

# Troubleshooting Guide

## *Pacific RO reverse osmosis systems*

This document has helpful troubleshooting hints for the end user of the Pacific RO water purification systems

<b>50132385, PACIFIC RO 3, 50132386, PACIFIC RO 7, 50132387, PACIFIC RO 12, 50132388, PACIFIC RO 20, 50132389, PACIFIC RO 40</b>
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<b>Revision Date: JULY 12, 2018</b>
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**1. The system does not turn on.**

- a. Make sure the power supply is securely plugged into the wall *and* into the Pacific RO at the 4 pin socket next to the concentrate outlet.



- b. Press the power button on the control panel.
- c. Check for the green LED light on the power supply. If it is not illuminated, yet it is plugged in, then the power supply is bad.

**2. The storage tank is not filling. The system is on, but tank never fills.**

- a. Make sure the feed water supply is turned on, and that the feed water line is connected to the correct connector on the system. It should be connected to the 3/4" connector on the right labeled "Raw Water Inlet" as shown below

Use the 3/4" hose supplied with the unit and connect the feed water inlet (labeled "Raw water inlet") to the Prefilter outlet



Use the second 3/4" hose supplied to connect the Concentrate outlet of the system to the atmospheric drain

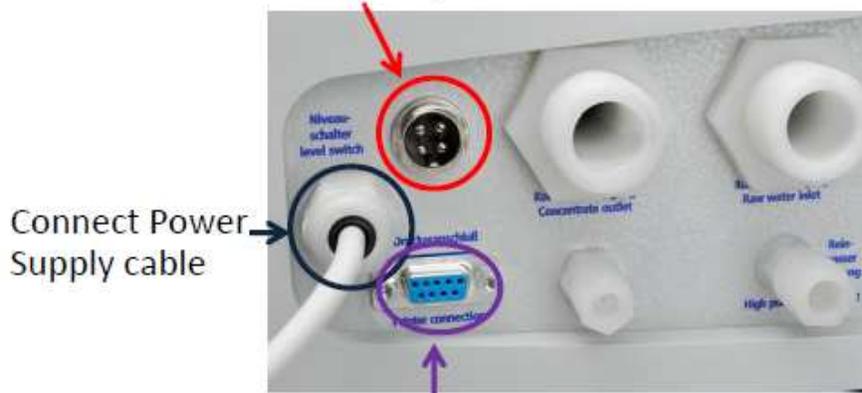
- b. Make sure the tubing is connected from the "High Purity Water Outlet" (just below the raw water inlet connector) to the correct inlet on the tank as shown below. Use the 8mm diameter tubing supplied to connect the "High Purity Outlet" to the "High Purity Inlet" of the tank.



The green arrow indicates the high purity inlet

- c. Make sure the float switch cable from the tank is plugged in as shown below, circled in red.

Connect Tank Float to four-pin connector

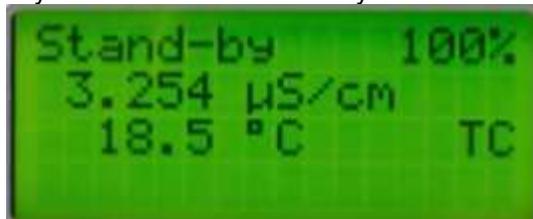


Connect Printer (if applicable)

- d. Note that there may be a short delay before the tank starts filling. This delay happens when the system is first started up, and when water is drained from the tank. So, if it seems like the tank is not filling, give it a few minutes and re-check.
- e. Check the concentrate flow rate and adjust if necessary. See page 13 for details on how to check and adjust the concentrate flow rate.

**3. There is a constant flow of water going to the drain from the concentrate flow tubing.**

- a. This is normal whenever the system is in Production Mode. This is the waste water rejected by the RO membrane. It will flow whenever the system is making water to fill the tank. It should stop when the tank is full. Check at the top of the display to see whether it says "Production" or "Stand By" as shown here.



If the system is in Standby and there is water coming out, see #4 below.

**4. Water is flowing out the concentrate tubing, but the system in is Stand-by Mode.**

- a. The system is designed to periodically flush/rinse the RO membrane. (Note that the User Manual uses the terms "flush" and "rinse" interchangeably.) The system will automatically rinse when the operating mode changes between stand-by and operation, and every 12 hours. It also does a rinse when the system is switched on. The duration of the rinse is user-adjustable, but is limited to 30 seconds max. So if you do see water coming out when in Stand-by, and the duration is 30 seconds or less, it is just a normal rinse.

