

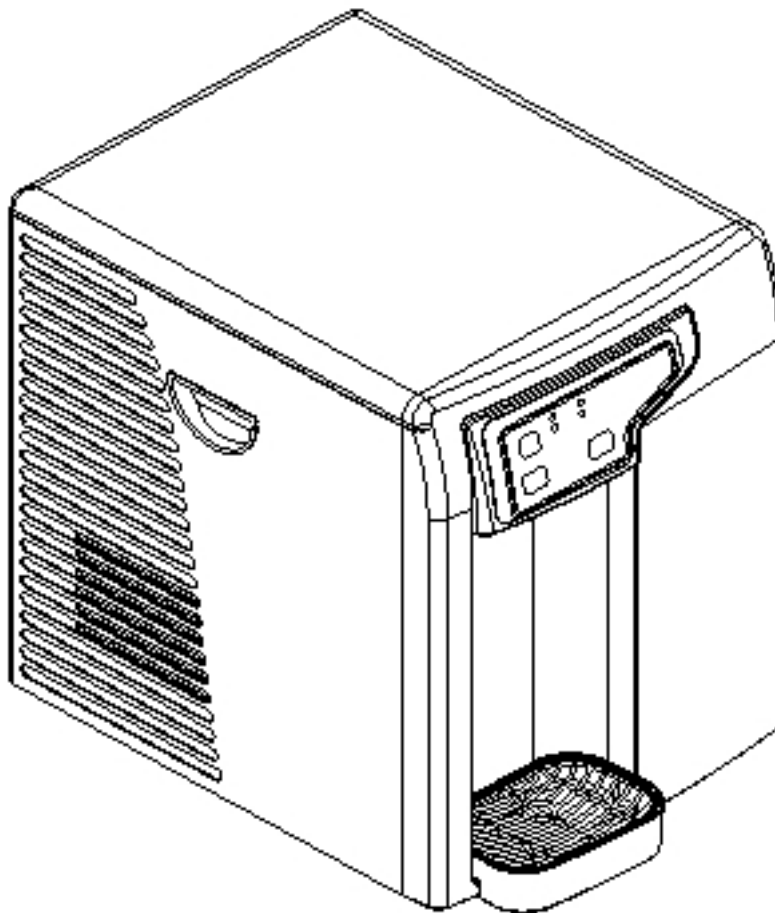
# SERVICE MANUAL

for

**PureWaterCooler™**

by Vertex

**Model PWC-450**



P/N man-7012

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# PWC-450 Cooler

## 1. Introduction

The PWC-450 line of point of use counter-top coolers are designed to give years of reliable Service. The cooler has a single spigot that dispenses water at 2 different temperature levels – hot and cold temperature water. The main (cold-temp) tank holds 1 gallon of water and is constructed of stainless steel. The cold tank can be accessed for cleaning by removing the cooler main top cover (see section 4).

The hot tank is made of stainless steel and holds 1/2 gallon of hot water. 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.*

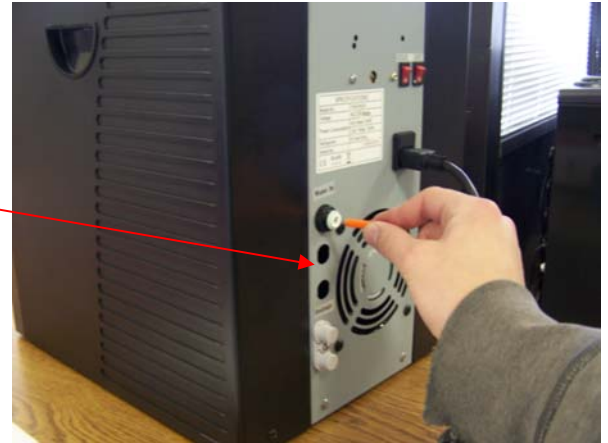
Electrical power is required for the cooler to fill the cooler with water. **CAUTION:** If hardness is higher than 7 grains, softening of the feed water is recommended or another option is to install a “phosphate” filter to the filter system.

