

INSTRUCTIONS
DURASTILL Fan-Cooled Electric Water Distiller

MODEL 30 H, J & 46 A, C

Durastill, Inc.

Fan-Cooled Electric Water Distiller Model 30H,J & 46A,C

Congratulations on your purchase of one of the world's finest water distillers. Durastill, Inc. was a pioneer in the development of the fan-cooled water distiller. Durastill, Inc. has manufactured thousands of distillers since 1970 and is proud of the quality of its product.

Distillers consists of an all stainless steel evaporator tank, stainless steel cabinet, stainless steel float, and an Incoloy (stainless steel) heating element. The condensing coils are stainless steel with steel fins. Several safety mechanisms have been incorporated for your safety and the preservation of the unit. With proper usage there is no reason why this sturdy unit could not be operated indefinitely.

HOW IT WORKS:

The purification process by its very nature will not only kill bacteria by the boiling temperature involved in the evaporator tank, but leaves the dead remains of bacteria in the boiler residue along with the minerals and pollutants in the original raw water. This residue is discarded by draining the evaporator tank occasionally. The steam which moves up and into the condenser coils will be essentially pure water vapor and this is what is condensed to become distilled water.

CAUTION:

Operate this distiller only from a properly grounded 120 volt A.C. current limited outlet. Failure to do this may result in fire or cause bodily harm.

Do not plug in the automatic distiller until the inlet water supply has been installed and turned on.

Never repair or adjust distiller while it is plugged into line current. Read instructions before operation of distiller.

LOCATION OF UNIT:

Due to the transfer of heat from the steam during the condensation process, the Model 46 distiller will release approximately 5,120 BTU's of heat (3413 BTU/Hr for the Model 30) to the surrounding air per hour of operation. This requires the unit to be placed so that the heat may be adequately dissipated, ventilated, or used beneficially. A high temperature of the surrounding air will result in a reduced condensing capacity of the distiller and may result in a steamy output of distilled water.

BEFORE OPERATING UNIT:

1. Unpack distiller. Be sure to remove all packaging materials from inside evaporator tank and around float. Examine all packaging for parts packages.
2. Unpack and assemble water storage tank and stand unit if also used. Some storage tanks do not require the legs to be on distiller (see Storage Tank and Stand Instructions). Remove all packaging material and see that float switch unit is in place on storage tank. Place distiller on top of stand.

If storage tank is not used, screw plastic legs onto distiller.

3. For automatic distillers, hook up water line to distiller using installation kit provided. If PRE 6 filter is used install at this time (See filter instructions). The plastic tubing should be connected to the brass fitting located on the back of distiller. Be sure to use the brass tube inserts when connecting plastic tubing with compression fittings.
4. Connect the distiller water output to PST 6 filter if used (See filter instructions), or connect directly to water storage tank. If distiller is to be operated as a manual fill, the flexible tubing provided with the distiller may be used to connect a bottle or other user supplied container to the distiller water output tube. The container must be able to hold at least 7 liters (1.9 gallons) of distilled water. This is the maximum amount that can be distilled per batch.

Smaller batches of water can be produced manually by first letting the distiller produce water until the low water shuts it off. Then adding equal amounts of water to the distiller to be distilled. (Example pour one-half (1/2) Gallon of water in to get one-half gallon of distilled water out.)

When connecting the flexible tubing to the distiller, use the hose clamp provided in order to prevent the accidental disconnection of the tubing during distiller operation. When the Durastill's Storage Tank is used, use the filler tube supplied. All DURASTILL automatic fill distillers are recommended to be used with an automatic DURASTILL storage unit.

5. Distiller should be level in order for the float to operate properly.
6. Turn on water. To operate distiller manually, fill the evaporator tank with water no higher than the maximum level indicated on the float arm gauge. DO NOT OVER FILL! (See Figure 3)
7. If Durastill water storage tank is used with a Durastill distiller, plug distiller into receptacle on the float control box of the storage tank. This connection controls the operation of the distiller by means of a float switch which senses the water level in storage tank.

