



## Understanding and Operating Your Reverse Osmosis/Deionization (RO/DI) System *The Chloramine Special CS5*

Congratulations on your purchase of a water purification system from Buckeye Hydro – you’ve made the right choice! You’ve purchased *The Chloramine Special*, a system designed for use with tap water containing chloramines. Start by carefully removing all parts from the shipping box. Identify your sediment cartridge, catalytic GAC cartridge, carbon block cartridge, DI resin cartridge, RO membrane, sediment housing “in” port, DI housing “out” port, static or adjustable flow restrictor, TDS meter, flush valve, drain saddle, housing wrench, pressure gauge, thermometer, and RO water “out” valve. Please read these instructions in their entirety before you begin.

Securely mount your system using the mounting holes on the back of the mounting bracket. Place the system in a location out of direct sunlight that will be protected from temperatures below freezing and above 100°F. Screw the four clear housings onto the white lids already mounted on the bottom of the white metal bracket. To prepare your system for operation:

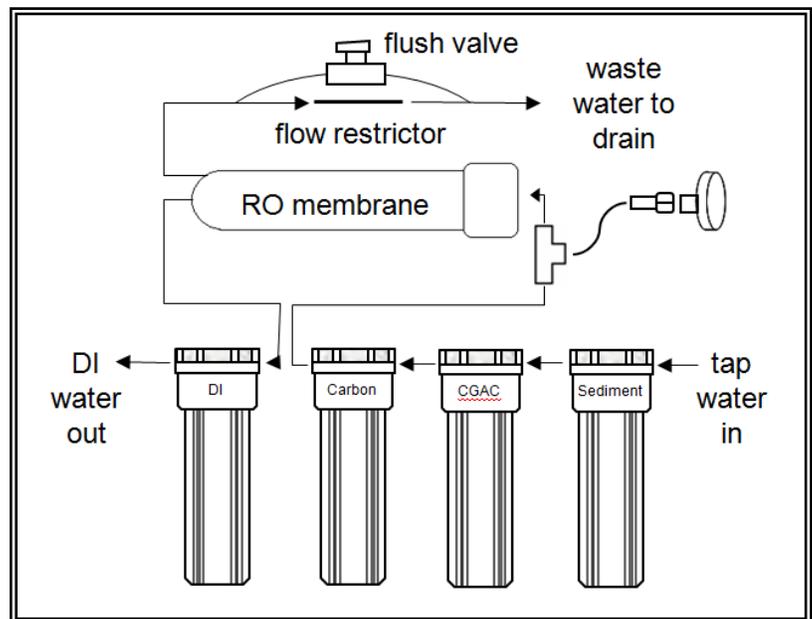
1. Attach the ¼” water supply tube (blue) to the quick connect fitting in the lid (marked “in”) on the sediment cartridge housing. Don’t turn the water on yet!

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 (i.e., 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 RO housing.

3. Connected to the wastewater port you will find a flow restrictor and flush valve. Connect YELLOW tubing to the wye fitting with the open port on the flow restrictor/flush kit. Run this tubing to a drain. Close the flush valve (place the handle of the valve perpendicular to the tubing), and if your system has an adjustable flow restrictor, turn the chrome thumb screw all the way in (down toward the fitting).

4. A drain saddle is provided with your system. Route the yellow drain line to a drain, or to the drain saddle installed high on the vertical drain pipe under a sink – select a location away from the dishwasher drain and 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.

