



neptronic®

Reverse Osmosis Systems

WP Series

WP25211, WP25212, WP25213 Models

Installation Instructions and User Manual



READ AND SAVE THESE INSTRUCTIONS

Foreword

Neptronic Company Overview

Founded in 1976, we're a private corporation that designs, manufactures and distributes products for the HVAC industry. Our product line includes intelligent controllers, electronic actuators, actuated valves, humidifiers and electric heaters.

Our products are designed and manufactured by over 250 dedicated employees in our 7,500 m² (80,000 ft²) state-of-the-art facility located in Montreal, Canada. Using a vertical integration model, our entire manufacturing chain is under one roof, from software and hardware development to SMT circuit board assembly, to sheet metal fabrication, to product testing, ensuring that our products are engineered to last.

We currently hold several national and international patents and with our continued commitment to research and development, we provide innovative products and technologies for the ever-evolving challenges of the HVAC industry. Exporting over 70% of our sales, we have an exclusive distribution network around the globe that provides comprehensive solutions to our worldwide customers.

About the Manual

These installation and operation instructions have been developed to facilitate the installation of the Reverse Osmosis for the WP-Series humidifiers.

- The strict application of these instructions will ensure the conformity of your installation and operation as per the manufacturer's recommendations.
- The application of these instructions is one of the conditions for the application of the warranty.
- The application of these instructions does not ensure, at any time conformity to procedures, regulation or local codes, regarding electric installation and connection to local water supply.

This product has been declared to conform to the applicable Canadian and American safety standards and directives and bear the ETL (c) & (us) mark. The Certificate for ETL is available, upon request to the manufacturer.

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Electricity



All work concerned with electrical installation **MUST** only be performed by skilled and qualified technical personnel, such as an electrician or a technician with appropriate training. The customer is always responsible for ensuring the suitability of the technical personnel.
Please observe the local regulations concerning the provision of electrical installations.

Correct Use

Neptronic systems and its products are designed only for humidification use. Any other application is not considered appropriate for the intended purpose. The manufacturer cannot be made liable for any damage resulting from incorrect use.

General Warranty

This product is subject to the terms and conditions described at <http://www.neptronic.com/Sales-Conditions.aspx>.

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WP-Series Reverse Osmosis System

Installation Instructions and User Manual

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General Information and Safety

Disclaimer: The information contained in this document is subject to change without notice. Applied Membranes, Inc. shall not be liable for technical or editorial omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

Power Connections: Use proper wiring and connection methods to satisfy local electrical codes.

- Connect this unit to a properly grounded connection in accordance with the National Electrical Code.
- Do not, under any circumstances, remove the ground wire or ground prong from any power plug.
- Do not use extension cord or an adapter without proper consideration.



WARNING: Risk of electric shock. Disconnect the appliance from electric supply before commencing servicing.



WARNING: Do not make any alteration or modification in the wiring or plumbing of the system. This can result in damage to the system and cause injury to operators or users.



WARNING: Flush the system for at least 30 minutes before use to remove all chemicals present.



CAUTION: Chlorine will damage the membranes. A carbon pre-filter is installed to remove chlorine from feed water. Care must be taken to change this carbon filter as needed to accomplish effective chlorine removal. Excessive chlorine in feed stream may require additional pre-filtration. The feed stream should be tested for chlorine at least once a week. Always follow proper maintenance



CAUTION: Never let the system freeze. Freezing can damage the membrane and plumbing.

RO System Specifications

Table 1 - RO System Electrical Specifications

Model	Hz	Motor HP	Volts	Phase
WP25211-116	60	1/3	115/230	1
WP25211-215	50	1/3	220/230	1
WP25211-216	60	1/3	220/230	1
WP25212-116	60	1/3	115/230	1
WP25212-215	50	1/3	220/230	1
WP25212-216	60	1/3	220/230	1
WP25213-116	60	1/3	115/230	1
WP25213-215	50	1/3	220/230	1
WP25213-216	60	1/3	220/230	1

Operational Notes

- All systems rated at 77 Degrees Fahrenheit (25 Degrees Celsius) using 1000 ppm sodium chloride (NaCl) solution. System capacity decreases significantly with decrease in feed water temperature (see temperature correction chart).
- Chlorine requirements for the feed water are as follows:

Thin-Film (standard)	0	ppm
CA (special order only)	0.1	ppm Minimum

- Feed water must be filtered to a turbidity of less than 1 NTU.
- System recovery (permeate to concentrate ratio) must be maintained at the recommended level. A higher than recommended recovery will lead to a premature fouling of the membrane with a loss of permeate flow and permeate quality.
- Softened water should be used for the feed water to the RO system.

WP Series Specification Sheet

Table 2 - WP Series Specification Sheet

MODEL	WP25211	WP25212	WP25213
Rated Capacity, Permeate*			
- Gal/Day	350	700	1000
- Gals/Min	.24	.48	.70
- Cubic Meters/Day	1.3	2.7	3.8
Concentrate Flow (Reject)			
- Gals/Min	1.1	1.2	.97
- System Pressure, PSI	100-150	100-150	100-150
- Degrees Celsius/ Degrees F	25/77	25/77	25/77
Pre-Filters			
- Sediment Cartridge - 5 micron	1	1	1
- Carbon Cartridge - 10 micron	1	1	1
Pressure Switch Settings			
- Low Pressure (for pump protection)	8 PSI	8 PSI	8 PSI

