

MEGA-PURE®
6A Water Still
OPERATION MANUAL
AND PARTS LIST
Series 676

Model#	Voltage
A440697	208V
A440518	240V

Table of Contents

General Information	3
Safety Information	3
Alert Signals	3
Warnings	3
Introduction	5
Electrical Requirements	6
Water Supply Requirements	7
Drain	7
Unpacking	8
Assembly	9
Pretreated Boiler Feed	10
3 1/2 Gallon Storage Bottle	11
Automatic Collection System	12
Plumbing Details	12
Tap Water Feed	12
Tap Water/Demineralizer	13
Tap Water/In-House Treated Water	14
Installation	14
Location of Unit	14
Wall Mounting	15
Bench Mounting	15
Operation	16
High Temperature Cut-off Switch	17
Maintenance and Servicing	18
Cleaning	18
Troubleshooting	20
Replacement Parts	23
Schematic Diagrams	25
Ordering Procedures	27
Warranty	28

General Information

Alert Signals



Warning

Warnings alert you to a possibility of personal injury.



Caution

Cautions alert you to a possibility of damage to the equipment.



Note

Notes alert you to pertinent facts and conditions.



Hot Surface

Hot surfaces alert you to a possibility of personal injury if you come in contact with a surface during use or for a period of time after use.

Safety Information

Your Barnstead MEGA-Pure® 6A 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, please pay attention to the alert signals throughout the manual.

Important Information

This manual contains important operating and safety information. The user 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 Barnstead products. The specific safety notes pertinent to the Barnstead MEGA-Pure® 6A Water Still are listed in the Warnings section.

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 MEGA-PURE® 6A 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. 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 lung injury or suffocation, ensure adequate ventilation when using chemicals for cleaning.

**Hot Surface**

Avoid contact. Hot water and steam heat the glass portions of the still to dangerous temperatures during operation.

7. Carefully follow the manufacturers' safety instructions on labels of chemical containers and Material Safety Data Sheets (M.S.D.S.).
8. Refer servicing to qualified personnel.

To ensure safe mounting:

1. 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 110 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.

Introduction

The Barnstead MEGA-PURE[®] 6A Water Still is a compact, all glass and Teflon[®] unit designed to provide 6 liters per hour of high purity distilled water. The product water, as produced, is non-pyrogenic per U.S.P. XIX and will have a resistivity up to 1.7 megohm-cm or higher at the product outlet using most tap water as feed. Pretreatment may be required to achieve >1.0 megohm/cm water. This water still can be used as a discrete unit, with customer supplied pretreated water or in conjunction with a Barnstead Demineralizer. It can also be connected to the Barnstead Automatic Collection System for complete automatic operation.

GENERAL INFORMATION



Warning

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

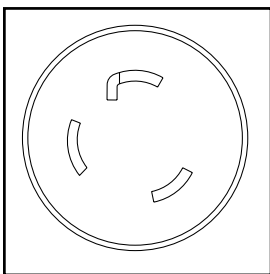


Figure 1

NEMA L6-30R Receptacle

The Barnstead MEGA-PURE[®] 6A Water Still is rated at 240V, 50/60 Hz, 5000 watts, single phase. It is also available in 208V. 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 thermal switches.

Choice of a location for your MEGA-PURE[®] 6A Water Still is primarily a matter of convenience. This unit may be located on a bench or wall mounted.

Electrical Requirements

To operate the Barnstead MEGA-PURE[®] 6A Water Still, the customer must provide a power source of single phase, 50/60 Hz. 30 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 NEMA L6-30R. Figure 1 shows proper wiring for this receptacle. As an alternate method, your electrician may remove the supplied plug and wire the cord to a 30A-250V breaker box as shown in Figure 2.

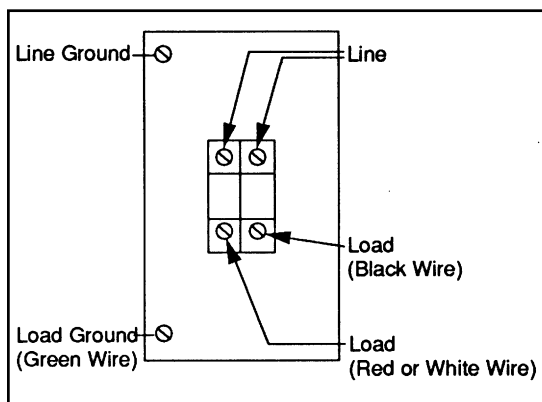


Figure 2

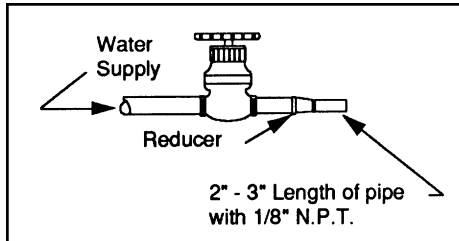
30A - 250V Breaker Box



Caution

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

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.



