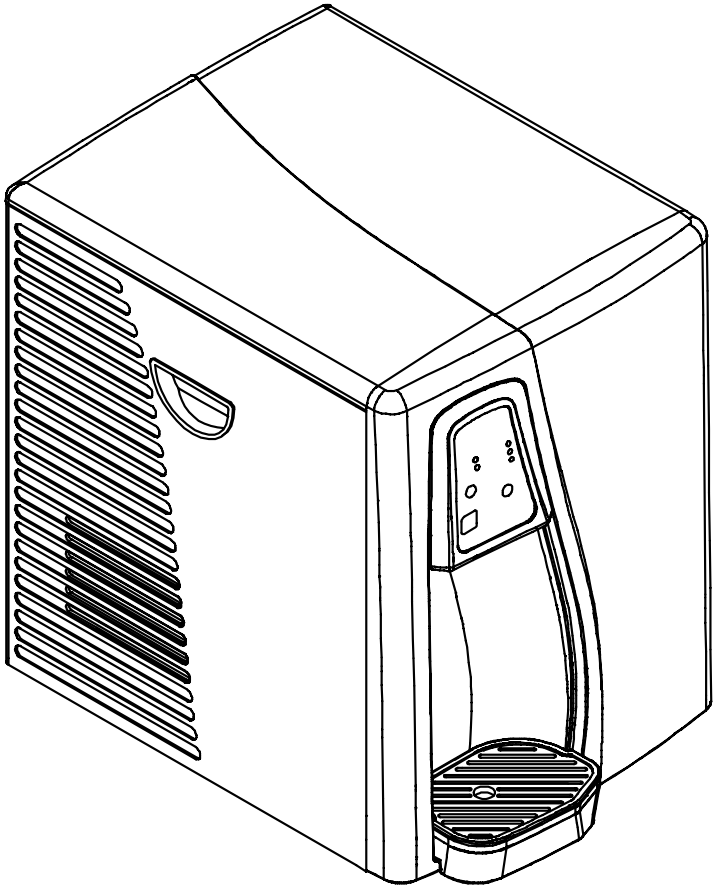
SERVICE MANUAL

for

PureWaterCooler™

by Vertex

Model PWC-400



P/N man-xxxx

Table of Contents

PWC-400 Cooler
1. Introduction

The PWC-400 line of point of use counter-top coolers are designed to give years of reliable Service. The cooler has a single spigot that dispenses filtered water at 2 different temperature levels – hot and cold temperature water. The main (cold-temp) tank holds 3/4 gallons of water and is constructed of FDA approved plastic. 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 1/4 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.*

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 <u>on</u> position to allow the unit to make water. Electrical power is required for the cooler to make purified water. CAUTION: The carbon filtration versions of the cooler (PWC-400F) 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

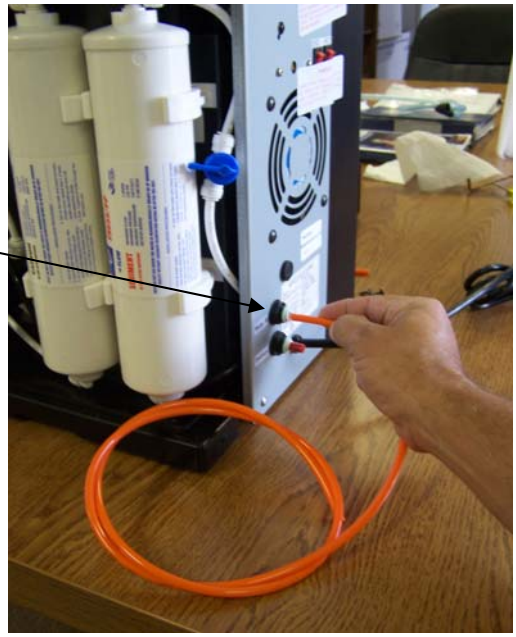
-Feed Connection

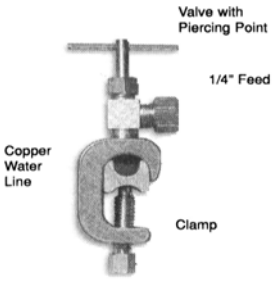
2.1 Remove 2 screws on back of right side panel and remove right side panel.

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

2. Cooler Set-Up cont.

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





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

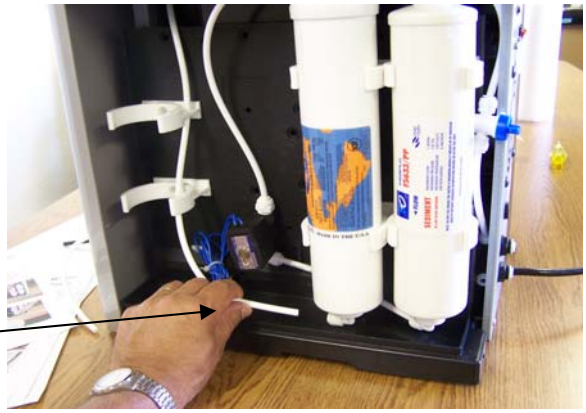
Feedwater connection (RO & filtration coolers)

(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 <u>Flushing carbon fines from carbon filter</u>. 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. Cooler Set-Up cont.