NOTE: Operation of a distiller is controlled automatically by a float switch located on Durastill water storage tanks. If a storage tank other than one manufactured by Durastill, Inc. is used, be sure that same type of water level control device is used on the storage tank to prevent overflow.

8. Plug distiller (if storage tank is not used) or plug the storage tank (if used) into properly grounded 120 volt A.C. 60 Hz current limited power source (receptacle N.E.M.A. 5-15R). Turn all toggle switches to the ON position.
For automatic distillers, the evaporator tank should now begin to fill with water. Observe the first filling to be sure that the water flow stops before the water level is 4-1/2 inches from top of the tank. If the water flow fails to stop then unplug the unit to determine cause of trouble before proceeding. (See troubleshooting guide).
9. Fasten the evaporator lid. Check for leaks.
10. Sterilize unit before first operation. (See sterilization procedure under Maintenance).
11. For automatic operation the fan switch and automatic fill switch should be turned to ON. For manual operation, the fan switch should be ON and the automatic fill switch (automatic distillers only) should be OFF.
12. The distiller is now ready for operation.

OPERATING PROCEDURE:

Routine maintenance should be practiced to insure proper operation of distiller.

All distillers have a fan toggle switch located on the side of the distiller. This will allow for turning OFF the fan for sterilizing the unit, otherwise the fan switch should be ON.

NOTE: The fan may also be shut off (along with heating element) by an internal safety switch activated by a critically low water level in evaporator tank.

For automatic distillers, there is a second toggle switch (Automatic Fill switch). This switch allows for the turning OFF the water solenoid valve.

The automatic fill switch should be ON for continuous automatic operation of distiller (Automatic operation of water solenoid valve is controlled by an internal float switch). It may be turned to OFF for small batch production of distilled water. Approximately one to two gallons of water may be distilled in the OFF position.

NOTE: Never turn off water supply saddle valve while distiller is operating and the automatic fill switch is on. A long period of continuous operation of the water solenoid valve without the water supply may damage the solenoid.

These distillers and storage tanks are intended for use on a municipal or well water supply. **DO NOT ATTEMPT TO PURIFY WATER HEAVILY POLLUTED WITH INDUSTRIAL WASTES OR TOXIC CHEMICALS.**

MAINTENANCE

The distiller, if properly cared for, requires very little maintenance except for periodic cleaning of evaporator tank and occasional sterilization of the unit.

CLEANING EVAPORATOR:

The evaporator tank must be drained periodically to remove the concentrated minerals and other impurities which collect during the distillation process. The drain valve located on the side of this unit is used solely for this purpose. Always unplug the distiller when draining tank.

The frequency of cleaning depends upon the impurity content of your water supply. Drain the evaporator after every twenty (20) liters (approximately 5 gallons) of water have been produced. If no excessive scaling occurs this amount can be increased; if scaling is excessive, drain more often. Failure to clean the evaporator tank periodically will result in excessive scaling which may cause heating element failure. In addition, a large concentration of residue may cause a foaming action to occur within the evaporator tank. Eventually the foam will rise to the level of the condenser tubing and contaminate the output.

Only food grade chemical cleaners should be used to remove scale from tank and heating element. Be sure the tank is rinsed thoroughly after cleaning and it is wise to discard the first batch of water after such cleaning. It also is recommended that a food grade cleaner such as STILL CLEAN be used to prevent damage to the heating element and gasket materials.

STERILIZING PROCEDURE:

It is suggested that the distiller be sterilized at the beginning of operation and occasionally thereafter.

To sterilize unit, turn fan switch to OFF. Allow steam to be generated into a separate container for approximately thirty minutes. (Do not allow steam to enter into the storage tank unless it is also being sterilized). This steam will sterilize the system. Remember to turn fan switch back to ON after sterilization cycle.