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

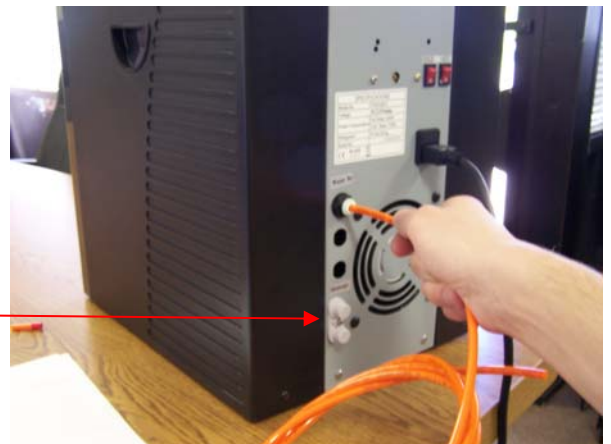
### Feedwater/Drain Connections

-Feed Connection

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



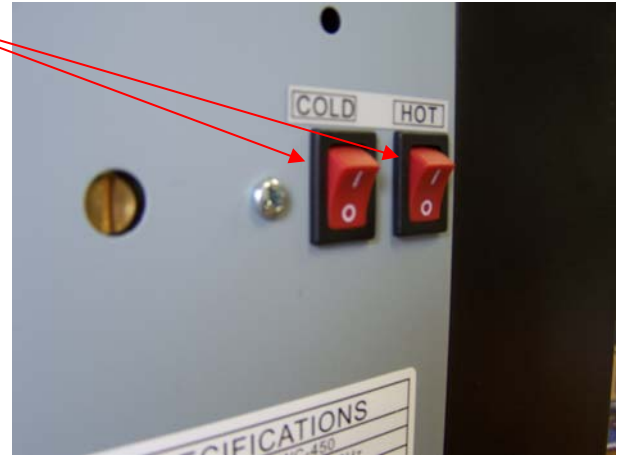
2.2 Connect tubing to feed connector on back of cooler.



2.3 **WARNING:** Do not turn on cooler hot power until cooler tanks are full of water.

## 2. Cooler Set-Up cont.

2.4 With both hot and cold power switches in the off position, plug the cooler into power.



2.5 Press and hold the cold dispense button on the control panel until water begins to flow from the spigot. This may take a few minutes depending on the inlet water pressure. Once the cold tank is full, repeat this process for the hot tank by pressing the hot lock button and then holding the hot dispense button.



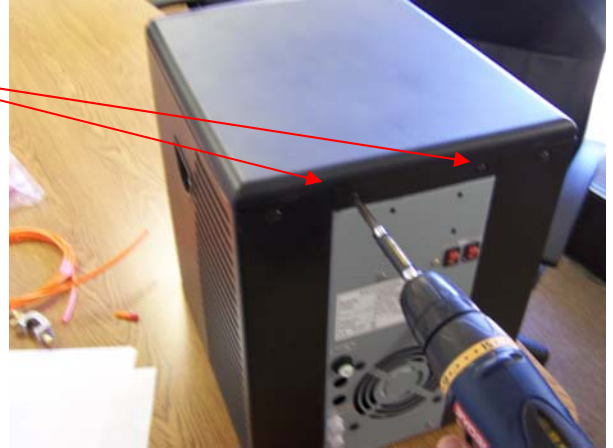
2.6 Once both hot and cold buttons dispense water, turn the hot and cold switches on the back of the cooler to the on position. Hot water will be ready quickly, but cold water may take a few hours.



2.7 The cooler is ready for use.

## 3. Top Cover/Side Panel Removal

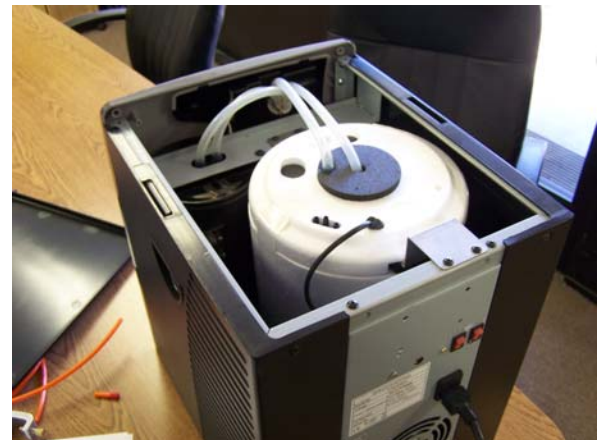
3.1 Remove (2) screws on back of cooler top cover



