MEGA-PURE® 11A Water Still

Series 677

Operating Manual and Parts List 927216 Rev. 1

Part of Thermo Fisher Scientific

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Models covered in this manual	
Model number	**Voltage**
A440117 (6745)	208V
A440118 (6746)	240V

MANUAL NUMBER 927216 (7006745)

REV	ECR/ECN	DATE	DESCRIPTION	By
1	28194	3/12/12	Removed 208V heater as no longer available - pg 10-1	ccs
--	--	6/28/10	Added environmental conditions and declaration of conformity information - pg 2-4	ccs
0	--	4/8/10	Transferred to Marietta (was 927216 4/11/07)	ccs

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. ▲

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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.

- ✔ 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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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:

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Section 1 Safety Information

Your Thermo Scientific MEGA-PURE 11A water still has been designed with function, reliability, and safety in mind. It is the user's 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. Disconnect from the power supply prior to maintenance and servicing.

3. 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.

4. Do not mount your Barnstead MEGA-PURE 11A 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.

5. For continued protection against possible fire hazard, replace fuses only with the same type and rating of fuse.

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. Glass portions of still become hot when still is operating. To avoid burns, do not touch hot glass.

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

4. Use this device with water feed only. Failure to comply with the above could result in explosion and personal injury.

5. Ensure all piping connections are tight to avoid leakage of chemicals.

6. Always depressurize chemical lines before disassembly.

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

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

9. Refer servicing to qualified personnel.

10. Install front protective cover before operating still.

To ensure safe mounting:

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 125 lbs.; inadequate support and/or fasteners may result in damage to mounting surface and/or equipment. If you are unsure of mounting surface composition, condition and construction, or correct fasteners, consult your building maintenance group or contractor.

Section 2 Introduction

The Thermo Scientific MEGA-PURE 11A water still is a compact, all glass and PTFE unit designed to provide 11 liters per hour of ultra high purity distilled water. The product water, as produced, is non-pyrogenic per U.S.P. XIX and will have a resistivity of 1.0M ohm-cm or higher at the product outlet using most tap water as feed. This water still can be used as a discrete unit, with customer supplied pretreated water or in conjunction with a Thermo Scientific Demineralizer. It can also be connected to the Thermo Scientific Automatic Collection System for complete automatic operation.

The MEGA-PURE 11A water still is rated at 240V, 50/60 Hz, 10,000 watts, single phase (Model A440118). It is also available in 208V (Model A440117). Changing the unit for use on either 240V or 208V operation requires only replacing the Vycor® immersion heaters with heaters having the required voltage rating.

The cabinet and glassware are protected against damage from overheating by two thermal switches.

Choice of a location for your MEGA-PURE 11A water still is primarily a matter of convenience. This unit may be located on a bench or wall mounted.

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Electrical Requirements

To operate the MEGA-PURE 11A water still, the customer must provide a power source of single phase, 50/60 Hz. 60 amp, 208 - 240VAC.

Your water still is supplied with a power cord and plug. A certified electrician should install a receptacle box within 5' of the still. The correct receptacle to match the supplied plug is a Hubbel #9460. Figure 2-1 (on following page) shows proper wiring for this receptacle. As an alternate method, your electrician may remove the supplied plug and wire the cord to a 60A-250V breaker box as shown in Figure 2-2.

Note If demineralizer is to be used, a 120V source of power will also be required. ▲

Electrical Requirements (cont.)

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

Warning To avoid electrical shock, use a properly grounded electrical outlet of correct voltage and current handling capacity. ▲

The electrical controls have been designed to operate on voltages between 208 and 240 volts A.C.

The Vycor immersion heaters will be labeled either 208V or 240V, according to your order. The 240 volt heaters may be used at 208V, 220V, 230V, or 240V, but at the lower voltages, there will be some reduction in the volume of distilled water produced. Exchange improperly ordered heaters with your dealer. You cannot exchange heaters that have been used.

Caution Never use 208V heaters on voltage higher than 208 volts as premature heater failure will occur. ▲

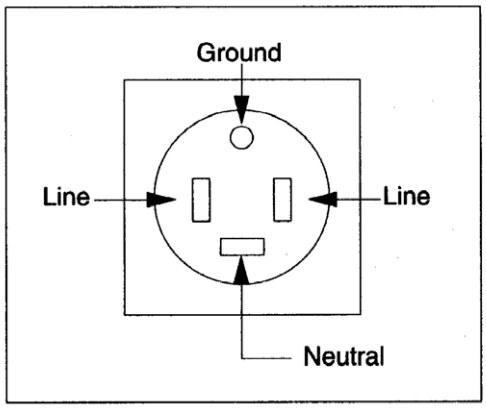

Figure 2-1. Hubbel #9460 Receptacle

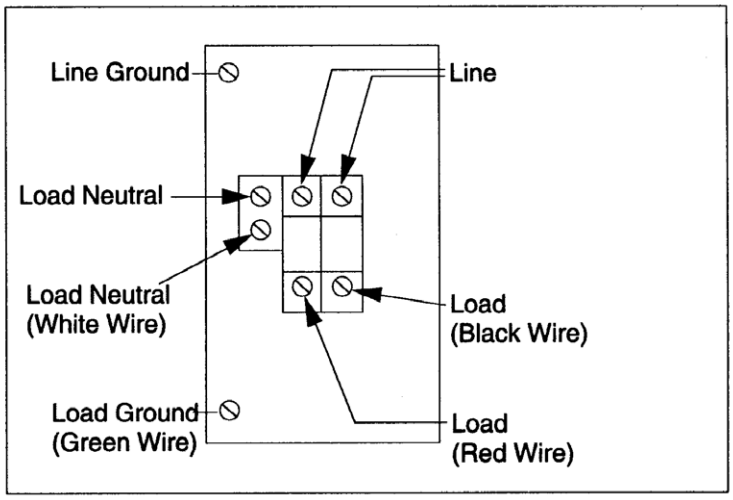

Figure 2-2. 60A - 250V Breaker Box

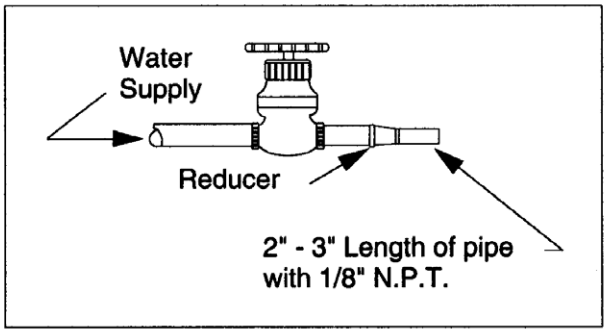

Figure 2-3. Shut-Off Valve

Water Supply Requirements

We recommend one of the following options for supplying water to operate your MEGA-PURE 11A water still.

