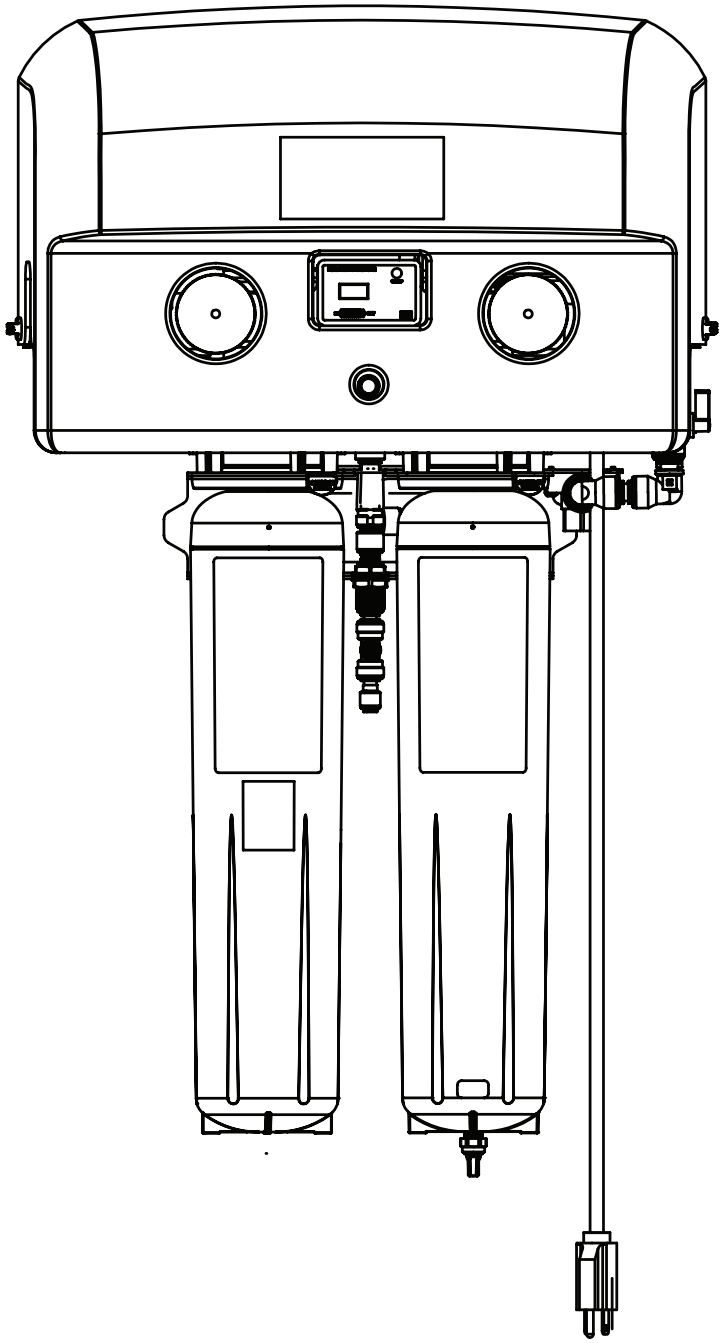
3M™ Water Filtration Products

Installation and Operation Instructions for ScaleGard™ HP Reverse Osmosis System

(Original Instructions)



Installer: Please leave this manual with owner/operator.
Owner/Operator: Please retain for operation and future instructions.

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SAFETY INFORMATION

Read, understand, and follow all safety information contained in these instructions prior to installation and use of the 3M™ Water Filtration Products ScaleGard™ HP reverse osmosis system. Retain these instructions for future reference.

Intended use:
The ScaleGard™ HP reverse osmosis system is intended for use in filtering potable water and has not been evaluated for other uses. The product is installed at the point of use and must be installed as specified in the installation instruction by a qualified professional.

EXPLANATION OF SIGNAL WORD CONSEQUENCES	
⚠ WARNING	Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury and/or property damage.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or property damage.
NOTICE	Indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

⚠ WARNING

Read entire manual. Failure to follow all guides and rules could cause personal injury or property damage.
- Check with your local public works department for plumbing codes. You must follow their guidelines as you install the water filtration system.
- Your water filtration system will withstand up to 125 pounds per square inch (psi) water pressure. If your water supply pressure is higher than 80 psi, install a pressure reducing valve before installing the water filtration system.
- An approved post filter and tank must be used with the RO system.

To reduce the risk associated with choking:
- DO NOT allow children under 3 years of age to have access to small parts during the installation of this product.

To reduce the risk associated with the ingestion of contaminants:
- DO NOT use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.