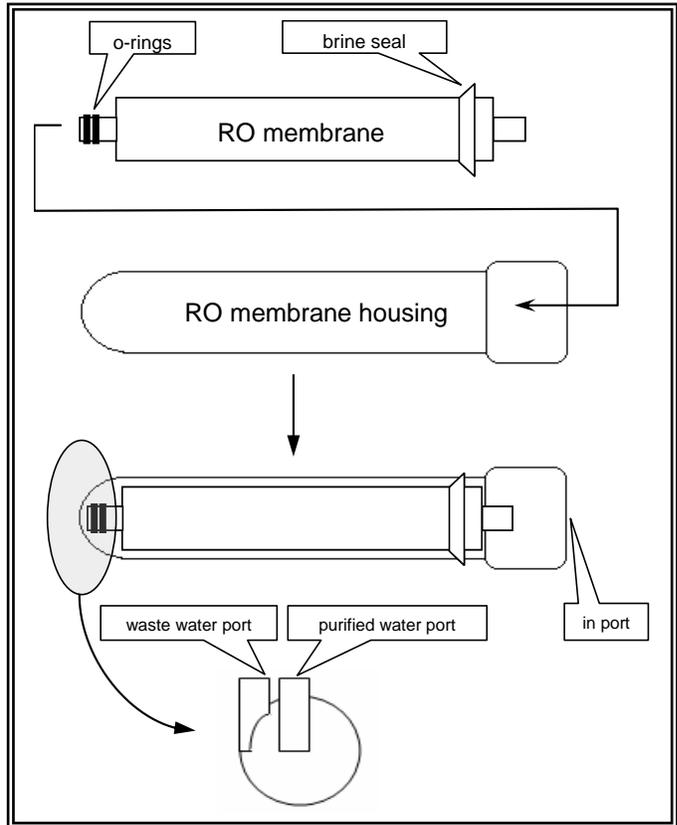
5. Route the white tubing from the “out” port on the left vertical housing to a drain. Eventually, DI water will flow from this tube.



Your system includes a Polyamide  
Thin-Film Composite (TFC)  
membrane by **FILMTEC™**



6. Place the sediment filter in the far right hand housing, and screw the housing on securely. As part of the start-up process only, place your Catalytic GAC cartridge in the far left hand housing, white end down (where your DI cartridge will eventually be placed).
7. Turn on the supply water to the unit and allow water to flow through the sediment filter, through the empty Catalytic GAC housing, the empty carbon block housing, into the horizontal empty RO membrane housing, and into the DI housing where you have placed the Catalytic GAC cartridge. Allow water to flush through the CGAC cartridge for at least 10 minutes, or until the water is visually clear of carbon fines/dust. Check the system for leaks. Turn off the water supply to the unit.
8. Turn off the water supply to the unit. Remove the CGAC cartridge from the DI housing, and place it in the housing to the left of the sediment housing, as shown in the diagram above. Place the carbon block cartridge in the housing to the left of the CGAC cartridge. Assure all four vertical housings are screwed on firmly, turn the water back on, and flush water through the system for 10 minutes.
9. On the right end of the RO membrane housing, locate the single quick connect elbow. This is the RO housing supply ("in") port. Disconnect the short length of 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. Unscrew this end of the RO membrane, 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, and immediately check for leaks.
10. If your system is equipped with an adjustable flow restrictor, unscrew the chrome thumb screw until you have four times as much water coming out the waste line as you do coming out the tube that extends from the out port on the empty DI housing. Check for leaks again. Flush water through the RO membrane for 10 minutes (if the membrane was shipped dry) or 40 minutes (if the membrane was shipped wet). Turn off the water supply to the RO/DI system.
11. Unscrew the vertical housing on the left, dump the water out, and insert your DI resin cartridge, white end down. Screw the housing back onto lid.
12. Turn the water supply on, check for leaks, and flush 1.5 gallons of water through the DI resin cartridge.
13. With water running through the system, and if the system has an adjustable flow restrictor, again adjust the chrome thumb screw/needle valve to produce four parts waste to one part RO permeate (or in this case water coming from the DI "out" port). Ratios ranging from 3:1 to 5:1 are acceptable. Recheck this ratio over the next several weeks as your system breaks in, periodically thereafter, and when tap water temperatures change with the seasons.
14. Turn off the water supply to the system, route the water supply, wastewater, and purified water tubings to their final locations, and your system is ready for use.



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 systems come with a 1 micron sediment filter and 0.5 micron, 20,000 gallon carbon block.

Both Premium and Value Series systems utilize a refillable DI cartridge filled with color-changing resin. Replace the resin in the cartridge when it becomes exhausted.

**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.
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 1/8 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 TDS at 77°F and 65 psi pressure for 150 gpd membranes. The rejection rate, or the percentage of TDS in the feed water that is rejected by the membrane, should be 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:

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