3.2 Slide cover back and lift off.



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

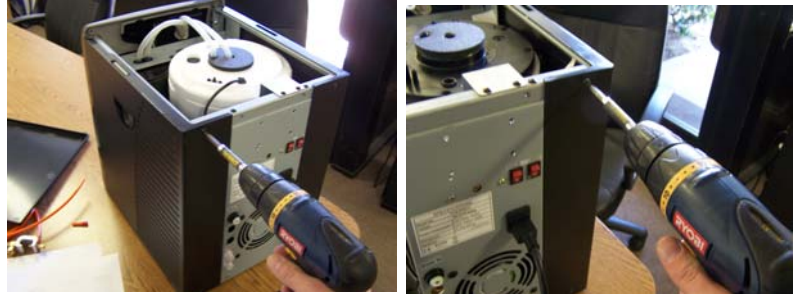


3.4 Reinstall top cover in reverse order

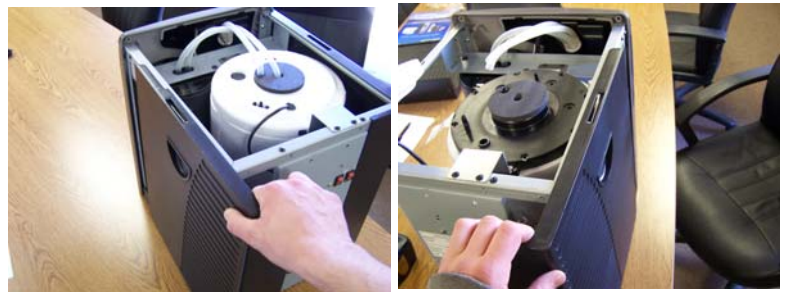
## 3. Top Cover/Side Panel Removal

Cont.

3.5 Remove (2) screws on back of cooler side cover.



3.6 Slide side cover back about half way off until tab in side cover lines up with slot in cooler frame.



3.7 Once slot and tab are lined up, pull side cover away from cooler.

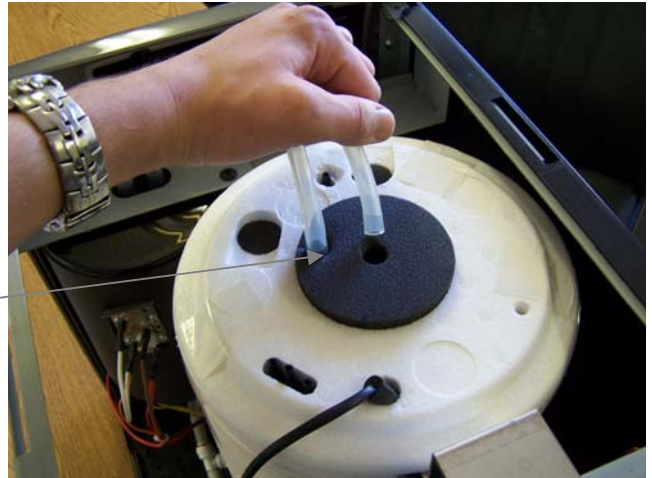
3.8 Reinstall side panels in reverse order



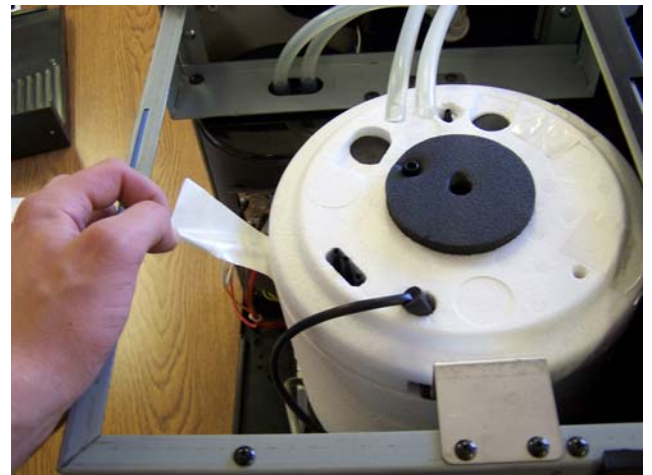
## 4. Access Cold Tank

4.1 Remove top and side covers (See section 3)

4.2 Remove tubing (2) from top of cold tank



4.3 Remove tape from top of tank foam (3 plcs). Leave tape attached to lower foam section.



4.4 Remove top foam of cold tank. Slide cold temperature sensor vertically out of top cover while keeping sensor through foam top.

