REPLACEMENT PARTS

Model	Replacement Part
SF-MT-1.0-10	1 micron MicroTec™ Sediment Filter
CF-1-10	1 micron Carbon Block Pre-Filter
SF-MT-0.5-10	0.5 micron MicroTec™ Sediment Filter (upgrade)
CF-0.5-10	0.5 micron Carbon Block Pre-Filter (upgrade)
MEM-100-ENC	100 gpd (340 lpd) Encapsulated TFC Membrane (Membrane and Disposable Housing,
MEM-200-ENC	200 gpd (340 lpd) Encapsulated TFC Membrane (Membrane and Disposable Housing, Use 2 for 100 gpd (680 lpd) System)
FR-100	Flow Restrictor for 100 gpd (340 lpd) System
FR-200	Flow Restrictor for 200 gpd (680 lpd) System
DI-SB-CI-10	SilicaBuster™ Color Change DI Cartridge
GHA-4	1/4" (6.35 mm) Garden Hose Adapter
XWR-UNIV	Filter Wrench

OPTIONAL ACCESSORIES

Model	Optional Part
FAU-SMP	Quick Connect Faucet Coupler
TK-CL-25	Total Chlorine Test Kit
TS-C61	Conductivity (micro-Siemens)Tester
TS-T71	TDS (Total Dissolved Solids)Tester
VA-FVK-4	Flush Valve Kit
BPLF-MO-115	Low-Flow Booster Pump, 115V
BPLF-MO-230	Low-Flow Booster Pump, 230V
BPHF-MO-115	Hi-Flow Booster Pump, 115V
BPHF-MO-230	Hi-Flow Booster Pump, 230V

See our Catalog or our Web Site for Liquid Level Controls and other Optional Accessories

SpectraPure®Inc. 480.894.5437 Call us toll-free 1.800.685.2783
2167 East Fifth St, Tempe, Arizona 85281

SpectraPure®
INNOVATORS IN WATER TECHNOLOGY

The Eliminator DI™ RO/DI System

Reverse Osmosis Water Purification System

(Single and Dual Membrane Models)

INSTALLATION AND OPERATING MANUAL

REV 02-14-2007

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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 10 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 10-11.
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 up to 6 months.

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).

SYSTEM 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 90% ?	No - Replace Membrane Yes - Membrane OK
Hardness Test Kit**	Measure feed water (X) RO product water (Y) for Hardness	Is Rejection greater than 90%?	No - Replace Membrane Yes - Membrane OK

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

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TERMS AND CONDITIONS OF SALE

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 insufficients 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 accure Finance charges at the rate of 1.5% per month (18% per annum).

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

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 ÷ 60 = 0.666
TCF = 0.754 (from Table 1)
Expected GPD = 75 × 0.666 × 0.754 = 37.7 GPD ± 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 Conductivity Meter (TS-C61) or (TS-T71).

Procedure:

1. Measure tap water conductivity. (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 conductivity directly from the blue product water line. (Call it Y).
5. Subtract RO water conductivity from tap water conductivity. (X - Y)
6. Divide this quantity by tap water conductivity. (X - Y) ÷ X
7. Rejection = [(X - Y) ÷ X] ×100

* Conductivity in the above procedure could be replaced by hardness, alkalinity, nitrate, phosphate, silica etc. (measured in ppm or mg/l).

Rejection of the RO Membrane Calculation Example

1. Tap water hardness = 150 ppm (X)
2. RO water hardness = 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 Hardness Rejection = 95.3 % : Rejection rates less than 95% may indicate that the membrane should be replaced.

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 500 ppm total dissolved solids.

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

Expected GPD = Rated GPD × PCF × 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 multipled by the PCF.