**5. The message "Limit Value Permeate" appears on the display.**

This means that the purity of the product water -also referred to as "permeate"- is below the limit value setting. The setting is user adjustable.

- a. Check/adjust the Permeate Limit Value. The purpose of the "Limit Value Permeate" message is to let the user know when the purity has dropped. To determine what is "too low" for your system, so that you can set the limit value correctly, we recommend to calculate the percent rejection. The % rejection can be easily calculated. See page 9 of this document for details on calculation.  
We suggest to replace the membrane whenever the % rejection drops below 75%. If you find that your % rejection is better than 75%, you can adjust the permeate limit value to avoid unnecessary "Limit Value Permeate" alerts. To view the Permeate Limit Value, press the menu button to advance through the screens until you see "Lim.val.perm. W." To *change* the value, you must first unlock the system as shown on page 11. Once the system is unlocked when you return to the Lim.val.perm. W.screen, there will be a cursor so that you can change the limit value using the arrow buttons on the keypad.
- b. Because reverse osmosis is a % rejection system, it is possible that the permeate may not be able to reach the desired purity. If the feed water quality is very poor, the purity of the permeate may fall below the range of the limit value. In this case, it may be desirable to disable the "Limit Value Permeate" message. This can be done by first unlocking the system, as shown on page 11. Then go to the permeate screen as directed in **a**. You can disable the message by increasing the limit value. As you continue to increase the setting, eventually it will turn it off.
- c. The RO membrane may have been damaged by chlorine. Chlorine causes pitting of the RO membrane, which will result in lower purity and a faster rate of production. See item #6 below.

**6. The life of the RO membrane is shorter than expected.**

- a. Make sure the proper pre-treatment is installed on the feed water line. The RO membrane cannot tolerate chlorine or scale-forming minerals, aka hard water. For sites with municipal water we recommend the double pretreatment system part# 09.4000. This includes one 5 µm filter with activated carbon and one hardness stabilizer cartridge. For sites where there is no chlorine in the feed water, a single pretreatment system, 09.4001 will suffice. It includes one 5 µm filter with hardness stabilizer. See page 13 for details and individual pretreatment component part numbers.
- b. Change the pre-treatment filters more often. The 5 µm filter with activated carbon (part# 06.5201) may need to be replaced several times per year. See the table on page 8 for information on carbon filter lifespan based on chlorine levels. The hardness stabilizer cartridge (part# 06.5204 or 06.5452) we suggest to replace up to twice per year.

**7. There is biological contamination in the storage tank (algae, bacteria, fungi).**

- a. Make sure the sterile overflow part# 06.5001 and vent filter, part# 50135142, are installed on the storage tank. The sterile overflow has changed appearance as shown in the pictures on the next page. Either version is acceptable.

- Sterile Overflow
- Old Style



- Sterile Overflow
- New Style



This picture shows the sterile vent filter part# 50135142

- b. Sanitize the tank using bleach following this procedure:  
Use chart below to determine volume of bleach to use based on tank size and bleach concentration.

Bleach Concentration	6L Tank	30L Tank	60L Tank	100L Tank
5.25%	25ml	120ml	240ml	400ml
6%	20ml	105ml	215ml	355ml
8.25%	15ml	80ml	155ml	255ml

1. If you have any devices such as a dishwasher, de-ionization system, etc. that are being fed from the storage tank, be sure to shut those devices down temporarily so that they do not draw any water from the tank during the sanitization procedure.
2. Dispense water from the tank so that the system goes into Production Mode.
3. Add to the tank the prescribed amount of bleach, based on the table.
4. Let the tank fill up, then allow the solution to soak in the tank for 30 minutes.
5. Drain the tank completely, then wait for it to fill back up.
6. When the tank is full again, drain the tank completely a second time.
7. Once the tank fills back up this water is OK to use.

**8. The storage tank is filling, but more slowly than expected.**

- a. Note that there is a tolerance of +/- 15% on production rates due to differences in temperature. The colder the feed water, the slower the production rate. The Pacific RO 20 for example may produce between 17-23 Liters per hour.
- b. Check the concentrate flow rate, adjust if necessary. The procedure for checking the concentrate flow is on page 12 of this document.

**9. The message "measuring cell LF3" or "measuring cell LF2" appears on the display.**

LF2 is the Product Water (permeate) conductivity Cell. LF3 is the Feed Water conductivity Cell. (LF1 is not used) Usually this error means service will be required, but it can sometimes be caused by air in the lines.

