

Pure Water C-50 Steam-Distillation System Owners Manual



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REPLACEMENT PARTS LIST C-50

<u>Part Number</u>	<u>Description</u>
7079	Neon Indicator Light, Red
31950A.....	LED, Red
31951A.....	LED, Green
31952A.....	LED, Yellow
7227	Momentary Water Switch
7221	Function Switch
7228	Main Switch
7234	1-1/2" Probe—Storage Tank
7235	11-1/2" Probe—Boiling Tank
7254	Water Inlet Solenoid
9589	Activated Carbon Cartridge
9654B.....	Heating Element, 240V, 2500W
9654	Heating Element, 240V, 3000W
9658	Heating Element, 240V, 3500W
9668	Heating Element, 208V, 4000W
9654A.....	Heating Element, 240V, 4500W
9660C	C-50/C-60 Control Board, 120V
9661	Contact Relay
31519C	Demand Pump Assembly
31503A.....	Fan Assembly
31569A.....	Condensing Coil Assembly
31570C	Boiling Tank Assembly
219-0049.....	2 Amp Primary 240V Fuse
229-0076.....	2 Amp Secondary 110V Fuse
219-0235.....	1.25 Amp Time Delay 240V Fuse (fan)

INSTALLATION, SERVICE AND MAINTANANCE IS TO BE PERFORMED BY QUALIFIED PROFESSIONALS ONLY

To monitor machine performance and facilitate troubleshooting the C-50:

The boiling tank has a plug which can be removed and in its place a screw-in pressure gauge can be installed. The pressure gauge is available from Pure Water.

The normal boiling tank operating pressure is 2-4 psi. If the operating pressure exceeds 4 psi, the condenser may not be operating as designed and the following items should be checked.

- 1) Is the blower operating at full speed continuously?
- 2) Is the blower clean?
- 3) Is the system blocked or restricted?

If any of these conditions are not met, the pressure in the boiling tank is likely to be higher than designed and the cause should be corrected.

A wiring diagram is shown on the inside door of the C-50 to assist in electrical troubleshooting.

INTRODUCTION

DISTILLATION: Contaminated water in the boiling tank is turned into steam by the energy from the electrical heating elements. Contaminants remain in the tank, while pure water vapor (steam) is driven off and condensed back into water in the condenser.

These contaminants become concentrated in the boiling tank and should be manually drained twice daily. This helps ensure maximum purity of the distilled water, and reduces the need to chemical clean the boiling tank.

The large activated carbon post filter incorporated into the distiller design compliments the distillation process. This must be replaced monthly for top results.

This distiller needs to be connected to an electrical source and a water supply. It is the responsibility of the person or company who is having the appliance installed to ensure that the installation complies with local and national ordinances.

Model and serial number can be found on the back panel of the C-50.

You should record model, serial number and purchase date below for future reference.

Model _____
 Serial Number _____
 Purchase Date _____

The unit has been designed and constructed by a pioneer company in the commercial distillation market. This product has been thoroughly tested in the laboratory, and field tested under a variety of conditions. Due to the wide variation of water contamination and the conditions of use which are beyond the control of Pure Water, it is the responsibility of the user to ensure the distilled water produced meets the requirements for intended use.

PLEASE READ ALL INSTRUCTIONS THOROUGHLY BEFORE OPERATING YOUR NEW UNIT.

- 1) It is important to complete the enclosed warranty card and return it within 10 days. This information is required should you ever need parts or repairs for your unit.
- 2) Your distiller has been tested at the factory to ensure proper unit operation. Therefore, it may have a water ring inside the boiling tank.
- 3) The boiling tank has been Heliarc welded, and as you distill water, the mineral contaminants may cause discoloration along welded seams. The tank is fabricated from type 304 stainless steel and the appearance of the seams should not be a matter of concern.
- 4) DO NOT subject your unit to misuse or abuse. This will void the warranty.

INSTALLATION

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To install this equipment you will need:

- 1) A qualified professional electrician to wire the unit into a 240 volt power source.
- 2) An appliance hose to connect the unit to the supply water line or a "Universal Hook-up Kit".
- 3) A 1/2"OD food-grade plastic hose for delivery of the distilled water to the point-of-use.

Additional considerations:

- You may need to vent the exhaust heat from the distiller outside the room or building. It is recommended that a local ventilation contractor be consulted.
- To minimize cleaning of the boiling tank, we recommend that a water softener be used. This is essential in hard water areas.