Option #1

A single, untreated cold water supply. The supply must be capable of providing a minimum of 26 gallons per hour at a pressure of 20-100 psi and be located within 4 feet of the water still. You must provide a shut-off valve and reducer as shown in Figure 2-3.

With Option #1, approximately 26 gallons of untreated water will be used per hour in the cooling section of the still, 3 - 4 gallons of this water will be used as boiler feed. Water connections are discussed in "Pretreated Boiler Feed" section.

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 26 gallons per hour at a pressure of 20-100 psi and be located within 4 feet of the water still. The treated supply must be capable of providing 3 - 4 gallons per hour and be located within 4 feet of the water still. You must provide a shutoff valve and reducer at each water supply (see Figure 2-3). In addition, the optional double solenoid valve kit (Catalog No. 440236) is required.

With Option #2, approximately 26 gallons of untreated water will be used each hour for cooling. The second (treated) water supply of 3 - 4 gallons per hour will be used as boiler feed. Water connections are discussed in "Pretreated Boiler Feed" section.

Caution Do not use NaCl regenerated water softeners to supply boiler feed as alkali attack will shorten heater life. ▲

Drain

An open or vented drain located lower than the still is necessary to allow for gravity flow. The factory supplies a 5 foot length of ½" I.D. vinyl tubing for the drain.

Additional tubing may be purchased from your laboratory dealer.

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:

EN61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part I: General Requirements

EN61010-2-010 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 3 Unpacking

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

1. Remove parts box and still from shipping carton and place on workbench.

2. Remove the two (2) shipping screws located on upper back of unit and discard. Turn two (2) cover fasteners located on the lower front of unit 1/4 turn counterclockwise, and lift cover out and up to remove. Set cover aside.

3. Check glassware inside the main cabinet for damage. Check parts in the accessory box for damage. Identify any broken or damaged parts and report them to your dealer immediately.

4. Using diagonal cutting pliers, cut and remove the five (5) plastic shipping ties. The shipping tie locations are: two (2) on the condenser “F”, two (2) on the boiler “A”, and one (1) on the trap “E”.

Refer to Figure 3-1 for the following steps:

5. Remove product delivery tube from condenser “F” by removing clamp “W” and packing material behind tube. Set tube and clamp aside.

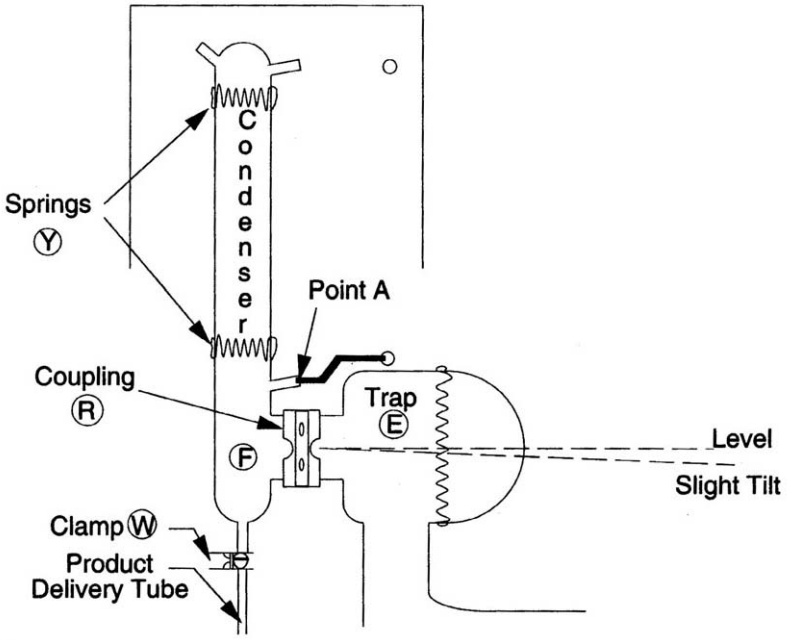

Figure 3-1. Remove Packing Materials

6. Using a 7/16" wrench, loosen the bolt (all the way) on coupling “R”. While holding onto condenser, remove springs “Y”. Carefully remove condenser from coupling and cabinet.

7. Remove tape from the condenser outlets. Allow the salt used as packing to flow into the plastic bag around the condenser. Discard the bag and salt. Rinse the remaining salt residue from the condenser.

Section 4 Assembly

1. Re-install the condenser “F” into the coupling and clamp condenser in place with springs “Y”.

2. Tighten coupling “R”using 7/16" wrench. Coupling should be just tight enough to prevent rotation with moderate hand pressure.

3. Check orientation of trap “E”. If it is not level or tilted back toward the boiler as shown in Figure 3-1, move the condenser “F” up in its bracket. This will tilt trap as shown.

4. In the following step, use warm water on connections for ease of assembly.

   a. Remove tape from 3/8" I.D. vinyl hose and connect to lower right condenser outlet at Point “A” (Figure 3-1). Move still to bench.

5. Unpack the four (4) Vycor immersion heaters “C” 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 correct heater.

Refer to Figure 4-1 (on the following page) for the following steps.

6. Insert the four (4) heaters into the top openings of boiler “A” as shown in Figure 4-1.

7. Thread heater plugs and cords through the 3" hole above the boiler “A”, then back through the hole below the control box “M”. Plug one heater plug into each receptacle on bottom of control box. Plugs are twist-lock type and requires 1/4 clockwise turn to lock in place.

9. Locate the boiler fill tubes “J”, “J”, “H” and “I” in the parts box.

10. Assemble the two “J” tubes at end marked "2." Attach one end marked "1" to top right condenser outlet as shown in Figure 4-2.

Caution Do not remove the PTFE sleeve covering the molded rubber sleeve on heater element. ▲

Note In the following steps, glass tubing will be assembled using PTFE connectors “S”. The PTFE connectors have been factory installed on one end of the glass tubing. Tubing has been numbered for ease of identification. To ease assembly, use warm water on glassware and PTFE connectors. ▲

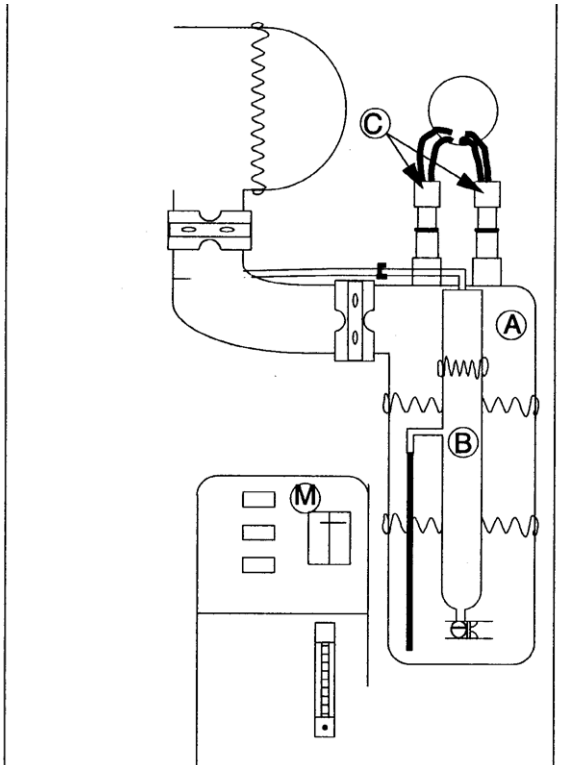

Figure 4-1. Component Locations

11. Assemble tubes “H” and “I” at end marked "5." Attach end marked "1" to end "1" of tube installed in Step 2. Route unmarked end into constant level chamber “B” as shown in Figure 4-2.