2.7 Attach 3 feet of ¼" tubing to the carbon filter outlet port (flush tubing)

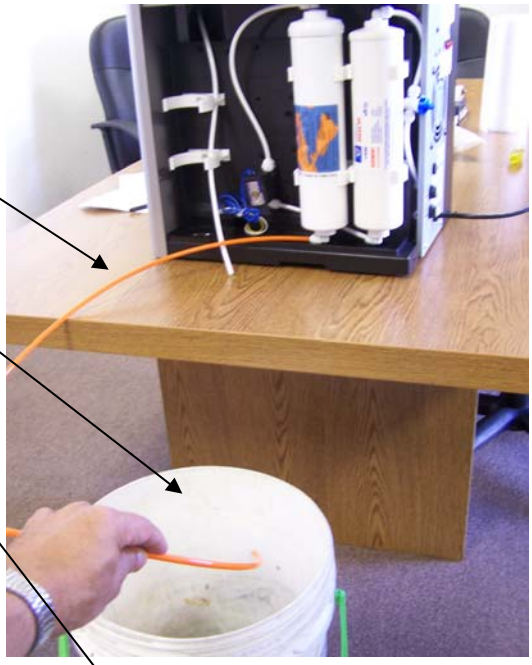
2.8 Place flush tubing in bucket to catch water carbon fines

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.

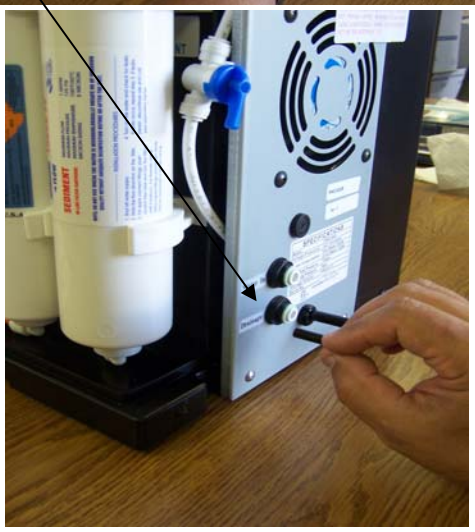


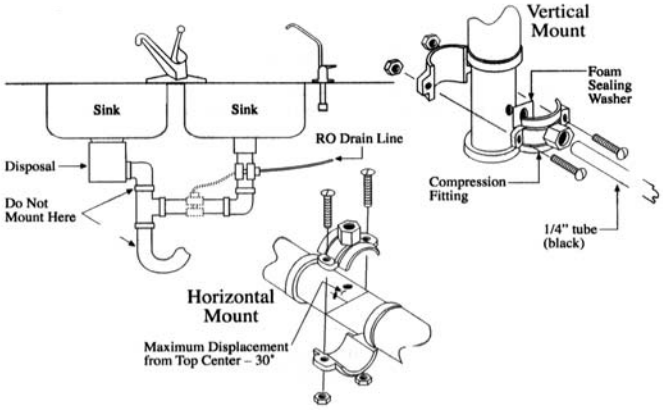
Drain Connection (for units equipped with RO)

2.13 Remove drain plug (black) from back of cooler

2.14 Connect supplied black water tubing to drain connector on back of cooler

2.15 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

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.

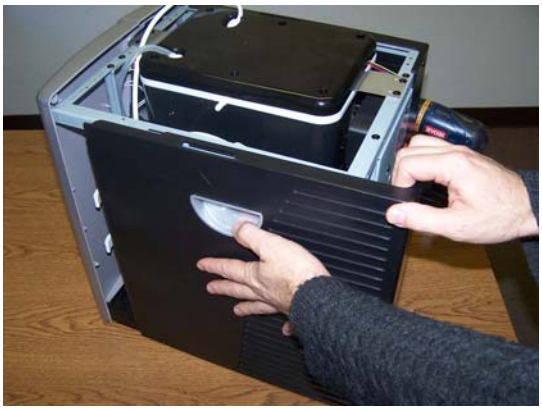
3.4 Reinstall in reverse order

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 in reverse order

4. Remove/Replace Electro/Mechanical Float Assembly

4.1 Remove top cover (See section 3)

4.2 Remove tubing from top of cold tank

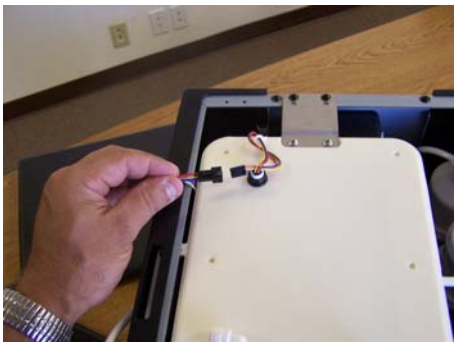
4.3 Remove screws from lid of cold tank. (6 plcs)

4.4 Remove outer lid of cold tank

4. Remove/Replace Electro/Mechanical Float Assembly

cont.