PCF = Line Pressure (in psi) ÷ 60

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

Sediment Pre-Filter	1 micron MicroTec™ sediment pre-filter
Carbon Filter	1 micron carbon block pre-filter
RO Membrane Type	Encapsulated thin-film composite
Rejection Rate	Greater than 97% average
Input Water Pressure	60 psi (4.15 bar) line pressure*
Input Water Temp	77˚F (25˚C)
Recovery Rate	20% (i.e. 20% of the water will be collected as pure water)

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

GPD (lpd)	Product Water Flow Rate	Concentrate Flow Rate
100 (340)	235 ml/min	940 ml/min
200 (680)	470 ml/min	1880 ml/min

Reverse Osmosis Membrane 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
Temperature Range	38˚F – 100˚ F (3˚C – 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	2000 ppm
Maximum Hardness	10 grains (170 ppm as CaCO3)
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 will require a high flow booster pump (BPHF-MO-115(230)).
*Operating pressure greater than 80 psi will require a pressure reducing valve.

SYSTEM DESCRIPTION

The Eliminator DI™ System is a four stage reverse osmosis/de-ionization system.

1. First, the incoming feed water is passed through a 1 micron Micro-Tec sediment pre-filter. This filter is required to remove excess turbidity (particulate matter) that may cause the membrane to plug.
2. The second stage of filtration is a 1 micron carbon block pre-filter. This filter removes organics and chlorine from the feed water that can damage the membrane.
3. The third filtration stage of the system is a high rejection thin film composite (TFC) reverse osmosis membrane. It removes over 98% of most inorganic salts, all micro-organisms and almost all high molecular weight organics in the water.
4. The fourth stage moves water through a color change strong based anion cartridge. The anion exchange resin removes all negative ions and replaces them with hydroxyl ions.

This super-capacity RO/DI system consists of newly developed color-indicating DI resin cartridges with twice as much phosphates/silica removal resin as in previous designs.

Fig. A: System Diagram

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DEIONIZATION CARTRIDGE REPLACEMENT

The DI stage is an anion cartridge DI-SB-CI-10. In order to determine the condition of the cartridge, watch for the color to change from the bottom to the top. The color will change from a very dark blue to a lighter blue or tan color. Once the cartridge has changed color by 70 to 80% it **must** be replaced. **Failure to replace the DI cartridge upon exhaustion will contaminate the product water.**

(For "down flow" DI systems or systems that incorporate a permeate pump, the color will change from the top to the bottom).

Note: If the pH of your tap water is too high, the resin may not change color.

Deionization Cartridge Replacement

Materials Needed: One DI-SB-CI-10 Deionizaton cartridge, filter wrench.

Procedure:

1. Remove the filter housing from its cap by unscrewing it counter clockwise as viewed from the bottom.
2. Remove and discard the old cartridge from the housing.
3. Thoroughly wash out the housings with hot soapy water to which a few teaspoons of household bleach have been added. Rinse well with clean hot water.
4. Install the new deionization cartridge. Make sure the cartridge is installed in the correct direction as marked on the filter housing and that the top seal is securely attached to the top of the cartridge
5. Re-install the bottom housing onto the cap by rotating it clock-wise and hand tighten only.
6. Turn on system and check for leaks.

19. Snap the dual RO membrane assembly into the holding clips.
20. Reconnect the black membrane feed tubing into the push-fitting on the carbon pre-filter housing.
21. Reconnect the black membrane feed tubing into the push-fitting on Membrane 1.
22. Reconnect the yellow concentrate tubing into the push-fitting on Membrane 2.

Note: The flow restrictor assembly should remain uninstalled at this point in the process.

23. Put the yellow concentrate tubing and the blue product water tubing in the drain and turn on the system water supply.
24. Allow the system to flush for several minutes to remove any loose particles.
25. Turn off the water supply to the system.
26. Depress the collar on the concentrate push-fitting of Membrane 2 with your thumbnail and remove the yellow concentrate tubing.
27. Replace the flow restrictor assembly into the end of the yellow tubing as described in the Removal, Adjustment, and Replacement section on page 12-13.
28. Turn on the water supply to the system and check for leaks.
29. Check, and if necessary adjust, the Concentrate to Purified Water Ratio per the procedures described on page 10.

