



## Understanding and Operating Your Reef/Residential Reverse Osmosis & Deionization System

Congratulations on your purchase of a water purification system from Buckeye Hydro – you’ve made the right choice! Start by carefully removing all parts from the shipping box(s). Remove any parts shipped within the left vertical housing. Read the entire instructions before beginning system setup. Refer to the attached diagram to identify your sediment cartridge (already installed in right housing), carbon block cartridge (already installed in center housing), DI resin housing, DI resin cartridge, RO membrane housing, RO membrane, sediment housing “in” port, DI housing “out” port, flow restrictor, flush valve, pressure tank, pressure tank valve, horizontal GAC stage, and faucet.

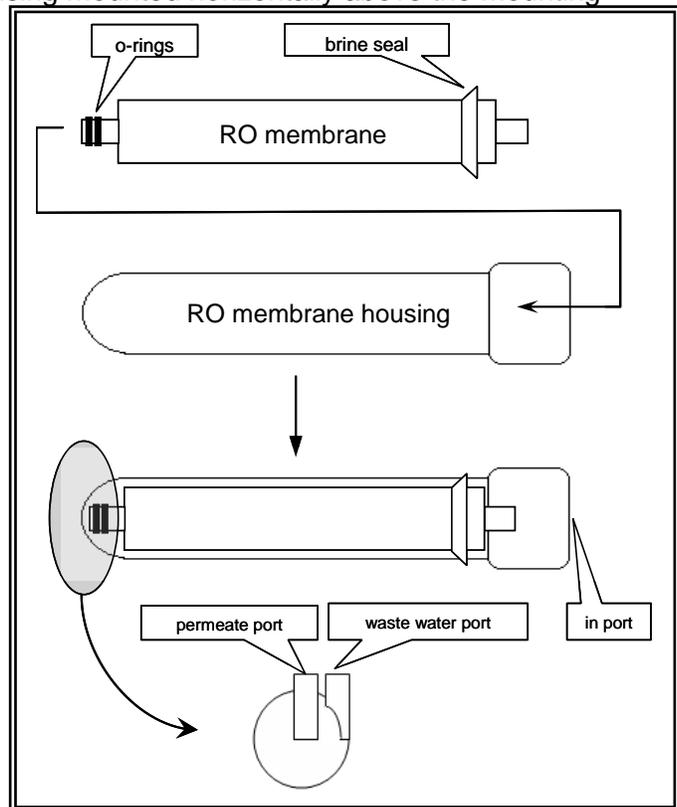
Securely mount your system using the holes on the back of the mounting bracket. Locate the system in a location out of direct sunlight that will be protected from temperatures below freezing and above 100°F. To prepare your system for operation:

1. Attach the blue water supply tube to the quick connect fitting in the lid (marked “in”) on the sediment cartridge housing. Attach the other end of the blue tube to your water supply. Don’t turn the water on yet!

2. Identify the white opaque RO membrane housing mounted horizontally above the mounting bracket. On the left end of the RO housing, locate the two quick connect elbows. The permeate port (the water that has been filtered by the RO membrane) is near the center of the end of the housing. The wastewater port is near the edge of the end of the RO housing.

3. Connected to the wastewater port you will find a flow restrictor and flush valve. Connect the yellow waste tube to the wye with the open port on the waste line. Run this tubing to a drain. Open the flush valve (place the handle of the valve parallel to the tubing). Wastewater will flow from this tube when your system is on. The flow restrictor is inside the short length of blue tubing.

4. A drain saddle is provided with your system. Route the yellow tube to a drain, or to the drain saddle installed high on a vertical drain pipe under a sink – select a location away from a dishwasher or disposal drain. After identifying the correct position of the drain saddle, drill a ¼-inch hole through one side of the vertical drain pipe. Center the gasket on the hole and tighten the drain saddle bolts. Insert the yellow tubing in the compression nut, and tighten the nut.