Shut-off Valve

**Caution**

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

**Caution**

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

Water Supply Requirements

Barnstead recommends one of the following options for supplying water to operate your MEGA-PURE® 6A Water Still.

OPTION #1

A single, untreated cold water supply. The supply must be capable of providing a minimum of 16 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 3. With Option #1, approximately 16 gallons of untreated water will be used per hour in the cooling section of the still, 2 gallons of this water will be used as boiler feed. Water connections are discussed on pages 12-14.

OPTION #2

An untreated cold water supply plus a source of RO, demineralized or previously distilled water. The untreated supply must be capable of providing a minimum of 16 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 2 gallons 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 3). In addition you will require the optional double solenoid valve kit (Catalog No. 440236). With Option #2, approximately 16 gallons of untreated water will be used each hour for cooling. The second (treated) water supply of 2 gallons per hour will be used as boiler feed. Water connections are discussed on pages 12-14.

Drain

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

Unpacking

Unpacking

1. Remove the parts box and the still from the shipping carton and place on a workbench.
2. Remove the two (2) shipping screws located on the upper back of the unit and discard. Turn the two (2) cover fasteners located on the lower front of the unit 1/4 turn counterclockwise, and lift the cover out and up to remove. Set the cover aside.
3. Check the glassware inside the main cabinet for damage. Check the parts in the accessory box for damage. Identify any broken or damaged parts and report them to your dealer immediately.

Refer to Figure 4 for the following steps:

4. 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 (P) and one (1) on the trap (U) .
5. Using a 7/16" wrench, loosen the nut (all the way) on coupling (C) While holding onto the condenser, remove springs (Y). Carefully remove the condenser from the coupling and the cabinet.
6. Remove the tape from the condenser outlets. Allow the salt used as packing to flow into the plastic bag around the condenser. Discard the bag and the salt. Rinse the remaining salt residue from the condenser.

Assembly

Assembly

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

1. Reinstall the condenser (B) into the coupling (C) and clamp the condenser in place with springs (Y).
2. Tighten coupling (C) using a 7/16" wrench. The coupling should be just tight enough to prevent rotation with moderate hand pressure.
3. Check the orientation of trap (U). If it is not level or tilted back toward the boiler as shown in Figure 4, move the condenser (B) up in its bracket. This will tilt the trap as shown in Figure 4.
4. In the following steps, use warm water on the connections for ease of assembly.
 - A. Connect tube (V) to upper the right condenser tubulation using Teflon® connector (W).
 - B. Connect the vinyl tubing from the flow-meter to the lower right tubulation of the condenser.
5. Remove the packing material and rotate tube (Q) into the constant level chamber of boiler (P) as shown in Figure 4.
6. Unpack the Vycor® immersion heaters (R) 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.



Caution

Do not remove the Teflon® sleeve covering the molded rubber sleeve on the heater element.

ASSEMBLY

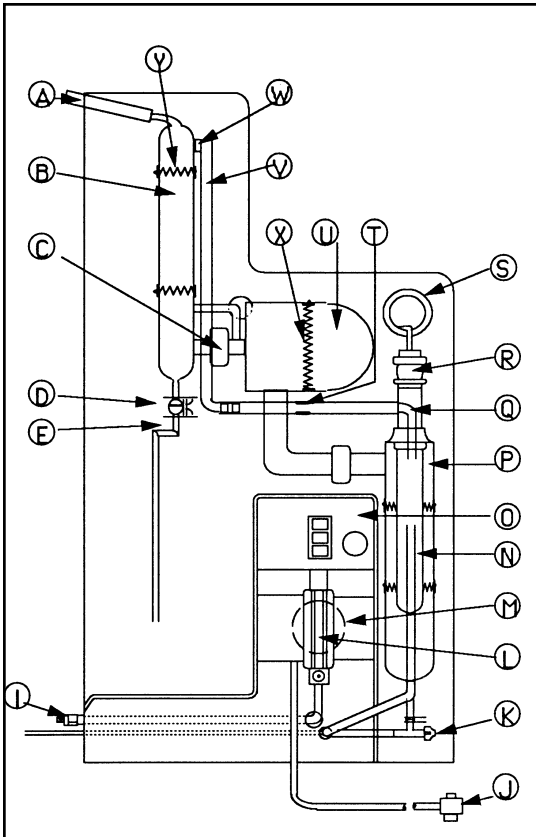


Figure 4



Note

Refer to the **Pretreated Boiler Feed** section if you will be using a source of pretreated water as boiler feed or to the **3 1/2 Gallon Storage Bottle** section if the optional 3 1/2 gallon storage bottle is being installed. If neither applies, move assembled still to its final location. See pg. 14 for layout recommendations, and pgs. 12-14 for plumbing details.