12. Locate the two boiler fill tube clips “P” in parts box. Install on boiler fill tube “H”, remove paper backing and stick to cabinet as shown in Figure 4-2.

13. Route hoses through side of cabinet as shown in Figure 4-3.

14. Your MEGA-PURE 11A water still is now ready to be moved to its final location. Visually check for loose connections.

15. Move the assembled water still to its final location. Refer to Installation Recommendations, and bench or wall mount the water still.

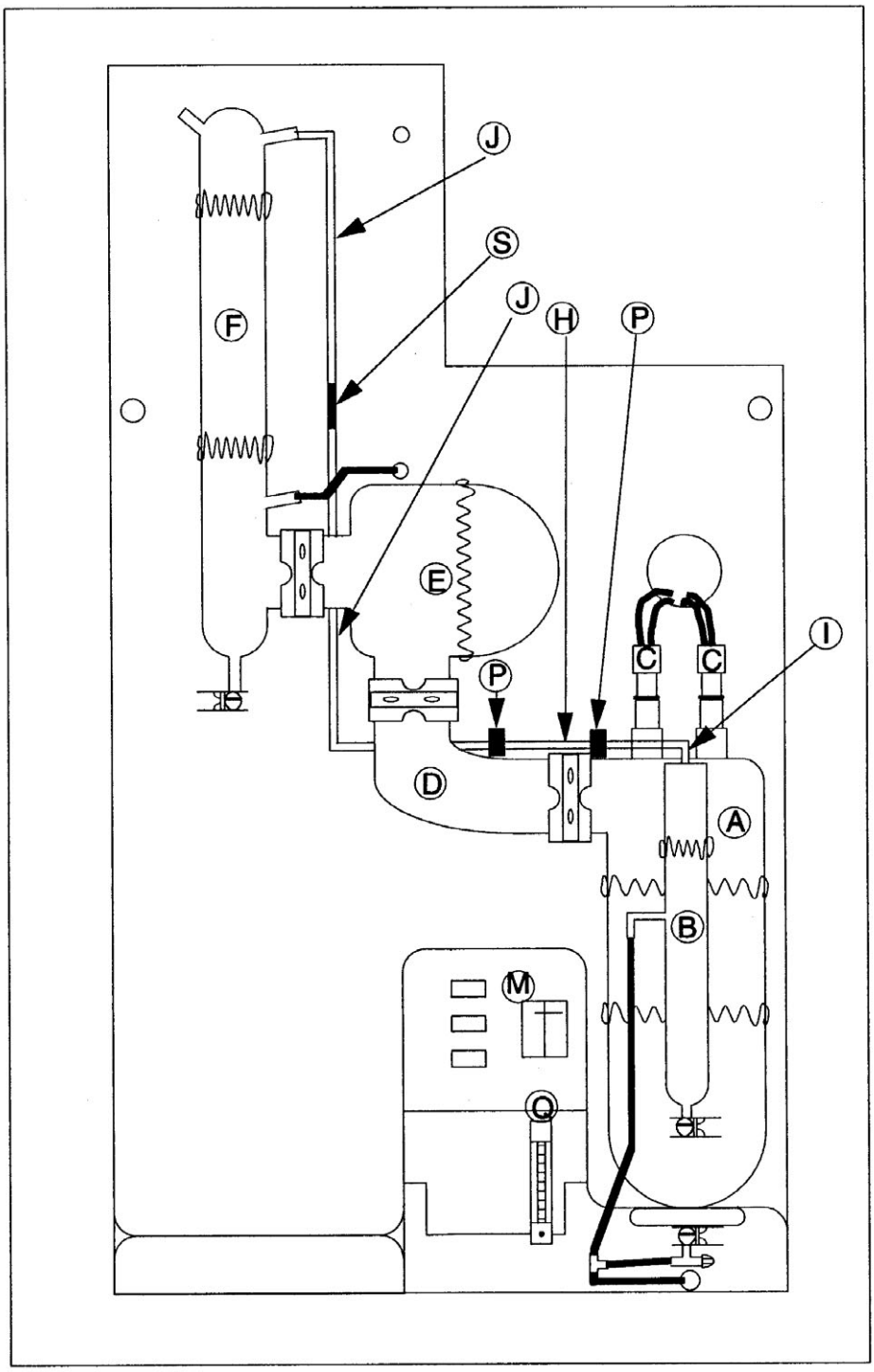

Figure 4-2. Assembled Component Locations

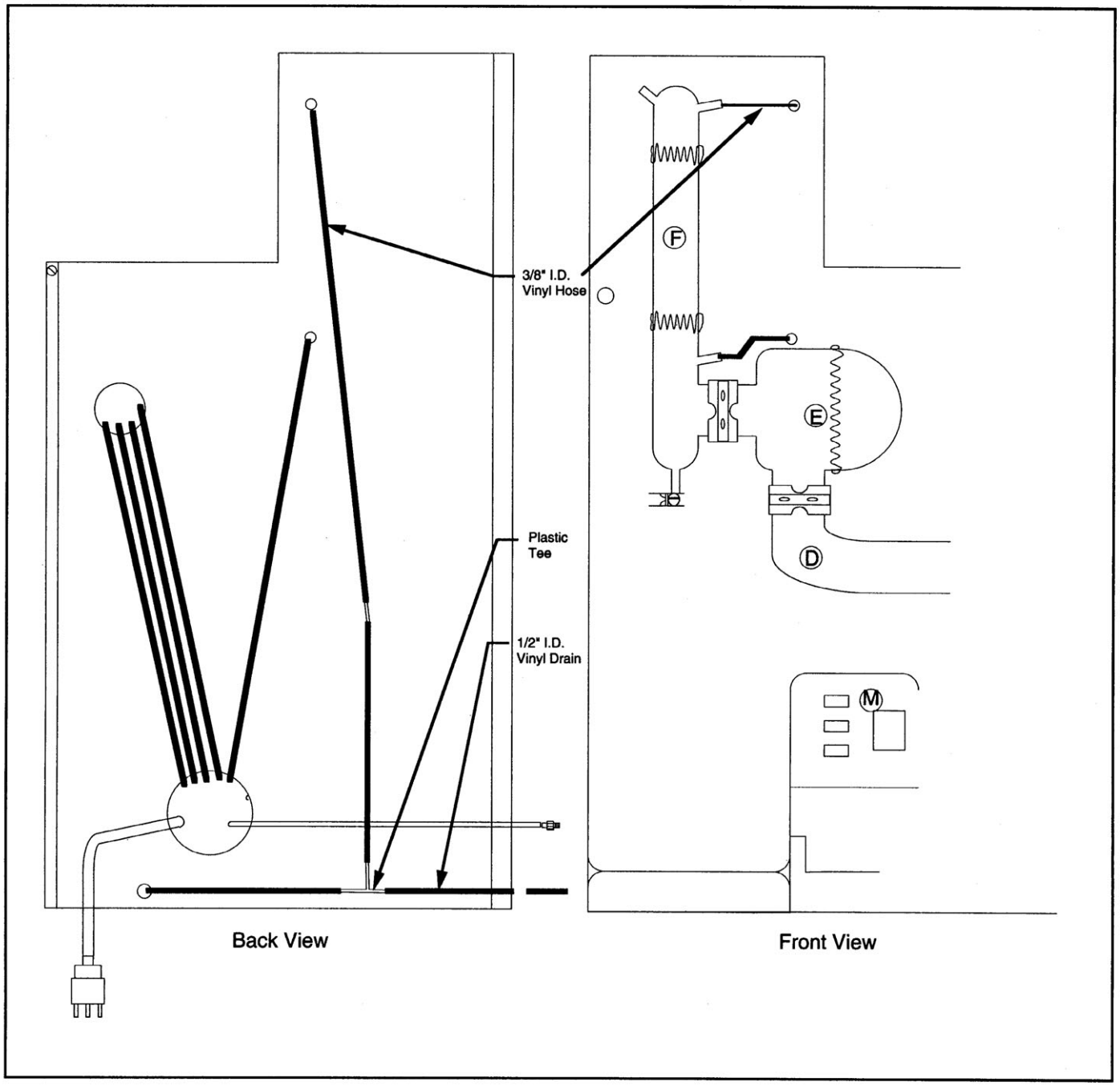

Figure 4-3. Components Installed

Pre-treated Boiler Feed

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

The four boiler fill tubes “J”, “J”, “H”, “I” and two boiler fill tube clips “P” from the parts box will not be used at this time.

1. Locate the roll of 3/8" I.D. vinyl hose and one plastic barbed tee in the parts box. Cut a 60" length of hose from the roll.

2. Install one end of the vinyl hose to the top right tube on condenser “F” and route the other end through the cabinet hole as shown in Figure 4-3.

3. Cut the 1/2" vinyl drain hose and install plastic barbed tee as shown in the left view of Figure 4-3. Push vinyl hoses all the way onto the tee to assure a leak-free connection.

3½ Gallon Storage Bottle

To install the optional 3½ gallon storage bottle inside the MEGA-PURE 11A water still cabinet, the bottle dust cover from the parts box and the product delivery tube and clamp “W” removed in Step 5 of the unpacking instructions will be used.

Place bottle dust cover on 3½ gallon bottle and route product delivery tube through hole in cover. Place this assembly inside still cabinet below condenser “F” and connect product delivery tube to condenser with clamp “W”.

Attach an appropriate length of vinyl tubing to bottle overflow tube and route to drain.

Automatic Collection System

Before connecting your MEGA-PURE 11A water still to the Automatic Collection System (ACS), move the still to its final location.

1. Refer to Figure 4-4 for location when connecting your water still to the ACS. Connect the ACS tube from the parts box to condenser “F”, using #18-A Thomas clamp “W”.

