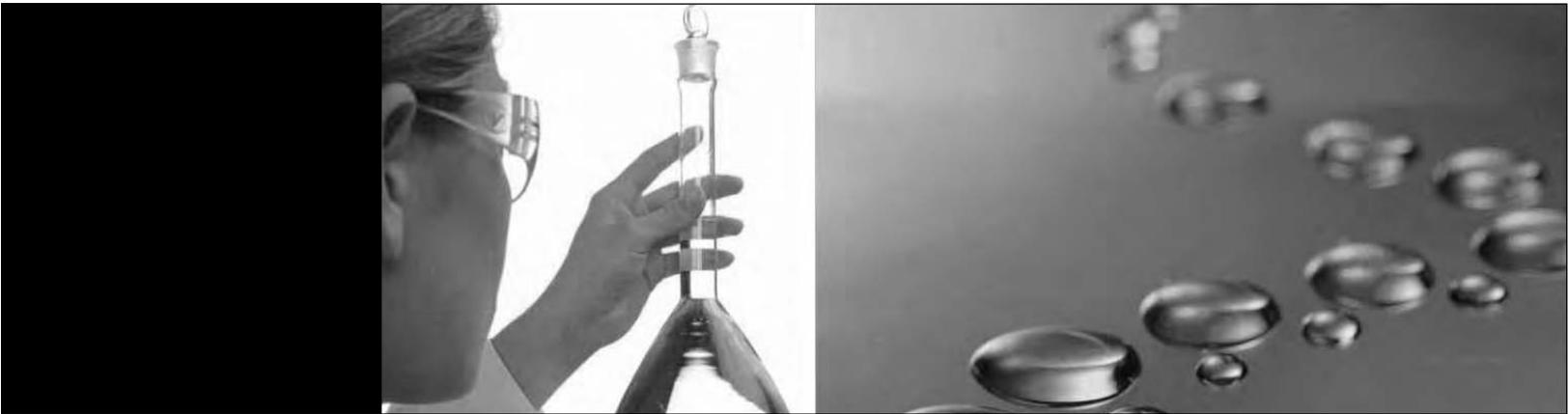


# MEGA-PURE® One Liter Water Still

Series 1922

Operating Manual and Parts List LT1922X1 Rev. 0



**Models covered in this manual**

<b>Model Number</b>	<b>Voltage</b>	<b>Description</b>
A440266 (6747)	120V	Without Bottle
A440267 (6748)	120V	With Bottle
A7981 (6755)	220-240V	Without Bottle
A7982 (6785)	220-240V	With Bottle

**MANUAL NUMBER LT1922X1 (7006747)**

0	--	4/13/10	Transfer to Marietta (was LT1922X1 2/12/08)	ccs
<b>REV</b>	<b>ECR/ECN</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>By</b>



**Important** Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

**Caution** All internal adjustments and maintenance must be performed by qualified service personnel. ▲

Material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. Thermo Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Thermo be held liable for any damages, direct or incidental, arising out of or related to the use of this manual.

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Important operating and/or maintenance instructions. Read the accompanying text carefully.



Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



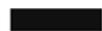
Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.



Marking of electrical and electronic equipment, which applies to electrical and electronic equipment falling under the Directive 2002/96/EC (WEEE) and the equipment that has been put on the market after 13 August 2005.



This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the WEEE symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State European Country, and this product should be disposed of or recycled through them. Further information on Thermo's compliance with this directive, the recyclers in your country and information on Thermo products will be available at [www.thermofisher.com](http://www.thermofisher.com).

- ✓ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✓ Always dissipate extreme cold or heat and wear protective clothing.
- ✓ Always follow good hygiene practices.
- ✓ Each individual is responsible for his or her own safety.

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<a href="mailto:service.led.marietta@thermofisher.com">service.led.marietta@thermofisher.com</a>	Service E-Mail Address

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When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, our professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Thermo Fisher Scientific  
401 Millcreek Road, Box 649  
Marietta, OH 45750

International customers, please contact your local Thermo Scientific distributor.

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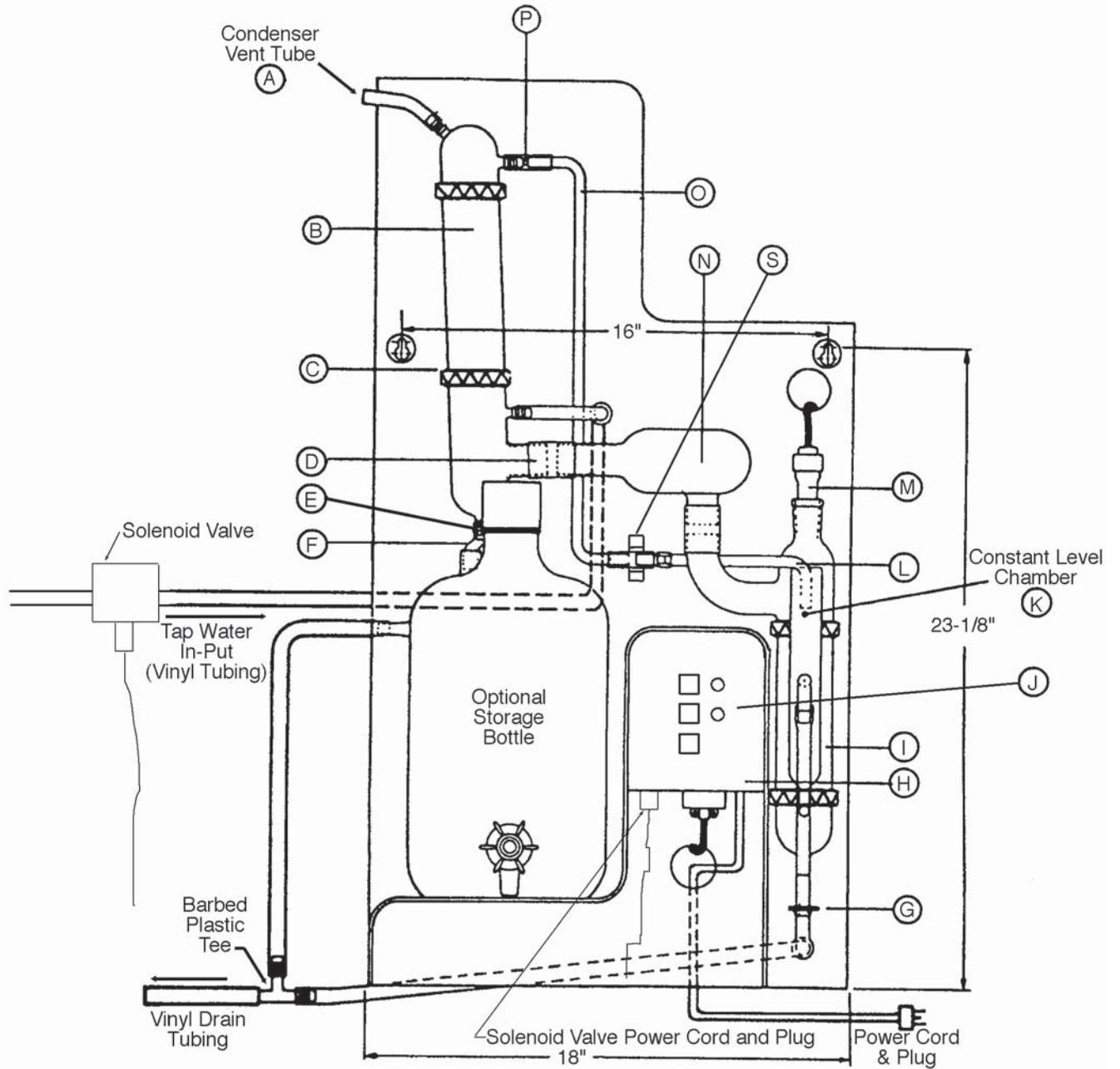
## Section 1 Important Information

This manual contains important operating and safety information. You must carefully read and understand the contents of this manual prior to the use of this equipment.

Water purification technology employs one or more of the following: chemicals, electrical devices, mercury vapor lamps, steam and heated vessels. Care should be taken when installing, operating or servicing Thermo Scientific products. The specific safety notes pertinent to this product are listed in the next section.

Refer to the illustration on the following page.

**Section 1**  
Important Information



**Figure 1-1.** MEGA-PURE One Liter Still

## Section 2 Safety Information

Your Thermo Scientific MEGA-PURE One Liter Water Still has been designed with function, reliability, and safety in mind. It is your responsibility to install it in conformance with local electrical codes. For safe operation, pay attention to Notes, Cautions and Warnings throughout the manual.

