



The Eliminator™ RO System

Reverse Osmosis Water Purification System

(Single and Dual Membrane Models)



INSTALLATION AND OPERATING MANUAL

WARNING

Please read carefully before proceeding with installation. Failure to follow any attached instructions or operating parameter may lead to the product's failure and possible damage to property.

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Thank You for your purchase of a *SpectraPure® System*. *With proper installation and maintenance, this system will provide you with high quality water for years to come. All SpectraPure® products are rigorously tested by us for safety and reliability. If you have any questions or concerns, please contact our customer service department at 1.800.685.2783 or refer to our online troubleshooting at www.spectrapure.com.*

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TERMS AND CONDITIONS:

1. Shipping charges on units or parts submitted to our facility for repair or replacement must be borne by the registered purchaser. After repair or replacement, the factory will return the unit or part freight prepaid to the customer.
2. We assume no warranty liability in connection with our equipment other than as herein specified.
3. This warranty is in lieu of all other warranties expressed or implied, including warranties of fitness for a particular purpose.
4. We do not authorize any person or representative to assume for us any other obligation on the sale of our equipment. This is the exclusive remedy and liability for consequential damages under any and all warranties which are excluded to the extent exclusion is permitted by law.
5. Proof of original purchase date must accompany all warranty claims.
6. SpectraPure, Inc. Reserves the right to change prices without notice when necessary. All prices in the catalog are quoted in US dollars.
7. Claims for error in quantity or condition must be made within 10 days of receipt of material. SpectraPure, Inc. Will not be responsible for any claimed shortages not reported within 10 days. Returns other than warranty claims may be subject to 20% restocking fee.
8. SpectraPure, Inc. Cannot be held liable for damage or loss to a shipment by a freight carrier. Check shipment for damage before acceptance or note on freight bill subject to inspection for concealed damage. Consignee must file claim. SpectraPure, Inc. Will offer as much assistance as possible.
9. A complete credit check is required prior to shipping on a Net 30 or "C.O.D. - CUSTOMER CHECK ACCEPTABLE" basis. In the interim period during which credit references are being evaluated, all orders must be shipped "C.O.D. - CERTIFIED FUNDS" (cash, cashiers check or money order).
10. All returned checks (due to insufficient funds or closed accounts) will be subjected to a **\$25 penalty charge.**

Invoices on Net 30 accounts not paid within 30 days of shipment will be considered delinquent and will accrue Finance charges at the rate of 1.5% per month (18% per annum).

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THREE YEAR LIMITED WARRANTY:

Effective on products purchased after March 10, 2005.

SpectraPure, Inc.® warrants the product to the original owner only to be free of defects in material and workmanship for a period of three years from the date of receipt. SpectraPure's liability under this warranty shall be limited to repairing or replacing at SpectraPure's option, without charge, F.O.B. SpectraPure's factory, any product of SpectraPure's manufacture. SpectraPure will not be liable for any cost of removal, installation, transportation or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by SpectraPure are subject to the warranty provided by the manufacturer of said products and not by SpectraPure's warranty. SpectraPure will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair or, if the product was not installed in accordance with SpectraPure's or other manufacturer's printed installation and operating conditions, or damage caused by hot water, freezing, flood, fire or acts of God.

SpectraPure will not be responsible for any consequential damages arising from installation or use of the product, including any water or mold damage due to flooding which may occur due to malfunction or faulty installation, including, but not limited to failure by installer to over- or under-tighten fittings, housings, and/or push-style fittings, or improper installation of push-style fittings. Consumable items such as pre filters and membranes are not covered under the 3 year warranty.

SpectraPure warrants (pro-rated) the performance of tested SpectraSelect™ RO membrane elements only, for one year from date of receipt by the buyer, providing that the loss of performance was not caused by fouling, neglect or water conditions exceeding the feed water parameters listed in the applicable product manual (refer to detailed membrane warranty information). SpectraPure will, on confirmation of loss of performance during the warranty period, credit the pro-rated amount of the current catalog price of the element. The disposable filters and cartridges are not covered under the warranty.

To obtain service under this warranty, the defective system or components must be returned to SpectraPure with proof of purchase, installation date, failure date and supporting installation data. Any defective product to be returned to the factory must be sent freight prepaid; documentation supporting the warranty claim and a Return Goods Authorization (RGA) number must be included. SpectraPure will not be liable for shipping damages due to the improper packaging of the returned equipment and all returned goods must also have adequate insurance coverage and a tracking number.

SpectraPure will not pay for loss or damage caused directly or indirectly by the presence, growth, proliferation, spread or any activity of "fungus", wet or dry rot or bacteria. Such loss or damage is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the loss. We will not pay for loss or damage caused by or resulting from continuous or repeated seepage or leakage of water, or the presence or condensation of humidity, moisture or vapor, that occurs over a period of 14 days or more. "Fungus" and "fungi" mean any type or form of fungus or Mycota or any by-product or type of infestation produced by such fungus or Mycota, including but not limited to, mold, mildew, mycotoxins, spores, scents or any biogenic aerosols.

