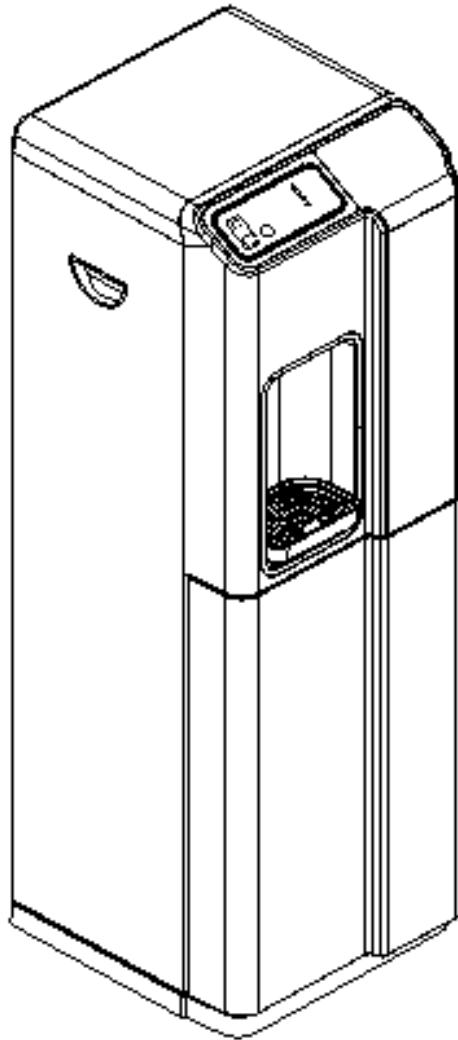


SERVICE MANUAL

for

PureWaterCooler™
by Vertex
Model PWC-1800



P/N man-7011

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PWC-1800 Cooler

1. Introduction

The PWC-1800 line of point of use coolers are designed to give years of reliable service. The cooler has 1 spigot that dispenses filtered water at 2 different temperature levels – hot and cold temperature water. The main (cold-temp) tank holds one gallon of water and is constructed of stainless steel. The cold tank can be accessed for servicing the float mechanism and for cleaning by removing the cooler main top cover (see section 4).

The hot tank is made of stainless steel and holds ½ gallon. It is important not to turn on the hot tank when there is no water in it as this will damage the heating element.

The compressor is a sealed unit and is not serviceable in the field. The compressor can be replaced by a qualified refrigeration technician with proper tools and equipment.

Please consult the factory if the compressor needs servicing.

CAUTION: *If the compressor has been stopped by switching it off or unplugging power, WAIT 10 MINUTES before turning the compressor on again. The compressor may stall and burnout if powered back on without waiting.*

The cooler makes clean water by filtration or by the reverse osmosis process. Water enters the back of the cooler and then passes through the filtration system. A feed water ball valve is located near the filters and must be turned to the on position to allow the unit to make water. Electrical power is not required for the cooler to make purified water. **CAUTION:** The carbon filtration versions of the cooler (PWC-1800F) should not be used with water hardness over 7 grains because of lime scale build up on the heating element. If hardness is higher than 7 grains, softening of the feed water is recommended or another option is to install a “phosphate” filter to the filter system.

2. Cooler Set-Up (for new cooler installation)

Feedwater/Drain Connections

-Feed Connection

2.1 Open hinged door to access filter compartment



2.2 Remove feed water plug (orange) from back of cooler.

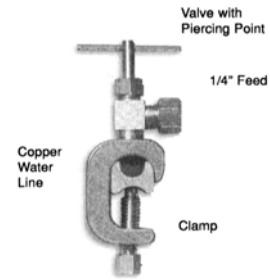


2.3 Connect supplied orange feed water tubing to feed connector on back of cooler.



2. Cooler Set-Up cont.

- 2.4 Make feed water connection to cold water line.
A self piercing saddle valve is provided.



Feedwater connection (RO & filtration coolers)

(For use on copper tubing)

Use supplied self piercing saddle valve. Connect to water inlet on cooler using 1/4" tubing. Clamp saddle valve over copper feed water line (cold water line only). Tighten needle valve until tube is pierced. Retract needle 1 -2 turns to start water flow.