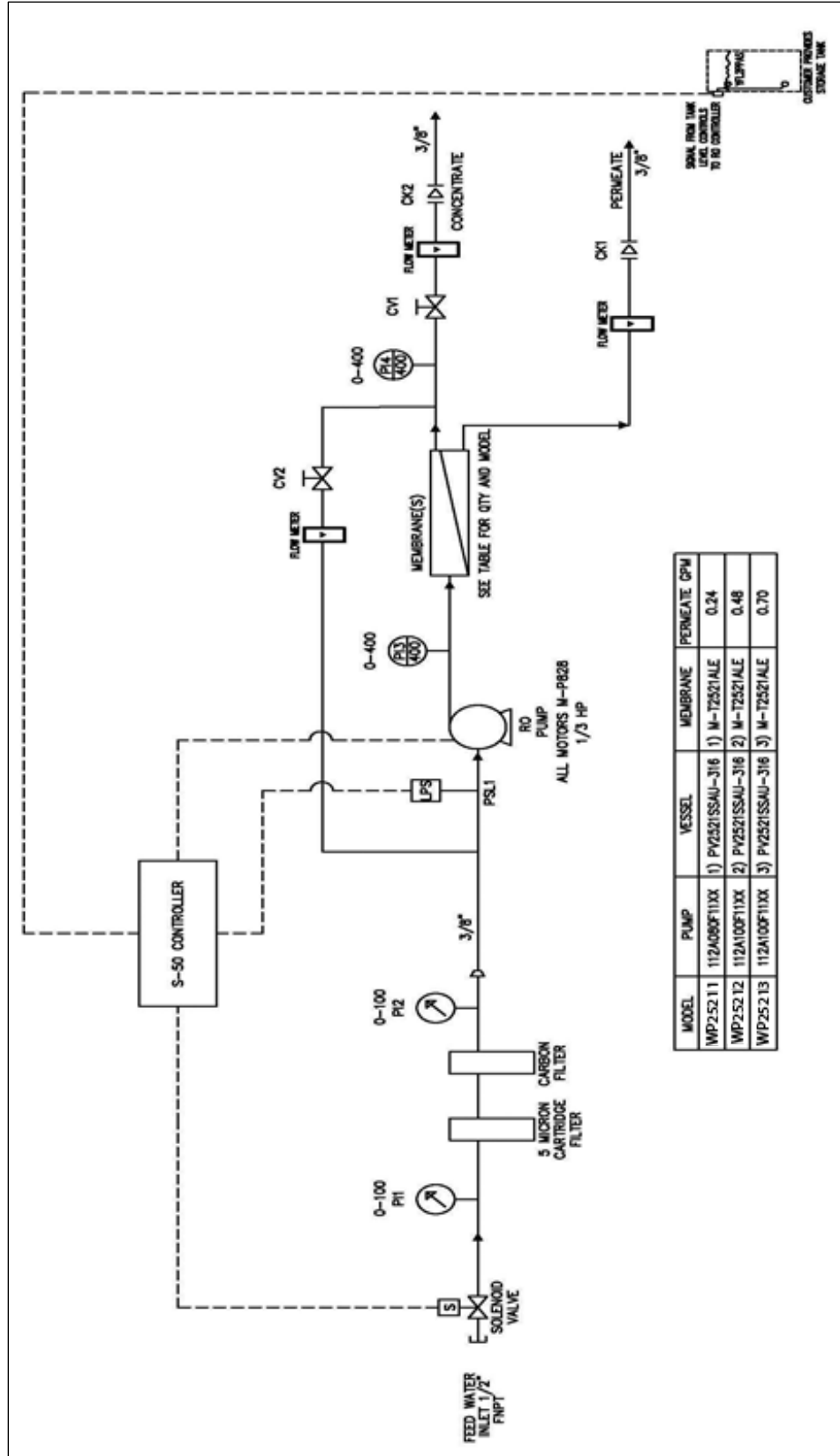


Illustration 1 - WP Series Flow Schematic

Component Identification

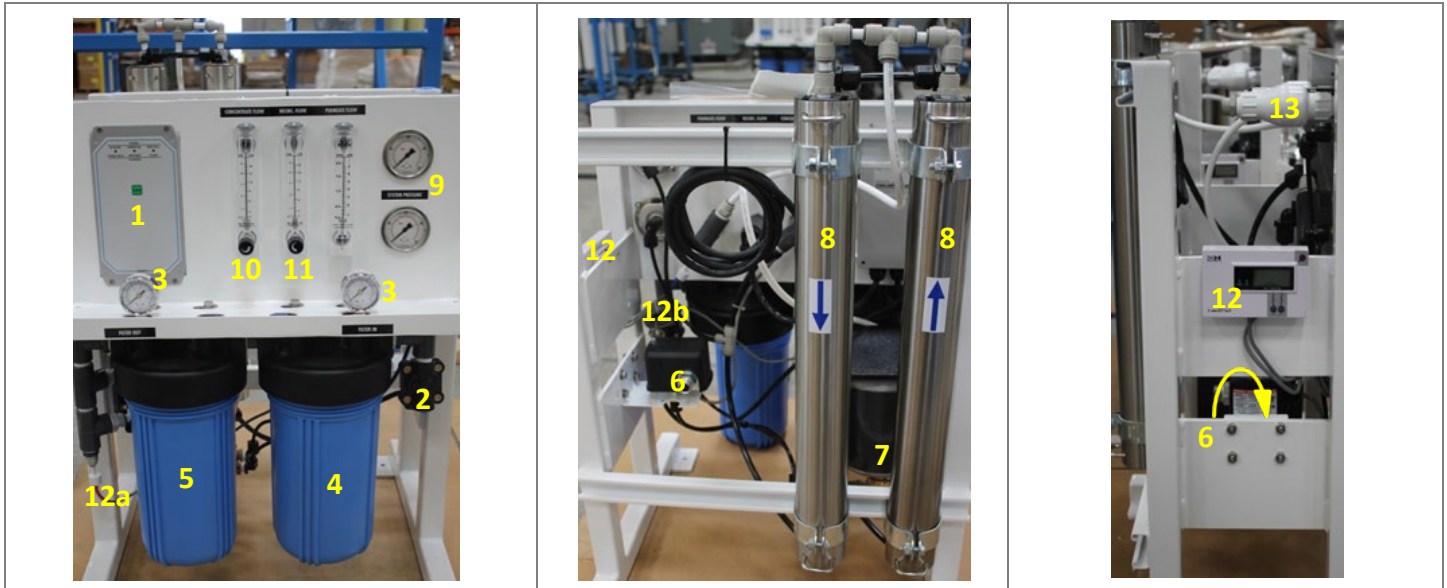


Illustration 2 – System Components

Table 3 - Component Description

#	Item	Description
1.	Controller	Power On/Off and Status Display
2.	Inlet Solenoid Valve	Normally closed. Opens when power is applied.
3.	Cartridge Filter Pressure Gauges (In-right/Out-left)	Measure the feed and effluent pressure of the cartridge filters. Pressure difference determines when cartridge change-out is required.
4.	Sediment Filter	5-micron sediment filter.
5.	Carbon Filter	10-micron extruded carbon cartridge to remove chlorine and reduce organics from the feed stream.
6.	Low Pressure Switch	Shuts the system down if the inlet pressure is lower than 8 psi (adjustable).
7.	High Pressure Pump & Motor	Rotary pump and motor to pressurize the incoming water.
8.	Membrane Modules	RO Membrane elements housed in stainless steel pressure tubes.
9.	System Pressure Gauges	Measure the System (feed) and Concentrate (effluent) pressure of the membrane modules.
10.	Concentrate Control Valve	To adjust system pressure. Must not be completely closed when the system is in operation.
11.	Recycle Valve	To adjust and maintain adequate flow thru membranes.
12.	TDS Monitor	Monitors the feed and permeate water quality. 12a – feed sensor; 12b – permeate sensor
13.	Permeate Check Valve	Prevents backflow into RO module.