To reduce the risk associated with hazardous voltage due to an installer drilling through existing electric wiring or water pipes in the area of installation:
- DO NOT install near electric wiring or piping which may be in path of a drilling tool when selecting the position to mount the filter bracket.

To reduce the risk associated with back strain:
- Follow safe lifting procedures.

To reduce the risk of physical injury:
- All hydro-pneumatic pressurized tanks MUST have an appropriate pressure relief valve installed. Pressure relief valve must be maintained and inspected every 6 months. Contact a plumbing professional if you are uncertain how to select/install/maintain a pressure relief valve.

To reduce the risk associated irritation from Sodium Metabisulfite during installation:
- Sodium Metabisulfite (CAS 007681-57-4) is used in a 1% preservative solution within the reverse osmosis membrane.
- DO NOT put this system into service before the RO tank is flushed as specified in the installation instructions. Wear eye and face protection during installation.
- To request an MSDS relating to this product call 203-238-8965 or visit the web at http://solutions.3m.com). For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

To reduce the risk associated with ingestion of water contaminaed with sanitizer:
- After installation, sanitizer MUST be flushed from the system before first use as directed within the installation instructions.

⚠ CAUTION

To reduce the risks associated with environmental contamination which, if not avoided, could result in minor or moderate injury:
- At the end of useable life, dispose of this system in accordance with applicable local regulations or laws.

To reduce the risks associated with impact which, if not avoided, could result in minor or moderate injury:
- Depressurize system as shown in manual prior to cartridge removal.

To reduce the risks associated with heavy objects which, if not avoided, could result in minor or moderate injury:
- Follow safe lifting procedures.

IF CONNECTION IS MADE TO A POTABLE WATER SYSTEM, THE SYSTEM SHALL BE PROTECTED AGAINST BACKFLOW.

SAFETY INFORMATION CONTINUED ON NEXT PAGE

NOTICE

To reduce the risk associated with property damage due to water leakage or flooding:

- Read and follow Use Instructions before installation and use of this system.
- Change the disposable filter cartridge at the recommended interval; the disposable pre-filter cartridge and post-filter cartridge MUST be replaced every 24 months or sooner.
- Change the disposable membrane filter cartridge at the recommended interval; the disposable RO membrane cartridge MUST be replaced every 24 months or sooner.
- Failure to replace the disposable filter and membrane cartridges at recommended intervals may lead to reduced filter performance and failure of the filters, causing property damage from water leakage or flooding.
- Installation and use MUST comply with all state and local plumbing codes.
- Protect from freezing, remove filter cartridge when temperatures are expected to drop below 33° F (4.4° C).
- DO NOT install systems in areas where ambient temperatures may go above 110° F (43.3° C).
- DO NOT install on hot water supply lines. The maximum operating water temperature of this filter system is 100°F (37.8°C).
- DO NOT install if water pressure exceeds 125 psi (862 kPa). If your water pressure exceeds 80 psi (552 kPa), you must install a pressure limiting valve. Contact a plumbing professional if you are uncertain how to check your water pressure.
- DO NOT install where water hammer conditions may occur. If water hammer conditions exist you must install a water hammer arrester. Contact a plumbing professional if you are uncertain how to check for this condition.
- Where a backflow prevention device is installed on a water system, a device for controlling pressure due to thermal expansion MUST be installed. Contact a plumbing professional if you are uncertain how to select/install/maintain a thermal expansion device.
- Where a booster pump is installed on a water system, you MUST maintain and inspect the attached pressure switch regularly in accordance with the booster pump manufacturer's instructions. Contact a plumbing professional if you are uncertain how to maintain your booster pump system.
- Where a booster pump is installed on a water system, you MUST install an appropriate pressure relief valve. Pressure relief valve must be maintained and inspected every 6 months. Contact a plumbing professional if you are uncertain how select/install/maintain a pressure relief valve.
- Where a booster pump is installed on a water system, you MUST install an appropriate pressure regulating valve and regulate water pressure to <80psi. Contact a plumbing professional if you are uncertain how select/install/maintain a pressure regulating valve.
- DO NOT install in direct sunlight or outdoors.
- DO NOT install near water pipes which will be in path of a drilling tool when selecting the position to mount the bracket.
- Mount filter in such a position as to prevent it from being struck by other items used in the area of installation.
- Ensure that the location and fasteners will support the weight of the system when installed and full of water.
- Ensure all tubing and fittings are secure and free of leaks.
- DO NOT install unit if collet is missing. Contact 1-866-990-9785 if collets are missing from any fittings.
- Use compatible flexible tubing with 'push in connections' (such as PEX tubing, PE tubing, PP tubing).
- DO NOT install with rigid piping (such as copper, aluminum, stainless steel, chrome plated, or anodized tubing).
- All hydro-pneumatic pressurized tanks MUST have an appropriate pressure relief valve installed. Pressure relief valve must be maintained and inspected every 6 months. Contact a plumbing professional if you are uncertain how to select/install/maintain a pressure relief valve.