TRUBLE-SHOOTING GUIDE

NOTE: All distillers have a safety switch that will shut off the heating element and the fan when the water level becomes too low. For automatic distillers, a second float switch regulates the ON/OFF operation of the water solenoid valve. These switches are preset at the factory and should require no adjustment.

TROUBLE-SHOOTING GUIDE (Continued)

PROBLEM: Distiller does not operate (neither fan nor heating element works).

- CAUSE:**
- A. Line current (120 Volt A.C.) is off or unit is not plugged in.
 - B. Thermostat button needs to be reset. Distiller must be cooled down before thermal switch can be reset.

NOTE: Anytime the thermal protective switch needs resetting this indicates that the float switch mechanism may need adjustment.

- C. Water level inside evaporator is too low. (Tank needs refilling.)
- D. Storage tank is full (if DURASTILL storage tank with float switch is used.)
- E. Float switch mechanism (if DURASTILL storage tank is used) is functioning improperly.

PROBLEM: Fan does not operate automatically.

- CAUSE:**
- A. Fan switch is turned OFF.
 - B. Water level inside evaporator is too low.
 - C. Fan motor is bad. (Steam will be produced through condenser coils).

PROBLEM: Fan operates yet no water is produced.

- CAUSE:**
- A. Heating element is bad.
 - B. Water in the evaporator is not boiling. Whenever the evaporator is filled (either manually or automatically), there is a short time required to heat the new water to boiling temperature.

PROBLEM: Evaporator tank will not fill with water automatically. (automatic distillers only)

- CAUSE:**
- A. Automatic fill switch is turned off.
 - B. There is no water pressure at water solenoid valve inlet. (Make sure saddle valve is turned on. Check for kinks in plastic tubing).
 - C. Float inside evaporator tank is stuck.
 - D. Float switch mechanism is incorrectly set.*
 - E. Water solenoid valve is damaged.
 - F. Water line pressure at inlet is more than 70 psi.

PROBLEM: Water solenoid valve will not shut off automatically. (automatic distillers only)

- CAUSE:**
- A. Float inside evaporator tank is stuck.
 - B. Float switch mechanism is incorrectly set.*
 - C. Water solenoid valve is damaged.
 - D. Water line pressure at inlet is less than 10 psi.

* Refer to float switch adjustment instructions.

Float Switch Adjustment Instructions

(FOR QUALIFIED SERVICE PERSONNEL ONLY)

The float switch mechanisms are located on the front of the evaporator tank behind the front panel. All distillers have a float switch to control the heating element and fan. Automatic distillers have a second float switch to control the water flow into the evaporator. These switches are activated by the float stem. The float must rest freely on the surface of water in order to properly activate these switches.

The switches are preset at the factory and generally require no further adjustment. Switches will require adjustment when replaced or possibly after replacement of the float. The following procedure is recommended in the event that adjustment is required.

BOTTOM SWITCH ADJUSTMENT (All distillers):

The bottom switch, S2, is a safety device that disconnects the heating elements and fan if the water level inside the evaporator tank becomes too low. The following steps are recommended for setting this switch:

1. UNPLUG distiller from electrical source.
2. Fill evaporator tank to minimum level of operation (recommended at 3 inches from bottom of evaporator tank).
3. Loosen the two mounting screws of the bottom microswitch, S2.
4. Rotate this switch fully clockwise.
5. Slowly rotate switch counter-clockwise until a "click" is heard. (If difficulty is encountered during this step then major adjustment of microswitch may be required as outlined below).
6. Tighten the mounting screws while being careful not to alter the position of the microswitch.
7. Check for proper setting by pulling float upward until first "click" is heard (heating elements and fan turn-on level); now slowly release float downward while listening for second "click" (heating elements and fan turn-off level). The second "click" should occur at approximately the preset water level. If the switch does not "click" at this level then repeat steps 3 through 7 until acceptable.