7. Insert the immersion heaters into the top openings of boiler (P) as shown in Figure 4.
8. Thread the heater plugs and cords through the large hole above the boiler (P), then back through the hole below the control box (O). Plug the heater plugs into the receptacles on the bottom of the control box. The plug is a twist-lock type and requires a 1/4 clockwise turn to lock in place.
9. Route the water supply and the drain tubing through the side of the cabinet.

Pretreated Boiler Feed

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

1. Remove boiler fill tubes (V) and (Q) and set aside.
2. Locate the 3/8" I.D. x 44" long vinyl tubing and one barbed tee (1/2 x 1/2 x 3/8) in the parts box.
3. Install one end of the vinyl tubing to the top right tubulation on the condenser (B) and route the other end through the cabinet and down the back as shown in Figure 5.
4. Cut the 1/2" I.D. vinyl drain tubing and install the barbed tee fitting. Connect 3/8" I.D. vinyl tubing from the condenser to the barbed tee. Push the vinyl tubing all the way onto the tee to assure a leak free seal.

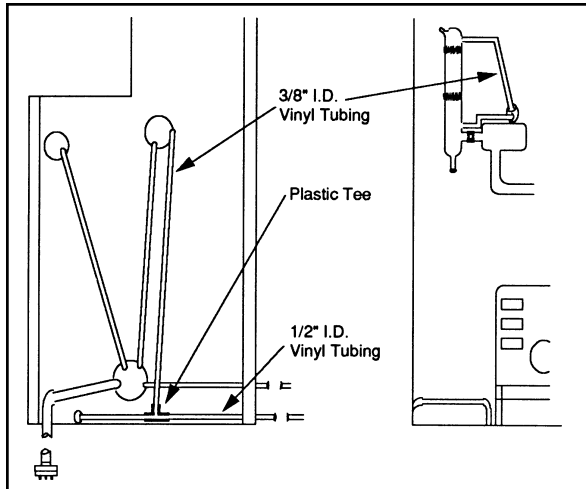


Figure 5

5. If the 3 1/2 gal. storage bottle is not being installed, move the still to its final location. See page 12 for layout recommendations and pages 10-12 for final plumbing details.

3 1/2 Gallon Storage Bottle

To install the optional 3 1/2 gallon storage bottle inside the MEGA-PURE® 6A Water Still cabinet, first locate the following parts:

- Bottle dust cover (F)
- Product delivery tube (E)
- Thomas clamp (D)
- 20" length of 1/2" vinyl tubing
- Plastic tee (1/2 X 1/2 X 1/2)

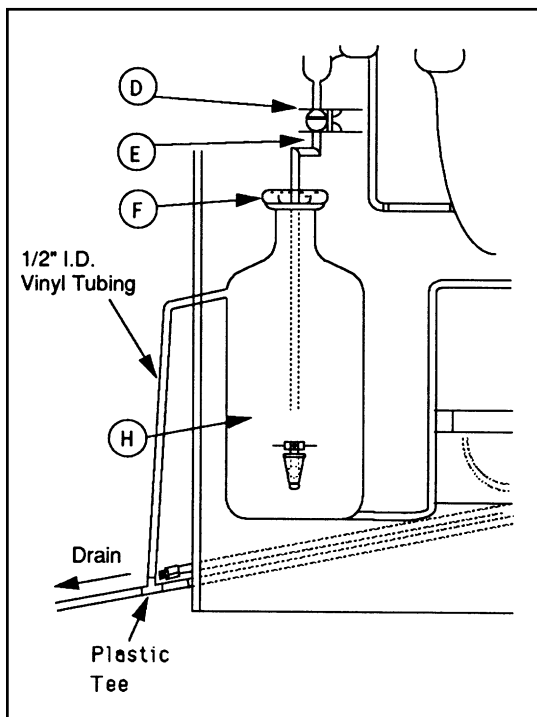


Figure 6

1. Place the bottle dust cover on the 3 1/2 gallon bottle and route the product delivery tube through the hole in the cover. Place this assembly inside the still cabinet below the condenser (B) and connect the product delivery tube to the condenser with clamp (D).
2. Locate the plastic tee (1/2 x 1/2 X 1/2) and the 20" length of 1/2" vinyl tubing in the parts box. Connect to the bottle overflow tubulation and drain as shown in Figure 6.
3. Move the still to its final location. See page 14 for layout recommendations and pages 12-14 for final plumbing details.