4.5 Disconnect electrical connector

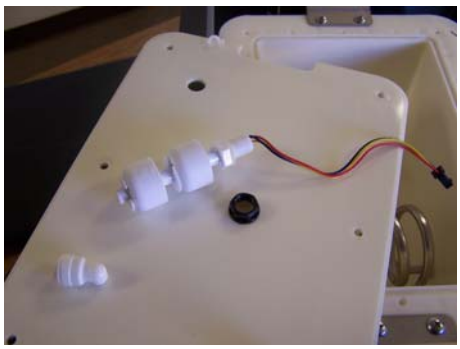


4.6 Lift off inner lid of cold tank

4.7 To remove float, remove nut from float stem

4.8 Remove float assembly from inner lid.

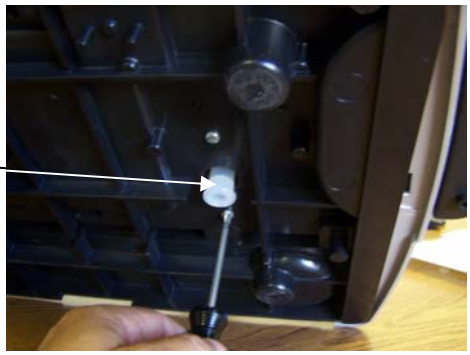
4.9 Reinstall in reverse order.



5. Removing/Replacing Hot Tank.

5.0 Unplug power from wall

5.1 Drain water from cooler using front spigots and by removing bottom drain plug.



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

5.3 To gain access to the hot tank, the filter bracket must be moved:

5.4 Remove water line from top of sediment filter

5.5 Put cooler on its' left side

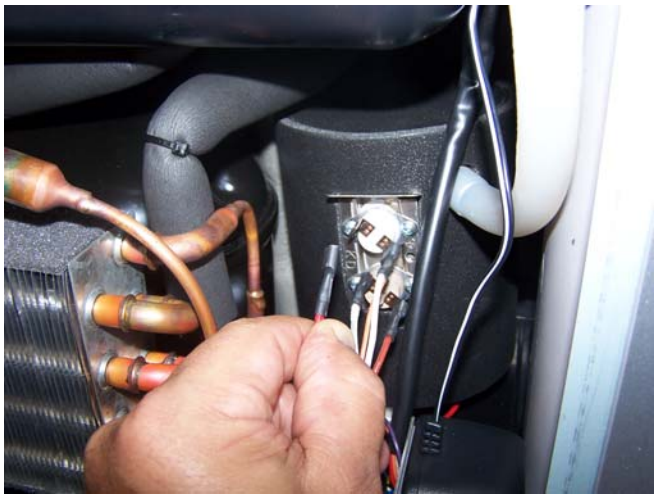
5.6 Remove 4 screws holding filter bracket to base

5.7 Set filter bracket aside to allow access to hot tank

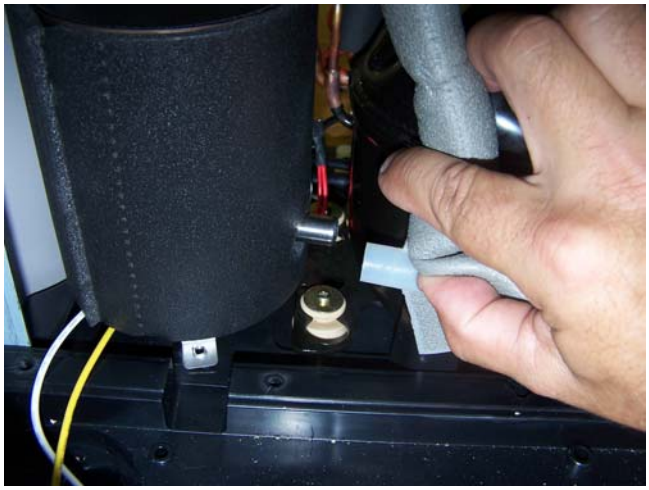
5. Removing/Replacing Hot Tank

Cont.