### Warnings

**To avoid electrical shock, always:**

1. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
2. Ensure that the equipment is connected to electrical service according to local and national standards. Failure to properly connect may create a fire or shock hazard.
3. Do not mount the MEGA-PURE One Liter Water Still directly over equipment that requires electrical service. Routine maintenance of this unit may involve water spillage and subsequent electrical shock hazard if improperly located.
4. Replace fuses with those of the same type and rating.
5. Disconnect from power supply before servicing.
6. Do not connect unit to electrical service until instructed to do so.

**To avoid personal injury:**

1. Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.
2. Wear eye and hand protection when using acid for cleaning, as acid spattering may occur.
3. Use this device with water feed only. Failure to comply with the above could result in explosion and personal injury.

4. Ensure all piping connections are tight to avoid leakage of chemicals.
5. Always depressurize chemical lines before disassembly.
6. To avoid exposure to chemical fumes, ensure adequate ventilation when using chemicals for cleaning.
7. Follow carefully the manufacturers' safety instructions on labels of chemical containers and Material Safety Data Sheets (M.S.D.S.).
8. "Caution - Hot Surface. Avoid Contact." Glass portions of still become hot when still is operating. To avoid burns, do not touch hot glass.
9. Refer servicing to qualified personnel.

**To ensure safe mounting:**

Wall and bench composition and construction, as well as fastener type, must be considered when mounting this unit. The mounting surface and fasteners selected must be capable of supporting a minimum of 60 lbs.; inadequate support and/or fasteners may result in damage to mounting surface and/or equipment. If unsure of mounting surface composition, condition and construction, or correct fasteners, consult your building maintenance group or contractor.

## Section 3 Specifications

### Electrical Power

Model A440266 and A440267. . .120V, 50/60 Hz, 9A

Model A798 and A7982 . . . . . 220-240V, 50/60 Hz, 1.0 KW, 4.5A

### Dimensions

Width . . . . .45.7 cm (18")

Depth . . . . .25.4 cm (10")

Height . . . . .86.4 cm (34")

### Clearance Requirements

Sides . . . . .15.2 cm (6") minimum for servicing

Above . . . . . 15.2 cm (6") minimum for removal of top cover & air circulation

### Water Usage

1.4 liters per hour of high purity distilled water

### Environmental Conditions

Operating . . . . . 17°C to 30°C; 20% to 80% relative humidity, non-condensing.

Installation Category II (over-voltage) in accordance with IEC 664.

Pollution Degree 2 in accordance with IEC 664.

Altitude limit . . . . .2,000 meters.

Storage . . . . . -25°C to 65°C; 10% to 85% relative humidity.

**Declaration of Conformity** (for 220-240 volt, -33 CE models only)

We hereby declare under our sole responsibility that this product conforms with the technical requirements of the following standards:

EMC:

EN 61000-3-2 Limits for Harmonic Current Emissions

EN 61000-3-3 Limits for Voltage Fluctuations and Flicker

EN 61326-1 Electrical Equipment for Measurement, Control and Laboratory Use - Part I: General Requirements

Safety:

EN 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part I: General Requirements

EN 61010-2-010 Part II: Particular requirements for laboratory equipment for the heating of materials.

*per the provisions of the Electromagnetic Compatibility Directive 89/336/EEC, as amended by 92/31/EEC and 93/68/EEC, and per the provisions of the Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC.*

Copies of the Declaration of Conformity are available upon request.

## Section 4 Introduction

Your Thermo Scientific MEGA-PURE One Liter Water Still is a compact, all glass unit with PTFE connectors designed to provide 1.4 liter per hour of high purity distilled water. The product water is non-pyrogenic per USP XIX. Resistivity will be greater than 1.0M ohm-cm at the condenser outlet using most tap water as feed. This water still can be used as a discrete unit, or with customer supplied pretreated water. It can also be connected to the Thermo Fisher Automatic Collection System for completely automatic operation.

Your MEGA-PURE One Liter Water Still allows you to replace tap water boiler feed with demineralized, distilled or reverse osmosis water for low maintenance operation and high purity distillate. Distilled water storage can be easily handled in the optional 6-liter polyethylene or 9-liter Pyrex brand storage bottle. Either fits conveniently inside the water still cabinet and dispenses distilled water through a valve which is accessible at the front of the still.

Choice of a location for your MEGA-PURE One Liter Water Still is primarily a matter of convenience. This unit may be located on a bench or wall mounted.

Your MEGA-PURE One Liter Water Still is rated at either 120 volts, 50/60 Hz, 1000 watts, single phase or 220-240 volts, 50/60 Hz, 1000 watts, single phase. This unit requires approximately 11 to 15 liters per hour of cooling water.

The cabinet and glassware are protected against damage from overheating by a thermal switch.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

**Warning** Use a properly grounded electrical outlet of correct voltage and current handling capacity. ▲

**Warning** Ensure that the equipment is connected to electrical service according to local and national standards. Failure to properly connect may create a fire or shock hazard. ▲

**Warning** Do not mount the MEGA-PURE One Liter Water Still directly over equipment that requires electrical service. Routine maintenance of this unit may involve water spillage and subsequent electrical shock hazard if improperly located. ▲

**Warning** Do not connect unit to electrical service until instructed to do so. ▲

**Note** Operation of the still at a voltage less than the stated voltage will cause a drop in still output. ▲

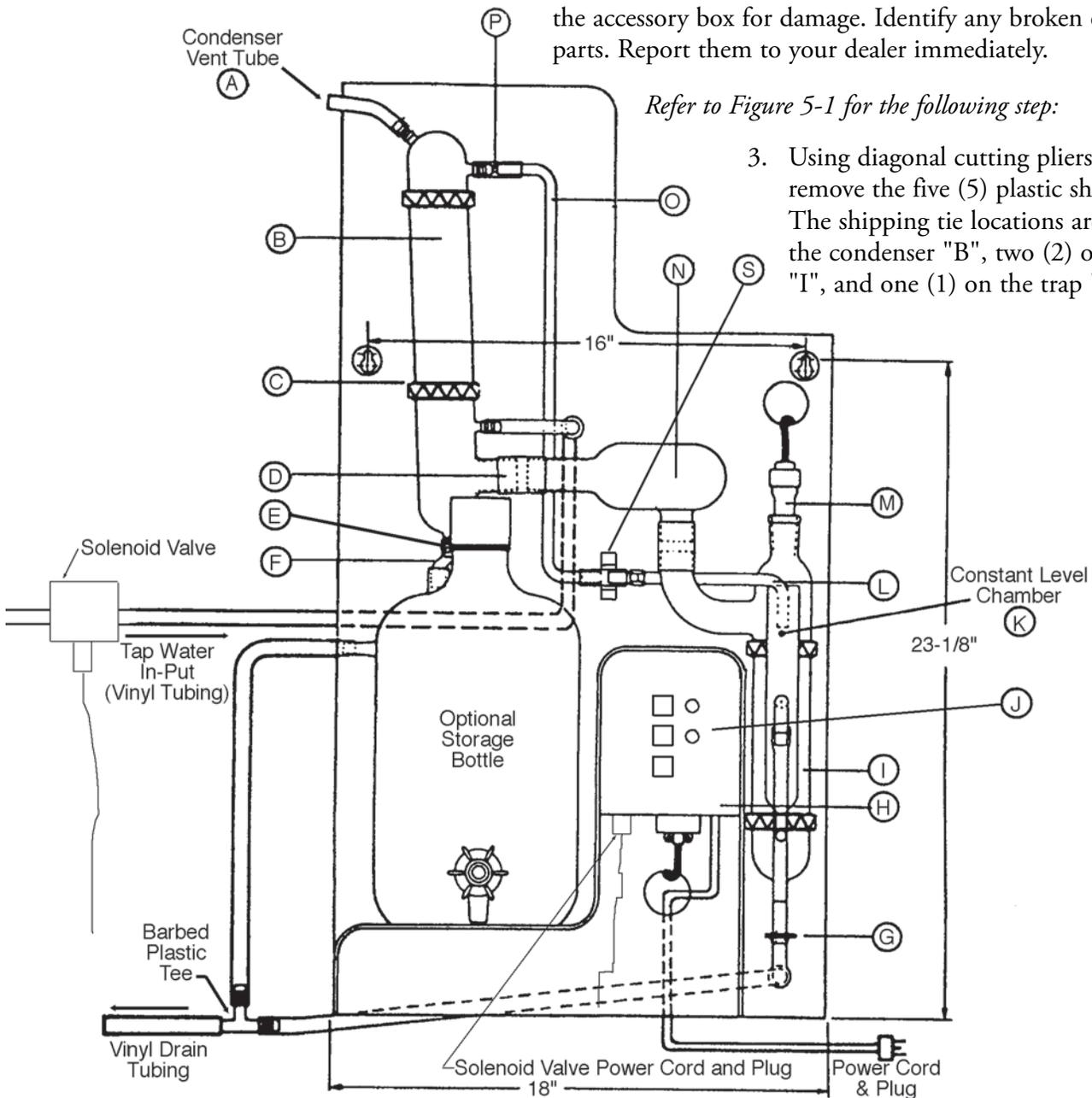
## Section 5 Unpacking

Tools required: Diagonal cutting pliers.