- 2.5 Flushing carbon fines from carbon filter.
Most carbon filters have fine particles of carbon material in the filter that will be swept into the water stream when the first water flows through the filter. Although not harmful, these carbon fines in the water are unsightly. Flush the carbon fines out of the filter before filling cooler tanks with the following procedure.



- 2.6 Remove outlet line of carbon filter (bottom)

- 2.7 Attach 3 feet of 1/4" tubing to the carbon filter outlet port (flush tubing)

- 2.8 Place flush tubing in bucket to catch water and carbon fines.



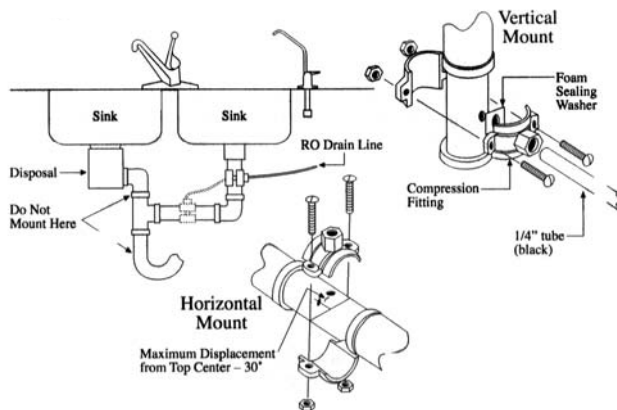
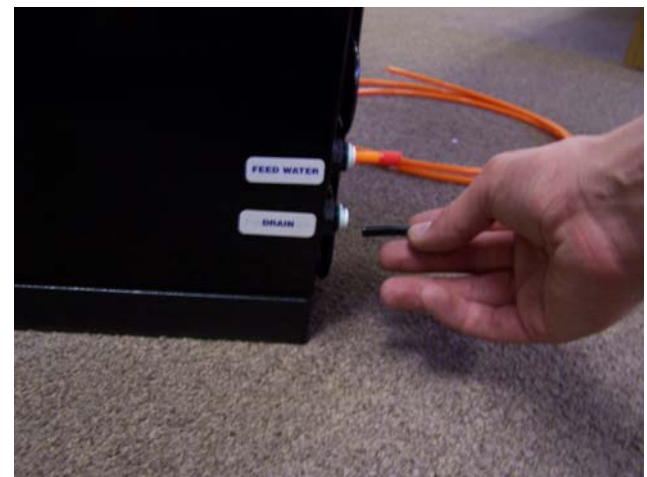
2. Cooler Set-Up cont.

- 2.9 Turn on feed water at source and turn ball valve at filter to “on” to let the water flush the filter.
- 2.10 Flush until water flows clear (1 – 2 gallons)
- 2.11 Remove flush line. Reconnect tank line to outlet of carbon filter
- 2.12 **WARNING:** Do not turn on cooler hot power until cooler tanks are full of water.



-Drain Connection

- 2.13 Drain Connection (for units equipped with RO)
- 2.14 Remove drain plug (black) from back of cooler
- 2.15 Connect supplied black water tubing to drain connector on back of cooler
- 2.16 Attach supplied drain saddle to a standard 1 ½” drain pipe see fig. 1 below



Drain saddle connection method

Drain connection required only for cooler with reverse osmosis filtration

Figure 1



RO filter set showing autovalve.
The autovalve automatically turns off the water flow when the tanks are full

3. Top Cover Removal

3.1 Remove (2) screws on back of cooler top cover



3.2 Slide cover back and up



3.3 Pop off cold tank lid using attached pull tab



3.4 Cold tank is now accessible for cleaning and servicing other parts of the cooler.

3.5 Reinstall in reverse order



4. Remove/Replace Mechanical Float Valve Assembly

4.1 First, remove top cover. See Section 3

Float Valve/Level Control



4.2 Using flathead screwdriver, pry the float from the inlet.



4.3 Remove the float.

4.4 Reinstall in reverse order



5. Removing/Replacing Hot Tank

5.1 Unplug power from wall

5.2 Drain water from cooler using front spigots and by removing rear drain plug

5.3 Remove top cover (section 3)

REMOVE FRONT PANEL:

5.4 Remove 2 top screws from front of panel

5.5 Remove 2 screws from bottom of panel.

5.6 Remove control panel by lifting back side of front panel and push on back side of control panel.



5.7 Remove control panel.



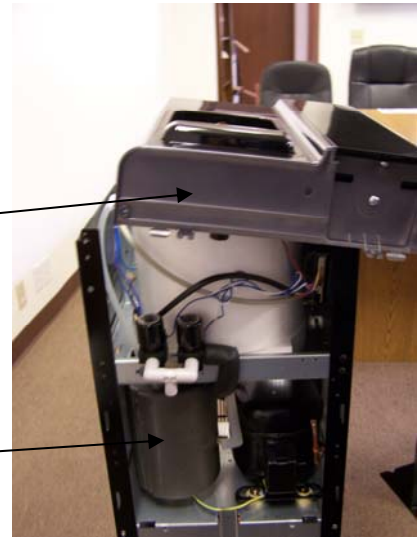
5. Removing/Replacing Hot Tank

Cont.

5.8 Pull straight up on front panel and then out to remove.



5.9 Since there are still wires connected to the control panel and front panel, place them on top of the cooler. (Make sure the panel is placed as shown in picture to make further steps easier.)



5.10 Hot tank is now accessible

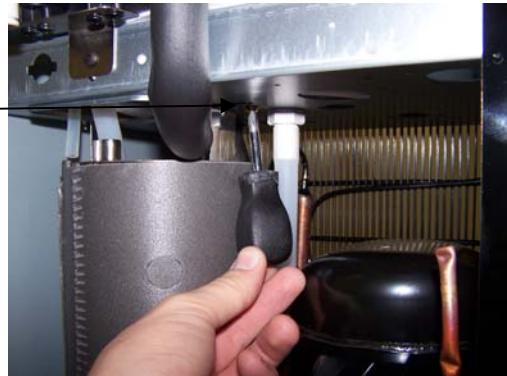
5.11 Remove silicon tubing from hot tank (4 places)



5. Removing/Replacing Hot Tank

Cont.

5.12 Remove (1) hot tank screw from below.



5.13 Remove (1) hot tank screw from above.



5.14 Pull hot tank down



5.15 Disconnect (4) electrical connectors from hot tank temperature sensors and 2 wires from bottom heating element terminals.



5.16 Hot tank can now be removed.

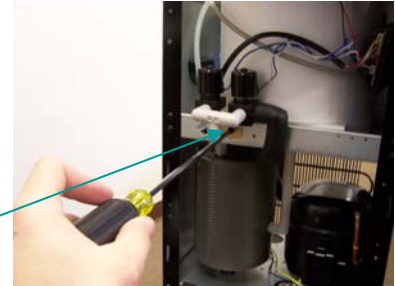
5.17 To replace the hot tank, reverse the above procedure.

6. Dispensing Solenoid – Remove/ Replace

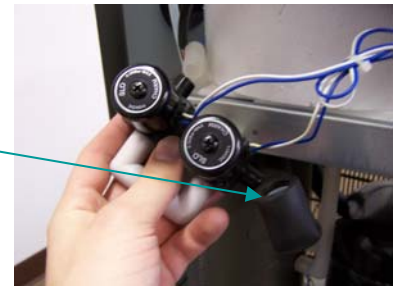
6.1 Remove top cover of cooler (section 3)

6.2 Remove control panel and front panel (as done in section 5)

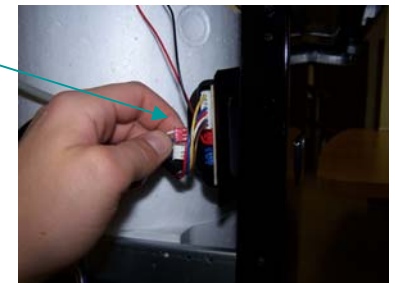
6.3 Remove (1) screw for solenoid mounting plate.