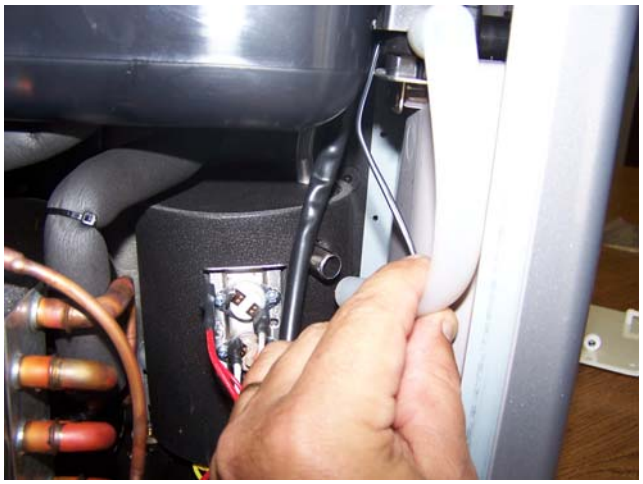
5.8 Remove wire from thermal sensors (4 places)



5.9 Remove inlet tubing (Access from right side of cooler)



5.10 Remove outlet tubing (Access from left side of cooler)

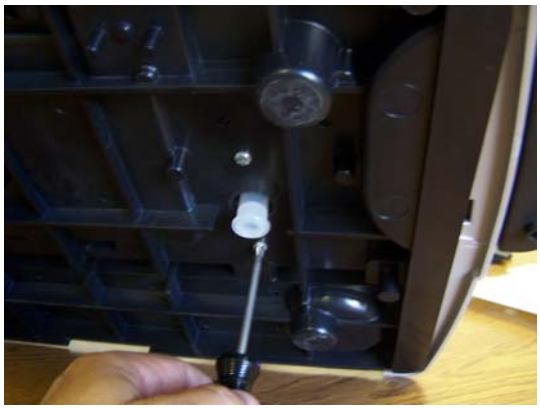


5. Removing/Replacing Hot Tank

Cont.

5.11 Remove vent tubing (top of hot tank)

5.12 Remove the 2 screws that hold the tank from the bottom of the cooler

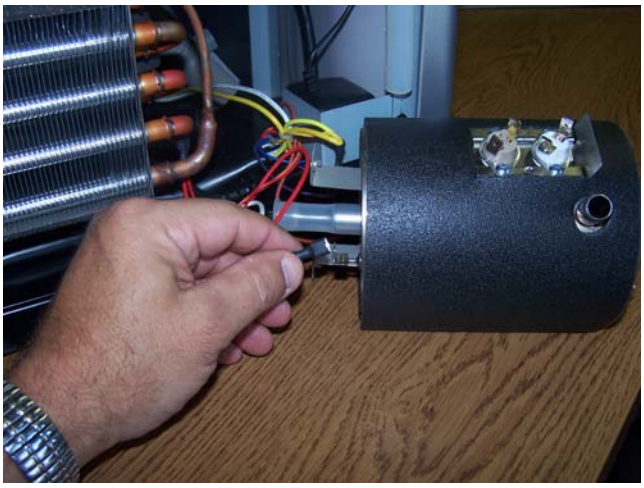


5.13 Remove the hot tank from cooler

5.14 Remove (2) heating coil leads from hot tank

5.14 Remove Thermal sensors from hot tank. Save and install on new hot tank.

5.16 Assemble hot tank in reverse order.

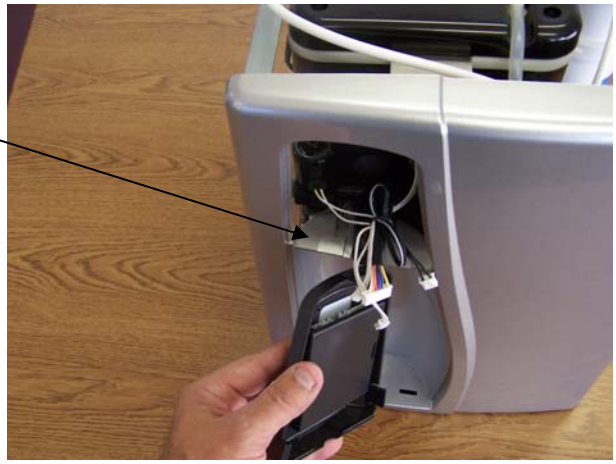


6. Dispensing Faucet Repair

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

6.2 Remove the control panel by grasping the bottom of the panel and pulling out sharply.

6.3 Remove (4) electrical connectors from back of the control panel. Set control panel aside.



6. Faucet Repair

Cont.

