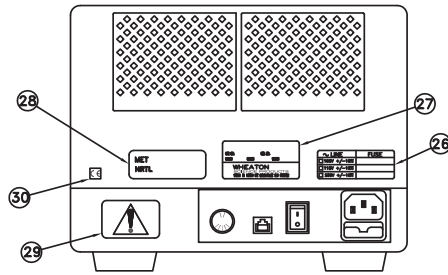
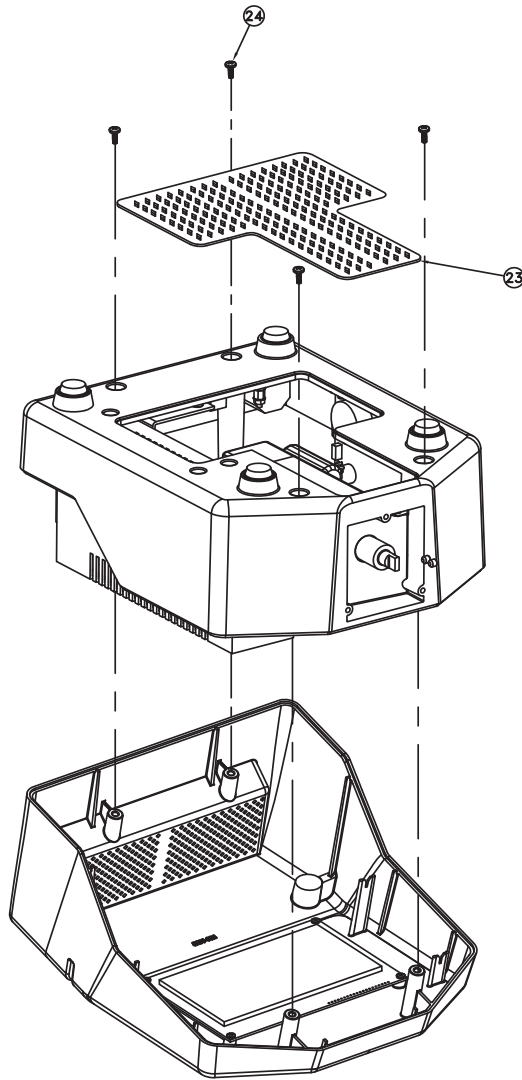