1. Remove parts box and still from shipping carton and place on workbench.
2. Check glassware inside the main cabinet for damage. Check parts in the accessory box for damage. Identify any broken or damaged parts. Report them to your dealer immediately.

Refer to Figure 5-1 for the following step:

3. Using diagonal cutting pliers, cut and remove the five (5) plastic shipping ties. The shipping tie locations are: two (2) on the condenser "B", two (2) on the boiler "I", and one (1) on the trap "N."





## Section 6 Installation and Service Requirements

Choice of location for the MEGA-PURE One Liter Water Still is primarily a matter of convenience as long as the service requirements listed are met.

- a. The still may be bench or wall mounted. Allow 4" - 6" clearance at the sides and top for circulation of ambient air to prevent buildup of heat in the cabinet.
- b. Unit dimensions: 18" wide x 10" deep x 34" high.
- c. Wall mounting: The still is supplied with slotted mounting holes located 16" on center in the rear of the cabinet and 22-7/8" from the bottom. The weight of the unit with a full storage bottle is 45-60 lbs.
- d. Bench mounting: The still is supplied with holes in the mounting flanges located at the bottom of the cabinet.

### Electrical Service Requirements

Your water still is supplied with a power cord (5 feet long) and plug. The plug on the 120V unit requires a standard North American 120V, 15A, 3-prong receptacle. The plug on the 220-240V unit requires a standard European 220-240 volt receptacle (see Figure 6-1). If you do not have the required receptacle available within 5 feet of your still, a certified electrician should install one in accordance with local and national standards. As an alternate method of power supply for a 240 volt unit, your electrician may remove the supplied plug and wire the cord to a 15A-250V breaker box (see Figure 6-2).

**Warning** Do not mount the MEGA-PURE One Liter Water Still directly over equipment that requires electrical service. Routine maintenance of this unit may involve water spillage and subsequent electrical shock hazard if improperly located. ▲

**Warning** Wall composition and construction, as well as fastener type, must be considered when mounting this unit. The mounting surface and fasteners selected must be capable of supporting a minimum of 60 lbs.; inadequate support and/or fasteners may result in damage to mounting surface and/or equipment. If unsure of mounting surface composition, condition and construction, or correct fasteners, consult your building maintenance group or contractor. ▲

**Warning** Ensure that the equipment is connected to electrical service according to local and national standards. Failure to properly connect may create a fire or shock hazard. ▲

**Warning** Do not connect unit to power supply until instructed to do so. ▲

## Water Supply Requirements

We recommend one of the following options for supplying water to operate your MEGA-PURE One Liter Water Still.

### OPTION #1

A single, untreated cold water supply. The supply must be capable of providing a minimum of 4 gallons (15 liters) per hour at a pressure of 20-100 psi and be located within 4 feet (1.2 meters) of the MEGA-PURE One Liter Water Still. You must provide a shut off valve and reducer as shown in Figure 6-3.

With Option #1, approximately 4 gallons of untreated water will be used per hour in the cooling section of the still, 1 gallon of this water will be used as boiler feed. Water connections are discussed in “Feedwater Connections” later in this manual.

### OPTION #2

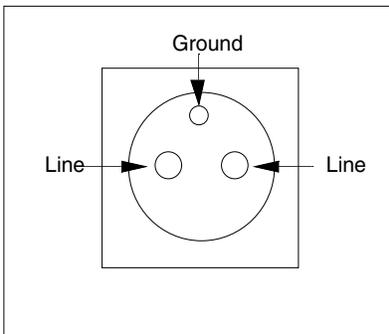
An untreated cold water supply plus a source of reverse osmosis, demineralized or previously distilled water. The untreated supply must be capable of providing a minimum of 4 gallons (15 liters) per hour at a pressure of 20-100 psi and be located within 4 feet (1.2 meters) of the water still. The treated supply must be capable of providing 1 gallon (3.75 liters) per hour and be located within 4 feet of the water still. You must provide a shut-off valve and reducer at each water supply (see Figure 6-3). In addition, the optional double solenoid valve kit is required.

With Option #2, approximately 4 gallons of untreated water will be used each hour for cooling. The second (treated) water supply of 1 gallon per hour will be used as boiler feed. Water connections are discussed in “Feedwater Connections” later in this manual.

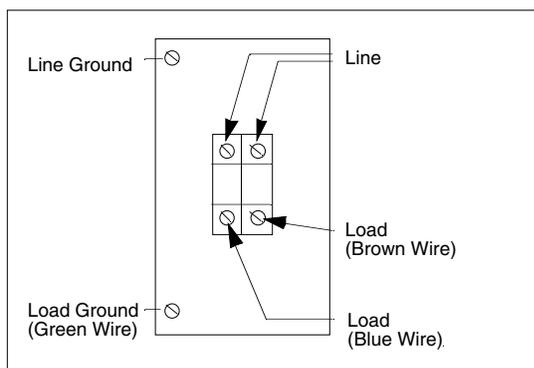
**Note** The double solenoid valve kit is not needed if a MEGAPURE D1 or D2 deionizer is being used for pretreatment. ▲

## Drain

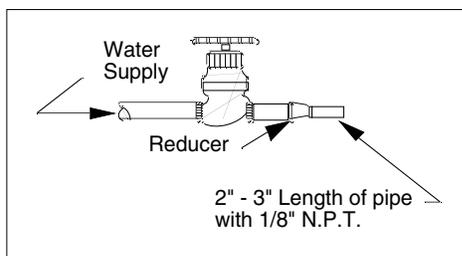
An open or atmospherically vented drain located lower than the still is necessary to allow for gravity flow. The manufacturer supplies a 5 foot length of 1/2" I.D. vinyl tubing for the drain. Additional tubing may be purchased from your laboratory dealer.



**Figure 6-1.** 240V Receptacle



**Figure 6-2.** 15A - 250V Breaker Box



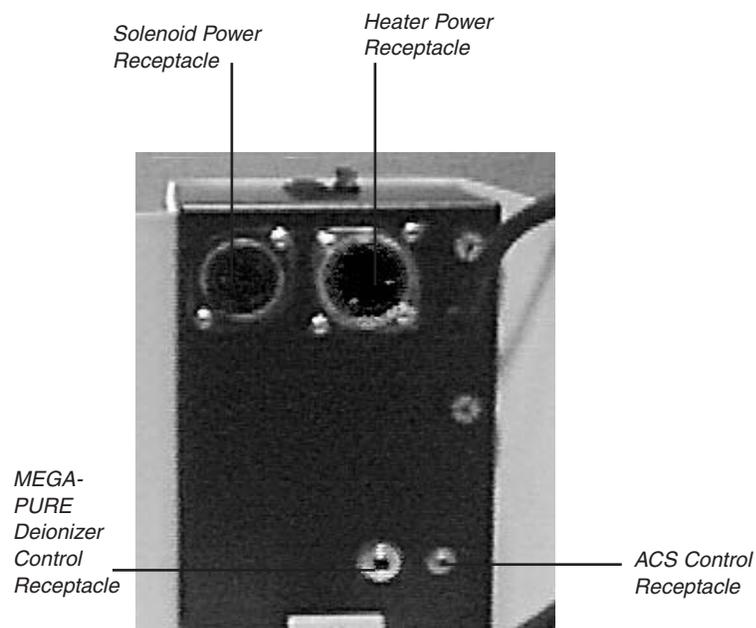
**Figure 6-4.** Shut-off Valve



## Section 7 Initial Assembly

Tools required for assembly: 7/16" open end wrench, diagonal cutting pliers, common screwdriver.

1. Unwrap the condenser "B" and thoroughly flush all of the salt out.
2. Reattach the condenser "B" to the still and then attach the two PTFE connectors "D" and "P" to the condenser "B" as shown in Figure 7-2.
3. Check orientation of trap "N." If it is not level or tilted back toward the boiler as shown in Figure 7-2, move the condenser "B" up in its bracket. This will tilt trap as shown.
4. Remove the packing material and rotate tube "L" into the constant level chamber of boiler "I" as shown in Figure 7-2.
5. Unpack the Vycor® immersion heater "M" and check the voltage rating on the top cap. It should agree with the voltage of your power supply. If it does not, contact your dealer and order the correct heater.
6. Insert the immersion heater into the top opening of boiler "I" as shown in Figure 7-2.