Design of the Dispensing System:

The internal pump is designed to give a maximum flow of 3 gpm. If water is to be drawn from the downstream side of the pump at a slow rate (less than 1 gpm), it is necessary to install a bladder tank downstream of the pump in order to stop the pump from cycling rapidly. Such cycling will quickly destroy the pump and motor.

VENTILATION

Because of the quantity of heated air generated from condensing the steam during the distillation process, the unit needs to be well ventilated. Since air is drawn into the bottom of the unit, a 3 inch air gap on all four sides is recommended, thus requiring a 31" x 38" floor space. The distiller should preferably be vented outside the room or building through an external wall or ceiling. Room ventilation must be adequate to keep surrounding air temperature below 90°F (32°C).

A professional air conditioning/ventilation contractor should be consulted if a ducting system is needed for venting the heated air from the distiller. Air flow through the distiller is designed for 350 cfm (cubic feet per minute) with an operating exhaust temperature of approximately 110° F. Parts for a ventilation system can be readily fabricated by a ventilation contractor.

WARNING:

Restricting air flow to less than 350 cfm may decrease the production rate of your distiller and may result in damage.

TROUBLESHOOTING

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This distiller has been thoroughly tested and operated successfully at the plant before being shipped. However, should any problems arise in the operation of your C-50 distiller, please contact Pure Water.

In the event that the distiller does not operate or is not operating properly as described in Figure 5, check the following according to the installation instructions.

- 1) Power Supply
- 2) Water Supply
- 3) Ventilation

PERMISSIBLE LIGHT COMBINATIONS

POWER	WATER IN	HEAT	FULL	MED	LOW	PURITY ALERT	OPERATING STATUS
							Power to controls and demand pump is turned OFF.
■			■	■	■		Storage tank is full and the distiller is shut down.
■	■			■	■		Feedwater is being added to the boiling tank. Normally ON for 2 seconds and OFF for 2.5-3 minutes. After boiling tank has been drained, it will be ON for about 50 seconds.
■		■		■	■		Distiller is operating. Distilled water may stop for 30 seconds after water fill cycle.
■		■		■	■		
■	■			■	■	■	MALFUNCTION Water in the storage tank has high conductivity. The demand pump will not operate. Shut down and check operation. See Troubleshooting section.
■			■	■	■	■	
■				■	■	■	
■	■			■	■	■	
■							Storage tank has less than 2 gallons left. Demand pump and purity light will not work.
■							

■ indicates light is ON

Figure 5

CLEANING THE CONDENSER/SQUIRREL CAGE BLOWER

(Yearly)

It is recommended that at least once a year the condenser be removed and cleaned. While the assembly is removed, the blower motor should be lubricated with 2 drops of light oil.

To remove the condenser/blower assembly:

- 1) Disconnect the C-50 from the electrical source.
- 2) Remove the top of the distiller by removing the sheet metal screws. Set the top of the distiller where it won't be stepped on or damaged.
- 3) The door will require to be supported as the top hinge is on the top panel.
- 4) Remove the boiling tank—condenser tubing from the condenser.
- 5) Remove the condenser—storage tank tubing from the condenser.
- 6) Remove the four nuts and lock washers securing the condenser into the blower assembly and lift out the radiator/condenser. The assembly is now accessible for cleaning. Remove any build-up of dirt and lint from the blower impeller. This can be readily accessed from the top of the machine.

To clean the radiator, either vacuum the dirt from the surface or blow with compressed air.

To install the assembly, reverse the above steps.

EXTERIOR PANELS

Clean the exterior steel panels with stainless steel polish available from Pure Water. The use of solvents is not recommended as they are likely to remove lettering from decals.

ELECTRICAL

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The unit operates off 240 volts and should be electrically connected by a qualified professional electrician.

The C-50 must be hard-wired into a 30A electrical supply circuit. For safety reasons, a service disconnect must be installed in the hard-wired service line. If the voltage at your location is less than 240V, then have the qualified professional electrician provide circuitry for a system that uses 7,000 Watts at your given voltage.

The circuit should be protected by a 30 amp fast blow fuse or a 30 amp circuit breaker. An electrical terminal block is located at the back of the distiller.

The C-50 is designed to produce up to 50 gallons of distilled water per day depending on supplied voltage. The unit is equipped with a volt meter to allow you to determine the actual voltage on which the unit is operating. If less than 240 volts are available at the unit, the distiller will produce proportionately less water. To compensate for the various voltages available around the world, this unit is equipped with two heating elements.