6.4 Remove (2) silicon tubes from solenoids.



6.5 Remove (2) solenoid connectors from control board.



6.6 Remove (4) mounting screws and remove mounting plate.



6.7 Slide solenoid off of manifold.



6.8 Reassemble in reverse order.

Make note of the following:

a. Water flow through the solenoid is directional. There is an arrow molded in the side of the solenoid body showing water flow direction. Make sure the solenoid is oriented correctly. Water can leak from the solenoid if not installed correctly.

b. When installing electrical connectors into the circuit board please note: the red female connector on the board connects to the red male connector (hot solenoid) and the blue female connector on the board connects to the white male connector with one blue wire (cold solenoid).

7. Circuit Board – Remove/Replace

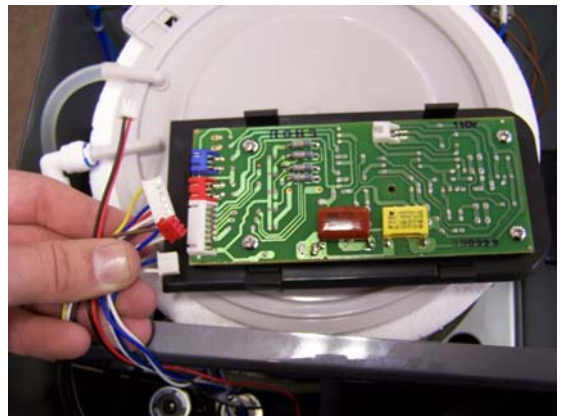
7.1 Remove the top cover (section 3)

7.2 Remove the control board (as done in section 5,
but no need to remove front panel)

7.3 Remove screw from back of control board.



7.4 Remove the (4) electrical connections from the
circuit board



7.5 Remove the (4) screws mounting the circuit
board. The circuit board is now free.



7.6 Reinstall circuit board in reverse order.

8. Hot Tank Reset Button

8.1 Observe that there are two circular sensors attached to the hot tank. The lower one is the main controller at 82 °C and the upper sensor is the over-temp cut off.

The power switch for the hot tank (at the back of the cooler) should not be turned on until water can be dispensed from the hot spigot. If the hot power is turned on without water in the hot tank the heating element will over heat. To prevent this, the upper thermal sensor on the hot tank will cut power to the heating element before any damage takes place. If this happens the switch on the thermal sensor can be reset to operational mode manually by the following procedure.

8.2 Make sure the power cord is unplugged.

8.3 From the back of the cooler, find the hot tank

8.4 Find the upper thermal sensor on the hot tank

8.5 Using a long thin object such as a screw driver or a pen, depress the small black button at the center of the upper thermal switch. You should feel a click when you depress the button. This action resets the over-temp sensor.



9. Remove/Replace Thermal Sensor

9.1 The hot tank thermal sensors are located on the outside of the hot tank. There are two thermal sensors. The sensor located lower on the hot tank controls the daily operation of the heating element. The upper thermal sensor is an overheat safety switch and cuts power to the hot tank should a malfunction occur and the tank starts to overheat.



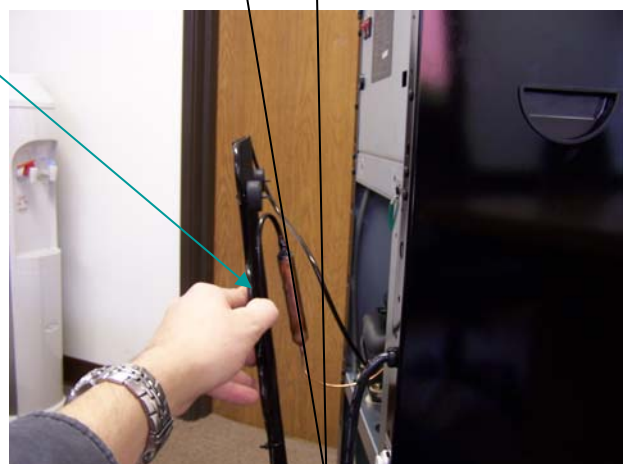
9.2 Unplug cooler from power source for this operation.