Plumbing Details

Automatic Collection System

Before connecting your MEGA-PURE[®] 6A Water Still to the Barnstead Automatic Collection System move the still to its final location.

Locate ACS tube (Z) and Thomas clamp (D) in the parts box. Assemble to the tubing from the collection system as shown in Figure 10.

Plug the input jack from the ACS into the ACS receptacle on the bottom of the still control box (O). See pages 12-14 for final plumbing details.

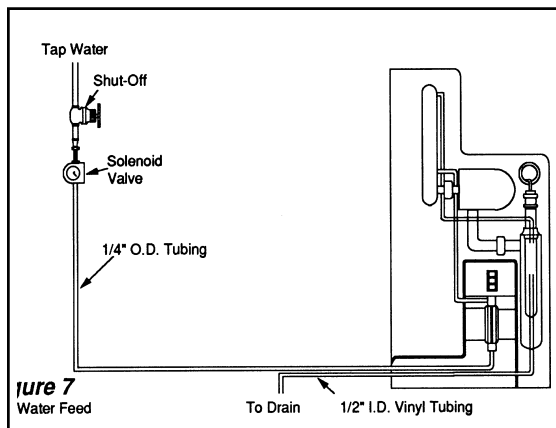


Figure 7
Tap Water Feed

Plumbing Details

Tap water feed only - Figure 7

1. Thread the solenoid valve onto the customer supplied shut-off, "in" side towards shut-off.
2. Install 1/4" O.D. tubing and supplied fitting to "out" side of solenoid valve.
3. Route 1/2" I.D. vinyl tubing to an atmospherically vented drain.
4. Plug the solenoid valve power cord (not shown) into the receptacle in the control box (O).

Tap water/Demineralizer - Figure 8

(Must have the optional still adapter kit: catalog no. 440376).

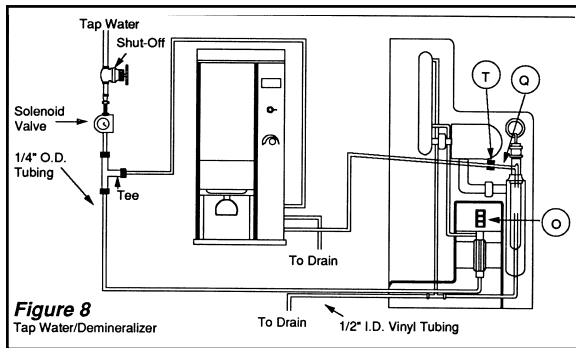


Figure 8
Tap Water Demineralizer

1. Thread the solenoid valve ("in" side towards shut-off) onto the customer supplied shut-off.
2. Install 1/4" O.D. tubing and the supplied fitting to the "out" side of the solenoid valve.
3. Cut the 1/4" O.D. tubing from the last step at a convenient point and install the tee from the still adapter kit.
4. Connect the 1/4" O.D. tubing from the demineralizer to the tee.
5. Locate the boiler fill tube (Q). Connect 3/8" I.D. vinyl tubing from the demineralizer output to the end of the boiler fill tube. Route as shown and install clip (T) to support.
6. Route the 1/2" I.D. vinyl tubing to an atmospherically vented drain.
7. Plug the solenoid valve power cord (not shown) into the receptacle in the control box (O).
8. Plug the still adapter kit cable into the receptacle located on the right side of the demineralizer and the receptacle in the control box (O).

Installation

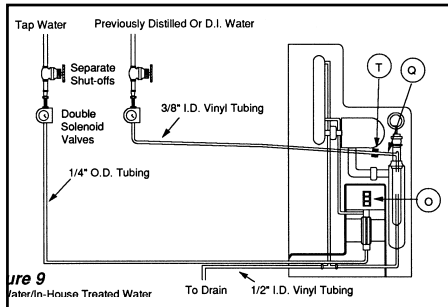


Figure 9
Tap Water/In-House Treated Water

Tap water/In-House Treated Water - Fig. 9

(Must have the optional double solenoid valves:
Catalog No. 440236)

1. Thread the solenoid valves (“in” side towards shut-off) onto the customer supplied shut-offs.
2. Install 1/4" O.D. tubing and the supplied fitting to the “out” side of the solenoid on the tap water.
3. Connect the fitting and 3/8" I.D. vinyl tubing from the double solenoid valve kit to the “out” side of the treated water supply.
4. Locate boiler fill tube (Q). Connect 3/8" I.D. tubing from the treated water supply solenoid to the end of the boiler fill tube. Route as shown and install clip (T) to support.
5. Route 1/2" I.D. vinyl tubing to an atmospherically vented drain.
6. Plug the solenoid valve power cord (not shown) into the receptacle in the control box (O).