System Installation

Location

Locate R.O. system with adequate clearance from walls and other equipment to enable membrane servicing. Run three polyvinyl tube lines to the system as follows:

- **Line #1:** Connect raw water feed supply to the solenoid valve inlet in front of the first cartridge filter housing. This will require ½ inch threaded pipe fitting and adaptor for the feed line. If desired, install an isolation valve in this line; ensure the valve opening does not restrict the water flow.



Illustration 3 - Line 1 Connection



CAUTION: Pump and system performance will be adversely affected if the feed/suction line is restricted.

- **Line #2:** Run a 3/8" line from the open end of the concentrate valve to a drain. Ensure that no liquids from other lines in the plant flow back through this line.

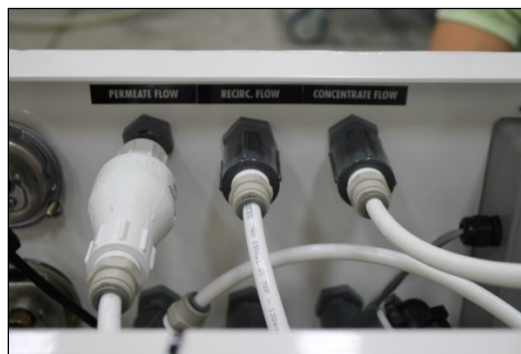


Illustration 4 - Line 2 & 3 Connections

- **Line #3:** Run a 3/8" line from the permeate outlet to desired permeate storage container. Pressurized storage or atmospheric storage tank options are available separately.



Note: The recirc flow line is pre-connected at the factory.



CAUTION: Be sure that all lines are connected before plugging in unit power.

Connection of Multi-Media, Carbon or Softeners to Lock-Out (Shut-down) RO during back-wash or regeneration:
If you have pre-treatment equipment and you wish to shut-down the RO system during backwash or regeneration, a microswitch is required (standard with Applied Membranes equipment). Wire the microswitch to terminal labeled Pretreat inside controller. See photo - Page 12.

When equipment goes into backwash or regeneration, the pre-treat limit switch opens and turns power off the inlet solenoid valve, which then turns the RO pump off - and back on when the cycle is complete.

Series 50 Controller

Specifications

Power: 120VAC - 240VAC, 50/60 Hz, +10/-15%, 2.5 watts. Input power is auto selected

Inputs: 3 switch inputs, selectable normally open or normally closed

Outputs: RO pump 1HP (Based on service factor of 1.0 max), Inlet solenoid 5A, 20A maximum total load

If you desire to change any switch functions, move that switch to the ON Position.



Note: The switches are factory set to the OFF Position: Auto Reset (disabled), Pressure Fault Retry (disabled), Tank Full restart time delay (2 seconds), Input contact type (NC, open to operate).

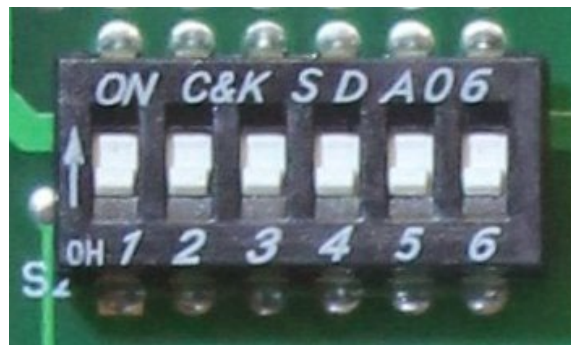


Illustration 5 – DIP Switches



CAUTION: The controller is rated for maximum 20A total load. Terminal strip P11 is dry contact for input signals from tank full, pressure fault and pre-treat lockout. Use small gauge 2 conductor cable for these wire connections.