9.3 Remove (2) screws holding the upper part of the cooling grill to the cooler cabinet. Keep the rubber grommets for reassembly.



9.4 Carefully pull the cooling grill away from the cooler. The grill is still attached at the bottom. Do not move the grill more than 30 degrees away from the cooler frame or the cooling system may be damaged.

30 degrees
Max



9. Remove/Replace Thermal Sensor

Cont.

9.5 There are (2) thermal sensors attached with screws to the hot tank. The lower sensor automatically turns the heating element on and off to maintain the water at 180 °F. The upper sensor is the over temperature sensor. This sensor activates if the temperature on the tank goes over 212 °F. If this sensor is activated due to a overheat condition, it will cut the power to the heating element. If this happens, it can be reset by pressing the button at the center of the sensor.

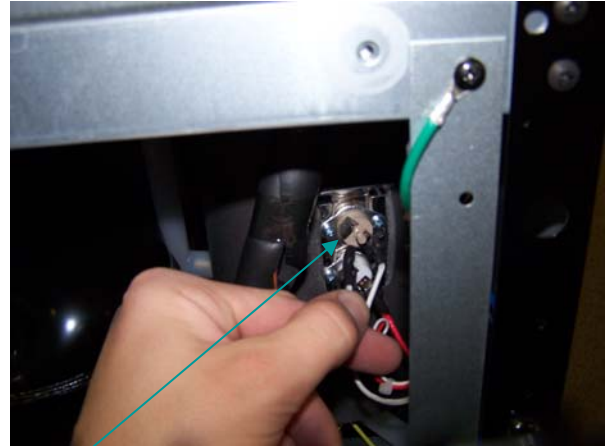
To check if either thermal sensor is good, use a continuity tester (ohm meter) to check for continuity across the thermal sensor. Make sure the thermal sensor is at ambient temperature for this test. If there is no continuity, replace the sensor.

9.6 To change either sensor, disconnect (2) electrical terminals from sensor.

9.7 Remove (2) screws holding sensor to tank.

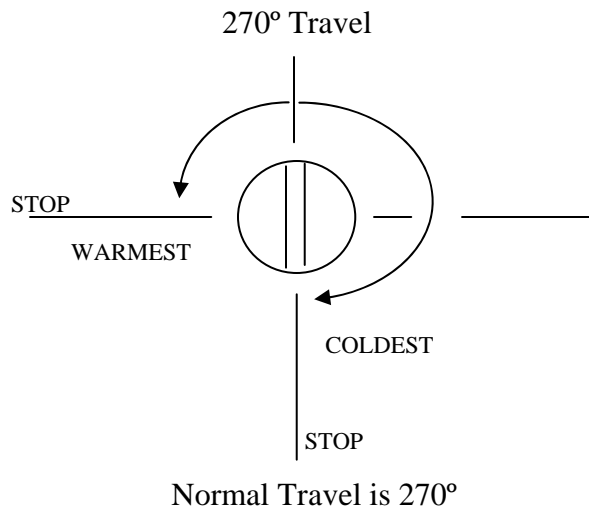
9.8 Install new thermal sensor, replace screws, reconnect electrical terminals to sensor.

9.9 Carefully relocate cooling grill to original location and re-attach using rubber grommets and screws.



10. Cold Tank Temperature Adjustment

- 10.1 The cold water temperature adjustment is located on the back of the cooler on the right side. An expansion tube senses temperature in the cold tank and open and closes the thermostat.
- 10.2 The cold adjustment is a shaft with a screw driver slot on the end.
- 10.3 To make the water colder, using a screw driver, rotate the shaft clockwise. For warmer water rotate the shaft counter clockwise. There are stops on the adjustment shaft. **DO NOT** force the control shaft over the stop. If this happens, it will be necessary to replace the temperature controller