2. The other end of this tube connects to the automatic collection system tubing using a #18-A Thomas clamp.

3. Plug ACS input jack into ACS receptacle on bottom of still control box “M”.

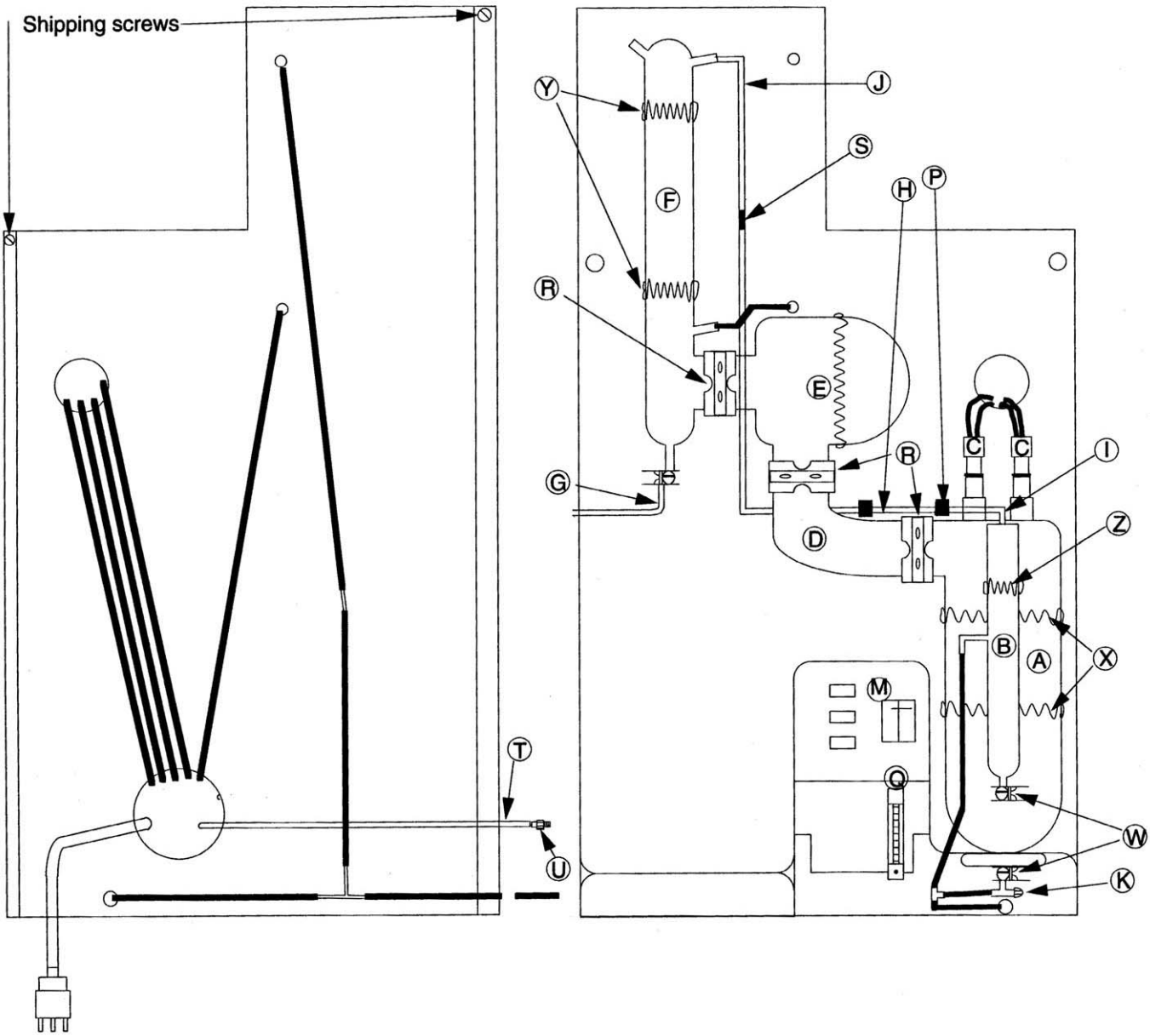

Figure 4-4. Assembled Components Complete

Section 5 Plumbing Details

Tap Water Feed Only - Figure 5-1

1. Thread solenoid valve onto customer supplied shutoff, "in" side towards shutoff.

2. Install 1/4" O.D. hose and supplied fittings to "out" side of solenoid valve.

3. Route 1/2" I.D. vinyl hose to vented drain.

4. Plug solenoid valve power cord (not shown) into receptacle in control box “M”.

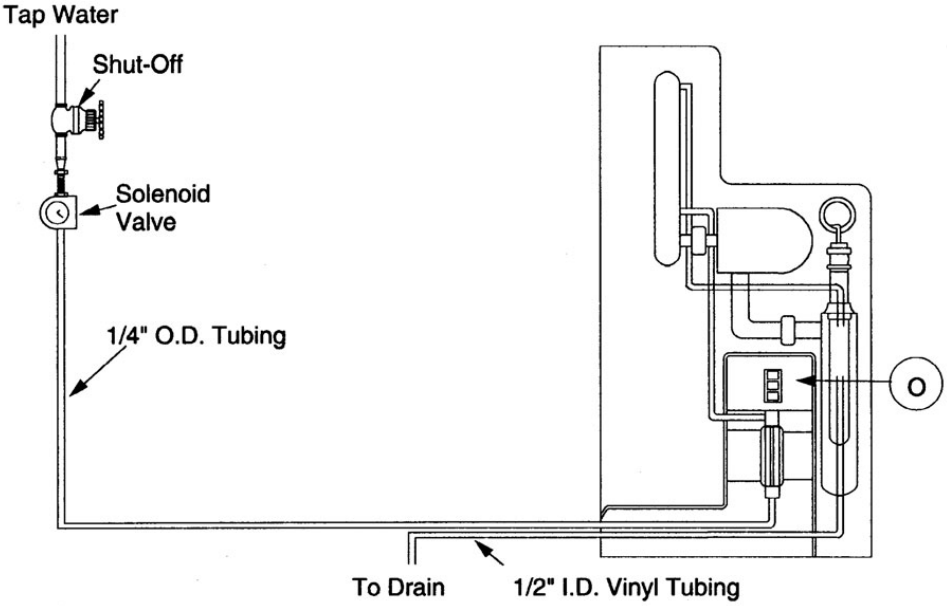

Figure 5-1. Tap Water Feed

Tap Water/Demineralizer - Figure 5-2 (Must have optional still adapter kit 440376)

1. Thread solenoid valve ("in" side towards shutoff) onto customer supplied shutoff.

2. Install 1/4" O.D. hose and supplied fittings to "out" side of solenoid valve.

3. Cut 1/4" O.D. hose from last step at convenient point and install tee from still adapter kit.

4. Connect 1/4" O.D. hose from demineralizer to tee.