Warning

Do not mount your MEGA-PURE[®] 6A 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.

Installation

Location of Unit

Space allotment for a still should include a 6" clearance at the sides and top to allow for cover removal and air circulation.



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 110 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.

Wall mounting

The MEGA-PURE® 6A 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. Barnstead 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 above).



Caution

Replace front protective cover before proceeding.

Bench mounting

No special consideration for a "still only" setup. When used with the ACS, the MEGA-PURE® 6A Water Still must be placed on a 12" platform to allow for gravity feed of distilled water to the ACS.

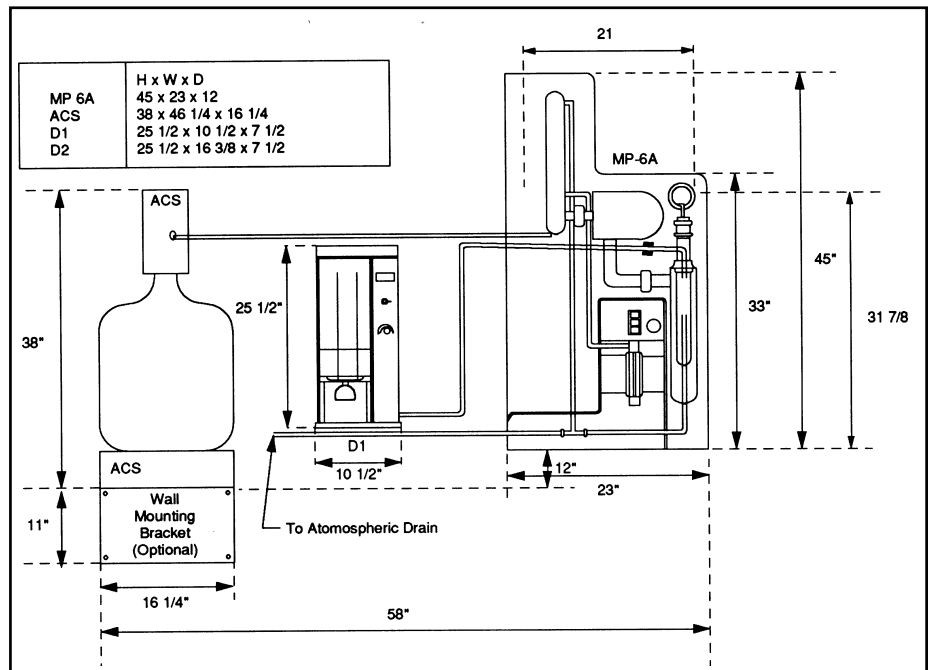


Figure 10

Operation



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



Hot Surface

Avoid Contact. Hot water and steam heat the glass portions of the still to dangerous temperatures during operation.



Note

Pretreated feedwater-flow rate to be adjusted so as to “just maintain a full boiler”. Too fast a flowwater will exhaust pretreatment cartridges prematurely.

Operation

Refer to Figure 11:

1. Close the drain stopcock (K) on the bottom of the boiler (P).
2. Open the valve at the tap water source and the treated water source if so installed.
3. Switch on the main power breaker on the control at the customer power source.
4. Push “Water” switch on control box (O) and allow boiler to fill. Set Flowmeter (L) to approximately 15 Gal/Hr.
5. Push “OPERATE” switch. Light will light and heaters will come on.
6. Allow the still to operate for 15-20 minutes. For distillate at maximum purity, set the flowmeter (L) at 11-12 GPH. For maximum volume of distillate, increase flow at flowmeter (L) to the point where only a slight wisp of steam is visible at the condenser vent (A).
7. Your MEGA-PURE® 6A Water Still should now be operational. Run the still for 4-5 hours to allow it to cleanse itself before collecting water for use. (Dispose of the water produced during the 4-5 hour cleansing period.)
8. To shut your water still off, push the OFF switch. This will shut the water supply and the heaters off.

**Note**

Under most feedwater conditions, the 11-12 GPH flow rate will provide greater than 60°C at the condenser vent. Very cold feedwater may require slightly less than 11-12 GPH to maintain vent temperature above 60°C. To optimize product water purity, use thermometer to verify vent temperature to > 60°C.

**Caution**

Do not use the flowmeter to turn the water off.

**Caution**

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

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.

High Temperature Cut-off Switch

Your MEGA-PURE[®] 6A Water Still is protected against overheating by dual thermal switches located in the brackets at the sides of the boiler. Should the boiler overheat, a switch will open causing the heaters 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” and “OPERATE” switches to restore normal operation. Check the boiler occasionally for proper water level.