If less than 240 volts are available at the unit, contact Pure Water as minor modifications may be necessary to get optimum performance.

CAUTION:

BEFORE REMOVING ANY PANELS, ISOLATE THE UNIT BY TURNING OFF THE DISCONNECT. THE MAIN SWITCH DOES NOT COMPLETELY ISOLATE THE UNIT FROM THE POWER SOURCE.

The Main Power Switch on the unit turns off the functionality of the unit, but does not disconnect the power supply. Before servicing the unit, disconnect the power supply at the wall or building electrical panel.

PLUMBING CONNECTIONS

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Plumbing is required for the feed water and the distilled water lines. Inlet/Outlet connections are located on the back of the distiller (see figure 1).

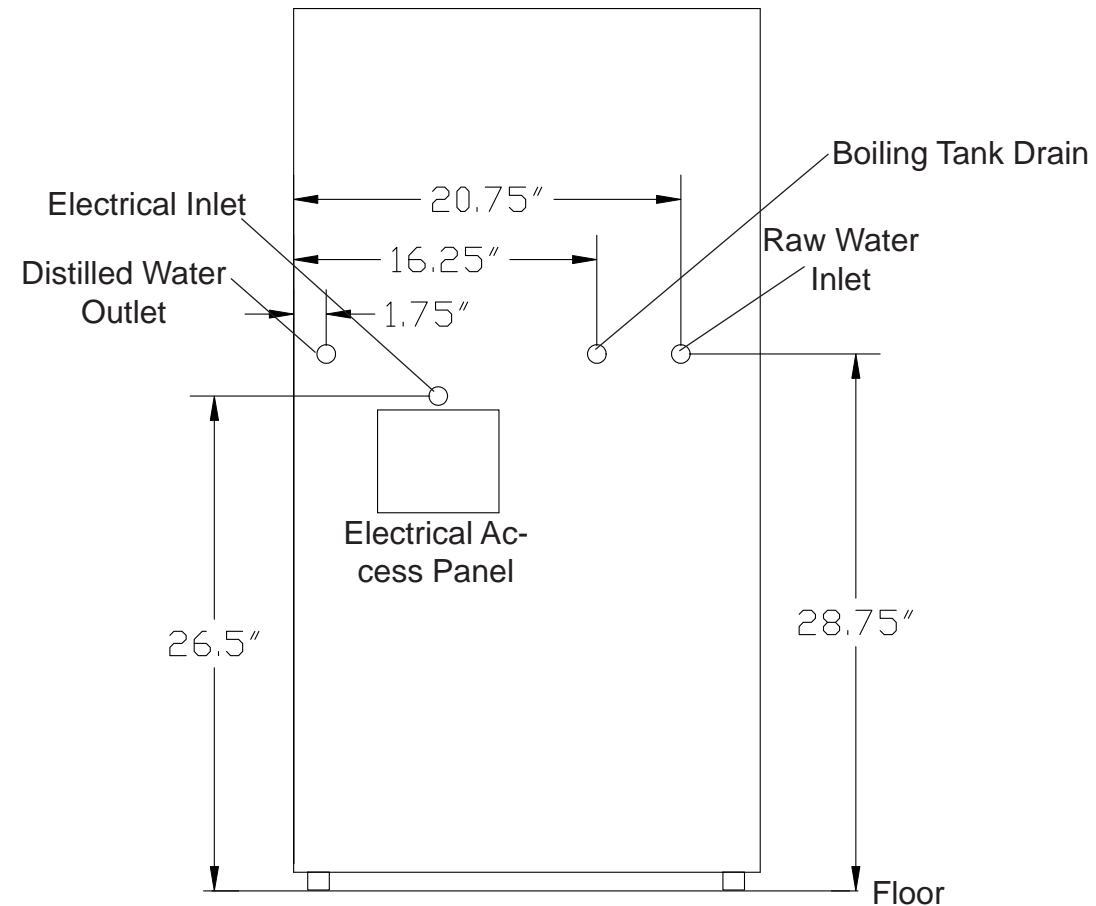


Figure 1

Feedwater Hook-Up:

Water must be fed to the distiller from a valve in the feed water supply line. To connect the distiller to the valve, use an appliance hose, available in 4 to 8 foot lengths from a local appliance dealer, or use the "Universal Hook-up Kit" available from Pure Water.