**Figure 7-1.** Control Bottom Connections

7. Thread the heater plug and cord through the large hole above the boiler "I," then back through the hole below the control box "H." Plug heater plug into the receptacle on the bottom of the control box. The plug is twist-lock type and requires  $\frac{1}{4}$  clockwise turn to lock in place.

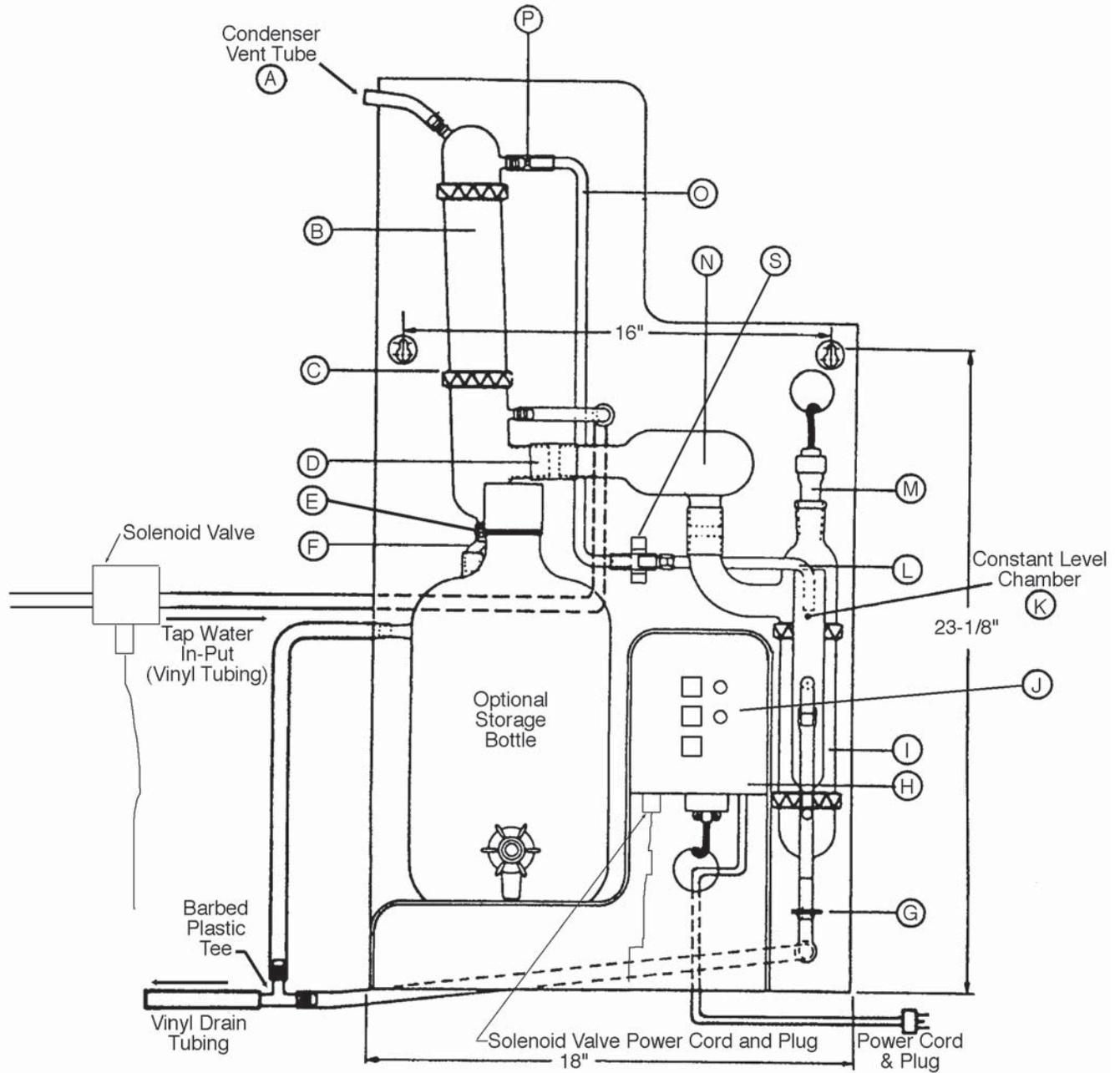


Figure 7-2. MEGA-PURE One Liter Still

## Section 8 Feedwater Connections

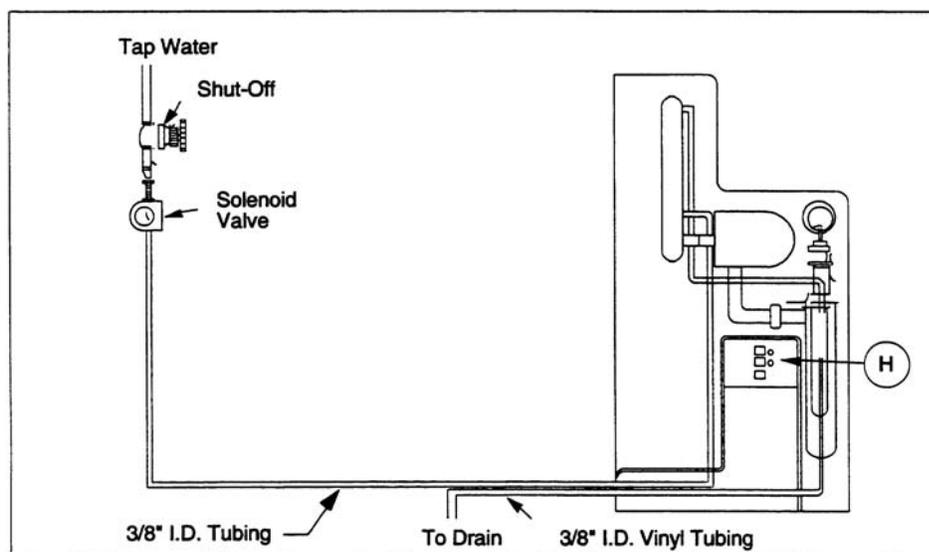
This still always uses tap water for cooling the steam in the condenser. However, you have the option of feeding your boiler with higher purity pretreated water, thereby reducing the need to drain and clean your boiler.

If tap water is to be used as your boiler feedwater, proceed to the Tap Water Boiler Feed section. If you will be using a supply of distilled, deionized or reverse osmosis water as your boiler feed, proceed to the Pretreated Boiler Feed section.

### Tap Water Boiler Feed

1. Install a customer supplied shutoff valve onto your tap water source. Thread the solenoid valve onto your customer supplied shutoff, with the side marked "in" toward the shutoff.
2. Install the supplied fitting to the "out" side of the solenoid valve. Connect the 5/16" I.D. tubing (from the condenser) to this fitting.
3. Route 3/8" I.D. vinyl drain tubing to an atmospherically vented drain.

**Note** We strongly recommend that the optional flowmeter be installed into your feedwater line(s). This will allow the flow of water to your still to be controlled more easily and precisely.



**Figure 8-1.** Tap Water Feed Only

## Tap Water Boiler Feed (continued)

4. Plug the solenoid valve power cord (not shown) into the receptacle on the bottom of the control box "H" (see Figure 7-1).
5. Go to the "Still Output Connections" section to complete your still's setup.

## Pretreated Boiler Feed

When a supply of distilled, deionized or reverse osmosis water is to be used as boiler feed, first revise the still connections as follows:

1. Remove boiler fill tube "O" from still and set aside.
2. Locate the 3/8" I.D. x 44" long vinyl tubing and one barbed tee (3/8" I.D. x 3/8" I.D. x 3/8" I.D.) in the parts box.
3. Install one end of the vinyl tubing to the cooling water outlet located on the top right of the condenser "B" (where boiler fill tube "O" was attached). Route the other end through the cabinet and down the back as shown in Figure 8-2.
4. Cut the 3/8" I.D. vinyl drain tubing and install the barbed tee. Connect the 3/8" I.D. vinyl tubing from condenser to the barbed tee. Push the vinyl tubing all the way onto the tee to assure a leak free seal. Push the vinyl tubing all the way onto the tee to assure a leak free seal.
5. Route the drain tubing to an atmospherically vented drain.

If a MEGA-PURE D1 or D2 demineralizer is to be used to provide pretreated boiler feed, go to the Demineralizer Treated Boiler Feed section. If an "in-house" source of pretreated water is to be used for boiler feed, go to the In-House Treated Boiler Feed section.