TOP SWITCH ADJUSTMENT (Automatic distillers only):

The top microswitch, S3, determines the water levels at which the water inlet solenoid valve turns on (low level) and turns off (full).

The following steps are recommended for setting this switch.

1. UNPLUG distiller from electrical source.
2. Fill evaporator tank to maximum desired level of operation (recommended at 4 1/2 inches from bottom of evaporator tank).
3. Loosen the two mounting screws of top microswitch, S3.
4. Rotate switch fully counter-clockwise.
5. Slowly rotate switch clockwise until a "click" is heard. (If difficulty is encountered during this step then major adjustment of microswitch may be required as outlined below).
6. Tighten the mounting screws while being careful not to alter the position of the microswitch.
7. Check for proper setting by pushing float downward until first "click" is heard (water turn-on level); now slowly release float upward while listening for second "click" (water turn-off level). Second "click" should occur at approximately the preset water level. If the switch does not "click" at this level then repeat steps 3 through 7 until acceptable.

NOTE: It is necessary that the water solenoid turn-on level is above the heating element and fan turn-off level. This allows the evaporator to fill with water automatically before the distiller shuts off. A simple method to check this setting is to pull float upward to top of evaporator tank. Now slowly release float and listen for the clicks. The top microswitch S3 must click before the bottom microswitch S2.

MAJOR ADJUSTMENT OF MICROSWITCH:

Occasionally it is necessary to perform a major adjustment on the microswitch if the switch is unable to be rotated far enough to allow proper setting. This adjustment is performed by bending the lever arm of the microswitch. It is recommended that the lever arm be held stationary near the plastic hinge to prevent breaking of the plastic. A needlenose pliers is ideal for this operation.

If S2 needs more counter-clockwise rotation or if S3 needs more clock-wise rotation, bend lever toward switch body. If S2 needs more clockwise rotation or if S3 needs more counter-clockwise rotation bend lever away from switch body. After a major adjustment, set the switch as indicated in switch adjustment instructions.