6.4 Remove hot water tubing from the left (hot) solenoid.

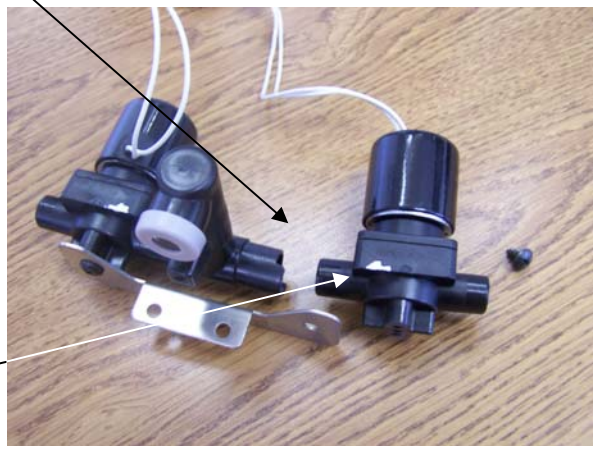
6.5 Remove screw holding solenoid/manifold assembly to the front panel.

6.6 Remove solenoid/manifold assembly by lifting it out of cooler. Disconnect cold water tubing from cold water solenoid (right side).

6. Faucet Repair

Cont.

6.7 Remove screw holding solenoid to manifold and bracket. 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 left solenoids' connector plugs into the left socket on the circuit board (when you are facing the circuit board). The right solenoid plugs into the right

7. Remove/Replace Circuit Board

7.1 Remove dispensing control panel (section 6)

7.2 Remove circuit board cover

7.3 Remove (3) screws holding circuit board to panel

7.4 Re-assemble in reverse order

8. Remove Front Panel

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

8.2 Remove the control panel and dispensing solenoid assembly (section 6.2)

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 Lift front panel off of the two pins. Remove cover

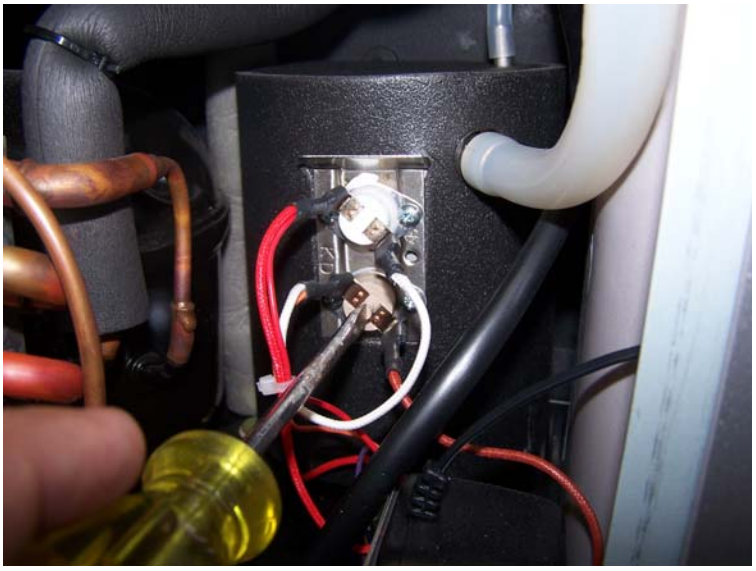
8.5 Re-assemble in reverse order

9. Hot Tank Reset Button

9.0 To access the hot tank, remove the left side cover per section 3.3

9.1 Observe that there are two circular sensors attached to the hot tank. The upper one is the main controller at 82 ºC and the lower 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 lower 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.



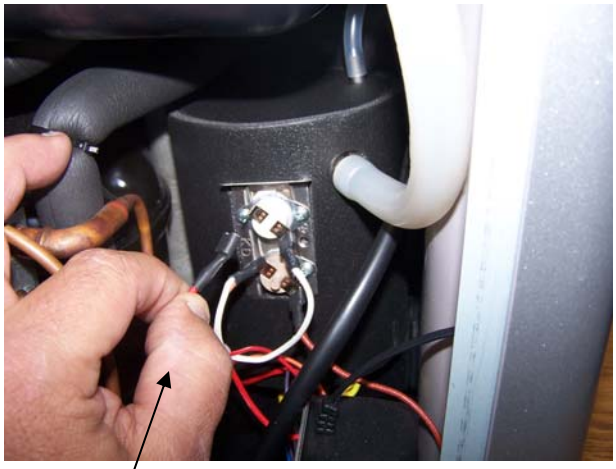
9.2 Make sure the power cord is unplugged.