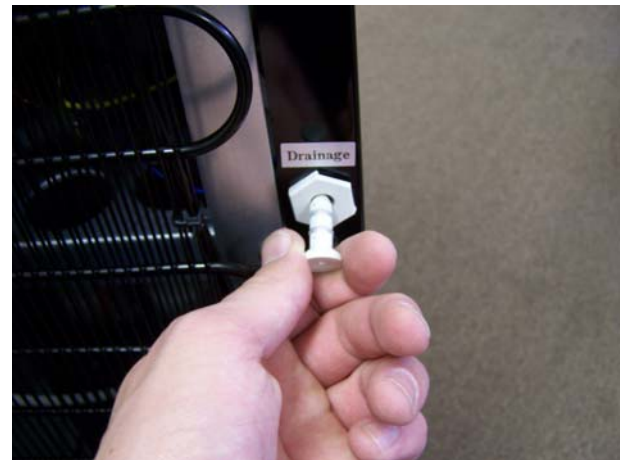
11. Draining Cooler Tanks

Completely draining the tanks is required when shipping the cooler or when one the of the tanks needs replacing. This procedure will allow you to remove all the water from the cooler.

11.1 Hot and Cold Tank Drain: Using a flat head screw driver, pry the hot tank plug out until you can grasp it with your fingers.



11.2 Remove the plug with fingers.
Water will pour from the port



11.3 Drain any remaining water in the system by depressing the faucets.

12. Remove/Replace Cold Tank Sensor

12.1 The cold tank sensor is extremely reliable and rarely needs replacing. Its function is to control the cold water temperature by turning the compressor on or off as needed.

12.2 Remove the top cover and cold tank lid (sec. 3)

12.3 Remove the front panel and control panel (as done in section 5)

12.4 Place the front panel on a nearby table and let the tank cover and control panel hang in front of the cooler so as to keep the area near the cold tank clear.

12.5 Carefully lift off the insulating foam from the cold tank

12.6 Cold tank cooling coils and sensor probe are now visible.



12. Remove/Replace Cold Tank Sensor

Cont.

12.7 Disconnect (2) wires from sensor switch



12.8 Remove (2) screws holding sensor switch body to cooler cabinet.



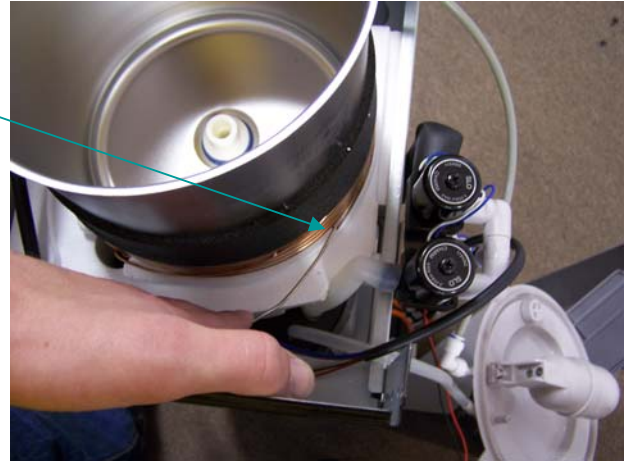
12.9 Remove cold sensor switch and sensor tube from cooler



12. Remove/Replace Cold Tank Sensor

Cont.

- 12.10 To remove the sensor tube, carefully pull the sensor out of the copper tube at the bottom outside of the cold tank



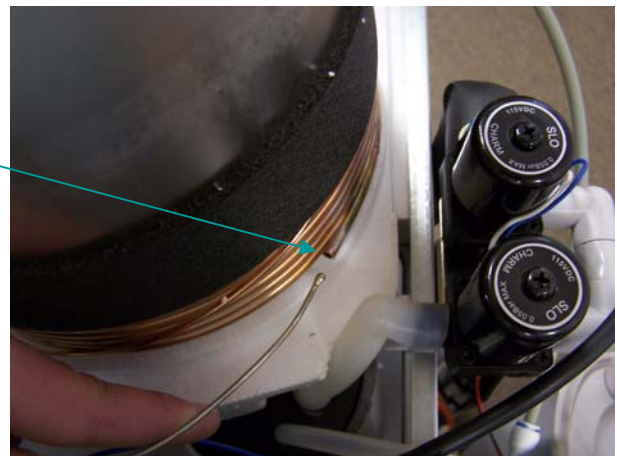
- 12.11 With new cold sensor, carefully install sensor tube into copper tube at bottom of cold tank.