1. Attach one end of the appliance hose to the valve on the feed water supply line. Attach the other end to the "WATER IN" connection on the back of the distiller.
2. Turn on the water supply and check for leaks.

INSPECTING AND CLEANING THE BOILING TANK

(monthly)

Using a flashlight, inspect the boiling tank monthly for any build-up of sediment. If any bridging of the sediment on to the heating elements, scaling of the side walls or bottom of the boiling tank or collection of loose sediment occur, it is critical that the tank be cleaned with boiling tank cleaner to remove the build-up of sediment. See the instructions below.

Inspect the boiling tank level probe for mineral build-up also. The cleaning procedure below should be used to remove the mineral build-up.

Proper cleaning is important. Improper cleaning may shorten the life of the unit and particularly that of the heating elements. Proper cleaning can reduce the concentration of chemicals, pollutants and other materials from building up in the bottom of the boiling tank.

Your unit should be cleaned whenever there is a noticeable amount of mineral build-up around the outside of the heating elements. The frequency of cleaning will vary from one area of the country to another, depending upon the mineral content in the water and how much water has been distilled. Any loose material is best removed by a wet/dry vacuum cleaner.

For bound-on scale, we suggest that you use a solution of industrial grade cleaner, which may be purchased through Pure Water.

Use the following procedures for chemically cleaning the boiling tank:

- a) Turn the Power Switch OFF and manually drain the water in the boiling tank.
- b) After the unit has cooled, remove the boiling tank lid. Turn the Function Switch to the CLEAN position.
- c) Turn the Power Switch ON.
- d) Add water up to approximately 4 inches above the bottom of the boiling tank probe by depressing the Water Switch.
- e) Add the boiling tank cleaner following the directions on the package. (The amount of cleaner may need to be increased depending upon the severity of mineral deposits in your boiling tank.) At this point, there are approximately 4-1/2 gallons of water in the boiling tank.
- f) Mix well.
- g) Let the solution stand overnight or until the mineral content softens.

CAUTION: UNDER NO CIRCUMSTANCES SHOULD THE CLEANING SOLUTION BE HEATED AND RUN THROUGH A STEAM STERILIZATION OR DISTILLATION CYCLE. MAKE SURE THE FUNCTION SWITCH IS IN THE CLEAN POSITION.

- h) The next morning, turn the Power Switch OFF and manually drain the boiling tank. Turn the Power Switch back ON. Use the Water Switch to momentarily fill the boiling tank to rinse the residue from the tank. Repeat these steps several times to thoroughly rinse out all residue.
- i) Replace the boiling tank lid and turn the Power Switch ON. Turn the Function Switch to DISTILL. The C-50/C-60 distiller is back in operation.

To easily reinstall the “O” ring into the groove, simply wipe the “O” ring clean with a clean cloth, then lubricate the “O” ring with a very light coating of white petroleum jelly (Vaseline®, for example), place in the groove and with two fingers wipe the “O” ring down into the groove. The “O” ring is a full fit in the groove and care must be taken to see that the wiping down operation assures a properly seated “O” ring.

Do not wipe the “O” ring clean of lubricant after it has been properly seated, because the lubricant prevents “crawling” of the “O” ring during the tightening of the cap. An “O” ring which is not properly lubricated could cause leakage.

Screw the housing onto the cap and hand tighten. Turn on the distiller and depress the pressure button. When all air has escaped from the filter, open a faucet down stream to vent any air from the distilled water line. Fully rinse loose carbon from the cartridge by running approximately two gallons through the distilled water line system with the cartridge installed. Check a sample of water to see that no carbon is being dispensed by the filter after rinsing.

WARNING: The filter must be protected against freezing. Failure to do so may result in cracking of the filter and water leakage.

BOILING TANK CLEANING SWITCHES

Boiling tank cleaning switches are located on the side panel of the electrical box located inside the distiller. They are to be used in the cleaning operation of the boiling tank. Their functions are shown in Figure 4.