5. Run white tubing from the “out” port on the left vertical housing to a drain. Eventually, this is where DI water will flow from the system. Close the valve on the end of the white tube (handle perpendicular to the tube).
6. Wrap the male threads on the top of the pressure tank with several wraps of Teflon tape. Attach and close the tank valve. Insert BLACK tubing in the fitting on the tank valve. Attach the other end of this black tube to the tee fitting/check valve as shown in the attached diagram. You can cut the tubing to length with a tubing cutter or sharp pair of scissors. Also run BLACK tubing from the GAC “out” fitting to the installed faucet.
7. Close the flush valve. Turn on the supply water to the unit and allow water to flow through the sediment filter, through the carbon block, into the empty horizontal RO membrane housing, and out the waste line. Check the system for leaks. Allow the carbon block to flush for 10 minutes. Turn off the water supply.
8. On the right end of the RO housing, locate the single quick connect elbow. This is the RO housing supply (“in”) port. Disconnect the tubing from the fitting by depressing the collar on the fitting with your thumbnail and pulling gently on the tubing - the tubing will come out easily if the collar is fully depressed. Have a towel ready as the RO membrane housing is full of water. Unscrew this end of the RO housing, and insert the RO membrane in the housing. Insert the end of the membrane with the two small black rubber o-rings first. The end of the membrane near the single large rubber seal (“brine seal”) should be closest to the end of the RO housing that unscrews. Push on the membrane firmly with the heel of your hand to assure it is seated, replace the cap of the RO housing, and replace the tubing into the fitting on the cap of the RO housing. Turn on the water supply to the unit, check for leaks, and flush the RO membrane for 10 minutes (if the membrane was shipped to you dry) or 40 minutes (if the membrane was shipped to you wet). Turn off the water supply to the RO/DI system.
9. Unscrew the vertical housing on the left, and insert the DI resin cartridge, with the end that unscrews at the bottom. Screw the housing back onto lid.
10. Turn the water supply on, check for leaks, and flush 1 gallon of water through the DI resin cartridge.
11. Close the valve on the white DI tube, and open the pressure tank valve. RO water will now fill the pressure tank. Allow the system to run until the tank is full and the system shuts off automatically. Open the valve on the faucet and drain approximately 2.5 gallons of water. You have now flushed the carbon block, the RO membrane, the DI resin, and the pressure tank. The system is ready for operation. Enjoy!

Buckeye Hydro is not responsible  
for any damage caused by leaks.  
*The user bears full responsibility to  
assure the system is not leaking.*

## ***Additional Notes***

Your reverse osmosis membrane capacity (in gallons of permeate produced per day, or gpd) was rated with supply water at 250 ppm total dissolved solids (TDS) at 77°F and 50 psi pressure for 50, 75, and 100 gpd membranes; and 550 ppm TDS at 77°F and 65 psi pressure for 150 gpd membranes. Colder water and/or lower pressure will reduce the amount of permeate your system produces. Low pressure can be corrected with a booster pump.

While your sediment filter and carbon block filter are new, note the water pressure reaching your membrane on the pressure gauge (the gauge reads in pounds per square inch, or “psi”). If you see this pressure drop over time, one or both of the filters is clogging and should be replaced.

Treat your DI resin gently! If resin was exposed to freezing temperatures during transit, allow it to warm to room temperature for 24 hours prior to use.

Don't run your system with supply water exceeding 100°F. If your system has an adjustable flow restrictor, don't use a waste:permeate ratio lower than 3:1. Ratios higher than 5:1 needlessly waste water.

Premium Series and Reef/Residential Series systems come with a 1 micron sediment filter and 0.5 mic, 20,000 gallon carbon block. Value Series systems come with a 5 mic sediment filter and 5 mic., 6,000 gallon carbon block.

Your system utilizes a refillable DI cartridge filled with color-changing resin. Replace the resin in the cartridge when the DI water TDS is 2 ppm or higher.