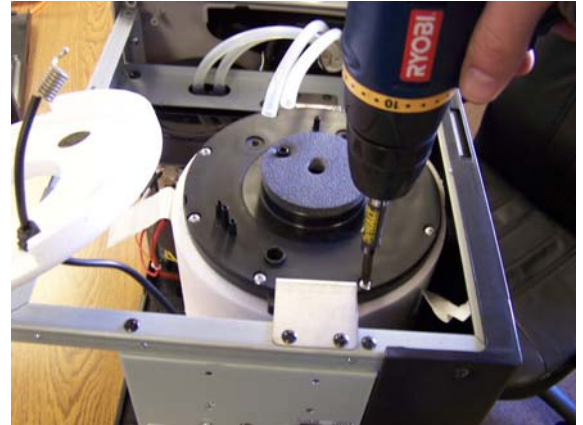




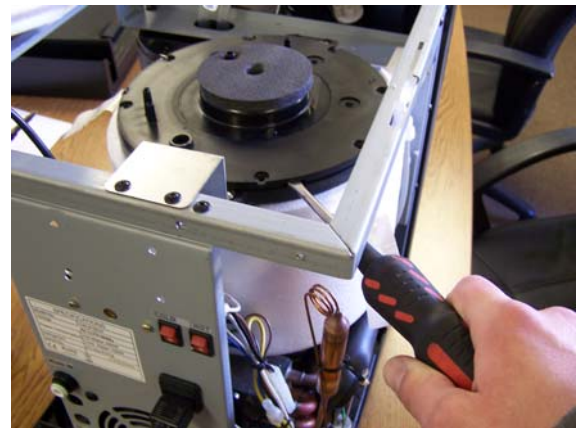
## 4. Access Cold Tank

cont.

4.5 Place cold temperature sensor and top foam together off to the side, as shown.  
Remove screws from cold tank (8 plcs).



4.6 Using a flathead or similar tool, find the gap located on the back right side of tank, and pry the lid from the cold tank with a twisting motion. Work around the edge until the lid is loose.



4.7 Remove lid. The cold tank is now accessible.

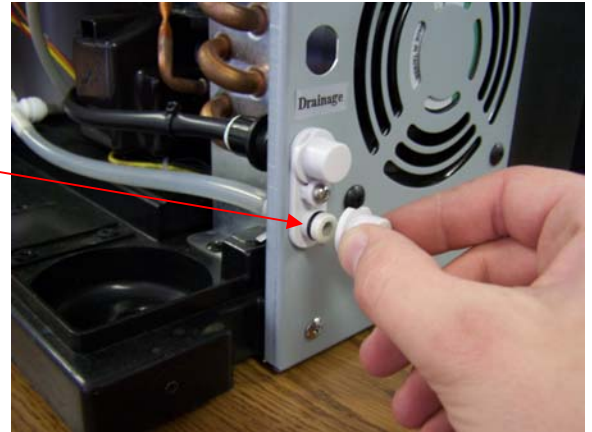


4.8 Reinstall in reverse order.

## 5. Removing/Replacing Hot Tank

5.1 Drain water from hot tank by removing bottom drain cap.

5.2 Remove top cover and left side cover (sec. 3)



5.3 Remove (4) electrical connectors from hot tank temperature sensors.



5.4 Remove (2) electrical connectors from hot tank heater coil leads.



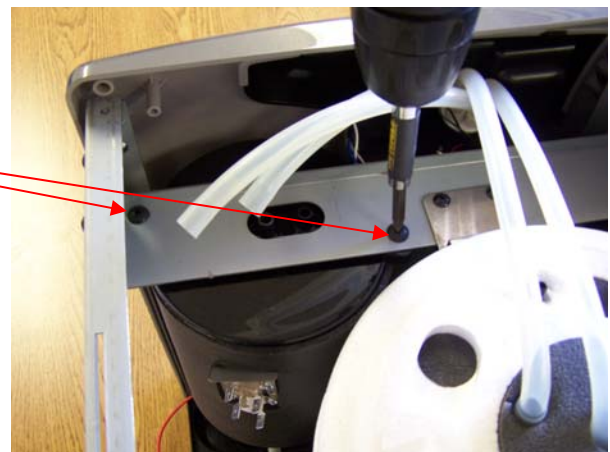
## 5. Removing/Replacing Hot Tank

Cont.