SpectraPure will not be liable for any incidental or consequential damages, losses or expenses arising from installation, use, or any other causes. There are no expressed or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

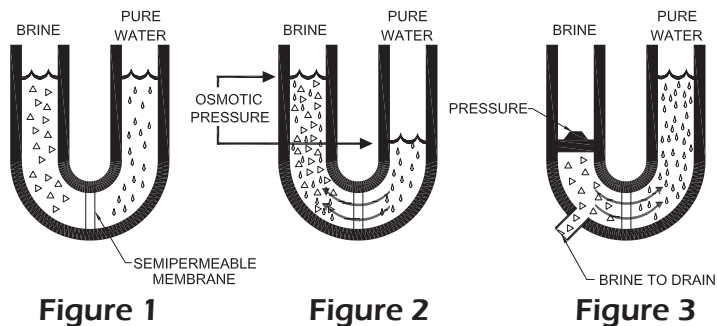
*** The thee year limited warranty does not apply to consumable items, including but not limited to, filters and cartridges unless specifically stated above**

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WHAT IS REVERSE OSMOSIS?

Osmosis is a process in nature that allows fluid of a lower concentration to pass through a semi-permeable membrane into a fluid of a higher concentration (See Figure 1). Because of the difference in salt concentration, pure water flows through the membrane as though a pressure were being applied to it (Figure 2). The effective driving force is called the osmotic pressure. As a rough guide, the osmotic pressure is equal to about 1 psi (pounds per square inch) per 100 ppm Total Dissolved Solids (TDS). When enough pressure is applied to the solution with a higher concentration it can then pass through the membrane into the solution of lower concentration. (See Figure 3). This is the basis of Reverse Osmosis.



Household water pressure is used to force tap water through the semipermeable R.O. membrane. The membrane only allows the purest of water molecules to pass through it while over 98% of most salts and other impurities are rejected and automatically rinsed from the membrane down the drain.

WHAT DOES THE SYSTEM DO?

SpectraPure's ELIMINATOR™ RO System uses household water pressure to reverse a natural physical process called osmosis. Water, under pressure is forced through a semi-permeable membrane where minerals and impurities are screened out and sent down the drain with waste water. These minerals and impurities are measured as total dissolved solids (TDS).

The system connects to a house COLD water pipe for a water supply. The system includes replaceable sediment, carbon pre-filters and a membrane. The sediment pre-filter removes sand, dirt, rust particles and other particulates while the carbon pre-filter takes chlorine and organics out of the feed water. The water then passes through the RO membrane.

The ELIMINATOR™ System gives you a continuous supply of sparkling clear, delicious water for drinking, cooking, hydroponics etc. Foods will look better and taste better too. The reliability with the ELIMINATOR™ Water Treatment System is greatly improved over other systems and costly maintenance is avoided. The system eliminates the need to buy bottled water. Instead, it puts high quality water at your fingertips.

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SYSTEM SPECIFICATIONS:

Sediment Pre-Filter	1 micron MicroTec™ sediment pre-filter
Carbon Filter	1 micron carbon block pre-filter
RO Membrane Type	Thin-Film Composite (TFC)
Rejection Rate	98% average
Input Water Pressure	60 psi (4.15 bar) line pressure*
Input Water Temp	77°F (25°C)
Recovery Rate	25% (i.e. 25% of the water will be collected as pure water)

Nominal Membrane Flow Rates @ 60 psi, 77° F, & 500 ppm TDS :

GPD	Product Water Flow Rate	Concentrate Flow Rate
100	263 ml/min	789 ml/min
200	526 ml/min	1578 ml/min

Reverse Osmosis Feed Water Requirements

For the 1 year TFC membrane pro-rated warranty to be honored, the following conditions must be met:

Operating Pressure*	40 – 80 psi (2.75 – 5.5 bar)
pH Range	3 – 11
Maximum Temperature	100° F (38° C)
Maximum Turbidity	1.0 NTU
Maximum Silt Density Index	5.0 (based on 15 min. test time)
Maximum Chlorine	less than 0.1 ppm
Maximum TDS	1500 ppm
Maximum Hardness	16 grains (272 ppm as CaCO ₃)
Maximum Iron	less than 0.1 ppm
Maximum Manganese	less than 0.1 ppm
Maximum Hydrogen Sulfide	0 ppm
Langlier Saturation Index	LSI must be negative

*Operating pressure less than 40 psi may require a booster pump:

For manual operation, use BPHF-MO-115 (-230).

For automatic operation, use BPHF-PS-250/4-115 (-230)

*Operating pressure greater than 80 psi will require a pressure regulator.

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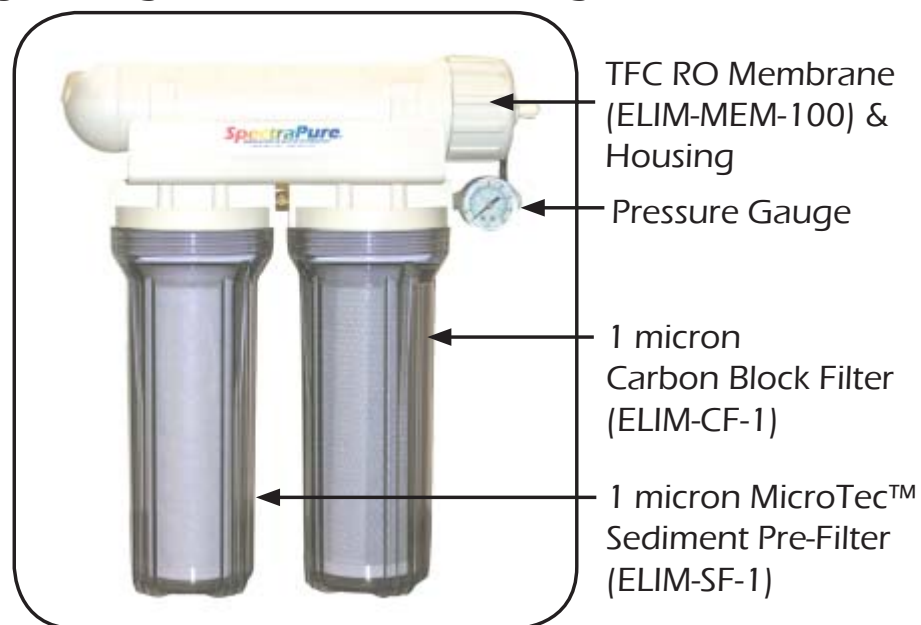
SYSTEM DESCRIPTION:

The incoming feed water from a cold supply pipe valve is directed through 1/4" BLACK tubing and is first passed through a 1 micron Micro-Tec™ sediment pre-filter. This filter is used to remove excessive turbidity, sand, dust, silt etc.that may cause the carbon filter to plug up.

The next stage of filtration is a 1 micron carbon block pre-filter. This filter is used to remove organics and chlorine from the feed water that can damage the membrane.

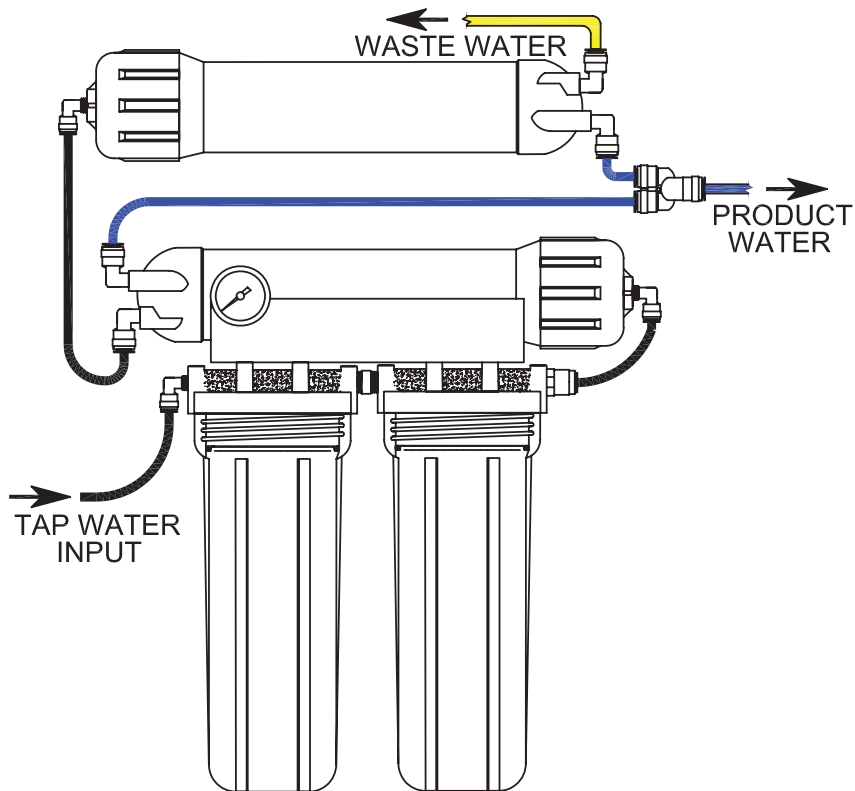
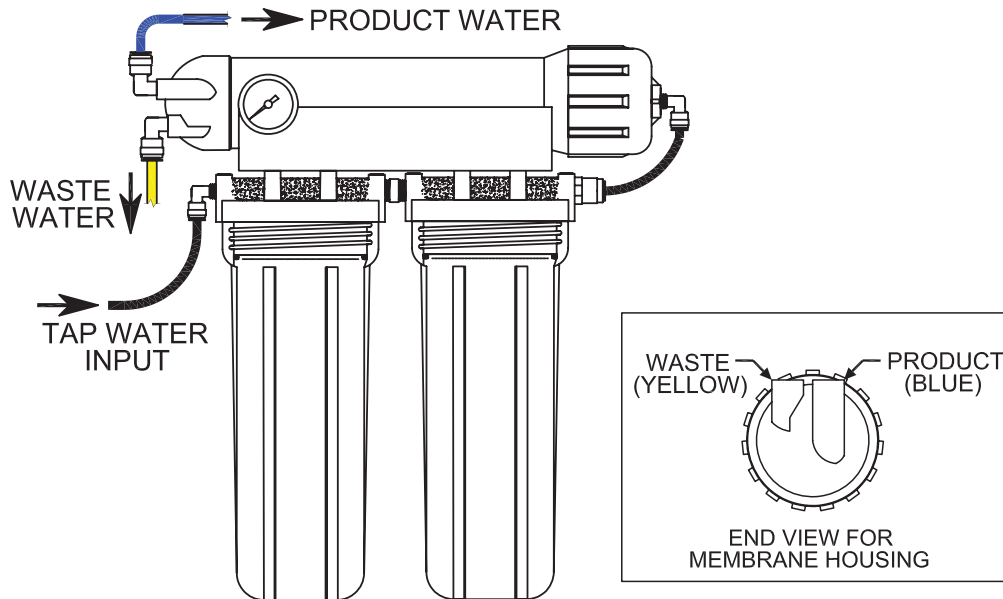
The final stage of the system is the R.O. membrane. A high rejection Thin Film Composite (TFC) membrane is used in this system. This removes as much as 98(+) % of most inorganic salts, all micro-organisms and almost all high molecular weight organics in the water.