**Replacing Prefilters** The sediment filter and carbon block should be replaced when they clog, or after 6 months, whichever comes first. To replace the filter:

1. Turn off the water supply to the system.
2. Use the housing wrench supplied with your system to loosen the sediment filter housing. Keep a towel handy during this process.
3. Discard the old sediment filter.
4. Wash your hands thoroughly.
5. Carefully remove and retain the large black o-ring at the top of the housing. Inspect the o-ring for damage (e.g., cracks, tears, deformations).
6. Wash the inside and outside of the housing and the o-ring with warm water to which you've added soap and 2 teaspoons of bleach.
7. Thoroughly rinse the housing and o-ring with warm, chlorinated tap water.
8. Place a small dab of food grade silicone grease on the o-ring, and spread the grease over the entire o-ring using your fingers.
9. Place the o-ring in the housing.
10. Insert the new sediment filter into the housing.
11. Screw the housing back onto the system. In most cases it is not necessary to use the wrench when tightening the housing.
12. Follow steps 2 through 11 to replace the carbon block.
13. Flush the carbon block for 10 minutes. Don't run flush water through later stages of your RO or RO/DI system.

**Replacing the Membrane** Under normal conditions RO membranes should last longer than one year. When the performance of the membrane indicates replacement is necessary:

1. Begin by washing your hands thoroughly.
2. Turn off the water supply to the system.

3. Remove the tubing from the quick connect fitting on the RO membrane cap, from the purified water port, and from the waste water port. Label the tubes if needed to assure they are reconnected correctly after replacing the membrane.
4. Remove the RO membrane housing from its clips.
5. Unscrew the RO membrane housing cap. This may require an assistant holding the membrane housing while you unscrew the lid.
6. Grasp the stem of the RO membrane with pliers, and twist and pull the membrane from the housing.
7. Carefully remove and retain the black o-ring(s) near the threads of the housing or from within the cap. Inspect the o-ring(s) for damage (e.g., cracks, tears, deformations).
8. Wash the inside and outside of the housing and the o-ring(s) with warm water to which you've added soap and 2 teaspoons of bleach.
9. Thoroughly rinse the housing and o-ring(s) with warm, chlorinated tap water. Dry the inside of the housing with a clean cloth.
10. Place a small dab of food grade silicone grease on the o-ring(s), and spread the grease over the entire o-ring using your fingers.
11. Place the o-ring(s) into position.
12. Place the RO membrane housing into its clips, and reinsert the purified water tube and the waste water tube, being careful to match the tubes to the correct fittings on the RO membrane housing.
13. Insert the end of the membrane with the two small black rubber o-rings first. The end of the membrane near the single large rubber seal ("brine seal") should be closest to the end of the RO housing that unscrews. Push on the membrane firmly with the heel of your hand to assure it is seated, and replace the cap of the RO housing.
14. Replace the tubing into the fitting on the cap of the RO housing.

**Replacing Deionization Resin** To assure the beads in mixed bed resin remain mixed, pack the beads tightly in the refillable cartridge. Fill the cartridge to within a 1/4 inch of full with resin. Compact the resin by bouncing the cartridge repeatedly (~40 times), rubber washer end down, on a hard surface from a height of about 0.5 inch. Add more resin and repeat the process twice. Fill the cartridge a last time to within 1/8 inch of the top and compact the resin again. If you see any settling, refill to within 1/16 inch of the top, and replace the cap. Don't use the first gallon of water produced by the DI resin.

**Testing Performance of the Membrane** The two most common symptoms indicating the RO membrane should be replaced are reduced production of purified water, and a declining rejection rate. Your membrane capacity (in gallons of permeate produced per day, or gpd) was rated with supply water at 250 ppm total dissolved solids (TDS) at 77°F and 50 psi pressure for 50, 75, and 100 gpd membranes; and 550 ppm total dissolved solids (TDS) at 77°F and 60 psi pressure for 150 gpd membranes. The rejection rate, or the percentage of total dissolved solids (TDS) in the feed water that is rejected by the membrane, is 96%+ for 50 gpd, 75 gpd, and 150 gpd membranes, and 90%+ for 100 gpd membranes.