5.5 Remove (2) tubes from top of hot tank.

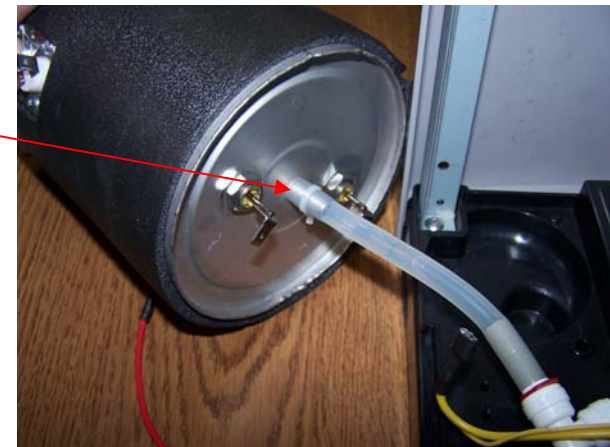


5.6 Remove (2) mounting screws.



5.7 Remove hot tank from cooler.

5.8 Remove inlet tubing.



5.9 Assemble hot tank in reverse order.

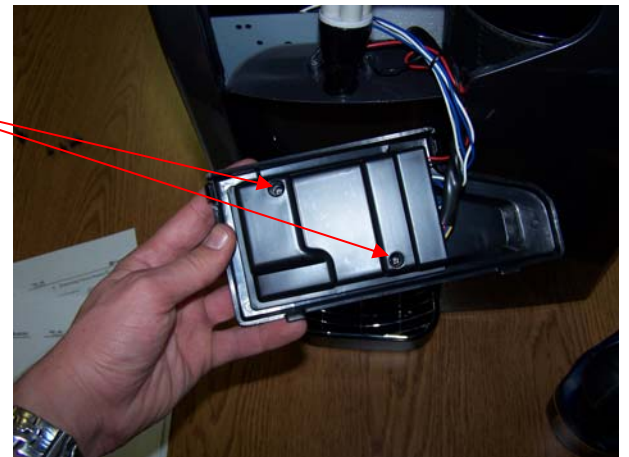
5.10 Remove thermal sensors from hot tank. Save and install on new hot tank.

## 6. Remove/Replace Circuit Board

6.1 Remove dispensing control panel by pulling outward from the bottom. Once the panel is loose, remove by pulling down.



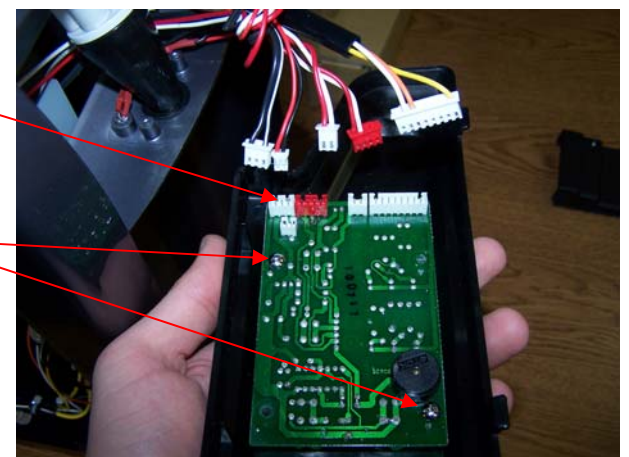
6.2 Remove circuit board cover, by removing (2) screws from the back and pulling the cover off.



6.3 Disconnect (5) electrical connectors from board.

6.4 Remove (2) screws holding circuit board to panel.

6.5 Re-assemble in reverse order

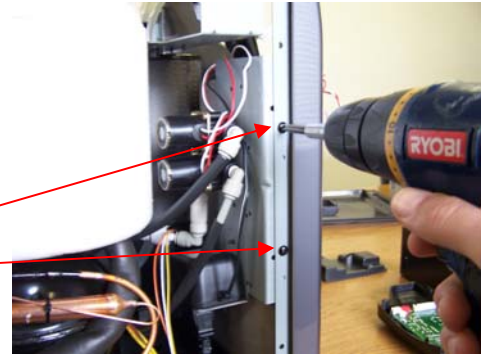


## 7. Remove/Replace Dispense Solenoid

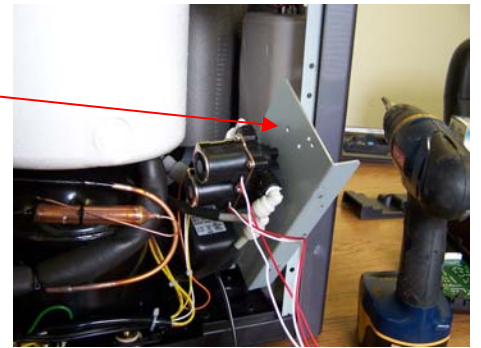
7.1 Remove top and left side cover of cooler (section 3)

7.2 Remove the control panel, remove the back cover, and disconnect the electrical connectors. (sec. 6) Set control panel aside.

7.3 Remove the (2) screws that hold the solenoid bracket to the cooler.

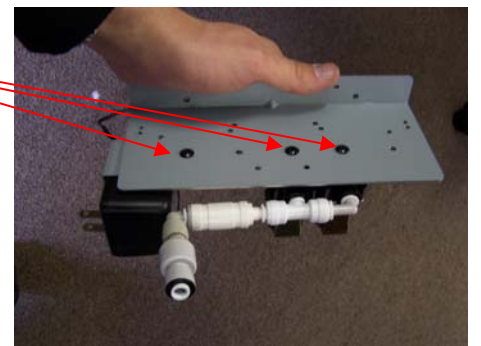


7.4 Pull bracket out so that all water and electrical connections to the transformer and solenoids can be accessed.



7.5 Disconnect power cable from transformer, and disconnect inlet and outlet tubes so that the bracket with the transformer and solenoids is free of the cooler.