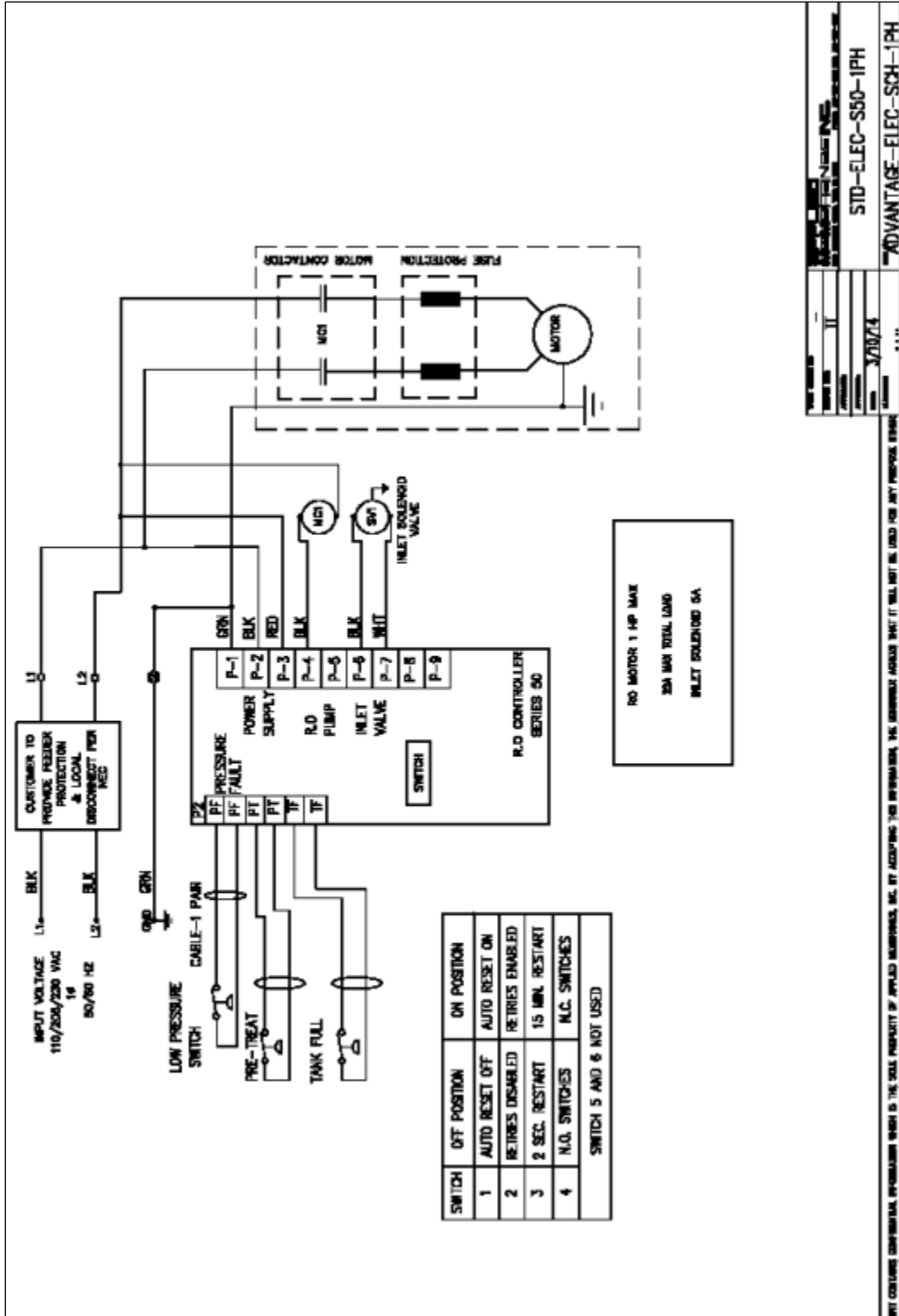


Illustration 6 - S50 Controller

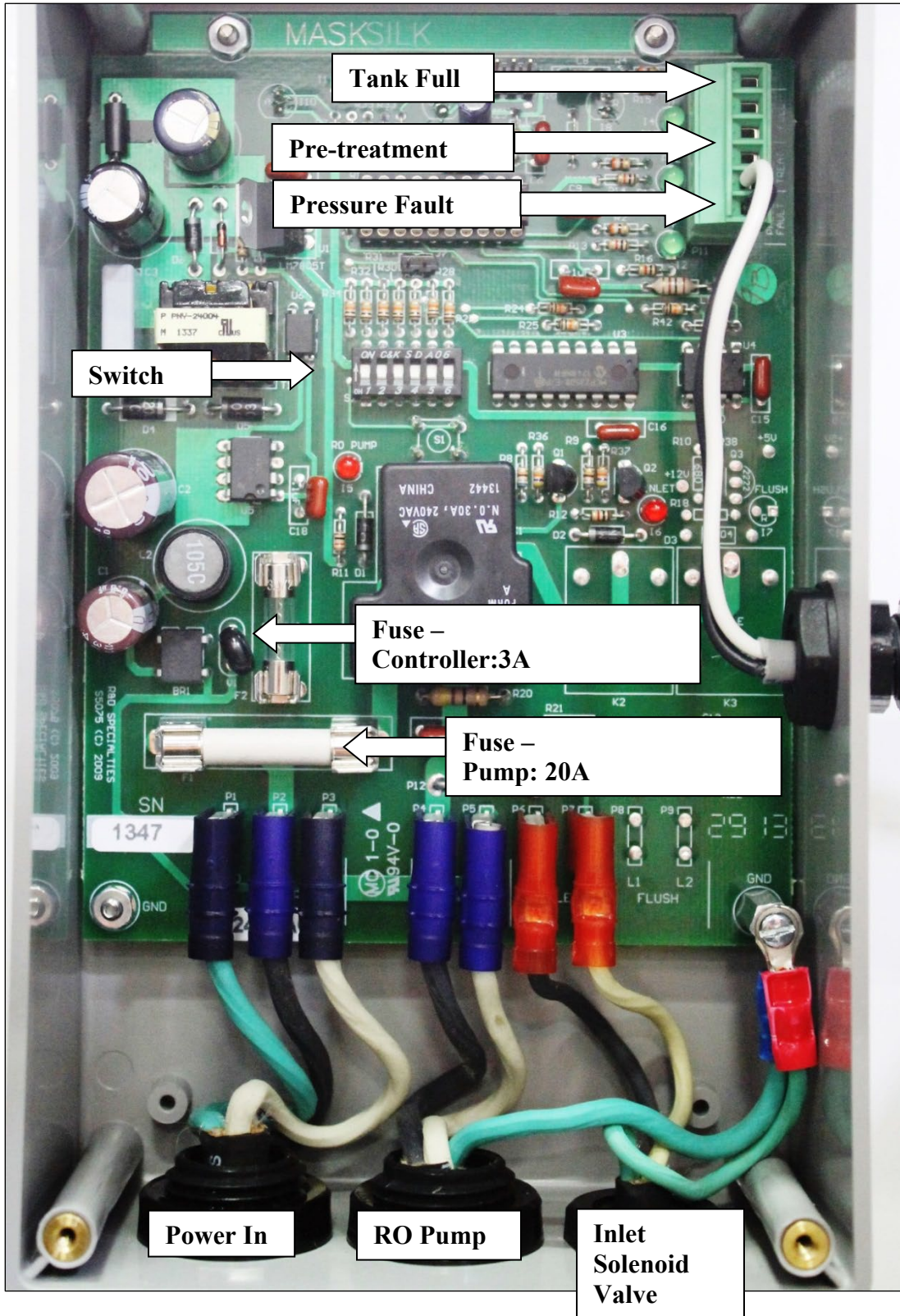


Illustration 7 – Controller Components and Wiring Connections

RO Pump Wiring

The RO pump connects to P4 (L1) and P5 (L2) RO pump terminals. This output can operate 120/240VAC motors up to 1HP directly.

Inlet Wiring

The inlet solenoid valve connects to P6 (L1) and P7 (L2) inlet terminals.

Pressure Fault Switch

The feed pressure switch is connected to the pressure fault input. Low pressure (factory preset 8 psi) will shut system off.