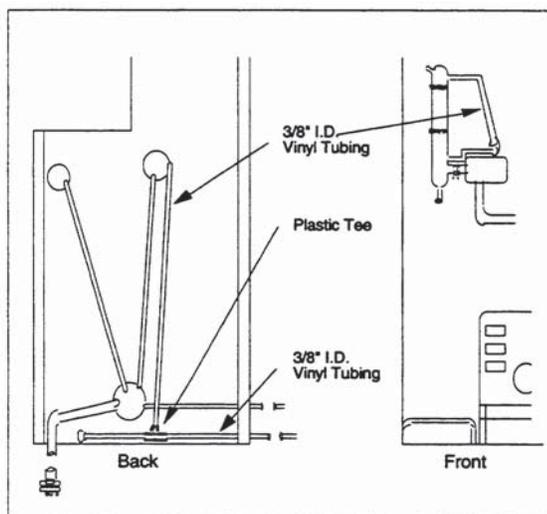


Figure 8-2. Tubing Connections

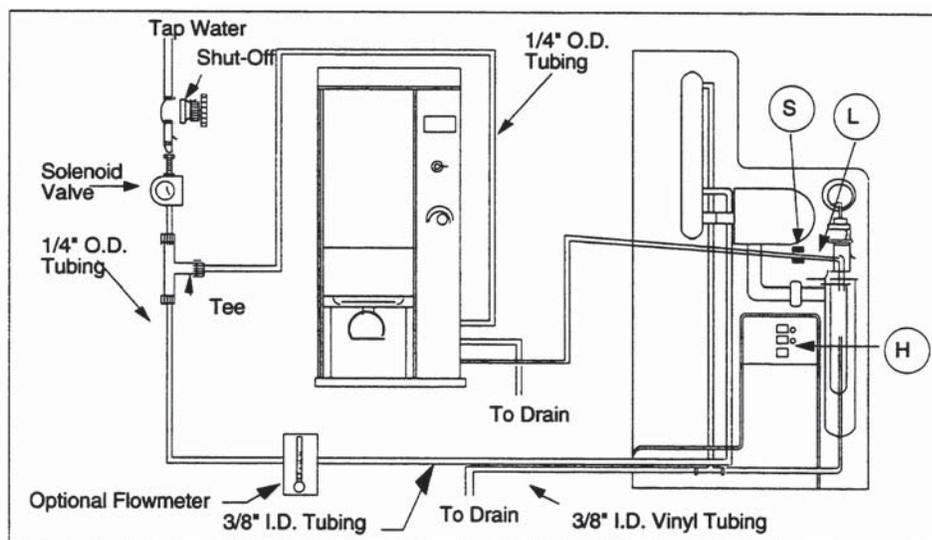
## Demineralizer Treated Boiler Feed

Refer to Figure 8-3 (must have optional still adapter kit).

1. Install a customer supplied shutoff valve onto your tap water source. Thread the solenoid valve onto your customer supplied shutoff, with the side marked "in" toward the shutoff.
2. Install the fitting supplied with the still adapter kit into the "out" side of the solenoid valve. Connect the 1/4" O.D. tubing (from the demineralizer) to this fitting.
3. Cut the 1/4" O.D. tubing (from last step) at a convenient point and install the tee from the still adapter kit.
4. Connect a length of 1/4" O.D. tubing to the third arm of the tee. Connect the 1/4" O.D. to 3/8" I.D. adapter to the free end of this length of 1/4" O.D. tubing. Connect the 5/16" I.D. tubing (from the condenser) to this adapter.

**Note** If using the optional flowmeter, install it at this point instead of the adapter. ▲

5. Locate boiler fill tube "L." Connect 7/16" I.D. vinyl tubing from demineralizer output to end of boiler fill tube. Route as shown and install clip "S" to support the tubing.
6. Route 3/8" I.D. vinyl drain tubing to atmospherically vented drain.



**Figure 8-3.** Deionizer Feed

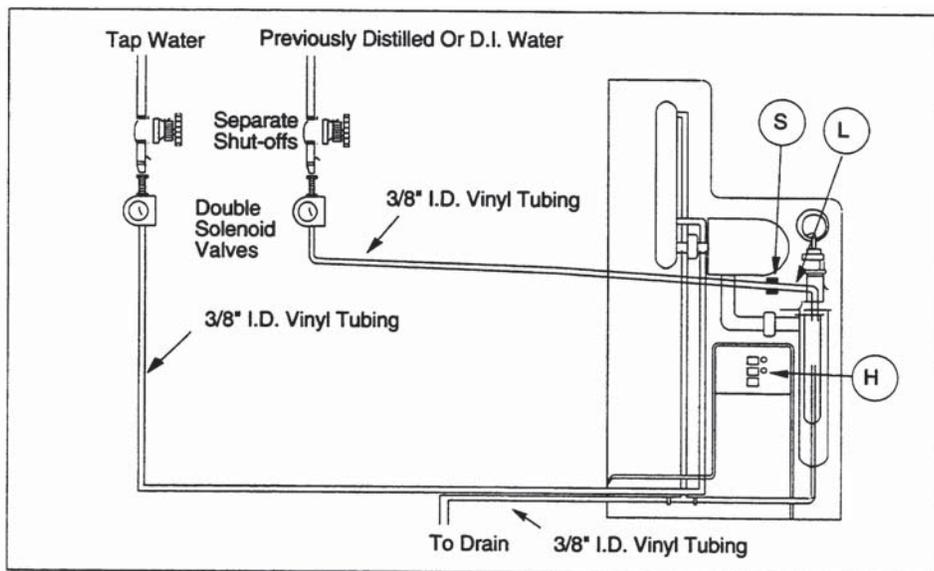
## Demineralizer Treated Boiler Feed (cont.)

7. Plug solenoid valve power cord (not shown) into receptacle in control box "H."
8. Plug still adapter kit cable into right side of demineralizer and receptacle in control box "H."
9. Go to the "Still Output Connections" section in this manual to complete the setup of your still.

## In-House Treated Boiler Feed

Refer to Figure 8-4 (must have optional double solenoid valves).

1. Install customer supplied shutoff valves onto your tap water source and your in-house treated water source. Thread the solenoid valves onto your customer supplied shutoffs, with the sides marked "in" toward the shutoffs.
2. Install the supplied 5/16" fitting to the "out" side of the solenoid valve on your tap water source. Connect the 5/16" I.D. tubing (from the condenser) to this fitting.



**Figure 8-4.** In-House Treated Feed

3. Connect the 3/8" fitting and 3/8" I.D. vinyl tubing from the double solenoid valve kit to the "out" side of the solenoid valve on your treated water supply.
4. Locate the boiler fill tube "L." Connect 3/8" I.D. from treated water supply solenoid to the end of the boiler fill tube. Route as shown and install clip "S" to support the tubing.

## **In-House Treated Boiler Feed (cont.)**

5. Route the 3/8" I.D. vinyl drain tubing to an atmospherically vented drain.
6. Plug the solenoid valve power cord (not shown) into the receptacle in control box "H" (See Figure 7-1).
7. Go to the "Still Output Connections" section in this manual to complete the setup of your still.



## Section 9 Still Output Connections

If one of the optional storage bottles is being used, go to the “Storage Bottle Installation” section. If your still is being connected to an automatic collection system, go to the “Automatic Collection System Installation” section.

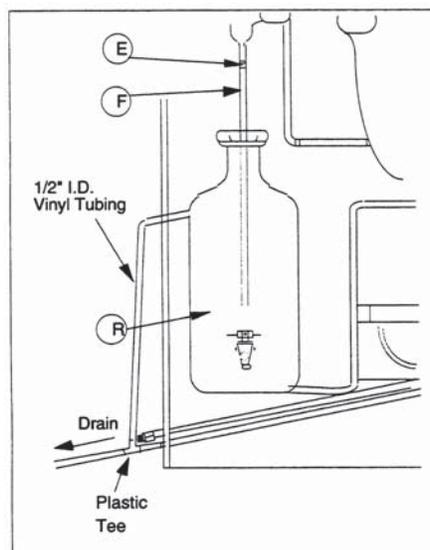
### Storage Bottle Installation

To install the optional 6 or 9 liter storage bottle inside the one liter still cabinet, first locate the following parts in the storage bottle parts box:

- Product delivery tube "F"
- PTFE Connector "E"
- 20" length of 1/2" vinyl tubing
- Plastic tee (1/2 X 1/2 X 1/2)

1. Place storage bottle (with product delivery tube "F" installed) inside still cabinet below condenser "B." Connect product delivery tube to condenser with PTFE.