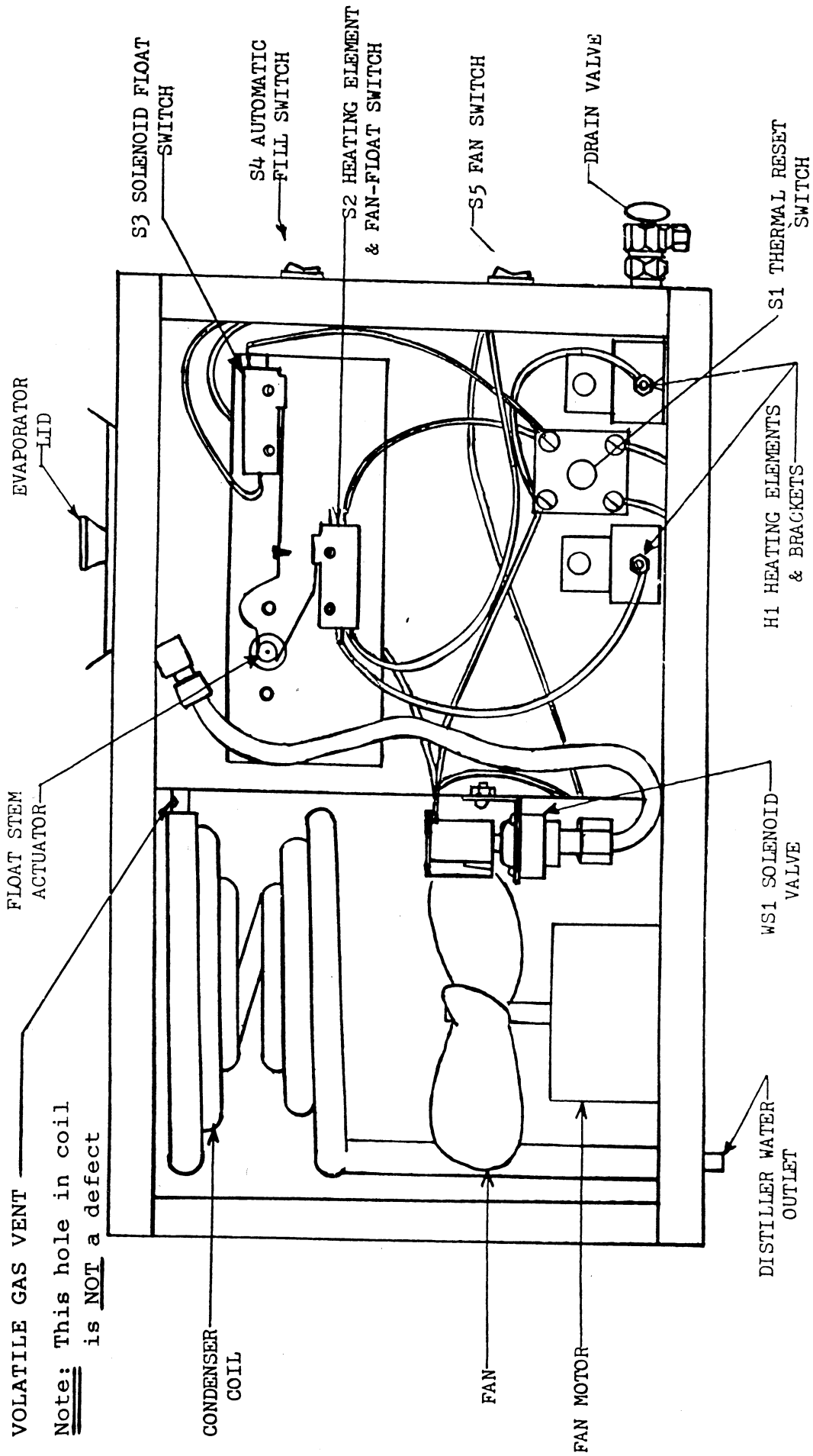


FIGURE 1

NOTICE: Wash and rinse the storage tank to remove any residue from shipping packaging before placing the tank into service