9.3 Find the lower thermal sensor on the hot tank

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

10. Remove/Replace Thermal Sensor

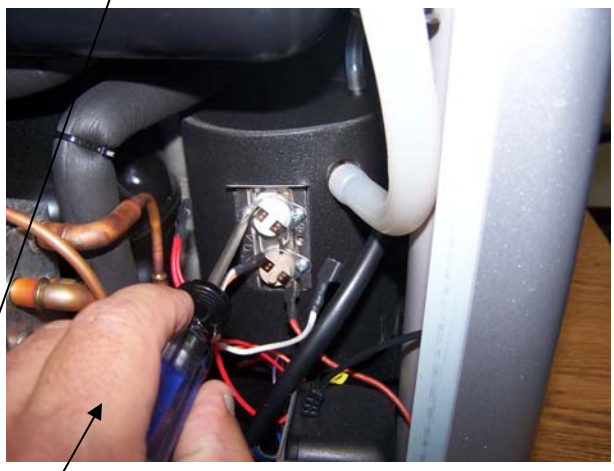
10.0 The hot tank thermal sensors are located on the outside of the hot tank. There are two thermal sensors. The sensor located higher on the hot tank controls the daily operation of the heating element. The lower thermal sensor is an overheat safety switch and cuts power to the hot tank should a malfunction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



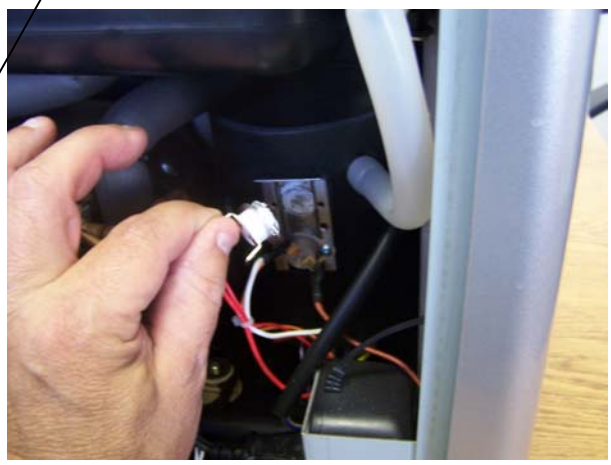
10.1 Unplug cooler from power source for this operation.

10.2 Remove left side cover per sec. 3.3

10.4 There are (2) thermal sensors attached with screws to the hot tank. The upper sensor automatically turns the heating element on and off to maintain the water at 180 ºF. The lower sensor is the over temperature sensor. This sensor activates if the temperature on the tank goes over 212 ºF. 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.



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

10.6 Remove (2) screws holding sensor to tank.

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

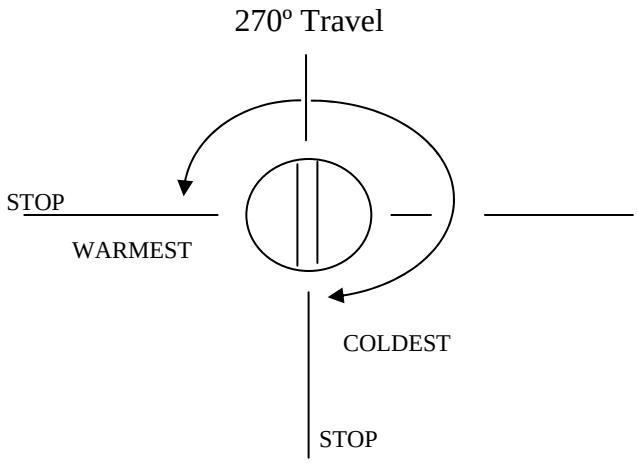
10.8 Replace left side cover.

11. 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



Normal Travel is 270º

12. 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 5
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.

13. Trouble Shooting

Water not cold from cold tank

(Water dispenses from spigot but is not cold)

Possible causes	Solution .
1. Cooler not plugged in	Make sure power cord is plugged into wall socket
2. Power switch not on	Make sure cold power switch on the back panel is on.
3. Adjust temperature control	The thermostat temperature control adjustment is located on the back of the cooler. (see section 11)
4. All cold water has been drained	Cooler needs time to recover. wait 10-15 minutes until water cools

13. 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.

Possible causes	Solution
5. Thermal sensor failure	The thermal sensors are attached to the hot tank. The upper sensor is a 96 ºC sensor and functions as an over heat safety. The lower sensor is a 82 ºC 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 10.
6. Hot tank turned on without water in tank	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 9.

13. Trouble Shooting Cont.

No Hot Water from Hot Tank cont.

An indicator of a hot tank problem can also be the lights on the front control panel. Below is a table of trouble shooting help.