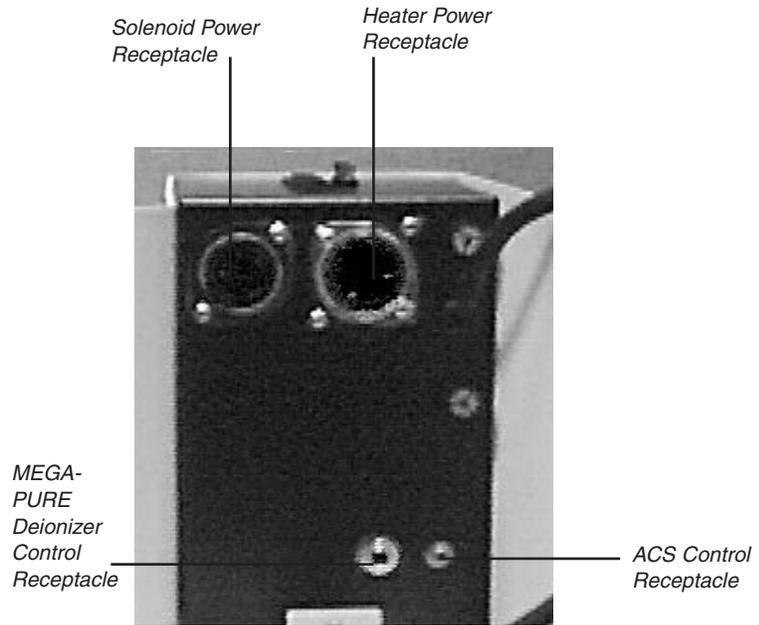
**Note** The storage bottles do not automatically control the still. ▲



**Figure 9-1.** Storage Bottle Installation



## ACS Installation (continued)



**Figure 9-3.** ACS Control Receptacle



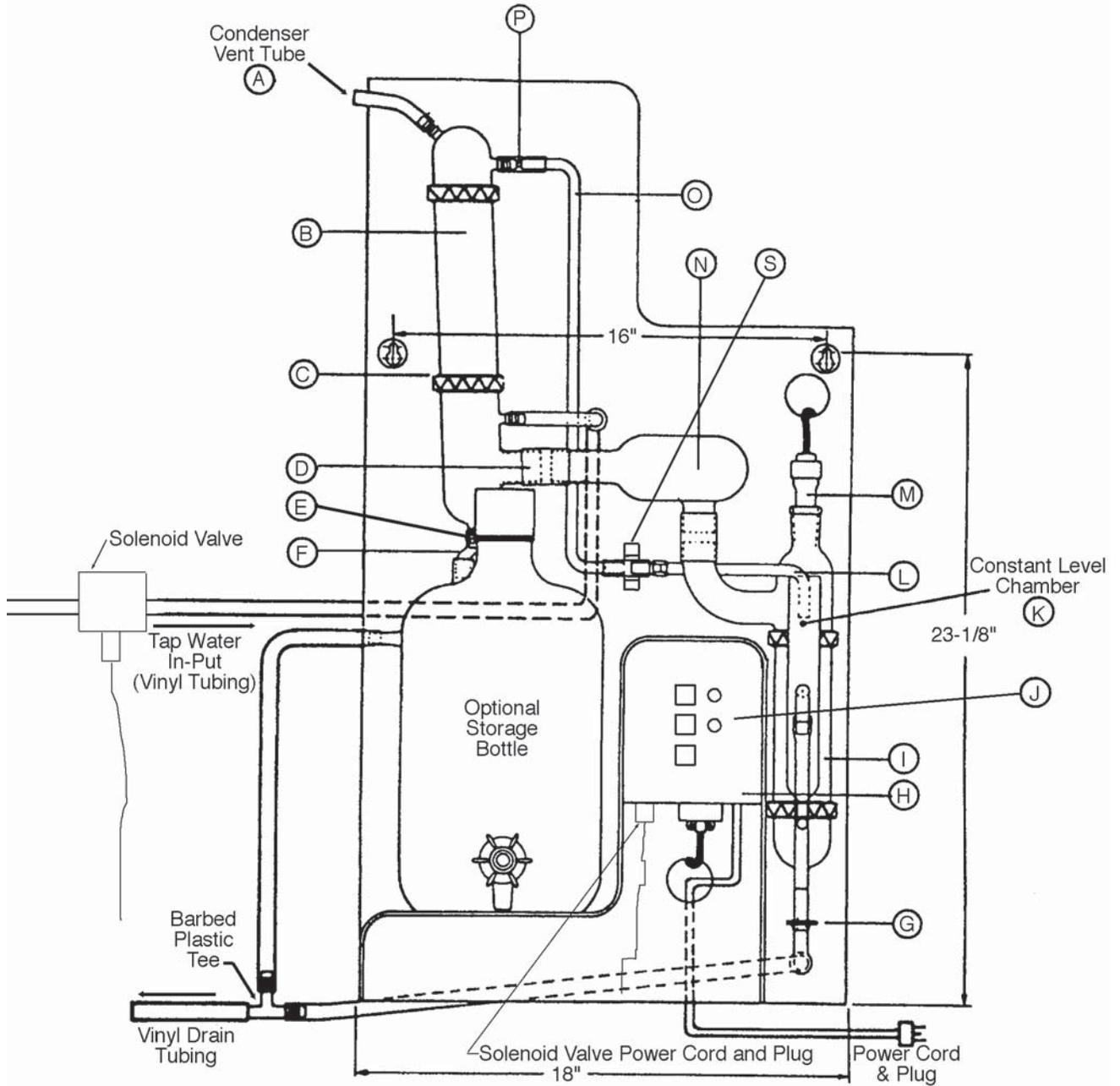
## Section 10 Operation

Plug electrical power cord into appropriate receptacle. Refer to Figure 10-1 for referenced locations.

1. Close drain clamp "G" on bottom of boiler "I."
2. Open valve at tap water source and treated water source, if so installed.
3. Switch on the main power breaker on control at power source.
4. Push "Water" switch on control box "H". Green indicator will light and solenoid will open. Allow boiler to fill.
5. Push "OPERATE" switch. Indicator will light and heaters come on.
6. Allow the still to operate for 15-20 minutes. For maximum volume of distillate, increase the flow of cooling water to the point where only a slight wisp of steam is visible at the condenser vent "A." If a separate source of pretreated water is being used for your boiler feed, adjust the boiler feed flow so that a constant overflow from the boiler is maintained.
7. Your MEGA-PURE One Liter Water Still should now be operational. Run the still for 4-5 hours to cleanse itself before collecting water for use.
8. To shut your water still off, push the OFF switch. This will shut the water supply and the heaters off. If any difficulties are encountered in operating this water still, check all operating and assembly steps to be sure the still was assembled and is being operated correctly. If the difficulty still exists, consult the Troubleshooting section of this manual.

**Warning** Use a properly grounded electrical outlet of correct voltage and current handling capacity. Ensure that the equipment is connected to electrical service according to local and national standards. Failure to properly connect may create a fire or shock hazard. ▲

**Warning** Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials. Failure to comply could result in explosion and personal injury. ▲



**Figure 10-1.** Still Components and Connections

**Caution** Use this device with water feed only. ▲

**Caution** - Hot Surface. Avoid Contact.” Glass portions of still become hot when still is operating. To avoid burns, do not touch hot glass. ▲

## **High Temperature Cut-off Switch**

Your MEGA-PURE One Liter Water Still is protected against overheating by a thermal switch located in the control box at the right hand side of the boiler. Should the boiler overheat, the switch will open, causing the heater and water supply to shut off. When the boiler cools (5-15 minutes), the switch will reset automatically, but the still will have to be restarted by the operator. When unit has cooled, press the “WATER” switch and then the “OPERATE” switch to restore normal operation. Check boiler occasionally for proper water level.

**Note** If you are feeding an ACS with your still, note that when the ACS is full, it will signal the still to shut down. During this shut-down, the heater and the water supply will both shut off and the front panel lights on the still will be extinguished. This normal operation can mimic the effects of an overheating boiler, but does not represent any problem with the still. ▲



## Section 11 Maintenance and Servicing

For top performance and efficiency, the MEGA-PURE One Liter Water Still should be kept clean and free of scale. It is recommended that the boiler be drained and refilled with fresh water daily to flush the boiler of the concentration of contaminants from the previous day's run.