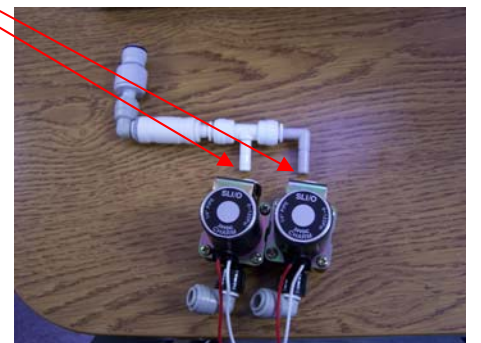
7.6 To remove the solenoids and transformer from the bracket, remove the corresponding screw(s).



7.7 Remove inlet plumbing from solenoids. The inlet connections can be removed using the same method for disconnecting tubing from quick connect fittings.

7.8 Re- assemble 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.

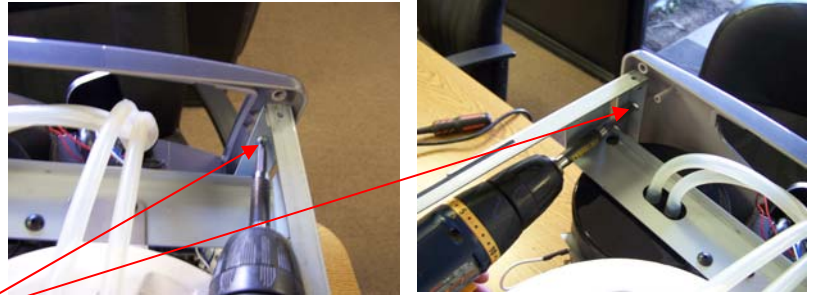


## 8. Remove Front Panel

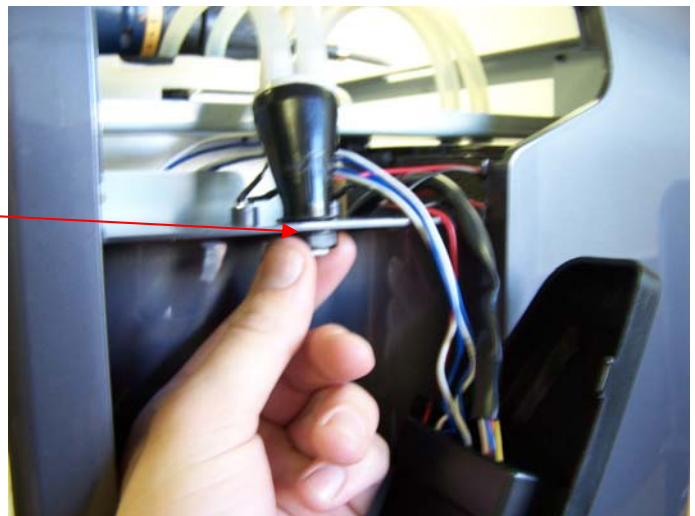
8.1 Remove top and side covers of cooler (section 3)

8.2 Remove the control panel (section 6)

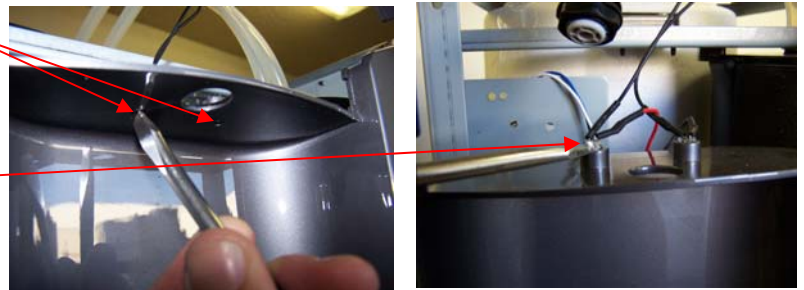
8.3 Remove (2) screws from the top of the front panel. The lower part of the front panel sets on two pins.



8.4 Unscrew spigot nut and remove spigot from front panel.



8.5 Using pointed tool such as a flathead screwdriver, push up on the LEDs to unseat them from the front panel. Then, using a flathead screwdriver, pry the LEDs from the front panel.



8.6 Tilt the front panel forward.

8.7 Pass all wiring and the control panel through the opening in the front panel.

8.8 Lift front panel off of the two pins on the base. Remove the panel.



8.9 Re-assemble in reverse order.

## 9. Remove/Replace Thermal Sensor

10.0 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.

10.1 Unplug cooler from power source for this operation.

10.2 Remove right side cover per sec. 3.3

10.3 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 will automatically reset once the temperature decreases.