FIG. C



REAR VIEW

FIG. D

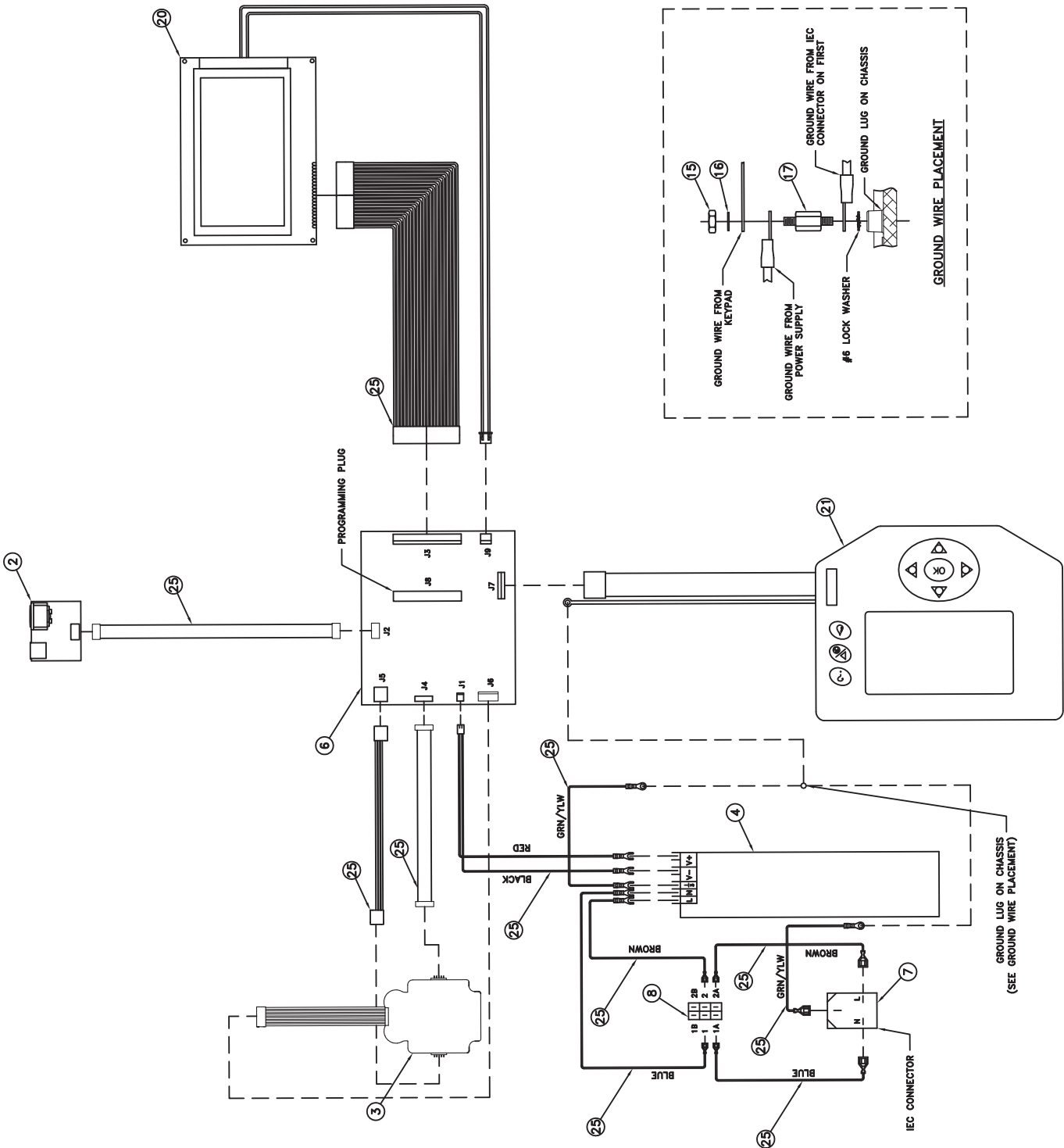
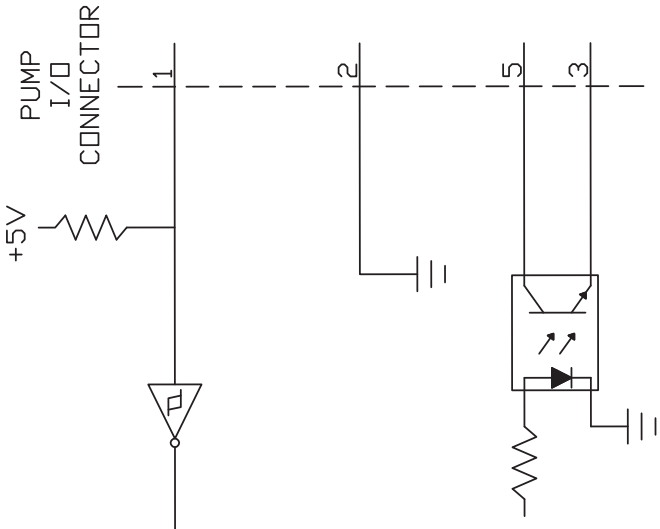
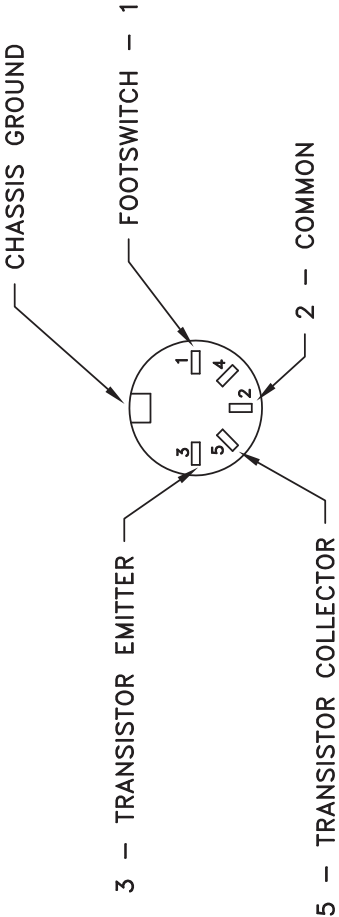


FIG. E



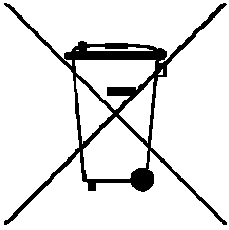
PARTIAL SCHEMATIC



I/O CONNECTOR PINOUT

FIG. F

18.0 WEEE STATEMENT



This OmniSpense® ELITE peristaltic pump is not to be discarded in typical trash outlets. This unit is to be discarded according to WEEE guidelines established in your area. There are no reusable parts. Contact the original distributor from which this product was purchased for proper disposal instructions.



WHEATON Industries Inc.

Declaration of Conformity

We, Wheaton Industries, Inc.
1501 North 10th Street
Millville, NJ 08332-2038
USA

Declare that the device described below - marked with CE - fulfills the relevant fundamental EMC and safety requirements specified by the appropriate EU - Directive, with respect to the design and construction of the commercialized version.

This declaration is invalid if modifications are performed on the device which has not been certified by Wheaton Industries, Inc.

Designation of the device: OmniSpense® ELITE / UniSpense® PRO

Relevant Directives:

Standards:

Nicholas DeBello,
Director, Quality Systems

9/1/2010

Date

OmniSpense® ELITE is a trademark of Wheaton Industries Inc.
Stylized "W" is a registered trademark of Wheaton Industries Inc.