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SYSTEM INITIALIZATION & START-UP

If you are setting up your system for the first time or replacing the RO membrane:

1. Remove the DI cartridge from the right-most housing and re-install the empty housing.
2. Attach the garden hose adapter to your cold water source. Never run hot water (greater than 100° F (38° C)) through the system.
3. Place the yellow concentrate tubing and the blue purified water tubing into the drain. Do not restrict flow from these lines.
4. Slowly open the cold water supply valve and allow the first two housings to fill. You may use pressure up to 80 psi (5.5 bar).
5. Check the system to ensure that all fittings are tight and leak-free before leaving the system unattended.
6. Allow the system to produce at least 2 gallons (7.57 liters) of purified water and discard.
7. Measuring the Concentrate to Purified Water Ratio by following the set-up instructions on the next page.
8. Close the cold water supply valve. Locate and re-install the DI cartridge.
9. Slowly open the cold water supply valve and discard the first gallon of product water.

Note: Air trapped in the DI cartridges is a normal condition and will not affect the operation of the DI cartridges. Mounting the blue product water tubing so that at least a short length of tubing is higher than the filter unit can often alleviate this condition.

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.

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, you may need to adjust the ratio of the concentrate 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 that exist in all water supplies. The flow rate of the concentrate must be a minimum of 4X the product flow rate. 4X to 6X is an acceptable concentrate flow rate.

Procedure:

1. Open the cold water supply valve and let the system run for 15 minutes. Direct both tubes down the drain.
2. Collect product water from the blue tubing into a measuring cup for one minute. Measure the collected amount in milli-liters. Do the same with the waste water from the yellow line.

WASTE (YELLOW) IN MILILITERS_____

DIVIDED BY

PRODUCT (BLUE) IN MILILITERS_____

The resultant is the Concentrate to Product Ratio

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

3. **If ratio is less than 4:1**

Disconnect yellow drain line from the membrane housing and then remove flow restrictor. Use the appropriate Waste to Product ratio to determine how long to cut the flow restrictor in order to obtain a 4:1 ratio. (Figure D)

* Please refer to pages 12-13 for Flow Restrictor Removal, Adjustment, and Replacement. *

4. **If ratio is greater than 6:1**, flow restrictor requires replacement (Please contact SpectraPure Inc).
5. Turn on feed supply.
6. This completes the procedure.

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8. Depress the collar on the Membrane 2 product water push fitting with your thumbnail and remove the blue product water inter-connect tubing.
9. Lift the dual RO membrane assembly from the holding clips.
10. Separate the two membranes by depressing the collar on the push fitting of the concentrate push-fitting on Membrane 1 and pulling the two membranes apart (see Fig. G).
11. Remove the black interconnect feed tubing that remains connected to Membrane 2.
12. Remove the double clips from both membranes.
13. Discard the two spent membranes.

Note: Insert all tubing into their respective push-fittings using the following directions:

a.) Moisten the o-ring seal inside the push-fitting by dripping a few drops of clean water into the fitting.

b.) Grasp the tubing near the 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.) Now firmly push the tubing approximately an additional 1/4 inch (6.35mm) further into the fitting to completely seat the line into the fitting and O-ring seal.

14. Insert the black interconnect feed tubing into one of the new replace ment membranes, which will now be designated as Membrane 2.
15. Re-attach the two clips to Membrane 2.
16. Align and inset the black interconnect feed tubing into the concentrate push-fitting of the other membrane, which is now designated as Membrane 1.
17. Clamp the two membranes together.
18. Re-attach one blue tubing to Membrane 1 and then the other blue tubing to Membrane 2.