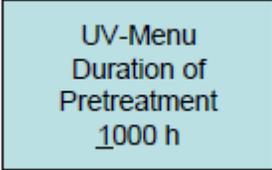
- a. Make sure the feed water is turned on
- b. Perform a rinse of the system. This will help to purge any air in the lines. To do this simply press the Menu button to scroll through the user menus until you see Rinse?



Press the Enter button to start the rinse, which will last 60 seconds. If one or two rinses does not solve the problem, most likely the cell will have to be replaced.

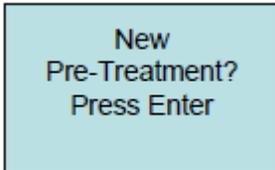
**10. The message "Pretreatment" appears on the display.**

This means that the time-elapsed reminder to replace the pre-treatment filters has expired. The setting for this can be found in the UV Menu "Duration of Pretreatment".



The factory setting is 1000hours. It is adjustable from 500hrs to 5000hrs in increments of 500 hours. It can be disabled by increasing past 5000hrs. We recommend to use the pretreatment timer to schedule replacement of the carbon pre-filter. The replacement frequency should be based on the levels of chlorine in the water. Use the table provided below to help determine the correct setting.

- a. Replace the pretreatment filters and reset the timer.  
To reset the timer the system must first be unlocked using the access code. See page 11 for steps to unlock the system. Once the system is unlocked, the UV Menus can be accessed by pressing the menu button and the UV button at the same time. Advance through the UV menus using the menu button to reach the menu "New Pre-Treatment?".



Press the enter button to reset the timer, then return to the home display by pressing the menu button.

- b. If the pretreatment cartridges are not due to be replaced, but the reminder appeared because the timer was not reset the last time filters were changed, you can increase the "Duration of Pretreatment" setting in the UV menus as described in "a." above.

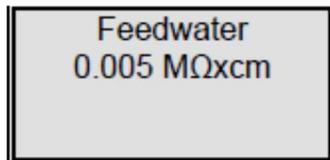
CARBON PREFILTER					
	Total volume flow through system (LPH) (reject + product)	Hours of use 2 ppm chlorine:	Days of use estimating 4 h/day run time with 2 ppm chlorine	Hours of use 1 ppm chlorine:	Days estimating 4 h/day run time with 1 ppm chlorine
Pacific 3	43	528	132	1056	264
Pacific 7	47	483	121	966	241
Pacific 12	72	315	79	631	158
Pacific 20	80	284	71	568	142
Pacific 40	140	162	41	324	81

**Calculating Percent Rejection**

Reverse osmosis works by rejecting a percentage of the impurities from the feed water. It washes the impurities down the drain via the concentrate flow tube while sending the remaining pure water (permeate) on to the storage tank. A new RO membrane will reject up to 90% of impurities. This percentage will drop as the membrane ages, resulting in a loss of permeate purity. Knowing the % rejection allows you to evaluate the performance of the RO membrane. We suggest to replace whenever the % rejection drops below 70%.

$$\frac{\text{feedwater PPM} - \text{permeate PPM}}{\text{feedwater PPM}} \times 100$$

To view the feed water purity on the Pacific RO, press the menu button once from the home screen:

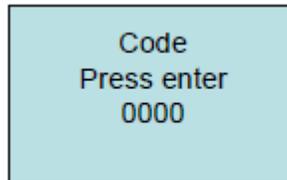


The Permeate purity is shown on the home display. Please make sure the system is in Production Mode when checking purity. During Stand-by the purity drops because the water is not flowing. Once you have obtained the purity readings for both feed water and permeate, use the conversion chart found on page 11 of this document to convert those to PPM.