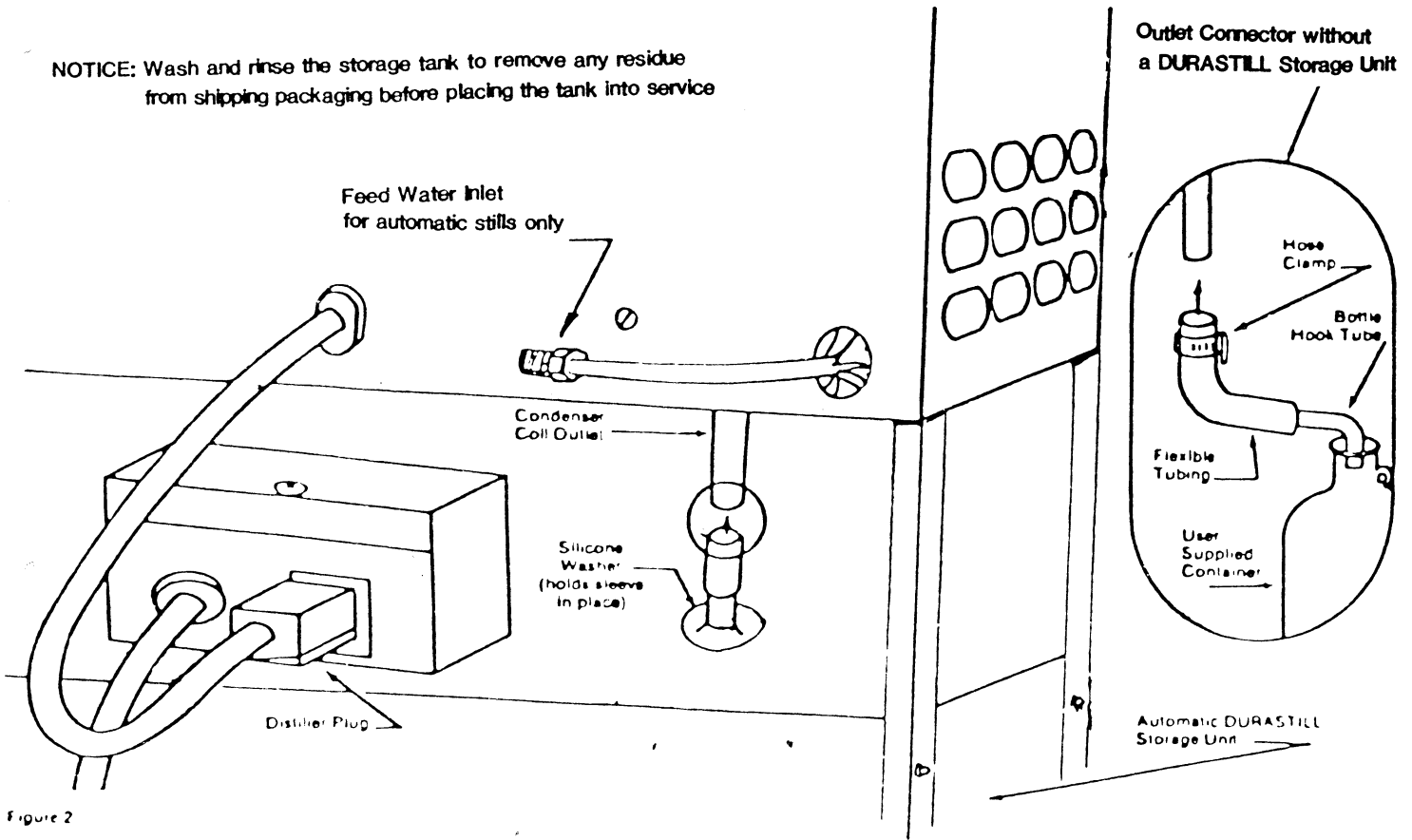


Figure 2