RO DUAL-MEMBRANE REPLACEMENT

Maintenance Regime: *As needed. Refer to the procedure for testing membrane quality on page 23-24.*

Materials Required: 2 Replacement Encapsulated RO Membranes

Procedure:

1. Turn off water supply to the system.
2. Mark, or otherwise note, the locations of the yellow, blue, and black tubing connected to Membranes 1 and 2 (see Fig. F).
3. Depress the collar on the Membrane 1 feed push-fitting with you thumbnail and remove the black membrane feed tubing.
4. Depress the collar on the Membrane 2 concentrate push-fitting with your thumbnail and remove the yellow concentrate tubing.
5. Remove the flow restrictor assembly from the end of the yellow tubing as described in the Removal, Adjustment, and Replacement section on page 12-13.
6. Place the flow restrictor in a safe location where it will not be accidentally crushed or damaged.
7. Depress the collar on the Membrane 1 product water push fitting with your thumbnail and remove the blue product water inter-connect tubing. (As Shown on page 12)

Fig. G: Dual RO Membrane Assembly
Left Side View

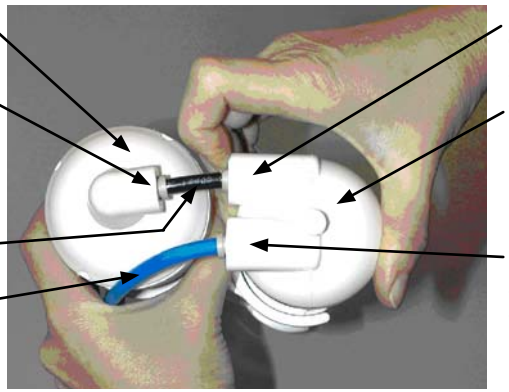

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Fig. D: Flow Restrictor Tables
(For 4:1 Concentrate to Product Ratio)

FR-100 (YELLOW)

PRODUCT RATE ml./min.	gpd	CUT TO LENGTH in.	cm.
269	102	1	2.5
233	88	2	5.1
213	81	3	7.6
198	75	4	10.2
183	69	5	12.7
175	67	6	15.2
164	62	7	17.8
154	58	8	20.3
148	56	9	22.9
141	54	10	25.4
136	52	11	27.9
133	50	12	30.5
129	49	13	33.0
128	48	14	35.6
124	47	15	38.1
124	47	16	40.6

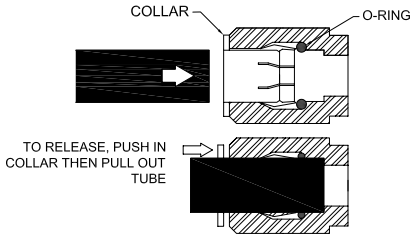
FR-200 (GREEN)

PRODUCT RATE ml./min.	gpd	CUT TO LENGTH in.	cm.
490	186	1	2.5
460	175	2	5.1
430	163	3	7.6
400	152	4	10.2
379	144	5	12.7
356	135	6	15.2
344	131	7	17.8
326	124	8	20.3
311	118	9	22.9
300	114	10	25.4
289	110	11	27.9
281	107	12	30.5
270	103	13	33.0
263	100	14	35.6
259	98	15	38.1
256	97	16	40.6

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

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 as follows:
   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. E). 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 coller and thin capillary tubing) may then be gently extracted.

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

3. Refer to the Flow Restrictor Tables (Fig. D). Find the table that represents the Flow Restrictor Assembly for the system that you have. Find the **product flow rate** in the left-hand column and the **length of the flow restrictor** in the right-hand column.

   Example: If your Flow Restrictor Assembly is for a 90 GPD Membrane and the **product flow rate** is 170 mL/Min, then the flow restrictor length should be cut to 6.5 inches (16.5 mm). 170 is about halfway between 164 (7 in.) and 175 (6 in.).

4. Using a new single-edge razor blade, carefully measure and then cut the flow restrictor to the total length indicated.

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RO SINGLE-MEMBRANE REPLACEMENT

Materials Required: Replacement Encapsulated RO Membrane

Procedure:

1. Turn off water supply to the system.
2. Mark, or otherwise note, the locations of the yellow, blue, and black tubing connected to the encapsulated RO membrane (see Fig. D or F).
3. Depress the collar on the membrane feed push-fitting with your thumbnail and pull the black feed tubing from the fitting. This is the line that runs between the carbon filter and the encapsulated ROmembrane.
4. Lift the encapsulated RO membrane from the holding clips.
5. Remove the yellow and blue tubing from the encapsulated RO membrane by depressing their push-fittings with your thumbnail and pulling the tubing from the fittings.
6. Remove the flow restrictor assembly from the end of the yellow tubing as described in the Removal, Adjustment, and Replacement section on page 12-13.
7. Place the flow restrictor in a safe location where it will not be accidentally crushed or damaged.
8. Re-insert the blue and yellow tubing into their respective push-fittings on your replacement encapsulated membrane, as described in the Removal, Adjustment, and Replacement section on page 12-13. Snap the membrane assembly back into its holding clips.