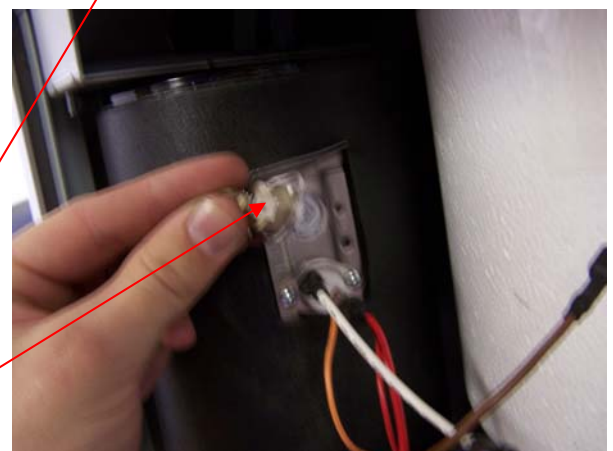
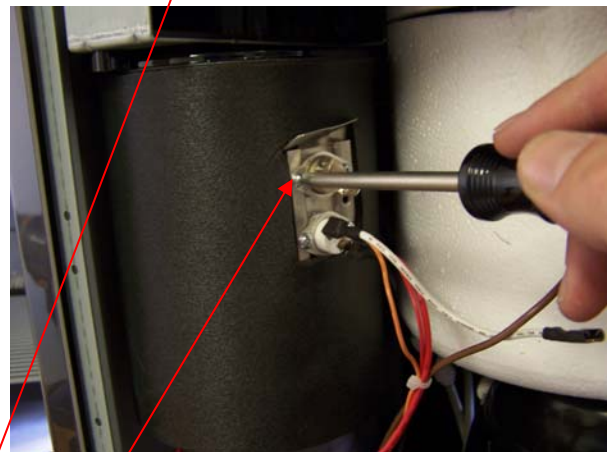
To check if either thermal sensor is good, use a continuity tester (ohm meter) to check for continuity across the thermal sensor. Before testing, make sure that at least one of the wires is disconnected from the sensor so as not to test continuity across a different part of the system. Make sure the thermal sensor is at ambient temperature for this test. If there is no continuity, replace the sensor.

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

10.5 Remove (2) screws holding sensor to tank.

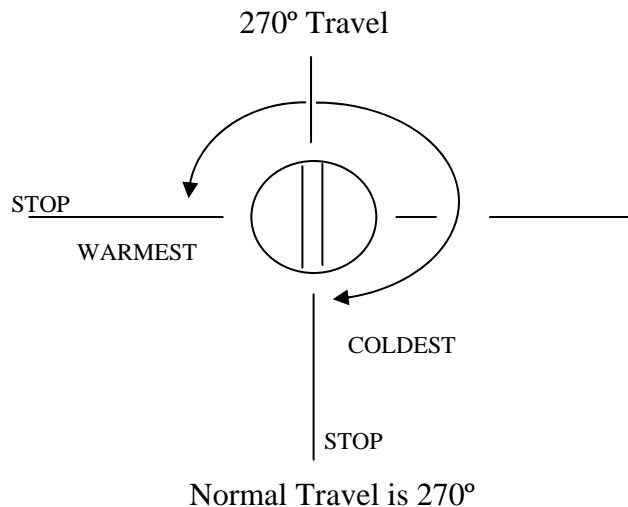
10.6 Install new thermal sensor, replace screws, reconnect electrical terminals to sensor.

10.7 Replace right side cover.



## 10. Cold Tank Temperature Adjustment

- 11.0 The cold water temperature adjustment is located on the back of the cooler in the middle of the panel. An expansion tube senses temperature in the cold tank and open and closes the thermostat.
- 11.1 The cold adjustment is a shaft with a screw driver slot on the end.
- 11.2 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

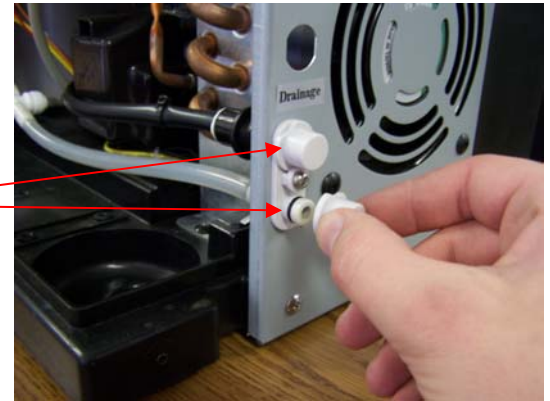




## 11. Draining Cooler Tanks

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: Rotate drain caps until caps are able to be pulled off of the drain port manifold. Remove drain caps. Water will pour from the ports.