5. Assemble boiler fill tubes “H” and “I” from parts box. Connect 3/8" I.D. vinyl hose from demineralizer output to end "1" of boiler fill tube “H”. Route as shown and install clips “P” to support.

6. Route 1/2"1.D. vinyl hose to vented drain.

7. Plug solenoid valve power cord (not shown) into receptacle in control Box “M”.

8. Plug still adapter kit cable into back of demineralizer and receptacle in control box “M”.

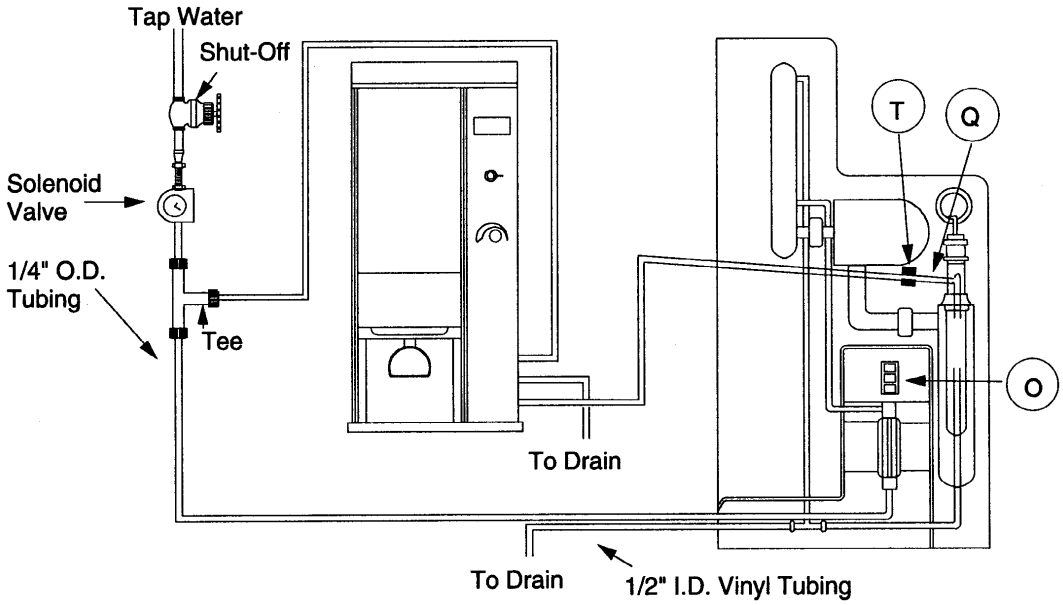

Figure 5-2. Tap Water with Demineralizer

Tap Water/In-House Treated Water - Figure 5-3 (Must have optional double solenoid valves 440236)

1. Thread solenoid valves ("in" side towards shutoff) onto customer supplied shutoffs.

2. Install 1/4" O.D. hose and supplied fitting to "out" side of solenoid on tap water.

3. Connect fitting and 3/A" I.D. vinyl hose from double solenoid valve kit to "out" side of treated water supply.

4. Assemble boiler fill tubes “H” and “I” from parts box. Connect 3/8" I.D. from treated water supply solenoid to end "1" of boiler fill tube “H”. Route as shown and install clips “P” to support.