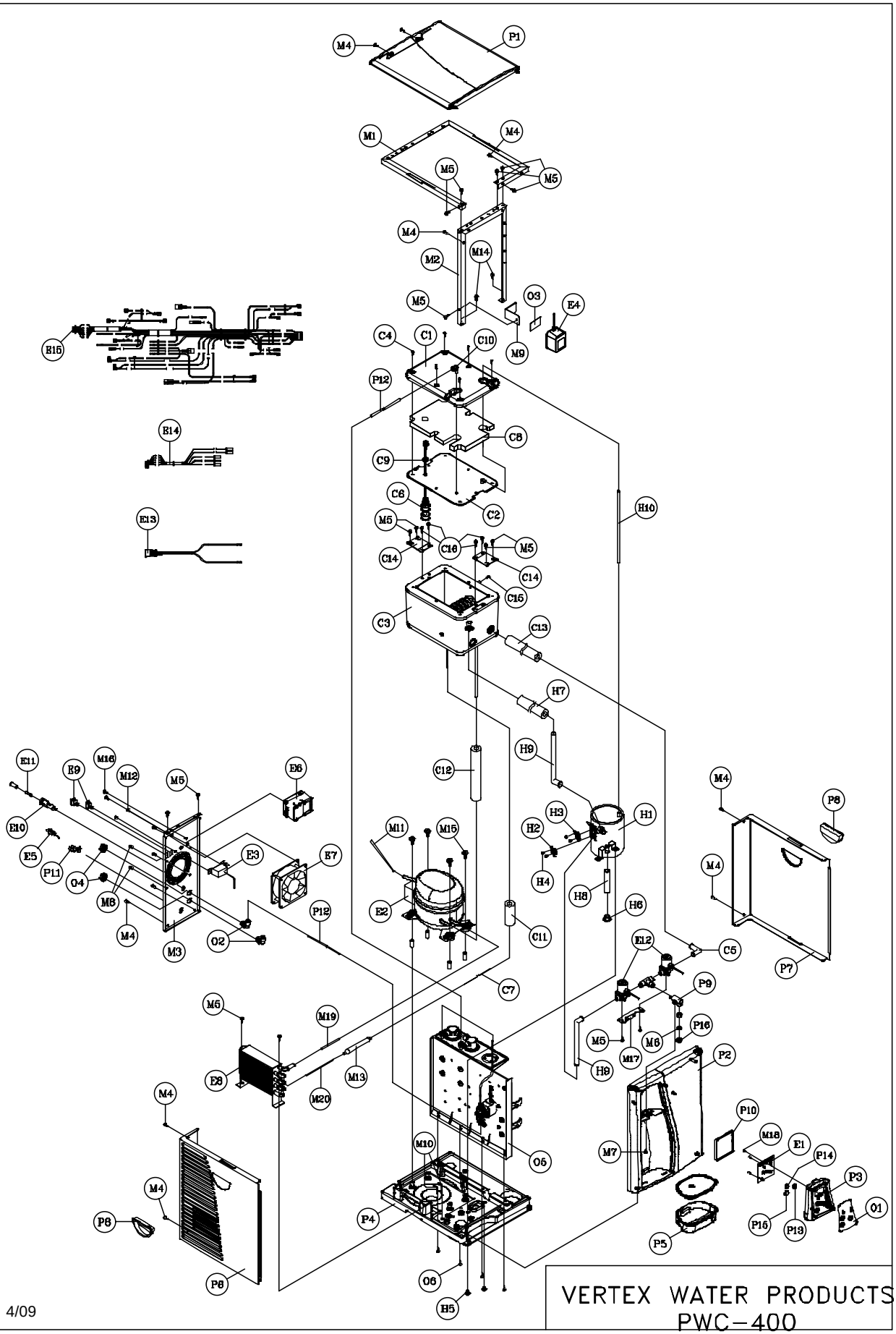
If the Hot Tank is not heating and the front panel lights are:

Front Panel Lights	Cause	Check
Hot Power – on Heating - on	Heating element disconnected or burned out	No Continuity across heating element
No lights at all Including cold power	Lower thermal sensor Reset button disengaged or sensor burned out	Press reset button / No Continuity across thermal sensor –replace sensor
Hot Power – on Heating -- off	Upper thermal sensor disconnected or burned out	No Continuity across lower thermal sensor

14. Specifications

PWC-400

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 ºF average
Cold (adjustable)	38 ºF average
Refrigerant	R134a 36 mg.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M1
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M14
M5
O3
E4
M9
E15
C4
C1
C10
P12
C8
C9
C6
C2
E14
E13
H10
M5
C16
M5
C14
C14
C15
C3
C13
H7
H9
C12
E11
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M16
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O4
M8
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O2
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P12
M11
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M10
O6
P4
O6
H5
M7
P10
M18
E1
P14
P3
P16
P13
O1
P5
VERTEX WATER PRODUCTS
PWC-400
4/09