Fig. A: Single-Membrane Filter Diagram



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SINGLE MEMBRANE SYSTEM- FIGURE B



DUAL MEMBRANE SYSTEM- FIGURE C

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SYSTEM INITIALIZATION:

If you are setting up your system for the first time or replacing the membrane with a different size, please follow the “Measuring Waste to Product Water Ratio” procedure on page 11 after you do the system hook-up below.

System Hook-Up

1. Attach the garden hose adapter (**connected to the black tubing**) to your cold water source. Never run hot water (greater than 100° F (38° C)) through the system.
2. Place the **yellow concentrate (waste) tubing** (with the Flow Restrictor inside) and the **blue purified (product) water tubing** into a drain. Do not restrict flow from these lines.
3. Open the cold water supply valve. You may use pressure up to 80 psi (5.5 bar).

Check the system to ensure that all fittings are tight and leak-free before leaving the system unattended. (If anything is leaking, contact SpectraPure for assistance.)

Note: It is recommended that at least 2 gallons (7.57 liters) of purified water be discarded now before collecting purified water for use. If the unit is not used for several days, run the system for at least 10 minutes before collecting any water. This will flush out any stale water in the system.

4. Now, follow the procedure on page 11 to adjust the Flow Restrictor.
5. Finish the installation by connecting the yellow line to a drain. The blue line can be placed into a Rubber Maid™ trash can or set up for automatic operation using a Liquid Level Controller (LLC-S-115), (LLC-M-115) or the Auto Shut-Off Kit (ASOFK) (*Shown on page 10*).

SpectraPure®Inc. Assumes no responsibility for water damage due to leaks. It is the user's responsibility to determine that the system is leak-free.

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Optional Accessories

AUTOMATIC SHUT-OFF FLOAT KIT (ASOFK) - Provides an economical way to automatically fill open reservoirs. The ASO valve in conjunction with a check valve provides positive shut-off and completely shuts off the waste water and product water lines, thus conserving water (Note: A pressurized storage tank of any size may be installed on the line leading to the float valve. This can provide on-demand drinking water via a tee and faucet.)

QUICK CONNECT FAUCET ADAPTER (ELIM-FAU-SNP) - The Quick Connect Faucet Coupler with aerator, adapts kitchen and bathroom faucets to 1/4" tubing for easy disconnects. (use in place of the Garden Hose Adapter)

FEED WATER ADAPTER (VA-FD-4) - Connects the "BLACK" input line to the tap water line under the sink (use in place of the Garden Hose Adapter that comes with the system)

DRAIN SADDLE (DS-4T) - Connects the "YELLOW" waste line to a drain line.

TOTAL CHLORINE TEST KIT (TK-CL-5-KIT) - The Chlorine Test Kit contains 5 tablets for five tests. Test the waste water stream for chlorine break-through from an exhausted carbon block filter.

FLUSH VALVE KIT (ELIM-VA-FVK-4) - The Flush Valve Kit is placed between the membrane rejection port and the flow restrictor to provide a high flow by-pass used to purge concentrated brine from the membrane housing and rapidly flush any particulates from the membrane surface.

TOTAL DISSOLVED SOLID METER (MTR-TDS-4TM-0-9990) - Measures the TDS level and temperature of the water. Perfect for both consumer or commercial use in fresh water or salt water.

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MEASURING WASTE TO PRODUCT WATER RATIO.

This procedure will assure you of maximum life and reliability of your SpectraPure System. Failure to perform this procedure can permanently damage the membrane and will void the pro-rated Membrane Warranty.

In order to maximize the life of your SpectraPure RO Membrane, a minimum waste-to-product ratio of 3-to-1 (3:1) is required. Depending upon your particular tap water pressure and temperature, you may need to adjust the ratio of the concentrate (waste) to purified water. If not enough concentrate is allowed to flow past the membrane during operation, the impurities will precipitate out on the membrane surface, clogging the RO Membrane. To keep this from happening, the Concentrate to Purified Water Ratio must be checked and adjusted in order to compensate for pressure and temperature variations. The flow rate of the concentrate must be a minimum of 3X the product flow rate. 3:1 to 5:1 is an acceptable ratio.

Procedure:

1. Locate the Yellow waste line. Direct the waste line into a sink drain.
2. Locate the Blue product line. Direct the product line into a sink drain.
3. Turn on the Feed Supply Valve and let the system run for 20 min.
4. Collect product water from the blue line into a measuring cup (marked in milli-liters) for one minute. Measure the collected amount **in milli-liters**. Do the same with the waste water.

WASTE IN MILLILITERS _____ ML

DIVIDED BY

PRODUCT IN MILLILITERS _____ ML

The resultant is the Concentrate to Product Ratio

(Although not needed in this procedure, the daily product flow rate in Gallons per Day (GPD) can be calculated to be equal to the product flow rate times 0.38).