Pretreat Switch

In systems with pretreatment, a pretreat lockout switch can be connected to the pretreat input. This switch should operate when the pretreatment device is out of service.



Note: The output from the pre-treatment device must be a dry contact and must not supply voltage.

Tank Full Switch

In systems with a level or pressure switch, the switch can be connected to the tank full input.

System Operation

Series S50 RO System Controller Operation

General Operation

The unit has a single mode of operation ON with 6 sub-modes or states as indicated by the steady or flashing panel lights. Any light condition other than steady Power ON indicates the unit is effectively in stand-by. If there are no lights – system is OFF and all outputs are turned off. In the operating mode, the unit operates automatically. All inputs are monitored, and the outputs are controlled accordingly. Pressing the Power key will toggle the unit from off to operate or from operate to off. If power is removed from the unit, when power is reapplied, the unit will restart in the mode it was in when power was removed.

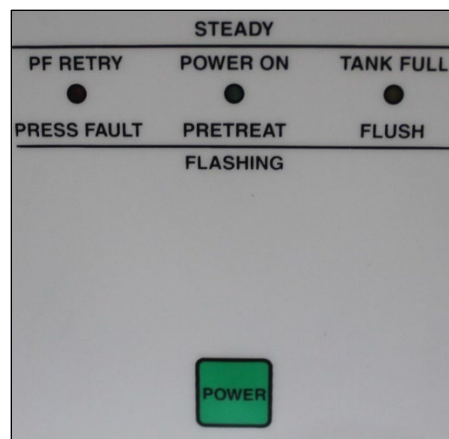


Illustration 8 - Controller Sub-Modes

Power Key: Places the controller in operating mode.

Pressure Retry: Steady red light.

Pressure fault: Flashing red light.

Power On: Steady green light. System operating.

Pretreat: Flashing green light.

Tank Full: Steady amber light.

Flush: There is no Flush sequence.

When the power switch is turned ON, the center status LED will light Green, the inlet valve will OPEN and the RO pump will START. (Refer also to Switch - pages 12.)

Under normal operation the RO unit will run until: (A) the storage tank is full (right LED Amber) or (B) Pretreat lockout has occurred (center status LED Flashing Green). When A or B has cleared, after a time delay, the RO unit will restart, and the center status LED will return to Green. Switch setting 3 selects a 2 second- or 15-minute tank full restart time delay.

Upon an alarm signal for Pressure Fault, the left status LED will Flash Red, the RO pump will stop and the inlet valve will close and the RO pump will turn OFF.

If switch 1 and 2 are in the OFF Position (disabled), the left status LED will be a steady RED and the RO will not restart until the Power Switch has been manually cycled OFF then ON to reset the unit. If switch 1 is in the ON Position (auto reset), every 60 minutes the RO will start and stop again if a pressure fault continues.

If switch 2 is in the ON Position (pressure fault retry), the RO will attempt to restart after 30 seconds, then 5 minutes, then 30 minutes. If the pressure alarm has not cleared after the third try, the RO unit will remain off until manually reset.

If switch 1 and 2 are in the ON Position, after a pressure fault condition, the RO unit will continually attempt to restart after each 60-minute cycle, until the pressure switch input has cleared.

Initial System Start-Up

System Flush

i *Note: Direct permeate flow to drain for first 30 minutes of operation.*

1. Connect the system to the appropriate electrical outlet, 110vac or 220vac 1 phase.

i *Note: Follow all NEC and local electrical codes.*

2. Ensure all plumbing connections are open to allow flow. Open Concentrate Valve (counterclockwise). Close Recirc Valve (clockwise).

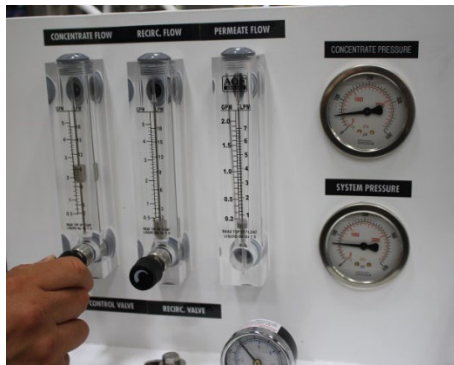


Illustration 9 – Concentrate & Recirc Valve

Ensure sufficient pressure (40 psi recommended) is in feed line. If pressure is less than 8 psi, the low-pressure switch will disallow start-up until pressure is adequate.

3. Press the Power button; the solenoid will open and the unit will start operating.
4. After water is flowing from the concentrate line, adjust the control valve to obtain designated flow for the specific model. (See Specifications Table – Page 6.)
5. Allow the unit to run for 30 minutes to ensure proper flushing of system.
6. After the flush time is over, press the Power button off.
7. Redirect the permeate line to the desired location.

Normal Operations

1. Turn the power back on. After the pump starts, adjust the control valve to the desired flow / pressure (not to exceed 150 psi).
2. The recycle valve may now be adjusted to achieve desired recycle flow rate, ensuring concentrate flow rate is as specified (Page 6).



CAUTION: To prevent concentrate from precipitating and causing irreversible fouling of the RO membrane, do not operate the system with the control valve CV2 completely closed. Also, do not exceed recommended maximum recovery.

Shutdown

1. Press power button to shut unit off. Close isolation valve, if installed on feed line.
2. If the unit is to be shut down for more than 1 week, a membrane preservative should be used. To accomplish this, perform 30 second flush using cartridge filter insert AMI No. C-C4210-A88. After 30 seconds, press Power button (Off) and close "Concentrate" valve. This will hold the preservative in the pressure vessel. (Complete instructions - Page 21.)
3. When the system is restarted after an extended shutdown, follow initial system start up procedures.

Maintenance Tips

Maintain proper operating conditions:

- Do not exceed 150 psi on the system inlet pressure gauge.
- Do not overuse recycle flow. This can cause premature scaling of the membrane. A proper concentrate flow is required for a long membrane life.
- To ensure no chlorine reaches the RO membranes, test the water from your carbon filter periodically for chlorine break through. To do this, a 'bucket' sample could be obtained by briefly removing the Feed TDS probe at the downstream side of the cartridge filters. Brief Power On/Off will be needed to perform this. See Component Identification photos - Page 9.