- 12.12 Install the sensor switch using (2) screw to cooler cabinet.

- 12.13 Adjust sensor tube so it is routed close to the outside of the cold tank. This will allow the insulating foam to fit properly over the tank.

- 12.14 Reinstall insulating foam.

- 12.15 Reinstall remaining parts in reverse order.



13. Sanitization Procedure

The sanitization procedure is performed to reduce/eliminate any bacteriological growth in the cooler tanks and dispensing plumbing. Bacteriological growth can be the cause of some taste and odor in the water.

The procedure is as follows:

1. Mix 1 teaspoon of common household bleach (5.25%) in 2 gallons of clean water.
2. Unplug the cooler from the power source.
3. Drain all water from the cooler tanks.
4. Pour the sanitizing solution into the main (cold temperature) tank until full.
5. Open all spigots to allow sanitizing solution to fill the dispensing faucets. Close the spigots.
6. Let the sanitizing solution stand in the cooler for 10 minutes.
CAUTION: Leaving the sanitizing solution in the cooler for more than 10 minutes can cause taste problems in the water.
7. Completely drain the sanitizing solution from all the tanks per section 10
8. Fill the main (cold temp.) tank with clear tap water to rinse out the sanitizing solution.
9. Completely empty the rinse water from the tanks.
10. The cooler is now sanitized and ready for filling with filtered water.

14. Trouble Shooting

Water not cold from cold tank

(Water dispenses from spigot but is not cold)

| <u>Possible causes</u> | <u>Solution</u> |
|------------------------------------|---|
| 1. Power switch not on | Make sure cold power switch on the back panel is on. |
| 2. Adjust temperature control | The thermostat temperature control adjustment is located on the back of the cooler. (see section 9) |
| 3. All cold water has been drained | Cooler needs time to recover. wait 10-15 minutes until water cools |

14. Trouble Shooting

Cont.

No Hot Water from Hot Tank

| Possible Causes | Solution |
|---|---|
| 1. Power switch not on | Make sure Hot power switch on back panel is on and hot power light on front is illuminated |
| 2. Electrical terminal disconnected | Check to see that both wires are connected to the heating element terminals. These are located at the bottom of the hot tank |
| 3. Heating element failure due to scaling | Check for continuity across hot tank heater terminals. To do this, unplug unit from wall power. Disconnect one of the connector at the heating element terminals (at bottom of tank). Using an ohm meter, check for continuity across the 2 terminals. If there is no continuity (open), the tank must be replaced. |

14. Trouble Shooting Cont.

No Hot Water from Hot Tank cont.

| <u>Possible causes</u> | <u>Solution</u> |
|---|--|
| 4. Thermal sensor failure | <p>The thermal sensors are attached to the hot tank. The upper sensor is a 96 °C sensor and functions as an over heat safety. The lower sensor is a 82 °C sensor and controls the heating element function. The lower sensor would be the problem if there was no hot water. To see if the sensor is functioning properly, first unplug the cooler from the wall. remove the terminal from the sensor. Using an ohm meter, check for continuity If there is no continuity (open), replace sensor as per section 8.</p> |
| 5. Hot tank turned on without water in tank | <p>The hot power should never be turned on without water in the tank. If this happens, the upper thermal sensor on the hot tank will switch, cutting power to the hot tank. This is a safety device to prevent the heating element from burning itself out due to dry heating. Once the hot tank cools off the switch can be reset to operating condition. See section 7.</p> |

15. Specifications

| | PWC-1800 |
|-------------------------|----------------|
| Voltage/Frequency | 120 VAC/ 60 Hz |
| Weight (dry) | 48 lbs. |
| Total Water Capacity | 1.5 gallons |
| Hot tank | .5 gallons |
| Cold tank | 1.0 gallons |
| Power Consumption Total | 600 Watts |
| Hot Tank | 500 Watts |
| Cold Tank | 100 Watts |
| Temperature | |
| Hot | 180 °F average |
| Cold (adjustable) | 38 °F average |
| Refrigerant | R134a 36 mg. |