PWC-400 Part List

Item No.	Description	Part Number	
P1	Top Cover	cl4 9500	
P2	Front Panel	cl4 9501	
P3	Control Pnl/Fct Cover, Rev F	cl4 9581	
P3	Cntrl Pnl/Fct Cover, Rev C,D	cl4 9502	
P4	Base	cl4 9503	
P5	Drip Tray Set	cl4 9504	
P6	Left Side Panel	cl4 9505	
P7	Right Side Panel	cl4 9506	
P8	Handle	cl1 9235/EG	
P9	Water Spout and T Manifold	cl4 9508	
P10	Cover, Circuit Board	cl4 9509	
P10.1	Cover, Circt Brd, REV D,E,F	cl4 9507	
P11	Strain Relief	cl4 9510	
P12	1/4" tubing	cl4 9511	
P16	Dispense Nozzle Cover	cl4 9547	
M1	Frame, Upper	cl4 9512	
M2	Frame, Front	cl4 9513	
M3	Rear Panel	cl4 9514	
M4	Screw	cl4 9515	
M5	Screw	cl4 9516	
M6	Screen, Stainless 304	cl4 9528	
M7	Screw	cl4 9517	
M8	Screw	cl4 9518	
M9	Bracket	cl4 9519	
M10	Probe, Leak detector	cl4 9520	
M11			
M12	Screw	cl4 9521	
M13	Dryer	cl4 9522	
M14	Screw	cl4 9523	
M15	Screw	cl4 9524	
M16	Screw	cl4 9525	
M17	Bracket	cl4 9526	
M18	Screw	cl4 9527	
M19			

Item No.	Description	Part Number	
E1	Control Board, Rev C	cl4 9529	
E1.1	Cntrl Brd w/beep snd, RevD,E	cl4 9587	
E1.2	Cntrl Brd w/beep snd, Rev F	cl4 9580	
E2	Compressor	cl1 9218	
E3	Cold Temperature Switch	cl4 9219	
E4	Transformer	cl4 9220	
E5	Power Cord	cl4 9221	
E6	Control Box, Level Sensor	cl4 9222	
E7	Fan	cl4 9223	
E8	Condensor	cl4 9224	
E9	On/Off Switch	cl1 9238	
E10	Fuse Holder	cl1 9252	
E11	Fuse	cl1 9262	
E12	Sol.Valve, Dspnsng,cold,24vdc	cl4 9540	
E13	Wiring Harness	cl4 9544	
E14	Wire Harness	cl4 9542	
E15	Wire Harness	cl4 9543	
E16	Sol.Valve, Dspnsng,hot,24vdc	cl4 9590	
OBSOLETE	REV E Control panel Assy	cl4 9588	
	REV F Control panel Assy	cl4 9591	
H1	Hot Tank	cl4 9545	
H2	92 C Temperature sensor	cl1 9277	
H3	82 C Temperature sensor	cl2 9030	
H4	Screw	cl4 9548	
H5	Screw	cl4 9549	
H6	Stopper	cl4 9555	
H7	Insulating Foam	cl4 9551	
H8	Silicon Tube	cl4 9552	
H9	Silicon Tube, 175 x 4 elbow	cl4 9553	
H10	Silicon Tube	cl4 9554	

PWC-400 Part List

Item No.	Description	Part Number	
C1	Lid, Outer, Cold Tank	cl4 9556	
C2	Lid, Inner, Cold Tank	cl4 9557	
C3	Cold Tank Assembly	cl4 9558	
C4	Screw	cl4 9559	
C5	Silicon Tube	cl4 9560	
C6	Level Sensor	cl4 9579	
C7	Capillary Tube	cl4 9561	
C8	Insulation	cl4 9562	
C9	Nut	cl4 9578	
C10	Fitting	cl4 9563	
C11	Insulation	cl4 9564	
C12	Insulation	cl4 9565	
C13	Insulation	cl4 9566	
C14	Bracket, Cold Tank	cl4 9567	
C15	Plug	cl4 9568	
C16	Screw	cl4 9569	
O1	Sticker, Cntrl Pnl, Rev C,D,E	cl4 9573	
O1	Sticker, Cntrl Pnl, Rev F	cl4 9582	
O2	Fittng,Bulkhead(nt usd aftr 8.09)	cl4 9574	
O3	Double backed Tape	cl4 9575	
O4	Nut	cl4 9576	
O5	Solenoid Valve, 115 VAC	cl2 9086	
O6	Screw	cl4 9570	
O7	Filter Bracket	cl4 9541	
	Sediment Filter Cart.-rplcmnt	ifa 4035	
	Carbon Filter Cart.-rplcment	ifa 4034	
	Membrane, 50 gpd-rplcmnt	ma 4203	
	UV bulb, 6 watt - rplcment	uv 4061	
O52	Straight, 1/4mpt x 1/4 tube	md 2624	
O53	Elbow, 1/4 mpt x 1/4 tube	md 2625	
O54	Bulkhead fitting, 1/4"	dm 2733	
O55	Stem Elbow, 1/4stem x 1/4t	md 2626	
O56	Filter Screen, 1/4"		

Item No.	Description	Part Number	
	REV D, 7/09		1/4/2013
	Updated 4/6/10		
	Updated 10/1/10		
	Updated 12/31/10		
	REV F, 7/11		