When using untreated boiler feed, cleaning is recommended after every 15-20 hours of operation. The unit should be cleaned with a hydrochloric acid solution. Follow the procedure below:

1. Push unit "OFF" switch.
2. Disconnect output tubing at condenser "B" from collection vessel and temporarily place a beaker under condenser outlet.
3. Drain boiler by opening clamp "G." Close clamp "G" after boiler has completely drained. Refill boiler.
4. Use the spare pinch clamp from the parts box to shut off overflow tube from constant level chamber "K" as close as possible to overflow stem.
5. Carefully pour approximately 260 ml. of 10% hydrochloric acid solution into top of constant level chamber "K."
6. Wait approximately 10 minutes or until residue disappears. If additional cleaning is required, drain boiler down 1 inch and turn unit on for a few minutes until residue disappears. Do not boil. Turn the still off.
7. Carefully drain the unit, remove clamp from overflow tube and refill with fresh water. Drain boiler, refill with fresh water and operate for 30 minutes. Reconnect tubing from collection vessel to condenser "B."

**Warning** Disconnect from the power supply before servicing. ▲

**Warning** Wear eye and hand protection when using acid for cleaning, as acid spattering may occur. ▲

**Warning** Ensure all piping connections are tight to avoid leakage of chemicals. ▲

## Section 11

### Maintenance and Servicing

**Warning** Always depressurize chemical lines before disassembly. ▲

**Warning** To avoid lung injury or suffocation, ensure adequate ventilation when using chemicals for cleaning. ▲

**Warning** Follow carefully the manufacturers' safety instructions on labels of chemical containers and Material Safety Data Sheets (M.S.D.S.). ▲

**Warning** Refer servicing to qualified personnel. ▲

## Troubleshooting - General

Problem	Causes	Solution
Leaks	The most common leak is one occurring in the vinyl drain tubing. Hot water causes softening and pulling loose at the plastic barbed connectors.	Runs of vinyl tubing should be supported to reduce the pull on the plastic connectors. Small clamps may be used to firmly hold vinyl tubing.
Rough boiling	Rough boiling is the result of alkali attack to the matte finish on the heaters. The most common cause is using water pretreated with NaCl regenerated water softeners.	Remove heater and lightly roughen surface with 150 grit sandpaper.
Scale build-up	A brownish-white scale in the boiler indicates that the boiler requires cleaning.	Clean boiler per cleaning instructions. Scale should not be allowed to accumulate as heaters may be damaged.
Heater failure due to scale build-up or alkali attack will not be replaced under warranty.	Softened water used as a boiler feed causes a concentration of sodium ions and alkaline attack of the Vycor® glass. Rough boiling will be the first indication of alkaline attack. At failure, the heaters will usually pinhole and water entering will short out the element.	If softened water must be used, heater life can be prolonged somewhat by draining boiler every day.
	Scale build-up will occur when boiler feed is not being deionized.	When using the still without a deionizer, scale build-up must be removed every 15-20 hours of operation (see "Cleaning Instructions"). Failure to do so will cause heaters to build up heat internally and fail or cause glass envelope failure.
Steam at condenser vent	A slight wisp of steam exiting at the condenser vent is normal. Gases in the steam ater also being removed.	If there is an excessive amount of steam leaving the condenser vent, increase the cooling water flow rate.
No steam at condenser vent		If no steam is visible, decrease the cooling water flow rate.
Water pressure variations	Pressure fluctuations in your tap water line will cause erratic flow in cooling water and may cause water level in boiler to drop.	Have a plumber install a pressure regulator in your tap water line and regulate to 20-25 psi.
Output less than 1 liter/hour.	Heaters will produce in excess of 1 L/hr. of distilled water when run at the rated voltage. At lower voltages, output will drop accordingly. Also see "Steam at Condenser Vent" as excess steam at this point will reduce output.	

# Electrical Troubleshooting

Before troubleshooting can begin, the problem component must be determined. That is accomplished as follows:

1. Disconnect the demineralizer and ACS jacks from the still control box and attempt to run the still. If still fails, see “Still Troubleshooting.” If still runs, go to Step #2.
2. Connect the demineralizer input jack back up to the still control box and attempt to run the still. If still fails to run see “Demineralizer Troubleshooting” (in the Demineralizer Manual). If still runs, see “Automatic Collection System Troubleshooting.”

## Still Troubleshooting

Problem	Causes	Solution
Heaters and water will not stay on.	Hi-Temp cut-off switch open.	Remove control box and replace switch.
Heater boiling, heater light on.	Heater element burned out.	Check heater (13.9 ohms for 120V or 55.9 ohms for 240V) and replace.
Heater not working.	Heater element burned out.	Replace heater.
Water will not come on, but light works.	Solenoid valve not working.	Check plug for connection. Replace solenoid valve.
No lights in switches.	ACS full; still off.	This is normal operation when the still is used to feed an ACS. When water level in the ACS drops, still will reactivate and lights will come back on automatically.
	Indicator lights burnt out.	Replace switches (switches will operate without lights).
Fuse blown.	Heater shorted.	Check heater (13.9 ohms for 120V or 55.9 ohms for 240V) and replace.
	High voltage.	Check input voltage against heater rating. Correct.
Unit off, but water still flowing.	Solenoid valve installed backwards.	Solenoid labeled “in” on input side. Check.
	Solenoid valve stuck open.	Replace solenoid valve.

**Caution** Replace fuses with those of the same type and rating. ▲

## ACS Troubleshooting

Problem	Causes	Solution
Will not turn still on or off as it should.	Float stuck.	Remove level control cover and free-up.
	Switch not working.	Replace switch.
	Input jack not plugged in.	Check and reconnect.
	Jack board defective.	Replace jack board.



## Section 12 Parts List and Diagrams

*Parts Arranged by Exploded View (page 12-3) Key Number*

<b>Exploded View Key Number</b>	<b>Figure 12-1 Item Key</b>	<b>Description</b>	<b>Part Number</b>
1	A	Steam Vent Tubing	TU674X6
2	C	Boiler/Condenser Spring (4 required)	416104
3	B	Condenser	401203
4	P	PTFE Connector (3/8" I.D.)	401398
5	Inlet Tubing	TU674X7	
6	D	PTFE Connector (1 5/32" I.D.)	401397
7	N	Steam Trap	401202
8	O	Boiler Fill Tube (Cond. to Conn.)	401215
9	PTFE	Connector (3/8" I.D.)	401398
10	L	Boiler Fill Tube (Conn. to Boiler)	401216
11	I	Boiler	401201
12		Constant Level Overflow Tubing	TU674X3
13	G	Boiler Drain Tubing Clamp	927917
14		Boiler Drain Tubing	TU674X2
15		Drain "T"	927326
16		Drain Tubing	TU674X1
17	H	Electrical Control Box (120V)	CN798X1A
		Electrical Control Box (240V)	CN798X2A
	F	Distillate Outlet Tube - Tubing/Bottle	TU798X2
	J	Water, Operate, Off Switches	SW745X1A
	M	Vycor Immersion Heater, 120V-1000W	740880
	M	Vycor Immersion Heater, 240V-1000W	EL798X1B
	Q	Distillate Outlet Tube - ACS	TU798X1
	Not Shown	Electrical Control Box PC Board	PC798X1A
	Not Shown	Solenoid Valve (120V)*	RY798X1A
	Not Shown	Solenoid Valve (240V)	440093
	Not Shown	Fuse (Buss Type ABC-12A, 250V)	410148
	Not Shown	Hi-Temperature Cutoff Switch	SWX150

<b>Optional Accessories</b>		
<b>Exploded View Key Number</b>	<b>Description</b>	<b>Part Number</b>
18	6-Liter Polyethylene Bottle	413964
18	9-Liter Pyrex Brand Bottle	410535
	Flowmeter Kit	440092
	Dual Solenoid Valve (120V)	RY798X2A
	Dual Solenoid Valve (240V)	440236
19	Connector** within electrical box	CE798X1A