To assess the amount of purified water produced by the system, measure the amount of RO or DI water produced in one hour, and multiple that by 24 to calculate the number of gallons per day. To assess the membrane's rejection rate, use a meter to measure TDS in the feed water and in the RO water. For example, if the feed water measured 265 ppm TDS, and the RO water measured 8 ppm TDS the rejection rate can be calculated as follows:

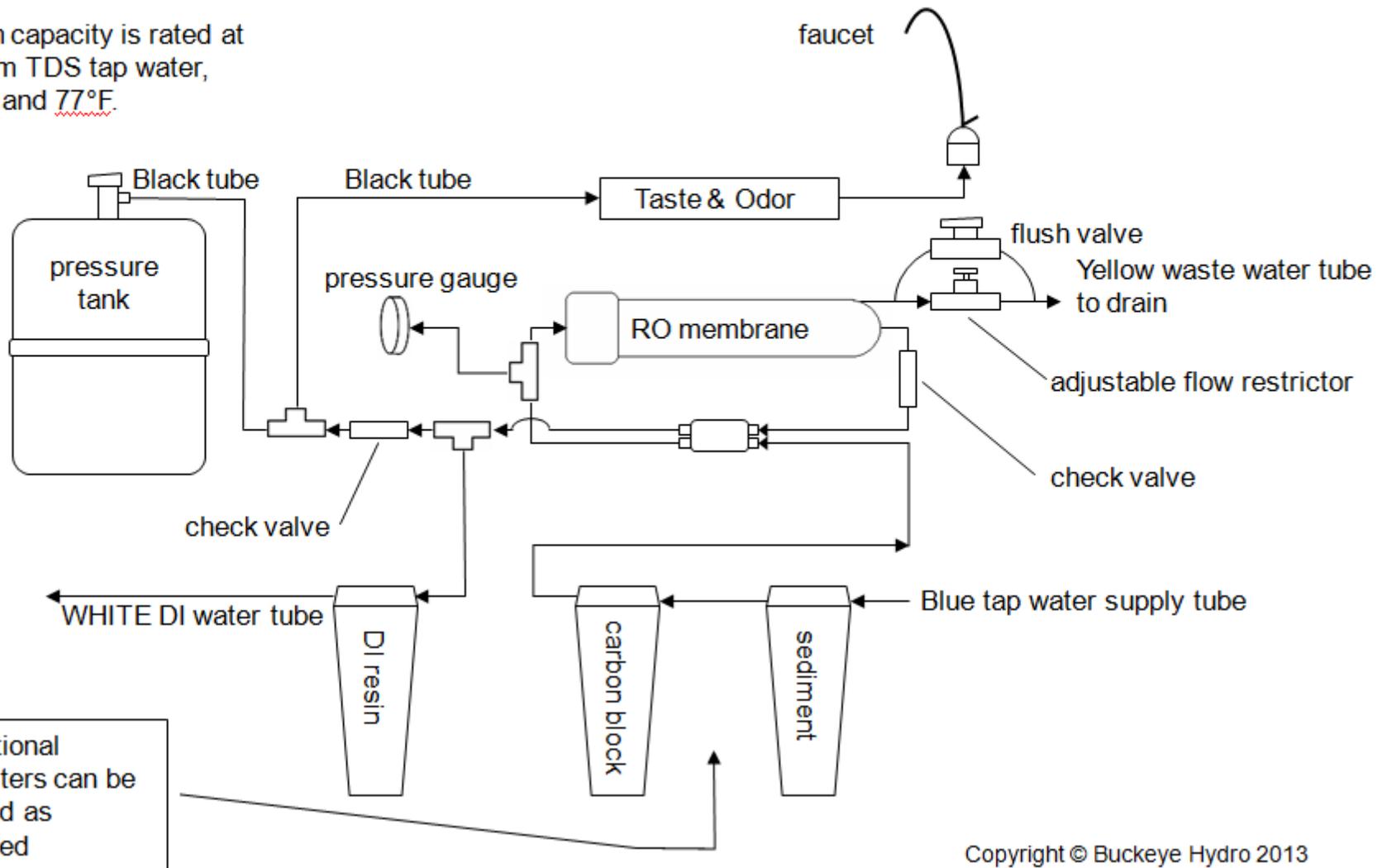
$$(265 - 8) / 265 = x$$
$$257 / 265 = 0.958 \text{ or approximately } 96\%$$



# Buckeye Hydro

## Reef/Residential RO/DI System

System capacity is rated at 250 ppm TDS tap water, 50 psi, and 77°F.



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