5. Route 1/2" I.D. vinyl hose to vented drain.

6. Plug solenoid valve power cord (not shown) into receptacle in control box “M”.

Note To conserve treated water, use the shutoff valve on the in-house treated water line to control the amount of water entering the boiler. Reduce the flow into the boiler until only a minimal amount overflows to drain. ▲

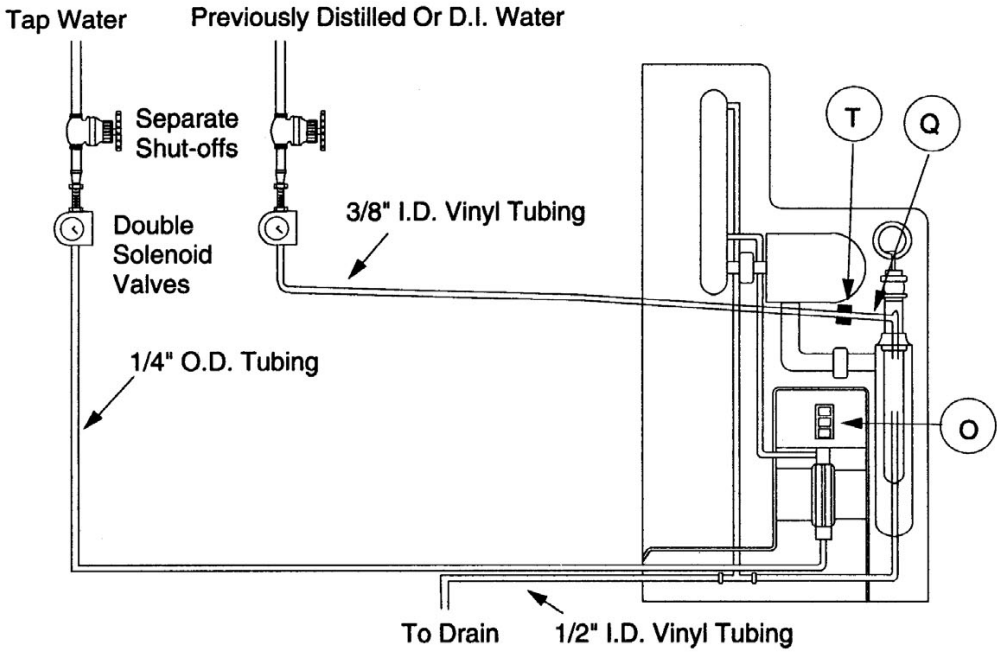

Figure 5-3. In-house Treated Tap Water

Section 6 Installation

Space allotment for a still should include a 6" clearance at the sides and top to allow for cover removal and air circulation. Unit must be placed within 4 feet of water supply and should not be mounted over electrical equipment to avoid shock hazard (see warning below).

Wall Mounting

The MEGA-PURE 11A water still has slotted holes for wall mounting. To support the weight of this unit, use 1/4" x 1 1/4" lag bolts for mounting. An optional wall mounting bracket is available for the Automatic Collection System. Demineralizers have slotted holes for wall mounting. Demineralizer location is not critical, though it should be close enough to the still to make all necessary connections and should not be mounted over electrical equipment to avoid shock hazard (see warning).

Warning Do not mount your MEGAPURE 11A 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 125 lbs.; inadequate support and/or fasteners may result in damage to mounting surface and/or equipment. If you are unsure of mounting surface composition, condition and construction, or correct fasteners, consult your building maintenance group or contractor.

Bench Mounting

No special consideration for a "still only" setup. When used with the ACS, the MEGA-PURE 11A water still must be placed on a 6" platform to allow for gravity feed of distilled water to the ACS.

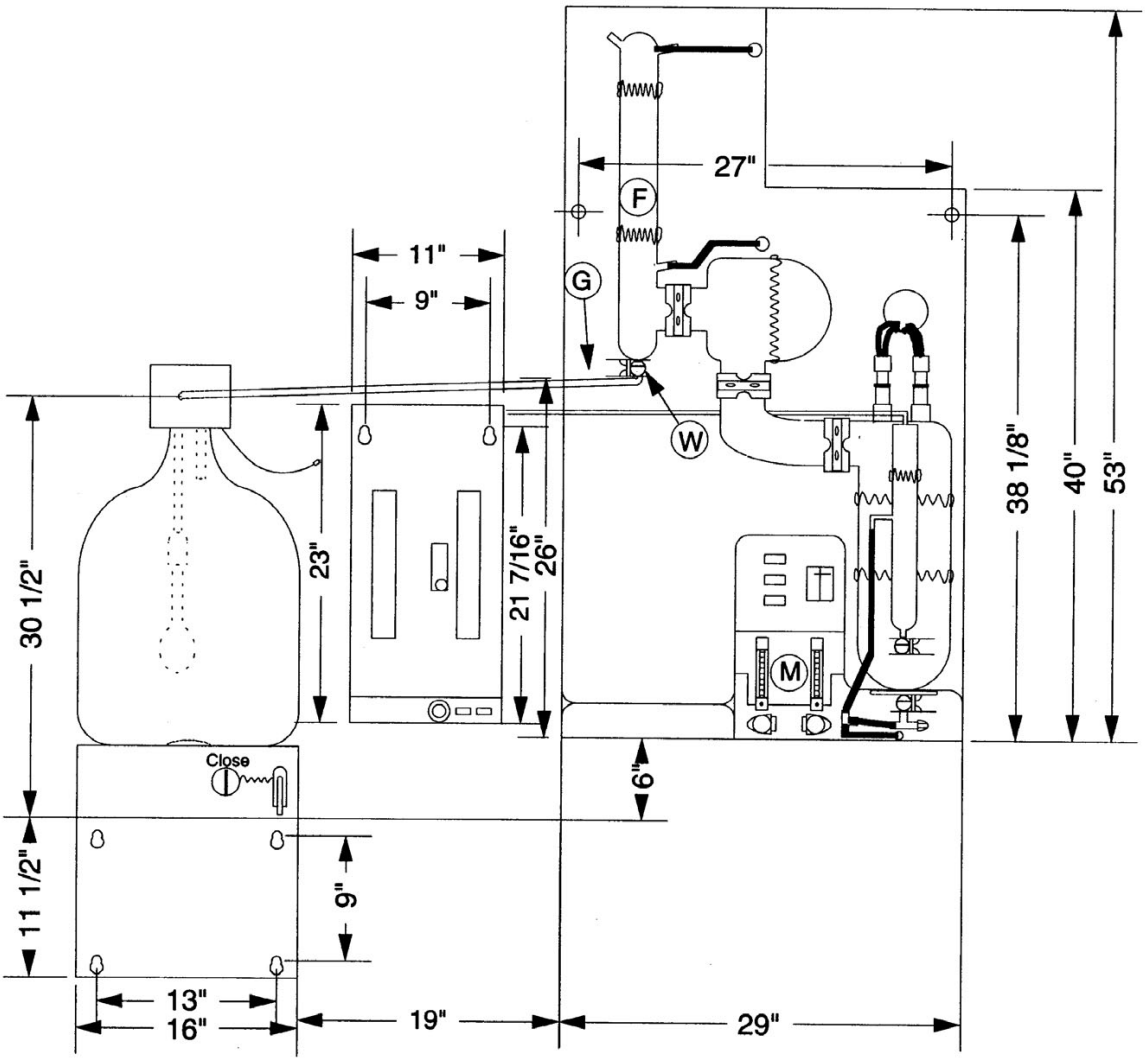

Figure 6-1. Layout

Warning Install protective front cover before operating still. ▲

Section 7 Operation

Plug electrical power cord into 208V, 220V or 240V, 60 amp receptacle (Hubbel #9460). Refer to Figure 7-1.