When To Change Cartridge Pre-Filters

Cartridge filters (both sediment and carbon) should be changed regularly to maintain proper pressure and flow. The carbon filter removes chlorine and will exhaust its capacity over time. This is dependent upon feed source concentration and flow rate. Check chlorine removal efficiency regularly.

Change the filters when the difference between the two cartridge filter pressure gauges increases by 10 psi - over the initial pressure difference. For example, if initial readings are 60 psi in / 58 psi out – the difference is 2 psi. So, when that difference reaches 12 psi – it's time to replace the sediment and carbon cartridges.

When To Clean Membranes

In normal operation, the membrane in reverse osmosis elements can become fouled by mineral scale, biological matter, and grime. These deposits build up during operation until they cause loss in water output or loss of salt rejection, or both. Elements should be cleaned whenever the water output rate drops by 10 percent from its initial flow rate (the flow rate established during the first 24 to 48 hours of operation) or when salt content in the product water rises noticeably.

It should be noted that the water output rate will drop if feed water temperature decreases (about 1-1/2 percent per degrees Fahrenheit). This is normal and does not indicate membrane fouling. A malfunction in the pretreatment, pressure control or pump can cause a drop in feed water delivery pressure, feed water flow, or product water output, or an increase in salt passage. If such adjustments are needed, the element may not require cleaning.

Membrane Cleaning and Preservative Cartridges:

- Clean and Preserve Membranes without Removing them from your System.
- Reduce Downtime.
- Maintain Your System Performance at a Higher Level.
- Prolong Membrane Life by Regular Use of Cleaning Cartridges.

Membrane Cleaning in RO System:

- Clean Membranes without Removing them from your System.
- Reduce Downtime.
- Maintain Your System Performance at a Higher Level.
- Prolong Membrane Life by Regular Use of Cleaning Cartridges.

How do they Work?

Simply exchange the most pre-filter cartridge in your system with a cleaning cartridge. Follow the instructions. Restart the system. You may repeat the process, if required. We recommend a monthly cleaning to obtain optimum results.

Acidic Cleaning Cartridge

C-C4210-A11 - Acidic Cleaning Cartridge for removal of mineral scale and build-up.

Cleaning Procedure

1. Shut down to RO system.
2. Disconnect permeate line and divert to drain before any cleaning cartridge is installed.
3. Remove the filter cartridge from the pre-filter housing.
4. Replace the filter cartridge with the cleaning cartridge and assemble into the filter housing.
5. Turn system ON. After 30-40 seconds*, shut down the system.
6. Let the membrane(s) soak in the cleaning solution overnight.
7. Remove the empty cleaning cartridge and replace it with the original filter.
8. Restart the system. Direct the permeate to drain for 5 minutes.
9. Go back to normal operations.

**Instead of time, you may use one of the following criteria:*

- a. Run the system until the pH of the concentrate is almost the same as the cleaning solution (pH=3)
- b. Permeate rate for the system drops to a very low value.



Illustration 10 - C-C4210-A11

Alkaline Cleaning Cartridge

C-C4210-A22 - Alkaline Cleaning Cartridge for removal of organics/fouling.

Cleaning Procedure

1. Shut down the RO system.
2. Disconnect the permeate line and divert permeate to drain during cleaning.
3. Remove the pre-filter cartridge from the filter housing.
4. Replace the sediment pre-filter cartridge with the cleaning cartridge and assemble into the filter housing.
5. Turn system ON. After 30-40 seconds*, shut down the system.
6. Let the membrane(s) soak in the cleaning solution overnight.
7. Remove the empty cleaning cartridge and replace it with the original filter.
8. Restart the system. Direct the permeate to drain for 5 minutes.
9. Go back to normal operations.

**Instead of time, you may use one of the following criteria:*

- c. Run the system until the pH of the concentrate is almost the same as the cleaning solution (pH=10-12)
- d. Permeate rate for the system drops to a very low value.



Illustration 11 - C-C4210-A22

Storage Protection

To prevent bacterial growth and help maintain flux, it is recommended that elements be immersed in AM-88 if the system will be off for more than 3 days.

C-C4210-A88 Membrane Preservative Cartridge

Preservation Procedure

1. Shut down to RO system.
2. Disconnect the permeate line and direct permeate to drain during cleaning/preserving.
3. Remove the 5M filter cartridge from the pre-filter housing.
4. Replace the filter cartridge with the preservative cartridge and assemble into the filter housing.
5. Turn system ON. After 30-40 seconds*, shut down the system.
6. Drain the system of the permeate solution as much as possible by opening a valve/fitting at a low point in the system. Close off the inlet and outlet to the membrane/system.

Flushing out Preservative/Re-start Procedure:

7. Open valves etc. and put the system back in the position it was before preserving.
8. Remove the empty preservative cartridge and replace it with a new cartridge filter.
9. Re-start the system. Direct permeate to drain for 15-30 minutes.
10. Go back to normal operation.



Illustration 12- C-C4210-A88

Replacing Membranes

Tools: Rubber Mallet - Flat Blade Screwdriver - Food Grade RT-111 silicone - Safety Glasses.

Procedure

1. Turn off the RO system.
2. Relieve pressure on the membrane array – open Control valve.
3. Remove all lines from both ends of the pressure vessel(s). Please make sure that the fittings are marked – so it can go back to the correct locations.
4. Pull U-pins from top of vessel and remove end cap. Grasp end of element using pliers - as shown in photo and pull upward until a firm hand grip is established to further remove the element from the vessel.
5. Install the new element such that the brine seal (big black exterior o-ring) is positioned in the feed end of the vessel. The flow arrow points away from the feed end. In multiple vessel units, the Flow direction will alternate between vessels. Check / ensure that the end adapters and all o rings are in good condition and in position.



Note: Brine seal flared end should 'cup' toward the feed end. Refer to illustration 14.

6. Replace end plug(s) using glycerin or silicone lubricant (Part No. H-C111DC) as required on O rings and seal. It is highly recommended to have a spare set of O-rings and brine seal while replacing the elements.
7. As the elements may have preservative or be contaminated - wash your hands thoroughly after replacing.