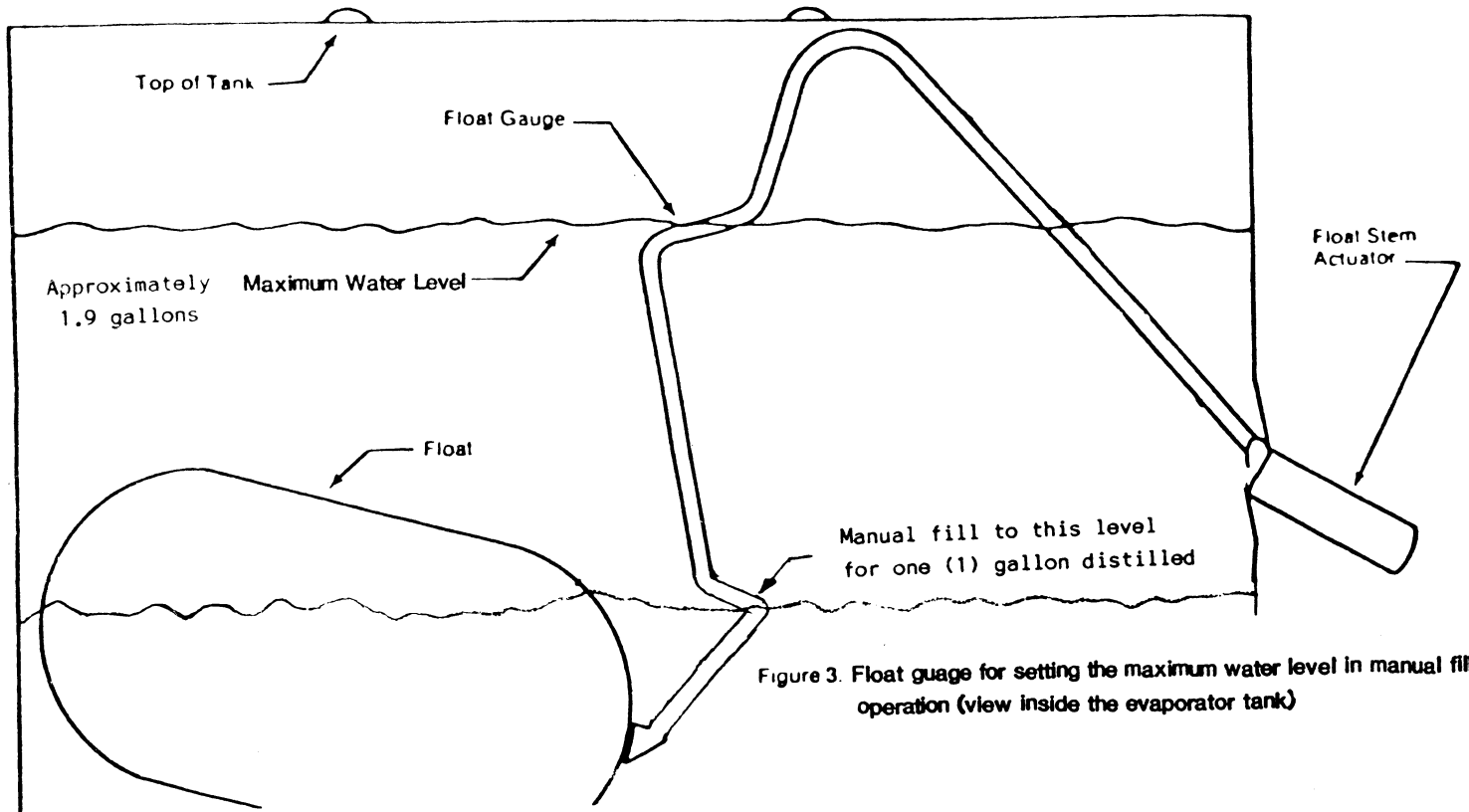
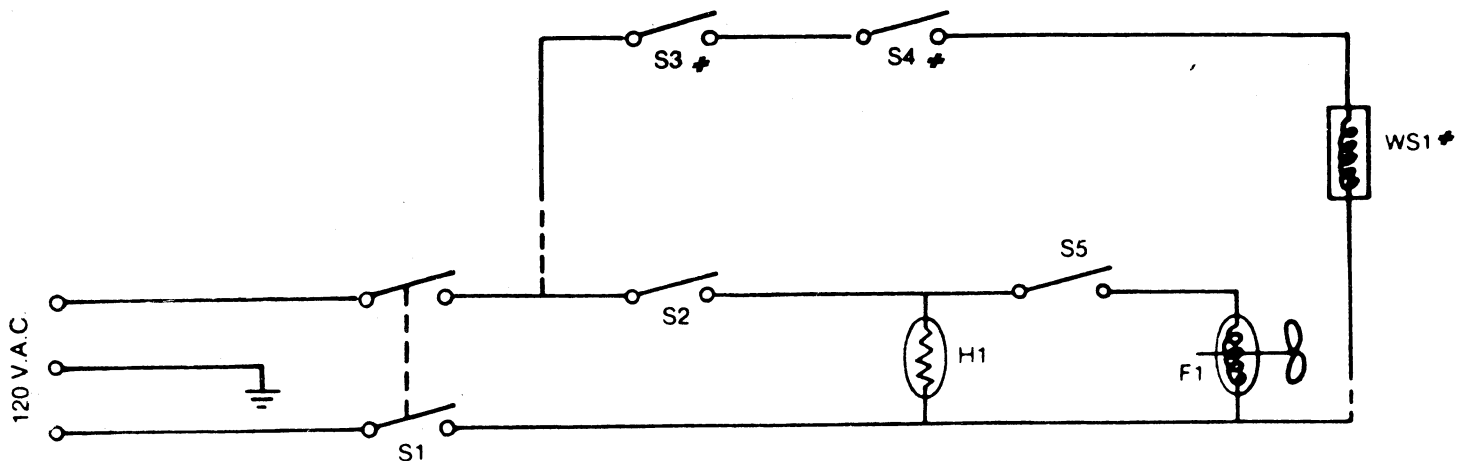