5. If ratio is **less than 3:1**, Remove Flow Restrictor as shown on page 12-13 and cut 1 inch off the end of the Flow Restrictor (FR).
6. Re-measure your ratio and repeat procedure until you achieve a 3:1 ratio.
7. If ratio is **greater than 5:1**, you will need to further restrict the waste water. You may contact SpectraPure Inc for a smaller FR, or, get a small 1/4" Ball Valve from a hardware store. Cut the yellow waste line about 18 inches from the Membrane Housing and then re-connect the two cut ends with the Ball Valve. You can then continue to reduce the waste water with the Ball Valve until you achieve the proper ratio.

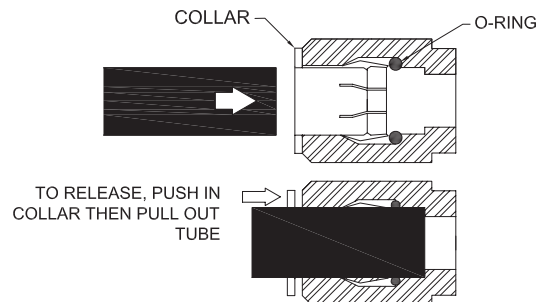
**Note: our New 100 GPD Membranes have Replaced the
90 GPD Encapsulated Membranes**

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FLOW RESTRICTOR REMOVAL, ADJUSTMENT AND REPLACEMENT

1. Locate the yellow concentrate tubing (Fig. B for Single-Membrane System or Fig. C for Dual-Membrane System). Remove the tubing from its push-fitting at the membrane:
 - a.) Firmly depress and hold the push-fitting collar down with your thumbnail.
 - b.) While the push-fitting collar is depressed, pull the tubing straight out of the push-fitting. Once the tubing is removed, release the collar.



2. Carefully remove the flow restrictor assembly, now visible as a plastic insert in the end of the yellow tubing (Fig. D). You may use an object such as a dull knife to help pry the flow restrictor insert from the end of the tubing. The entire flow restrictor (consisting of the insert collar and thin capillary tubing) may then be gently extracted.

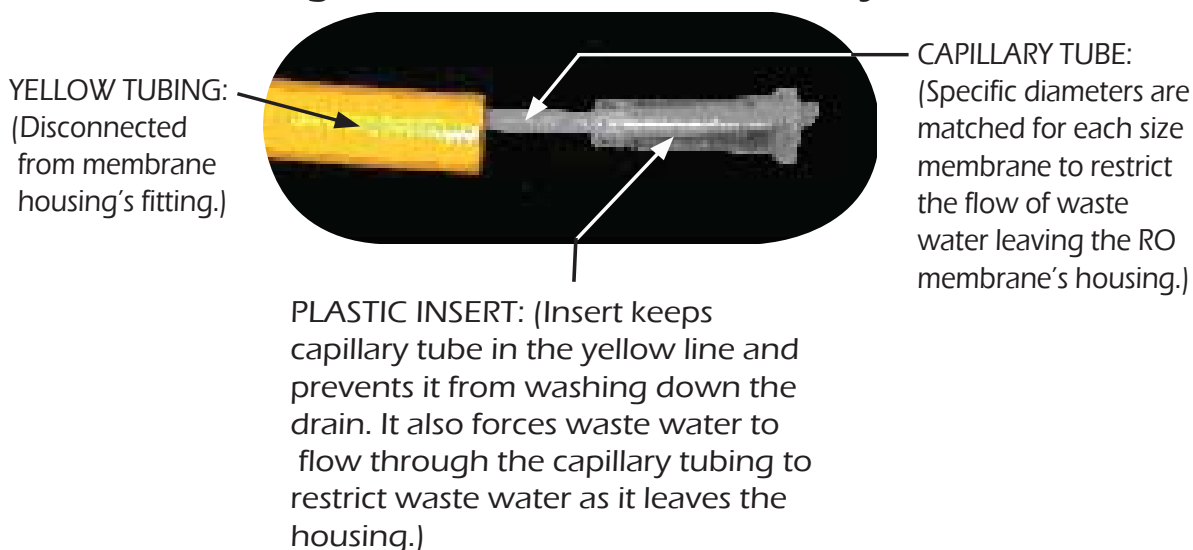
Note: Take care not to crush or otherwise damage the delicate capillary tubing.

3. Using a new single-edge razor blade, carefully measure and then cut the flow restrictor as instructed.
4. Re-insert the flow restrictor assembly into the yellow tubing and firmly re-seat the insert into the end of the yellow tubing by carefully pressing on the insert with your thumbnail. Care should be taken not to crush or otherwise damage the end of the capillary tubing protruding from the end of the insert.

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5. Re-insert the yellow tubing into its push-fitting in the RO membrane:
 - a.) Moisten the O-ring seal inside the concentrate outlet fitting by dripping a few drops of clean water into the fitting.
 - b.) Grasp the yellow tubing near the flow restrictor end, and insert the tubing into the push-fitting. Push the tubing into the fitting until resistance is felt, approximately 1/2 inch (12.7 mm). The tubing is now resting on the O-ring seal inside the fitting.
 - c.) Firmly push the tubing approximately an additional 1/4 inch (6.35 mm) further into the fitting to completely seat the line into the fitting and past the O-ring seal.
6. Turn on the system water supply and check for leaks prior to further use or testing. If a leak is observed, you may not have pushed the yellow tubing into the push-fitting far enough to seal the tubing against the O-ring. Turn off the system water supply and re-seat the tubing as described above.