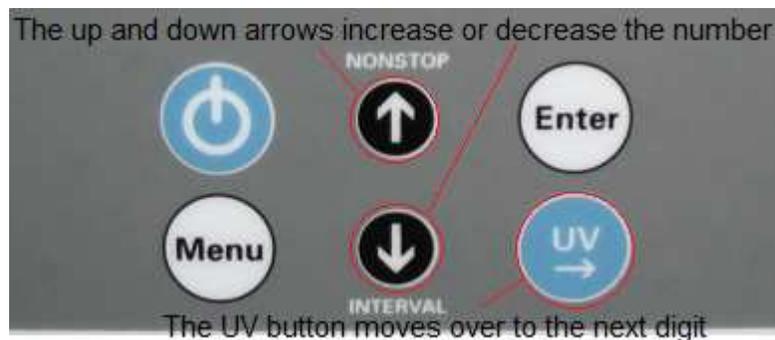
Conductivity Micromhos-cm. @25°C	Resistivity Ohms-cm. @25°C	Dissolved Solids Parts per Million (ppm)	Approximate Grains/Gallon (GPG) as CaCO <sub>3</sub>
0.056	18,000,000	0.0277	0.00164
0.059	17,000,000	0.0294	0.00170
0.063	16,000,000	0.0313	0.00181
0.067	15,000,000	0.0333	0.00193
0.072	14,000,000	0.0357	0.00211
0.077	13,000,000	0.0384	0.00222
0.084	12,000,000	0.0417	0.00240
0.091	11,000,000	0.0455	0.00263
0.100	10,000,000	0.0500	0.00292
0.111	9,000,000	0.0556	0.00322
0.125	8,000,000	0.0625	0.00368
0.143	7,000,000	0.0714	0.00415
0.167	6,000,000	0.0833	0.00485
0.200	5,000,000	0.100	0.00585
0.250	4,000,000	0.125	0.00731
0.333	3,000,000	0.167	0.00971
0.500	2,000,000	0.250	0.0146
1.00	1,000,000	0.500	0.0292
1.11	900,000	0.556	0.0322
1.25	800,000	0.625	0.0368
1.43	700,000	0.714	0.0415
1.67	600,000	0.833	0.0485
2.00	500,000	1.00	0.0585
2.50	400,000	1.25	0.0731
3.33	300,000	1.67	0.0971
5.00	200,000	2.50	0.146
10.0	100,000	5.00	0.292
11.1	90,000	5.56	0.322
12.5	80,000	6.25	0.368
14.3	70,000	7.14	0.415
16.7	60,000	8.33	0.485
20.0	50,000	10.0	0.585
25.0	40,000	12.5	0.731
33.3	30,000	16.7	0.971
50.0	20,000	25.0	1.46
100.0	10,000	50.0	2.92
111	9,000	55.6	3.22
125	8,000	62.5	3.68
143	7,000	71.4	4.15
167	6,000	83.3	4.85
200	5,000	100	5.85
250	4,000	125	7.31
333	3,000	167	9.71
500	2,000	250	14.6
1,000	1,000	500	29.2
1,110	900	556	32.2
1,250	800	625	36.8
1,430	700	714	41.5
1,670	600	833	48.5
2,000	500	1,000	58.5
2,500	400	1,250	73.1
3,330	300	1,670	97.1
5,000	200	2,500	146
10,000	100	5,000	292

### How to Unlock the Pacific RO controller

From the home display press the menu button repeatedly until you reach the “Code” menu.



Using the arrow keys, input the code 0950.



Once you have 0950 selected, then press the enter button. The controller will return to the home display, and the system is now unlocked. Please note, there is nothing on the display to indicate that the system is unlocked. The home display will look normal, but you will find that now you can access menus which were previously hidden. And some settings that previously could only be viewed but not changed will now have a cursor that you can use to change the values.

**Checking the Concentrate Flow Rate**

1. Obtain a 1000mL graduated cylinder and a stopwatch.
2. Make sure the system is in Production Mode.
3. Remove the concentrate tubing from the drain.
4. Collect the water flowing from the concentrate tube for 36 seconds.
5. Compare the volume you collected to the expected volume in the table below.
6. If the volume is too high or too low, adjust the concentrate valve.
7. Repeat this process until the concentrate flow is correct.

Model	Expected mL
Pacific RO 3	400
Pacific RO 7	400
Pacific RO 12	600
Pacific RO 20	600
Pacific RO 40	1000

**Adjusting the Concentrate Flow Rate**

1. Use a screwdriver to remove the screws holding the back cover in place.
2. Remove the rear cover.
3. Locate the concentrate adjustment valve on the left, near the bottom:



4. Turn the knob clockwise to reduce concentrate flow, or counter-clockwise to increase the concentrate flow.
5. Re-check the flowrate as above and re-adjust the knob until the expected concentrate flow is achieved.

**Pre-Treatment Information and Part Numbers**



**09.4000** Double cartridge pretreatment system -->

The 09.4000 system includes two holders with wall mounting brackets and connecting hose. It also includes the 5µm filter with carbon cartridge 06.5201:



06.5201

AND the 06.5452 hardness stabilizer cartridge below:



06.5452