Maintenance and Servicing



Warning

To avoid electrical shock, always disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel. For continued protection against possible fire hazard, replace fuses only with the same type and rating of fuse.



Warning

Ensure adequate ventilation when using chemicals for cleaning. Wear eye and hand protection when using acid for cleaning, as acid spattering may occur.

Maintenance and Servicing

Cleaning

For top performance and efficiency, the MEGA-PURE® 6A 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. This is done as follows:

1. Push the unit's "OFF" switch.
2. Disconnect the output tubing at the condenser (B) from the collection vessel and temporarily place a beaker under the condenser outlet.
3. Drain the boiler 2/3 by opening the stopcock (K). Close the stopcock (K) after the boiler has drained.
4. Use the spare pinch clamp from the parts box to shut-off the overflow tube from the constant level chamber (N) as close as possible to the overflow stem.
5. Carefully pour approximately 400 ml. of 10% hydrochloric acid solution into the top of the constant level chamber (N). May need to add water to boiler to bring solution level up to scale level.
6. Wait approximately 10 minutes or until the residue disappears. If additional cleaning is required, drain the boiler

down 1 inch and turn the unit on for a few minutes until the residue disappears. **Do not boil.** Turn still off. If scale remains that the 10% hydrochloric solution will not remove, rinse boiler three times with feedwater (fill and drain). Add 400 ml of 6% NaOH to boiler and let stand for 30 minutes. Flush boiler several times after draining.

7. Carefully drain the unit, remove the clamp from the overflow tube and refill with fresh water. Drain the boiler, refill with fresh water and operate for 30 minutes. Reconnect the tubing from the collection vessel to the condenser (B).

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 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	<p>Short life on Vycor® immersion heaters can usually be attributed to use of water pretreated with NaCl regenerated water softeners or excessive scale build-up.</p> <p>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.</p> <p>Scale build-up will occur when boiler feed is not being deionized.</p>	<p>If softened water must be used, heater life can be prolonged somewhat by draining boiler every day.</p> <p>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.</p>
Steam at Condenser Vent	A slight wisp of steam exiting at the 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 (L).

General (cont.)

Problem	Causes	Solution
No steam at Condenser Vent		If no steam is visible, decrease flow rate at flowmeter (L).
Water pressure variations	Pressure fluctuations in your tap water line will cause erratic reading 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.
Output less than 6 liters/hour	Heaters rated 208V or 240V will produce in excess of 6/hr. of a 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 the jacks from the still control box and attempt to run the still. If still fails see **Still Troubleshooting**. If still runs, go 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 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 High voltage.	Check heater (19Ω for 208V or 22Ω for 240V) and replace. Check input voltage against heater rating. Correct.
Unit off, but water still flowing.	Solenoid valve installed backwards.	Solenoid labeled "in" on input side. Check.

TROUBLESHOOTING

Demineralizer

Problem	Causes	Solution
Still will not operate.	Cartridge expended. Red light burned out. Relay contacts open. No power.	Change cartridge. Check light and replace. If operational, clean contacts. If not, replace. Check fuse.
No green light.	Green light burned out.	Check and replace. Check ohm rating of light on circuit board.
Still on with red light on demineralizer.	Relay contacts closed. Input jack not plugged in.	Check and replace. Check and reconnect.
Both lights on, 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. Switch not working. Input jack not plugged in.	Remove level control cover and free-up. Replace switch. Check and reconnect.

Replacement Parts



Warning

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

Item	Description	Part No.
	Glass Replacement Parts	
E	Product Delivery Tube	401185
P	Boiler	401375
U	Steam Tap	401376
B	Condenser	401377
V	Boiler Fill Tube (Condenser to Connector)	401378
Q	Boiler Fill Tube (Connector to Boiler)	401379
Z	Auto Connection System (ACS) Tube	410915
F	Bottle Dust Cover	413935
R	VYCOR Immersion Heater, 240V-2500W	740883
R	VYCOR Immersion Heater, 208V-2500W	740895
K	Drain Stopcock Assembly	410038
	Electrical Replacement Parts	
—	Hi-Temp Cut-Off Switch (2 req)	410137
—	Fuse, KTK, 30A-600V	410167
—	Bridge Rectifier	410471
—	Fuse .5A	FXZ16
—	Transformer	410472
R-1	Relay	410473
R-2 and 3	Relay	410474
—	Water and Operate Switches	410916
—	Power Off Switch	410917
J	Solenoid Valve Assembly	440093
O	Electrical Control Box Complete	410168
—	30 Amp Fuse Holder	927391
—	DI & ACS Jack Assembly	CE675X1A