Fig. D: Flow Restrictor Assembly



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SEDIMENT PRE-FILTER REPLACEMENT:

A Sediment Filter will usually last approx. 4-6 months, depending on micron rating and quality of water. (The life span of the filter is determined by the turbidity, iron content, organics, and total particulate volume in your water source). The best way to determine when your Sediment Pre-Filter needs replacement is to use a Pressure Gauge. When you have a drop in pressure between 15-20% below your normal house pressure, replace the filter. To verify this, run water through the system without the filter in its housing. If the pressure jumps back to your normal house pressure without the filter, you will know the filter you just took out was plugged up.

**NOTE: A drop in the system's production is "in most cases" an indication that the sediment filter has become saturated with contaminants and will need to be replaced. If you remove the sediment and the pressure does not return to normal, the carbon filter may be plugged.

Sediment Pre-Filter Replacement

Materials Required: 1-micron MicroTec™ Sediment Filter (ELIM-SF-1),
Filter Wrench

Procedure:

1. Turn off water supply to the system.
2. Refer to Fig. A (System Diagram). Using the provided filter housing wrench, remove the first housing on the left. Unscrew it counterclockwise as viewed from the bottom.
3. Remove the old filter and discard.
4. Thoroughly wash the housing with a mixture of hot soapy water and a few teaspoons of household bleach. Rinse well with clean hot water.
5. Install the new pre-filter onto the round port in the head of the housing, Screw the housing back onto the assembly, and hand tighten **only**. **NOTE: Do not use filter wrench to tighten housings. Over-tightening will damage housings and void your warranty.**
6. Proceed with carbon block filter replacement.

** If your water contains a great deal of sediment or chlorine, the pre-filters may require more frequent changes to maintain adequate production rate and extended membrane life.

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CARBON BLOCK FILTER REPLACEMENT:

A Carbon Filter will usually last approx. 4-6 months, depending on micron rating for the filters, usage and the quality of your tap water. The best way to determine when your Carbon Block Pre-Filter needs replacement is to use a chlorine test kit.

Any chlorine level above 0.1 ppm will cause damage to the membrane and indicates that the carbon block filter must be changed. To test for chlorine breakthrough, collect a 10 ml sample of the concentrate from the yellow tubing and test the chlorine concentration using test kit TK-CL-5-KIT. If the chlorine concentration is above 0.1 ppm, replace the carbon pre-filter.

****NOTE:** A drop in the system's production is "in most cases" an indication that the sediment filter has become saturated with contaminants, but a carbon filter can also drop production, if its covered with extremely fine sediment. If the carbon becomes plugged with sediment, it will no longer be able to remove chlorine.

Carbon Block Filter Replacement

Materials Required: 1 micron Carbon Block Filter (ELIM-CF-1),
Filter Wrench, Chlorine Test Kit (TK-CL-5-KIT)

Procedure:

1. Turn off water supply to the system.
2. Refer to Fig. A (System Diagram). Using the provided filter housing wrench, remove the second housing from the left. Unscrew it counterclockwise as viewed from the bottom.
3. Remove the old filter and discard.
4. Thoroughly wash the housing with a mixture of hot soapy water and a few teaspoons of household bleach. Rinse well with clean hot water.
5. Install the new carbon block filter, making sure that the black gaskets on both ends of the filter are firmly seated in the gasket recesses.
6. Screw the housing back onto the assembly, and hand tighten **only**. **NOTE: Do not use filter wrench to tighten housings. Over-tightening will damage housings and void your warranty.**
7. Turn on system water supply and check for leaks.

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RO MEMBRANE DIAGNOSTICS:

In order to accurately determine the condition of the RO Membrane, a conductivity tester capable of reading the tap water conductivity (or TDS) and the product water conductivity (or TDS) would typically be required.

You may also use an alkalinity test kit (on softened water sources) or a hardness test kit (cannot be used on softened water sources).

Before performing any membrane test, the waste -to-product water ratio must be 3-to-1 or greater.

Note: All water sources are different and are subject to changes in conductivity from season to season which could affect the monitor reading depending on the time of the year. For this reason, we recommend the use of a conductivity tester in order to register the most accurate measurement for determining the condition of the RO membrane.

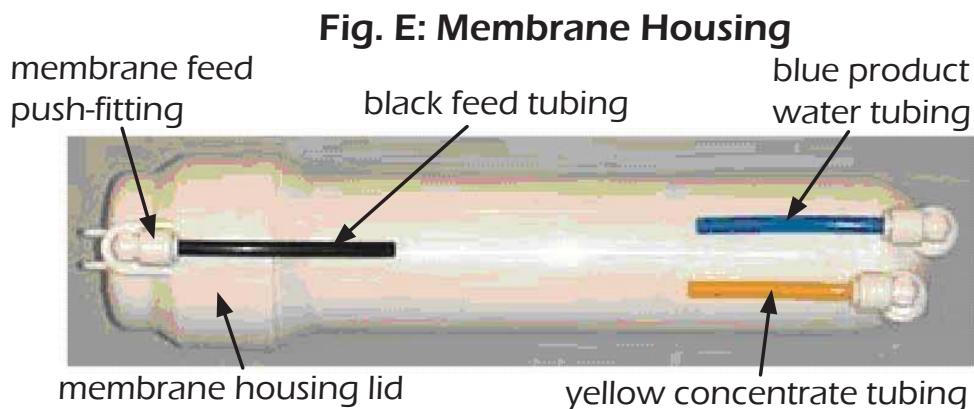
MEMBRANE WARNING: All replacement SpectraPure RO membranes, except for encapsulated membranes, must remain moist at all times. It is the customer's responsibility to inspect the membrane upon receipt and maintain adequate moisture.