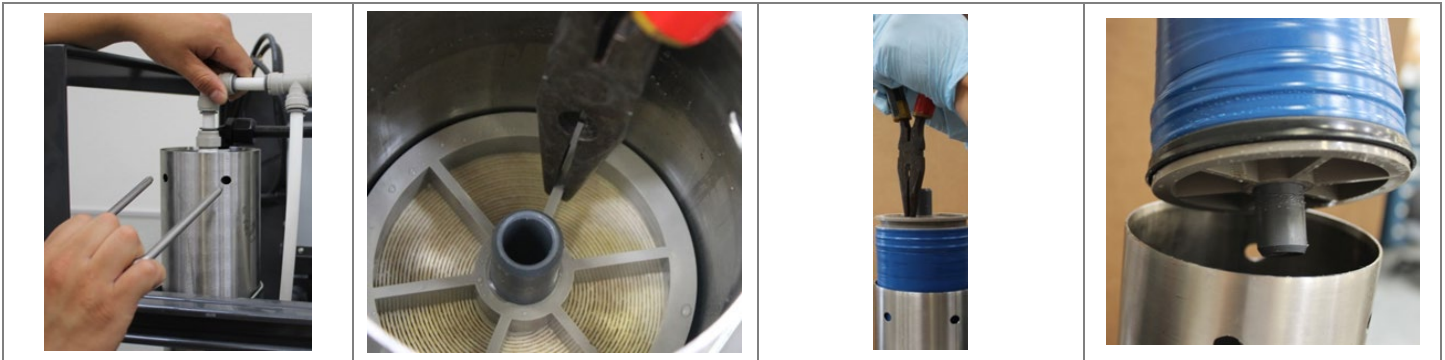


Illustration 13- Replacing Membranes

Replacing Prefilters

Procedure

1. Shut unit down.
2. Close inlet supply valve.
3. Turn the blue pressure housings counterclockwise (Available - filter wrench **AMI Model No. H-C9205.**) Filter cartridge should come free from the housing top and remain in the housing.
4. Remove and replace cartridges.
5. Before replacing housing, ensure that o-ring seal is lubed and placed in groove of housing (**AMI Model No. for lubricant: H-C111DC**). Inspect seal and replace as needed.
6. Rotate housing clockwise until hand tight.



Illustration 14- Prefilters

1. **Sediment Filter** – Removes sediments and particles down to 5-micron size.
2. **Carbon Filter** – Primarily to remove chlorine; also removes organics as well as sediments down to 10-micron size.

Adjustment Of Pressure Switch



CAUTION: Pressure switch has been factory pre-set to 8 psi. This switch should not be adjusted unless recommended by factory.



CAUTION: 220 Volt Shock Hazard.

Tools Required: Flat Blade Screwdriver.

Turn off R.O. unit and disconnect all electrical power prior to removing cover plates on pressure switches.

Low Pressure Cut-Out Switch

1. Loosen nut and remove cover plate.

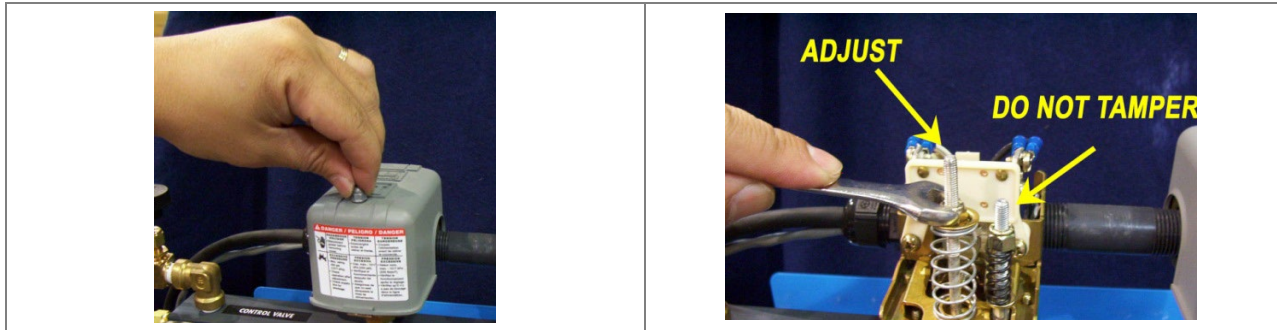


Illustration 15- Pressure Switch Adjustment

2. Use box wrench to adjust nut on left side counterclockwise to lessen pressure; clockwise to raise pressure.
3. Do not tamper with nut on right side.
4. Replace cover.



Temperature Correction Factor

The water temperature is one of the key factors in the performance of the reverse osmosis membrane element. The higher the temperature, the more the product flow, and vice versa. All reverse osmosis membrane elements and systems are rated at 77° Fahrenheit (25° Celsius).

To find the membrane permeate rate at a different temperature, follow these steps:

1. Find the temperature correction factor (TCF) from the below table.
2. Divide the rated permeate flow at 77° Fahrenheit by the temperature correction factor.
3. The result is the permeate flow at the desired temperature.

EXAMPLE

QUESTION: For a thin-film membrane permeate rated at 1800 gallons per day at 77° Fahrenheit, what is the actual permeate rate at 59° Fahrenheit?

ANSWER: Temperature correction factor (from below table) for 59°F = 1.47

Permeate flow at 59 degrees Fahrenheit = 1800 ÷ 1.47 = 1224 gallons/day

Table 4 – Temperature Correction Factor

Feed Water Temperature		TCF for Thin Film	TCF for CTA/CAB	Feed Water Temperature		TCF for Thin Film	TCF for CTA/CAB
C °	F°			C °	F°		
1	33.8	3.64	2.23	26	78.8	0.97	0.97
2	35.6	3.23	2.15	27	80.6	0.94	0.94
3	37.4	3.03	2.08	28	82.4	0.91	0.91
4	39.2	2.78	2.00	29	84.2	0.88	0.89
5	41	2.58	1.93	30	86	0.85	0.86
6	42.8	2.38	1.87	31	87.8	0.83	0.83
7	44.6	2.22	1.80	32	89.6	0.80	0.81
8	46.4	2.11	1.74	33	91.4	0.77	0.79
9	48.2	2.00	1.68	34	93.2	0.75	0.76
10	50	1.89	1.63	35	95	0.73	0.74
11	51.8	1.78	1.57	36	96.8	0.71	0.72
12	53.6	1.68	1.52	37	98.4	0.69	0.71
13	55.4	1.61	1.47	38	100.4	0.67	0.68
14	57.2	1.54	1.42	39	102.2	0.65	0.66
15	59	1.47	1.38	40	104	0.63	0.65
16	60.8	1.39	1.33	41	105.8	0.61	
17	62.6	1.34	1.29	42	107.6	0.60	
18	64.4	1.29	1.25	43	109.4	0.58	
19	66.2	1.24	1.21	44	111.2	0.56	
20	68	1.19	1.17	45	113	0.54	
21	69.8	1.15	1.13	46	114.8	0.53	
22	71.6	1.11	1.10	47	116.6	0.51	
23	73.4	1.08	1.06	48	118.4	0.49	
24	75.2	1.04	1.03	49	120.2	0.47	
25	77	1.00	1.00	50	122	0.46	

Operating Do's and Don'ts

DO:

1. Change the cartridge filters regularly.
2. Monitor the system and keep a daily log.
3. Run the system, as much as possible, on a continuous basis.
4. Adjust the system recovery to recommend value.