*\*RY798X1A Solenoid Valve (supplied with still)*

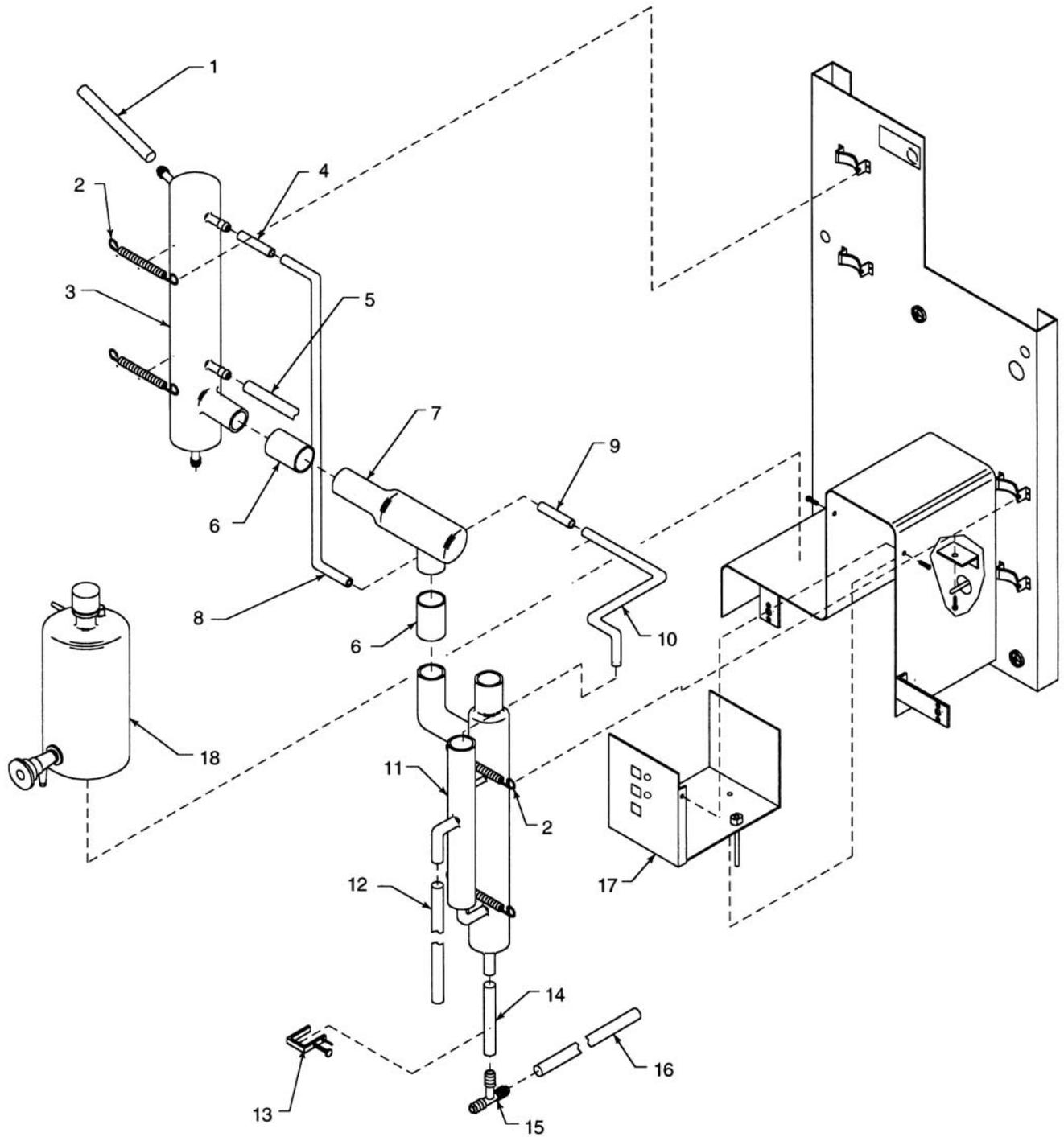
*\*\*CE798X1A #19 is shown in Figure 7-1*

## **Ordering Procedures**

Please refer to the Specification Plate for the complete model number, serial number, and series number when requesting service, replacement parts or in any correspondence concerning this unit.

All parts listed herein may be ordered from the Thermo Scientific dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed, check first with your dealer. If the dealer cannot process your request, then contact our Technical Services Department.

Prior to returning any materials, please contact our Technical Services Department for a "Return Materials Authorization" number (RMA). Material returned without an RMA number will be refused.

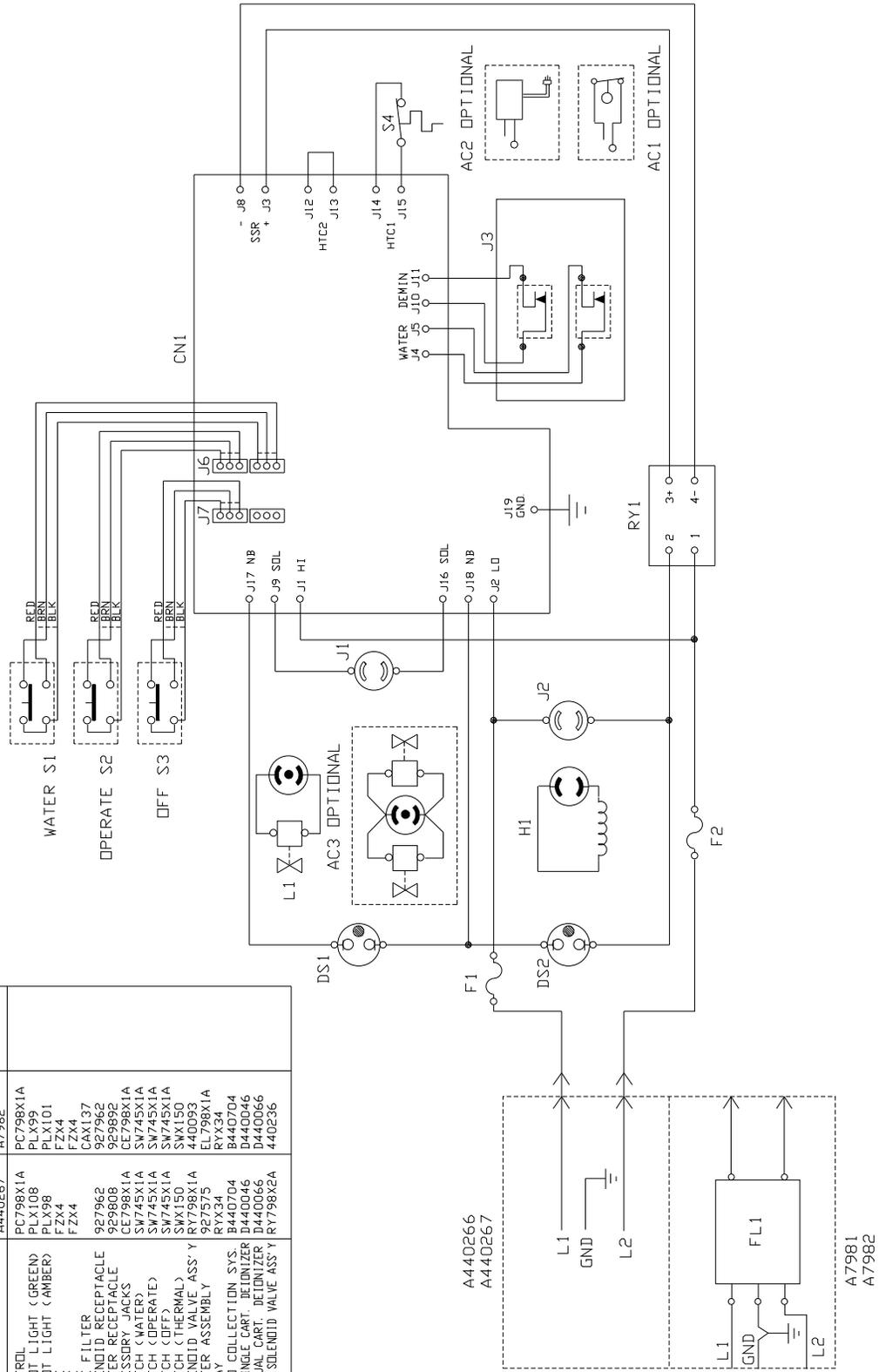


**Exploded View Drawing**

**Section 12**  
Parts List and Diagrams

DIAGRAM COMPONENT LIST

REF. NO.	DESCRIPTION	MODEL NO.	AND OUR PART NO. (s)
CN1	CONTROL	A440266	A7981
DS1	PILOT LIGHT (GREEN)	A440267	A7982
DS2	PILOT LIGHT (AMBER)	PC798X1A	
F1	FUSE	PLX108	PLX99
F2	FUSE	PLX98	PLX101
FL1	LINE FILTER	FZX4	FZX4
J1	SOLENOID RECEPTACLE	FZX4	
J2	HEATER RECEPTACLE	CAX137	
J3	ACCESSORY JACKS	927962	929892
S1	SWITCH (WATER)	CE798X1A	CE798X1A
S2	SWITCH (OPERATE)	SW745X1A	SW745X1A
S3	SWITCH (OFF)	SW745X1A	SW745X1A
S4	SWITCH (THERMAL)	SWX150	SWX150
L1	SOLENOID VALVE ASS'Y	R7798X1A	440093
H1	HEATER ASSEMBLY	EL798X1A	EL798X1A
RY1	RELAY	RYX34	RYX34
AC1	AUTO. COLLECTION SYS.	B440704	B440704
AC2	DS SINGLE COIL MOTOR	D440046	D440046
AC3	DUAL COIL MOTOR	D440046	D440046
	DUAL SOLENOID VALVE ASS'Y	A440266	A440266
		R7798X2A	R7798X2A



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