Replacement membranes should be kept in the sealed non-permeable shipping bag and in a refrigerator until use. The membrane can be kept there for up to 1 year. (DO NOT FREEZE)

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RO MEMBRANE REPLACEMENT:

1. Turn off the water supply to the RO system. Place the system where the membrane housing is easily accessible.
 2. Remove the black tubing from the membrane feed push-fitting by depressing the collar on the fitting with your thumb and pulling the tubing from the push-fitting (Page 12).
 3. Lift the membrane housing from the retention clips.
 4. Unscrew the membrane housing lid. This may require two people.
 5. Use a pair of pliers to grasp the membrane stem and pull the membrane from the housing (Fig. F).
 6. Remove the black housing O-ring (Fig. F). Wash the empty housing with soapy water. Rinse thoroughly with hot, clean water.
 7. Insert the new membrane into the housing, with the double O-ring end first (Fig.G). The o-rings and tube must fit into the recess at the bottom of the membrane housing. When the membrane is aligned with the hole, firmly push the membrane into the hole until it bottoms out.
 8. Place the black housing O-ring on the housing rim and carefully screw the lid back on to the base. Hand-tighten.
 9. Reconnect the black tubing to the membrane feed push-fitting.
- Note: If you have a dual-membrane system, perform steps 2 thru 9 on the second membrane.
10. Disconnect the yellow concentrate tubing (Fig. E) from the membrane housing and remove the flow restrictor (Fig. D)



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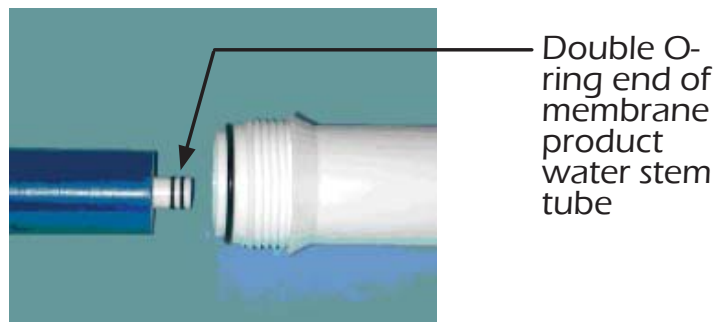
from the yellow tubing (see Flow Restrictor Removal, Adjustment, and Replacement). Reconnect the tubing to the membrane housing. Place the flow restrictor in a safe location where it will not be accidentally crushed or damaged.

11. Put the yellow concentrate tubing and the blue product water tubing in the drain and turn on the system water supply. Allow the system to flush for several minutes to remove any loose particles.
12. Turn off the water supply to the system. Remove the yellow tubing from the membrane housing and replace the flow restrictor assembly as described on page 12-13.
13. Re-insert the flow restrictor end of the yellow tubing into its push-fitting at the RO membrane housing.
14. Turn on the water supply to the system and check for leaks. Check, and if necessary adjust, the Concentrate to Purified Water Ratio per the procedures described in that section.

Fig. F: Removing the Membrane Element



Fig. G: Inserting the New Membrane Element



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MEMBRANE OUTPUT CALCULATION:

Membranes produce the rated gallons per day (GPD) at 60 psi (4.1 bars) operating pressure, 77°F (25°C) operating temperature and no more than 500 ppm total dissolved solids.

Membrane output gallons per day (GPD) depends on operating pressure, water temperature and the TDS in the feed water.

$$\text{Expected GPD} = \text{Rated GPD} \times \text{PCF} \times \text{TCF}$$

PCF is the pressure correction factor

TCF is the temperature correction factor

Calculation of Pressure Correction Factor (PCF): The output (GPD) from the membrane is directly proportional to the applied pressure.

Note: The membrane is rated to produce the rated GPD at 60 psi. For any pressure other than 60 psi the output GPD is multiplied by the PCF.

$$\text{PCF} = \text{Line Pressure (in psi)} \div 60$$

Calculation of Temperature Correction Factor (TCF): The output (GPD) decreases with a decrease in temperature. This is because water viscosity increases with a decrease in water temperature.

Temperature Correction Factor Table (TCF)

°F / °C	TCF	°F \ °C	TCF	°F \ °C	TCF
41.0 / 5	0.521	59.0 / 15	0.730	77.0 / 25	1.000
42.8 / 6	0.540	60.8 / 16	0.754	78.8 / 26	1.031
44.6 / 7	0.560	62.6 / 17	0.779	80.6 / 27	1.063
46.4 / 8	0.578	64.4 / 18	0.804	82.4 / 28	1.094
48.2 / 9	0.598	66.2 / 19	0.830	84.2 / 29	1.127
50.0 / 10	0.620	68.0 / 20	0.857	86.0 / 30	1.161
51.8 / 11	0.640	69.8 / 21	0.884	87.8 / 31	1.196
53.6 / 12	0.661	71.6 / 22	0.912	89.6 / 32	1.232
55.4 / 13	0.684	73.4 / 23	0.941	91.4 / 33	1.267
57.2 / 14	0.707	75.2 / 24	0.970	93.2 / 34	1.304

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Membrane Output Calculation Example

What is the expected GPD from a 75 GPD System at 40 psi pressure and 60°F water temperature?

$$PCF = 40 \div 60 = 0.666$$

$$TCF = 0.754 \text{ (from Table 1)}$$

$$\text{Expected GPD} = 75 \times 0.666 \times 0.754 = 37.7 \text{ GPD} \pm 15\%$$

37.7 GPD would be the Actual Production Rate

TESTING THE QUALITY OF THE MEMBRANE

The performance of a RO membrane is measured by its ability to reject salts (or TDS (Total Dissolved Solids)).