1. Close drain plug “K” on bottom of boiler “A”.
2. Open valve at tap water source (and treated water source if installed).
3. Turn power on, then turn on main power breaker on control box “M”.
4. Push "Water" switch on control box “M” and allow boiler to fill. Set Flowmeter “Q” to approximately 25 GPH.
5. Push "OPERATE" switch. Light will light and heaters will come on.
6. Allow still to operate for 15-20 minutes. For distillate at maximum purity, set flowmeter “Q” at 25 GPH. For maximum volume of distillate, increase flow at flowmeter “Q” to the point where only a slight wisp of steam is visible at the condenser vent.

Your MEGA-PURE 11A water still should now be operational. Run the still for 4-5 hours to cleanse itself before collecting water for use.

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 difficulty still exists, consult Troubleshooting section of this manual.

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.

Use this device with water feed only.

To avoid electrical shock, always 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. ▲

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

Caution Do not use the main power switch as an "OFF" switch. ▲

Caution Do not use the flowmeter to turn the water off. ▲

High Temperature Cut-off Switch

Your MEGA-PURE 11A water still is protected against overheating by two thermal switches, located in the black "V" shaped bracket at the left hand side of the boiler, that will shut off both the water supply and power to the heaters when activated. Always allow the unit to cool completely (5 - 15 minutes) before resuming operation. Cool water on hot glass could cause boiler damage. When unit has cooled, press "WATER" and "OPERATE" switches to restore normal operation. Check boiler occasionally for proper water level.

Caution Always allow the unit to cool completely before resuming operation. Cool water on hot glass could cause boiler damage. ▲

Section 8 Maintenance and Servicing

For top performance and efficiency, the MEGA-PURE 11A 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, or when boiler scale is visible. The unit should be cleaned with a hydrochloric acid solution. This is done as follows:

1. Push unit "OFF" switch.

2. Disconnect output tubing at condenser “F” from collection vessel and temporarily place a beaker under condenser outlet.

3. Drain boiler by opening stopcock “K”. Close stopcock “K”after boiler has completely drained.

4. Use the spare pinch clamp from the parts box to shut off overflow tube from constant level chamber “B” as close as possible to overflow stem.

5. Carefully pour approximately 800 ml of 10% hydrochloric acid solution into top of constant level chamber “B”.

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.

7. Carefully drain the unit, remove clamp from overflow tube and refill with fresh water. Turn still off, drain boiler, refill with fresh water and operate for 30 minutes. Reconnect tubing from collection vessel to condenser “B”.

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

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

Section 9 Troubleshooting

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 the vinyl tubing to the plastic connectors.
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 *Heater failure due to scale build-up or alkali attack will not be replaced under warranty.*	Short life on Vycor immersion heaters can usually be attributed to use of water pretreated with NaCl regenerated water softeners or excessive scale buildup.	If softened water must be used, heater life can be prolonged somewhat draining boiler every day.
	Softened water used as a boiler by 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.	
	Scale build-up will occur when boiler feed is not being deionized.	When using the still without the deionizer, scale build-up must be removed after 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 condenser vent is normal. Gases in the steam are also being removed.	If there is an excessive amount of steam leaving the condenser vent, increase the cooling water flow rate at flowmeter “Q”.

Problem	Causes	Solution
No Steam at Condenser Vent		If no steam is visible, decrease flow rate at flowmeter “Q”
Water Pressure Variations	Pressure fluctuations in your tap water line will cause erratic readings in the flowmeter 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.
Outlet less than 11 liters/hour	Heaters rated 208V or 240V will produce in excess of 11 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

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

1. Disconnect the demineralizer and jacks from the still control box and attempt to run the still. If still fails, see "Still Troubleshooting." If still runs, go on to the next step.

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." If still runs, see "Automatic Collection System Troubleshooting."

Still

Problem	Causes	Solution
Heaters and water will not stay on.	Hi-temp cut-off switch open.	Remove control box and replace switch.
Heater not working.	Heater burned out.	Replace heater.
Water will not come on, but light still works.	Solenoid valve not working. Check plug for connection. Replace solenoid valve.	
No lights in switches.	Lights burned out.	Replace switches (switches will operate without lights.)
Fuse blown.	Heater shorted.	Check heater (19Ω for 208V or 22Ω 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.

Demineralizer

Problem	Causes	Solution
Still will not operate.	Cartridge expended.	Change cartridge.
	Red light burned out.	Check light and replace.
	Relay contacts open.	If operational, clean contacts. If not, replace. Check fuse.
No green light.	Green light burned out.	Check and replace.
Still on with red light on demineralizer.	Relay contacts closed.	Check and replace.
	Input jack not plugged in.	Check and reconnect.
Both lights on, or good lights will not light, or erratic light operation	Printed circuit board.	Replace.

Automatic Collection System

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.

Section 10 Replacement Parts Listing

Warning To avoid electrical shock, always disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel. ▲

Glass Replacement Parts - Refer to Figure 10-1		
Item	**Description**	**Part Number**
A	Boiler	401934
B	Constant Level Chamber	401923
C	Vycor Immersion Heater 240V, 2500W	740883
D	90° x 3" Elbow	401924
E	Steam Trap	401925
F	Condenser	401926
G	ACS Tube	410915
H	Boiler Fill Tube #1	400608
I	Boiler Fill Tube #2	401929
J	Boiler Fill Tubes #3 & #4	400607
K	Boiler Drain Stopcock Assembly	410038
N/S	Bottle Dust Cover	413935
N/S	Product Delivery Tube	401185

Electrical Replacement Parts - Refer to Figure 10-1		
Item	**Description**	**Part Number**
M	Complete Control Box	440378
N/S	Main Power Breaker	410138
N/S	"Water" or "Operate" Switch	410916
N/S	"Off" Switch	410917
N/S	R-1 Relay	410473
N/S	R-2, 3 Relay	410552
N/S	Bridge Rectifier	410471
N/S	Transformer	410472
N/S	High Temp Cut-Off Switch	410137
N/S	Fuse, .5 Amp	FZX16

Hardware Replacement Parts		
Item	**Description**	**Part Number**
P	Boiler Fill Tube Clip	410921
Q	Flowmeter (0-30 gal/hr)	400485
R	3" Coupling	409170
S	Glass Center, PTFE, 7/16" I.D.	401416
T	Tubing, Hi-Press, 1/4" O.D. x 5' Long	410126
U	Plastic "Hose Fitting" Assortment	410447
W	#18-A Thomas Clamp	410141
X	Boiler or Trap Spring	410528
Y	Condenser Spring	410919
Z	Constant Level Chamber Spring	410211
N/S	Solenoid Valve Assembly	440093

N/S = Not Shown

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Ordering Procedures

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.