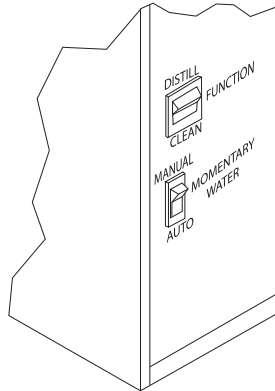


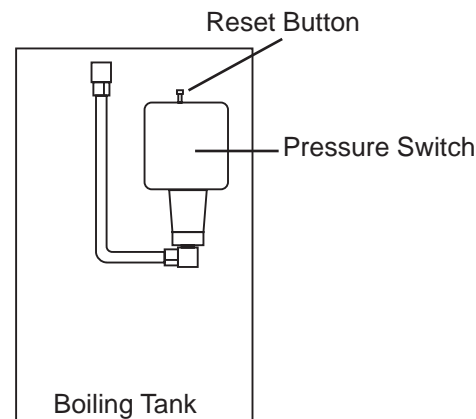
Figure 4

Boiling Tank Pressure Switch . . .

If your unit is operating and the pressure in the boiling exceeds a preset level, then the pressure switch will turn off the heating elements. The button on the top of the pressure switch must be pushed to restart the heating elements and blowers.

Possible causes of over-pressurization are:

1. Heating elements are providing too much wattage.
2. Restricted air flow from the blowers.
3. Restricted air flow through the condenser.
4. Overflow of the boiling tank.
5. Inlet solenoid valve malfunction.



Distilled Water Hook-Up:

The distilled water outlets utilize quick-connect fittings which are a simple and secure method of connecting 1/2” tubing. To release the plugs from the fittings, depress the fitting “collet” and hold while removing the plug.

Using only 1/2” food-grade plastic tubing (NEVER COPPER), connect the distilled water outlet port on the back or side of the distiller to the faucet or dispenser .

When connecting the tubing into the quick-connect fittings supplied with this unit, it’s critical the tubing be inserted fully. The tubing should insert into the fittings 1/2” - 3/4”. Failure to do so could result in the tubing being released when the line is pressurized with water.

We recommend that prior to inserting the tubing into a fitting, you mark the tubing 1/2” from the end being inserted into the fitting to ensure the tubing is fully and properly installed.

The distilled water line will require a valve since the demand pump is controlled by the distilled water line pressure in normal operation mode. Turn the main switch of the distiller off to stop automatic operation of the demand pump.

If you need to remove the distilled water line fitting, be sure to turn the pump off and relieve line pressure before disconnecting. To release the tubing from the fitting, depress the fitting “collet” and hold while pulling on the tubing.

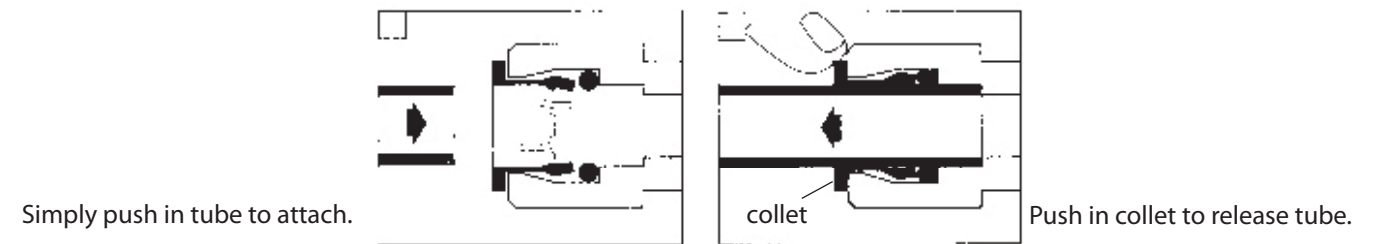


Figure 2

OPERATION

DISTILLATION

Once the power, feedwater, and distilled water connections have been completed, you can put the distiller into operation.

- 1) Turn the Power Switch ON.
- 2) Water will start to enter the boiling tank and once it reaches the desired level, the heating elements will automatically turn on. The condensing fan will run when the heating elements are energized.
- 3) Within 15 minutes, production of distilled water will begin.
- 4) Feed water should be added to the boiling tank every 2-1/2 to 3 minutes. If the cycle time between water additions is longer than 3 minutes, progressively close the valve on the feedwater supply line until the cycle time is between 2-1/2 to 3 minutes. Longer cycle times may result in decreased water production.
- 5) After 2 hours of operation, distilled water will be available from the storage tank. A faucet downstream from the storage tank will need to be turned on to bleed the distilled water line of air. Allow the unit to run until the holding tank is filled with water and the machine shuts down. This will take approximately 36 hours.

Note: The purity light may come on while distilling the first tank of water. This is normal and to be expected. Drain and discard the first tank of water produced. (If you wish to sterilize the storage tank at this time, you may use this tank of distilled water.)