REPLACEMENT PARTS

Item	Description	Part No.
	Hardware Replacement Parts	
W	Teflon® Glass Connector, 7/16" I.D.	401416
C	Drainline Coupling, 2"	409171
	Hi-Pressure Tubing, 1/4" O.D. x 5" long	410126
D	#18 Thomas Clamp	410141
L	Flowmeter	400485
—	Plastic "Tube Fitting" Assortment	410447
X	Boiler and Trap Springs	410528
Y	Condenser Springs	410918
T	Boiler Fill Tube Clip	410921
	Optional Accessories	
H	3-1/2 Gallon (Manual) Storage Bottle	413934
—	Double Solenoid Valve Assembly	440236
Z	Drain Assembly O-Ring	GSX29

Schematic Diagrams

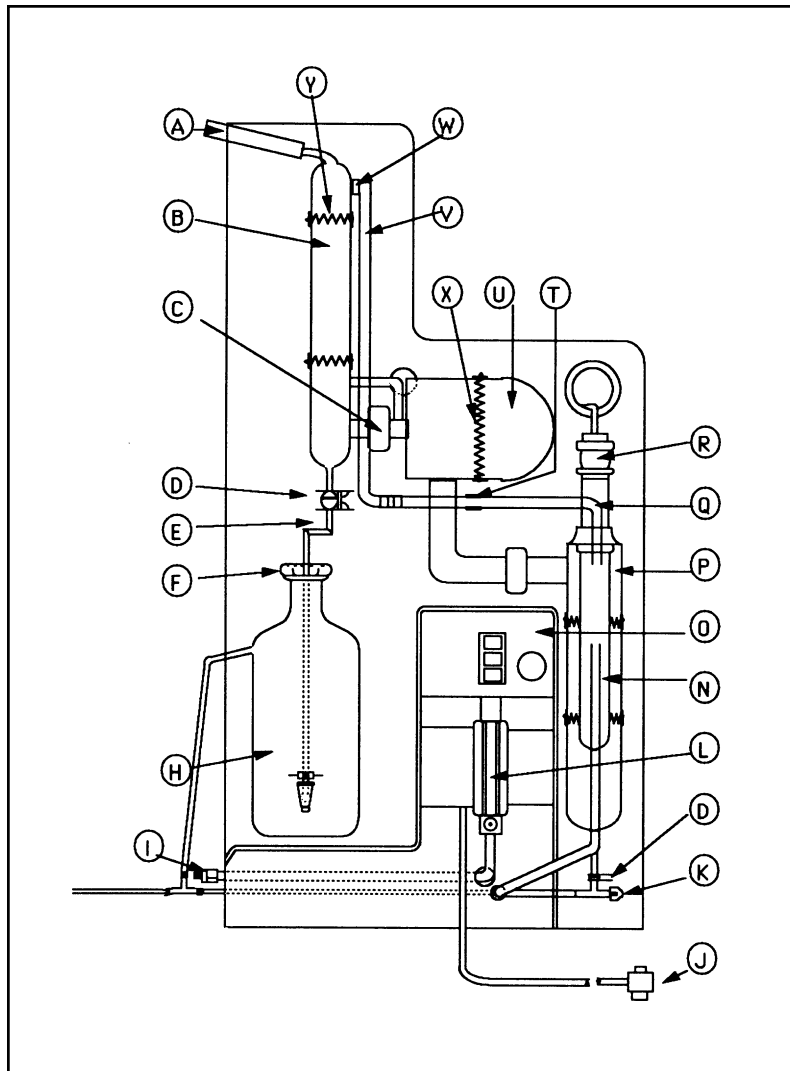


Figure 11
Still Schematic

SCHEMATIC DIAGRAMS

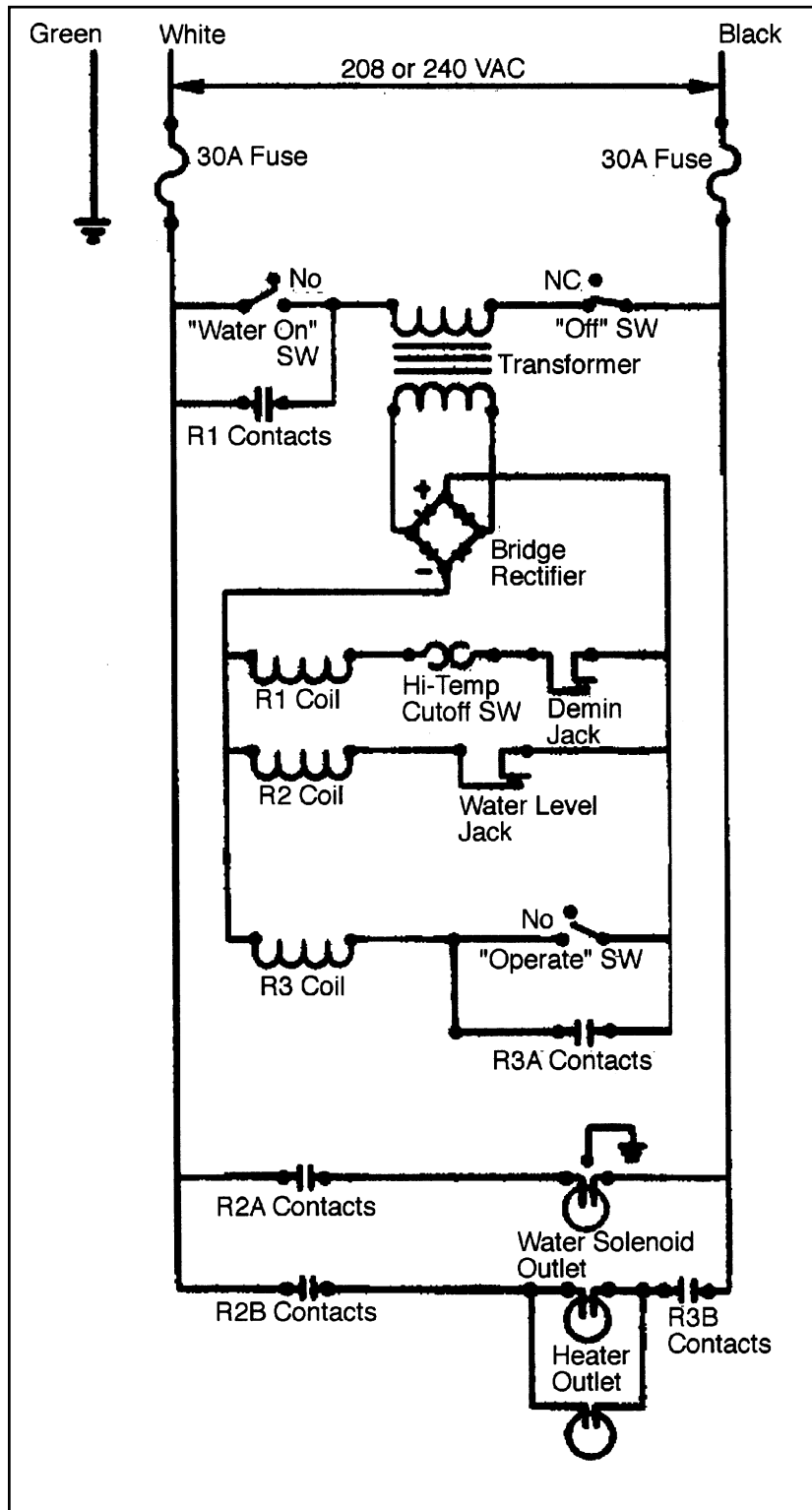


Figure 12
Wiring Diagram

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 **Barnstead Thermolyne** dealer from whom you purchased this unit or can be obtained promptly from the factory. When service or replacement parts are needed we ask that you check first with your dealer. If the dealer cannot handle your request, then contact our Customer Service Department at 563-556-2241 or 800-553-0039.

Prior to returning any materials to **Barnstead Thermolyne Corp.**, please contact our Customer Service Department for a "Return Goods Authorization" number (RGA). Material Returned without an RGA number will be returned.

One Year Limited Warranty

Barnstead|Thermolyne Corporation (“BARNSTEAD”) warrants that if a product manufactured by Barnstead shall be free of defects in materials and workmanship for one (1) year from the first to occur of (i) the date the product is sold by BARNSTEAD or (ii) the date the product is purchased by the original retail customer (the “Commencement Date”). Except as expressly stated above, BARNSTEAD MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of BARNSTEAD must perform all warranty inspections. In the event of a defect covered by BARNSTEAD’s warranty, BARNSTEAD shall, as its sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold by BARNSTEAD within the continental United States or Canada, BARNSTEAD shall provide provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

BARNSTEAD’s warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than BARNSTEAD or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of BARNSTEAD.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the BARNSTEAD factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, BARNSTEAD will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to BARNSTEAD’s factory, it shall be sent prepaid and a prior written authorization from BARNSTEAD assigning a Return Goods Number to the product or part shall be obtained.

IN NO EVENT SHALL BARNSTEAD BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

The name of the authorized Barnstead|Thermolyne dealer nearest you may be obtained by calling 1-800-446-6060 (563-556-2241) or writing to:

Barnstead|Thermolyne

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P.O. Box 797
Dubuque, IA 52004-0797
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