Figure 3. Float gauge for setting the maximum water level in manual fill operation (view inside the evaporator tank)

ELECTRICAL SCHEMATIC



- S1 -- Thermal Reset Switch (Thermo-Disc)
- S2 -- Heating Element Float Switch (Cherry E-14)
- ✦ S3 -- Water Solenoid Valve Float Switch (Cherry E-13)
- ✦ S4 -- Automatic Fill Toggle Switch (Leviton 1720-5)
- S5 -- Fan Toggle Switch (Leviton 1720-5)

- ✦ WS1 -- Water Inlet Solenoid Valve (Horton)
- H1 -- Heating Element 1500 Watt (**Model 46**)
- F1 -- Fan & Motor
- H1- Heating Element 1000 Watt (Model 30)**

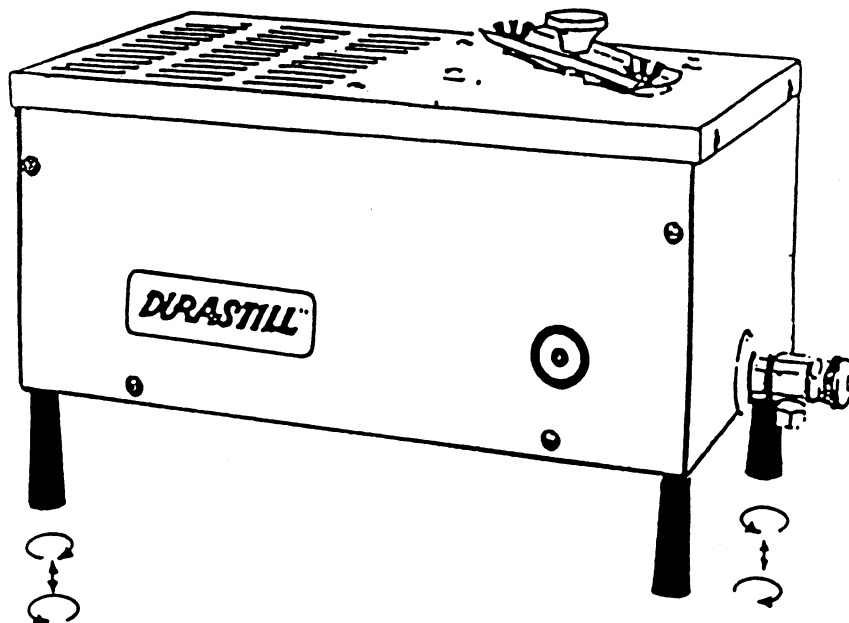
✦ Automatic Distillers Only

POWER CORD NOTICE

A short power supply cord is used with this distiller to reduce the risks resulting from becoming entangled in or tripping over a longer cord. An extension cord may be used if care is exercised in its use. If an extension cord is used, the marked electrical rating of the extension cord must be at least as great as the electrical rating of this distiller. The extension cord is to be a grounding type, three-wire cord and is to be arranged so that it will not drape over the countertop or table where it can be pulled on by children or tripped over unintentionally.

NOTICE

The physiological effects of the operation of this appliance and the optional carbon filters, beneficial or otherwise, have not been investigated by Underwriters Laboratories.



Distillers operate properly when condenser coil has a constant downhill slope. To level distiller on uneven surfaces, unscrew one or two legs at opposite corners to achieve proper height and stability.