Important: Test the quality of the membrane once every 6 months.

Note: This procedure will require a TDS Meter. SpectraPure offers several models.

Procedure:

1. Measure tap water TDS. (Call it X)
2. Run the system for 15-20 minutes.
3. Rinse test instrument cell 2-3 times with RO water.
4. Measure RO water TDS directly from the blue product water line. (Call it Y).
5. Subtract RO water TDS from tap water TDS. (X - Y)
6. Divide this quantity by tap water TDS. (X - Y) ÷ X
7. Rejection = [(X - Y) ÷ X] × 100

* TDS in the above procedure is measured in ppm or mg/l.

Rejection of the RO Membrane Calculation Example

1. Tap water TDS = 150 ppm (X)
2. RO water TDS = 7 ppm (Y)
3. X - Y = 143 ppm
4. (X - Y) ÷ X = 143 ÷ 150 = 0.953
5. Rejection = [(X - Y) ÷ X] × 100 = 0.953 × 100 = 95.3

Membrane TDS Rejection = 95.3 % : Rejection rates less than 95% may indicate that the membrane should be replaced.

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TROUBLESHOOTING GUIDE:

Product Water - Low Production Rate

Cause	Corrective Action
Plugged pre-filters	Replace pre-filters
Low water temperature	Heat feed water or use higher GPD membrane
Low water pressure	Use booster pump or use higher GPD membrane
Fouled membrane	Replace membrane

MEMBRANE TROUBLESHOOTING GUIDE

The following chart illustrates the procedure for determination of RO membrane performance. However, the chart represents only rough guidelines for determining performance of RO membrane. Depending on your tap water chemistry, the rejection characteristics of the membrane may vary significantly.

Method of Testing	Calculate % Rejection	Test Results	Conclusion
TDS/ Conductivity Tester	Measure feed water (X) RO product water (Y) for TDS/Conductivity	Is Rejection greater than 95% ?	No - Replace Membrane Yes - Membrane OK
Alkalinity Test Kit	Measure feed water (X) RO product water (Y) for Alkalinity	Is Rejection greater than 95% ?	No - Replace Membrane Yes - Membrane OK
Hardness Test Kit**	Measure feed water (X) RO product water (Y) for Hardness	Is Rejection greater than 95%?	No - Replace Membrane Yes - Membrane OK

**Caution: This test is not to be used on softened water sources.

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TIPS FOR LONG MEMBRANE LIFE:

1. Replacement of 1 micron sediment filter once every 6 months. This will prevent membrane fouling due to silt or sediment depositing on the membrane.
2. Replacement of 1 micron carbon block filter at least once every 6 months or when chlorine breakthrough occurs. This will ensure good membrane life and protect the membrane from chlorine damage.
3. Membrane should not be operated at lower than the recommended concentrate to purified water ratios, as described on page 11.
4. Operating reverse osmosis systems on softened feed water greatly reduces the chances of membrane fouling.
5. Use the optional flush valve kit **after each use** of the system to extend membrane life. This may be difficult to do with automated systems.

STORAGE

1. It is recommended that you store your RO System in a cool place when not being used.
2. Your RO System must be protected from freezing or temperatures above 100° F (38°C).

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CHOOSING A MOUNTING LOCATION:

When considering a location for the installation of the RO System, consider the following factors:

Light Sources

1. Most of the components of this system are plastic and are subject to damage by ultraviolet light from the sun and other sources such as metal halide lighting.
2. Algae is more likely to thrive inside the clear filter housings when exposed to bright light.
3. Avoid installing this unit in bright light or direct sunlight.

Temperature Extremes

1. The unit must be kept out of areas that are subject to freezing temperatures.
2. High temperatures greater than 100° F (38° C) must be avoided. If the unit is used outside, avoid putting the system in direct sunlight or connecting it to a garden hose that may be exposed to sunlight.

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REPLACEMENT PARTS:

<u>Model</u>	<u>Replacement Part</u>
ELIM-SF-1	1 micron MicroTec™ Sediment Filter
ELIM-CF-1	1 micron Carbon Block Pre-Filter
*ELIM-MEM-0100	100 gpd TFC Membrane (Use 2 for 200 gpd systems)
ELIM-FR-100	Flow Restrictor for 100 gpd System
ELIM-FR-200	Flow Restrictor for 200 gpd System
ELIM-GHA-4	1/4" (6.35 mm) Garden Hose Adapter
WR-UNIV	Filter Wrench

* When replacing your RO membrane, if you have an encapsulated housing, you will need to replace it with the ELIM-MEM-100-GRIP. (We no longer offer encapsulated membranes.)