STERILIZING THE STORAGE TANK

Prior to dispensing distilled water, the storage tank needs to be sterilized. Open the front panel to gain access.

WARNING: Disconnect the distiller from the power source before opening the front panel.

To sterilize the tank:

- 1) Turn Power Switch OFF and remove the filter cartridge from the filter housing.
- 2) Using method a or b below, add chlorine bleach to the storage tank full of distilled water and splash solution into the top surface of the storage tank. Follow the precautions listed on the container label.
 - a. Add 8-3/4 cups (1 liter) of chlorine bleach to make a 200 ppm chlorine solution and allow to stand for 3 hours.
 - b. Add 2-1/4 cups (250 ml) of chlorine bleach to make a 50 ppm chlorine solution and allow to stand for 24 hours.
- 3) Following the allowed standing time, turn the Power Switch ON and empty the storage tank by running the disinfecting solution through the distilled water line to a drain.
- 4) Rinse the storage tank by letting the unit fill the storage tank with distilled water and draining it again.
- 5) After the storage tank is rinsed, replace the activated charcoal filter cartridge in the filter housing. The activated carbon filter will filter out any remaining chlorine.
- 6) Unit is ready to continue operation.

Secure front panel on distiller before resuming operation.

CONTROL PANEL FUNCTIONS:

Switches and lights used in normal operation of the distiller are located on the front panel of the unit. The lights indicate the status of operation as shown below in Figure 3.

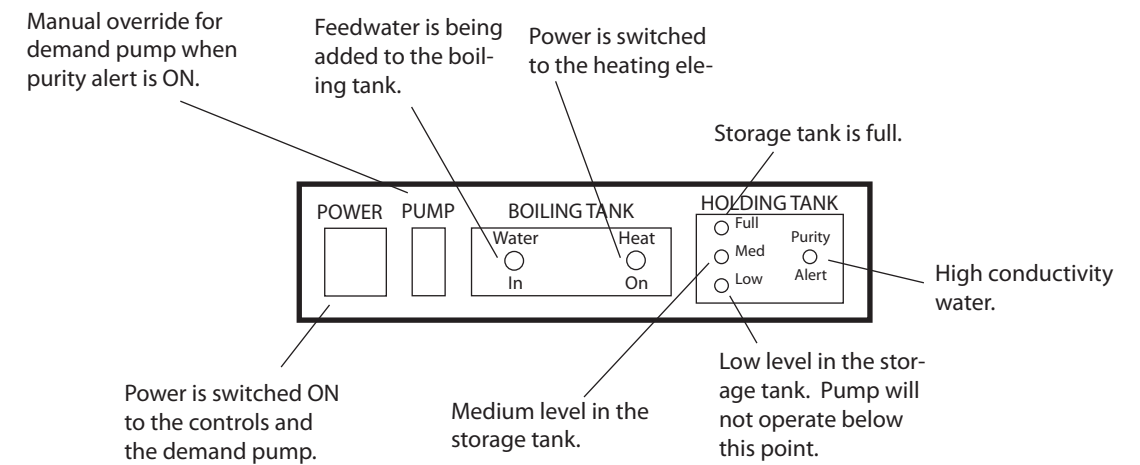


Figure 3

PERIODIC MAINTENANCE

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STERILIZING THE STORAGE TANK

(occasionally)

Follow the instructions listed under the *Operation* section on page 8. Use a new activated charcoal filter cartridge after each cleaning.

CHANGING THE FILTER CARTRIDGE

(monthly)

An activated carbon filter is installed behind the front panel down stream of the demand pump. The activated carbon filter cartridge should be changed every 30 days.

Turn the Power Switch OFF and depress the pressure release button on the filter housing to relieve pressure in the distilled water line. The distilled water line down stream from the filter housing may also need to be drained, or provide a container under the filter for water spillage.

Unscrew the housing from the cap, discard the used cartridge and insert a new cartridge. **IMPORTANT: When opening the filter housing to install or change the cartridge it is common for the "O" ring seal to lift out of the groove and, at times, it may even stick to the cap.**

The runner (Buna-N) "O" ring seal, which fits into the groove in the sump (lower housing) provides the water-tight seal between the cap and the sump when your filter is in operation. It is important that the "O" ring be properly seated in the groove in the lower housing each time the unit is reassembled or a water leak could occur through the seal.