11.2 Drain any remaining water in the system by pressing the hot and cold dispense buttons.

11.3 Replace Drain Cap(s).

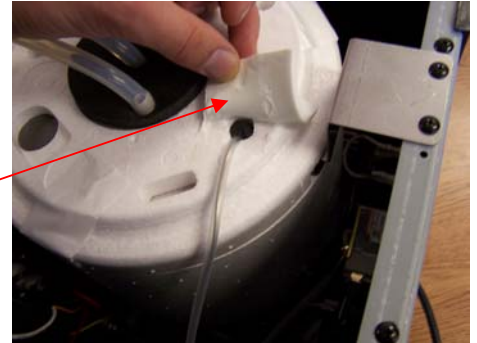


## 12. Remove/Replace Cold Tank Sensor

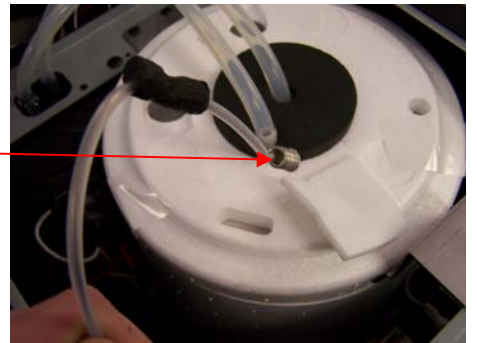
12.1 The cold tank sensor is extremely reliable and rarely needs replacing. Its function is to control the cold water temperature by turning the compressor on or off as needed.

11.2 Remove the top cover of the cooler (sec. 3)

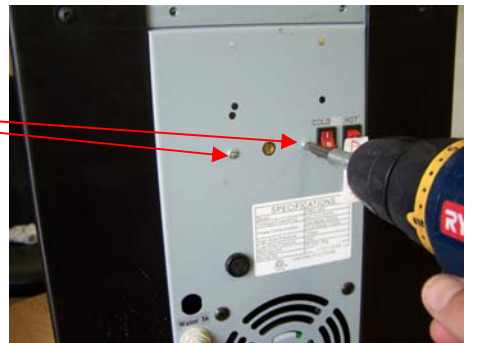
11.3 Carefully peel back adhesive foam.



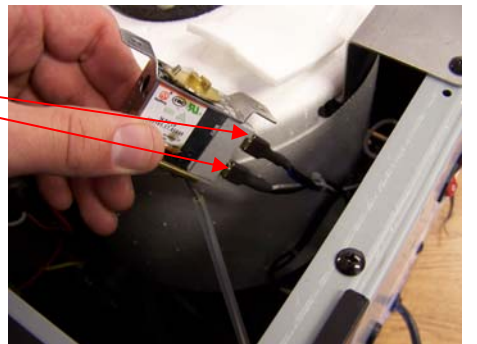
11.4 Slowly pull out the sensor.



11.5 Remove (2) screws on back of cooler that hold temperature switch to cooler.



11.6 Pull temperature switch out of cooler and remove (2) electrical connectors.



11.7 The Cold Tank Sensor is now free of the cooler.

11.8 Re-assemble 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 ½ Tsp. of common household bleach (5.25%) in 1 gallon of clean water into a filter housing fixed with ¼” ports.
2. Unplug the cooler from the power source.
3. Drain all water from the cooler tanks.
4. Plumb the filter housing into the inlet water to the cooler.
5. Simultaneously press the hot and cold dispense buttons on the control panel.
6. When the mixture begins to flow from the spigot, release the hot dispense button.
7. When the mixture begins to flow from the spigot again, release the cold dispense button.
8. 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.
9. While solution stands, disconnect the filter housing from the water line.
10. Drain the cooler completely.
11. Re-plumb fresh tap water to the cooler.
12. Fill the cooler completely with water. Let a few pints of water drain out of the spigot while pressing the hot button and then the cold button.
13. Drain the cooler completely.
14. Repeat steps 12-13, 2-3 times.
15. The cooler is now sanitized and ready for normal use.

## 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 used	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. Cooler not plugged in	Make sure power cord is plugged into wall socket
2. Power switch not on	Make sure Hot power switch on back panel is on and hot power light on front is illuminated
3. 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
4. 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.

## 13. Trouble Shooting Cont.

### No Hot Water from Hot Tank cont.

<u>Possible causes</u>	<u>Solution</u>
5. Thermal sensor failure	<p>The thermal sensors are attached to the hot tank. The upper sensor is a 90 °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 9.</p>
6. 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 will be reset automatically to operating condition. See section 7.</p>

## 15. Specifications

### PWC-450

Voltage/Frequency	120 VAC/ 60 Hz
Weight (dry)	45 lbs.
Total Water Capacity	1.5 gallons
Hot tank	.5 gallons
Cold tank	1.0 gallons
Room tank	
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.