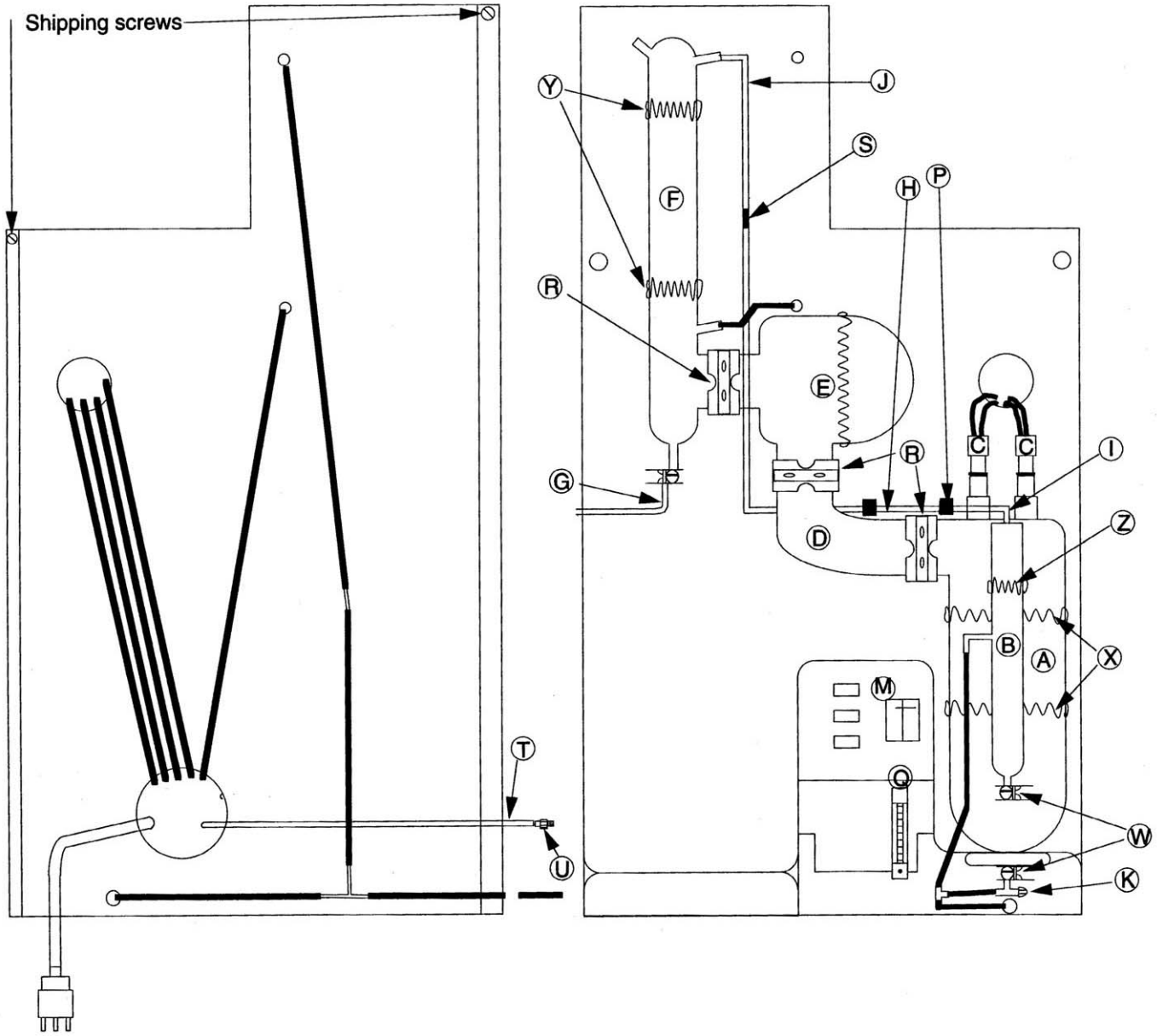

Figure 10-1. Parts Locations

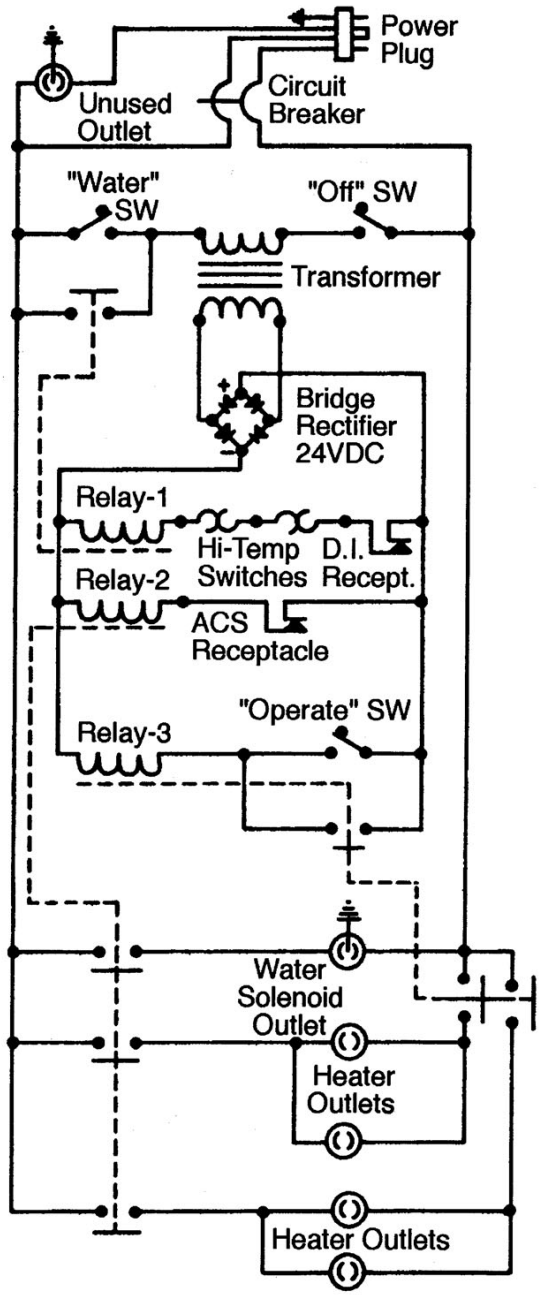

Figure 10-2. Still Control Box

Notes

1. Control box schematic is illustrated with no power applied.

2. When control jacks from demineralizer and ACS are connected to still control box, still operation is controlled by the demineralizer and ACS. Disconnect these jacks to isolate problems for troubleshooting.

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