DON'T:

1. Permit chlorine in the feed water.
2. Shut down the system for extended periods.
3. Close the control valve completely.
4. Operate the system with insufficient feed flow.

System Monitoring and Record Keeping

The system should be monitored, and all pertinent data recorded daily. This includes cartridge filter pressure in/out, system pressure in/out, flows and water quality (TDS) in/out. Data is needed to determine operating efficiency and for performing system maintenance.

The latter includes cleaning of the membranes, adjusting the operating conditions as well as replacement of cartridge filters and RO membranes. Refer to System Log Sheet below.

Table 5 - System Operating Log

DATE							
TIME							
CHLORINE (ppm)							
CARTRIDGE IN PSI							
CARTRIDGE OUT PSI							
WATER TEMP.							
TDS IN							
TDS OUT							
SYSTEM PSI							
CONCENTRATE PSI							
CARTRIDGE FILTER CHANGE							
MEMBRANE CHANGE							
RECORDED BY:							

General Troubleshooting

Table 6 - General Troubleshooting

Problem	Possible Cause	Solution
Inlet pressure low	Low supply pressure	Correct incoming supply pressure
	Cartridge filters plugged	Change filters
	Solenoid valve malfunction	Replace solenoid valve and/or coil
Permeate flow low	Low water temperature	Adjust water temperature
	Low system pressure	Adjust control valve
	Membranes fouled	Clean membranes
Pump noisy	Low inlet flow	See "Inlet pressure low"
Permeate quality poor	Low inlet flow	Adjust control valve
	Low system pressure	See above
	Recovery too high	Reduce recovery
	Membranes fouled	Clean membranes
	Membranes damaged	Replace membranes

Component Part Numbers

Table 7 - Component Part Numbers

Item	Part Number
Solenoid Valve 1/2" for 110V units	850BF-H120A
Solenoid Valve 1/2" for 220V units	850BF-H240A
Low Pressure Switch	I-PS915CUL
Sediment filter Cartridge 5 Micron	H-F10BB05CF
Carbon Filter Cartridge 10 Micron	H-F4210AC
Filter Housing 10-inch Big Blue	H-H101BBE (Qty 2)
Pump Motor (1/3HP 110-240V/1/50-60Hz)	P-MP828
High Pressure Pump	
WP25211	112A08OF11XX
WP25212	112A100F11XX
WP25213	112A100F11XX
Membrane Element	
WP25211	M-T2521ALE
WP25212	M-T2521ALE (Qty 2)
WP25213	M-T2521ALE (Qty 3)
Membrane Housing	
WP25211	PV2521SSAU-316
WP25212	PV2521SSAU-316 (Qty 2)
WP25213	PV2521SSAU-316 (Qty 3)
Pressure Gauge – Cartridge filters	101D-204F (Qty 2)
Pressure Gauge – RO system	I-PG400NSS (Qty 2)
Flow control valve / flow meter for concentrate and recirc streams	AQF-ZT-055 (Qty 2)
Check Valve 1/2"	46835K32
TDS Monitor In/Out Digital 0-9990 ppm	DM-2

Product Warranty

- SELLER hereby warrants to CUSTOMER that the goods herein described will be free from any liens or encumbrances, that good title to said goods will be conveyed to CUSTOMER by sale of same. SELLER warrants materials of its own manufacture against defects in material and workmanship under normal conditions of usage and service for one year from whichever of the following events occurs first:
 - First use of the system
 - Three (3) months following date of shipment from Vista.

Materials not manufactured by seller receive only such warranty, if any, of the manufacturer thereof and which are hereby assigned to CUSTOMER without recourse to SELLER.

SELLER'S obligation under this warranty is limited to and shall be fully discharged by repairing or replacing any defective part FOB its works. SELLER shall not be liable for repair or alterations made without SELLER's prior written approval; for membrane elements becoming plugged by suspended matter, precipitates, or biological growth; or failure to properly maintain the element. SELLER shall not be liable for damages or delays caused by defective material. Elements returned to SELLER for warranty examination must be shipped freight prepaid.

- **SELLER'S Liability.** SELLER SHALL NOT BE LIABLE FOR PROSPECTIVE PROFITS OR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, NOR SHALL RECOVERY OF ANY KIND AGAINST SELLER BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE SPECIFIC GOODS SOLD AND CAUSING THE ALLEGED DAMAGE, WHETHER SUCH CLAIM BE BASED ON CONTRACT OR TORT; provided, however, the aforesaid to the contrary notwithstanding, SELLER shall not be liable for any bodily injuries or property damage directly caused by its willful, wanton or negligent acts.
- **All Other Warranties and Damages.** THERE ARE NO WARRANTIES ESTABLISHED, EXPRESS OR IMPLIED OR STATUTORY, INCLUDING THE WARRANTY OF MERCHANTABILITY, EXCEPT THOSE SET FORTH ABOVE OR ANY PERFORMANCE WARRANTY WHICH IS ATTACHED TO THIS ORDER.
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- **Governing Law.** Any agreement based upon this Order and the obligations thereby imposed on SELLER and CUSTOMER shall be governed by and construed according to the laws of the State of California.



neptronic[®]

400 Lebeau blvd, Montreal, Qc, H4N 1R6, Canada

www.neptronic.com

Toll free in North America: 1-800-361-2308

Tel.: (514) 333-1433

Fax: (514) 333-3163

Customer service fax: (514) 333-1091

Monday to Friday: 8:00am to 5:00pm (Eastern time)