   Note: The flow restrictor assembly should remain uninstalled at this point in the process.
9. Reconnect the short black tube to the membrane feed push-fitting on the membrane housing.
10. Put the yellow concentrate tubing in the drain and turn on the system water supply. Allow the system to flush for several minutes to remove any loose particles.
11. Turn off the water supply to the system. Remove the yellow tubing from the membrane housing and replace the flow restrictor assembly as described in the Removal, Adjustment, and Replacement section on page 12-13. Re-insert the flow restrictor end of the yellow tubing into its push fitting at the encapsulated RO membrane.
12. 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 on page 10-11.

RO MEMBRANE DIAGNOSTICS

In order to accurately determine the condition of the RO Membrane, a conductivity tester capable of reading the tap water conductivity and the product water conductivity 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 DI cartridge must be removed and the empty housing re-installed; also, the waste -to-product water ratio must be 4 to 1 or greater.

Procedure:

1. Turn on the system, let it operate long enough to fill the empty DI housing, then let it run for an additional 20 minutes.
2. See the section on Testing the Quality of the Membrane, page 21. Perform the test using your chosen method.
3. Turn off the system, drain the DI housing, re-install the DI cartridge, and turn on the system.

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.

RO MEMBRANE REPLACEMENT

If you have a Single-Membrane System (Fig. E), follow the directions on this page. If you have a Dual-Membrane System (Fig. F), follow the directions on page.

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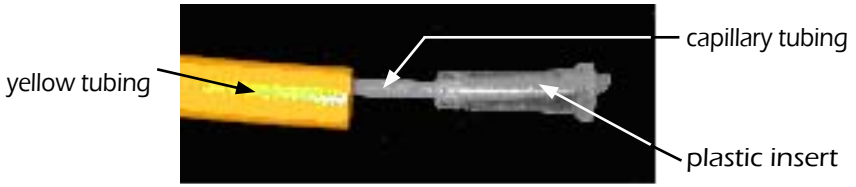
5. Re-insert the flow restrictor assembly into the yellow tubing and firmly re-seat the insert into the end of the yellow tubing by carefully pressing on the insert with your thumbnail. Care should be taken not to crush or otherwise damage the end of the capillary tubing protruding from the end of the insert.

6. Re-insert the yellow tubing into its push-fitting in the RO membrane as follows:
   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 O-ring seal.

7. 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 reseat the tubing as described above.

Fig. E: Flow Restrictor Assembly



SEDIMENT PRE-FILTER REPLACEMENT

For maximum contaminant removal and long membrane life, the sediment and carbon pre-filters must be changed at least 6-month intervals.** 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.

Sediment Pre-Filter Replacement

Materials Required: 1-micron MicroTec™ Sediment Filter (SF-MT-1-10), 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 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 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.

**NOTE: A drop in the system's production is "in most cases" an indication that the sediment and/or carbon filter has become saturated with contaminants and will need to be replaced.

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CARBON BLOCK FILTER REPLACEMENT

Replace the Carbon Block Filter at least every 6 months OR when chlorine breakthrough greater than 0.1 ppm occurs in the yellow concentrate line**. 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-25. If the chlorine concentration is above 0.1ppm, replace the carbon pre-filter.

Materials Required: 10 micron Carbon Block Filter (CF-1-10), Filter Wrench, Chlorine Test Kit (TK-CL-25)

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.

**NOTE: A drop in the system's production is "in most cases" an indication that the sediment and/or carbon filter has become saturated with contaminants and will need to be replaced.