IMPORTANT NOTES

- Failure to follow instructions will void warranty.
- Allow a minimum of 3" (6.72 cm) clear space under filter to facilitate cartridge change.
- Install with the inlet and outlet ports as labeled. Make sure not to reverse connections.
- Some local codes may require the use of a licensed plumber or certified installer when disrupting a potable water line.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children without supervision.
- For cold water use only.

Parts List

The following parts comprise the ScaleGard™ HP Reverse Osmosis System. Please unpack the contents from the product box and check to verify that all of the parts listed below are included. Should any parts be missing, please contact 3M Purification Inc. at 1-866-990-9785.

Description	Quantity	Part Number
ScaleGard™ HP Reverse Osmosis System	1	**5629101** (110-120VAC with Pre-filter and RO)
		6239301 (110-120VAC w/out Pre-filter and RO)
		6239302 (220-240VAC w/out Pre-filter and RO)
		6239303 (220-240VAC w/out Pre-filter and RO with UK plug)
		6239304 (220-240VAC w/out Pre-filter and RO with AU plug)
HF90-CL-RO (Pre-Filter)	1	5613529
HFRO 500 (RO membrane)	1	5626903

Required/Sold Separately

Description	Quantity	Part Number
BEV140/BEV160 Post Filter (Required/Sold Separately)	1	5616201/5616301
10 Gallon Pressure Tank (Required/Sold Separately)	1	5598407
20 Gallon Pressure Tank (Required/Sold Separately)	1	5598408
40 Gallon Pressure Tank (Required/Sold Separately)	1	5598409

Equipment Components Sold Separately

Description	Quantity	Part Number
Install Kit (Sold Separately)	1	6841441
SGHP Pre-Expansion Assembly Manifold	1	6235205
SGHP RO-Expansion Assembly Manifold	1	6232705
HFRO 700 (RO Membrane)	1	5626904
HFRO 33% Recovery Kit	1	50-93201

Feedwater Requirements

NOTICE

See safety information regarding reducing the risk associated with property damage due to water leakage or flooding on page 4 prior to set-up and installation of the system.

IMPORTANT NOTES

- Be sure to confirm that the feedwater falls within the limits shown below. If unsure of the feedwater quality, check with your 3M™ Water Filtration Products distributor.

Inlet water pressure .....30-125 psi (207-862 kPa)

Feed TDS ..... 1,000 ppm Maximum

Hardness.....<10 grains (171 mg/l)

Iron (Fe) ..... <0.1 mg/l

Hydrogen Sulfide..... None Allowed

Feed pH 4-11

Free Chlorine..... <0.1 mg/l

Manganese (Mn) .....<0.05 mg/l

Turbidity.....<5 NTU

Temperature.....>50 °F*

*If at any time during the year water temperature falls below 50 °F, see challenge water recommendations below.

Challenge Water Recommendations
(Contact dealer/distributor for assistance in water testing)

If there is iron or manganese above recomended limits present in the incoming-water, it is recommended to install water softening system upstream of ScaleGard™ HP System.

If incoming water hardness is greater than 10 grains (171 mg/l), it is recommended to install water softening system upstream and change the standard flow control on the drain-line to achieve recovery of the RO system at 33%. (HFRO 33% Recovery kit PN-50-93201)

If the particle count is >1000 counts/ml for particles less than 2 micron size or turbidity is greater than the recommended 5 ntu limit, then it may be required to consider different prefiltration options and change the standard flow control on the drain-line to achieve recovery of the RO system at 33%. (HFRO 33% Recovery kit PN-50-93201) . Contact your dealer/distributor for details.

It is recommended to install an SGHP RO-EXP and SGHP Pre-EXP under the following conditions:

1. If more production capacity is needed.
2. If installed in a location where water temperature drops below 50 °F (10 °C) during any part of the year.
3. If the particle count is >1000 counts/ml for particles less than 2 micron size or turbidity is greater than 5 NTU limit.
4. If the incoming water TDS is greater than 1000ppm limit.

Other Requirements

Power.....110V (PN-5629101, 6239301), 220V (PN-6239302)

Equipment Set-Up and Installation

NOTICE
See safety information regarding reducing the risk associated with property damage due to water leakage or flooding on page 4 prior to set-up and installation of the system.

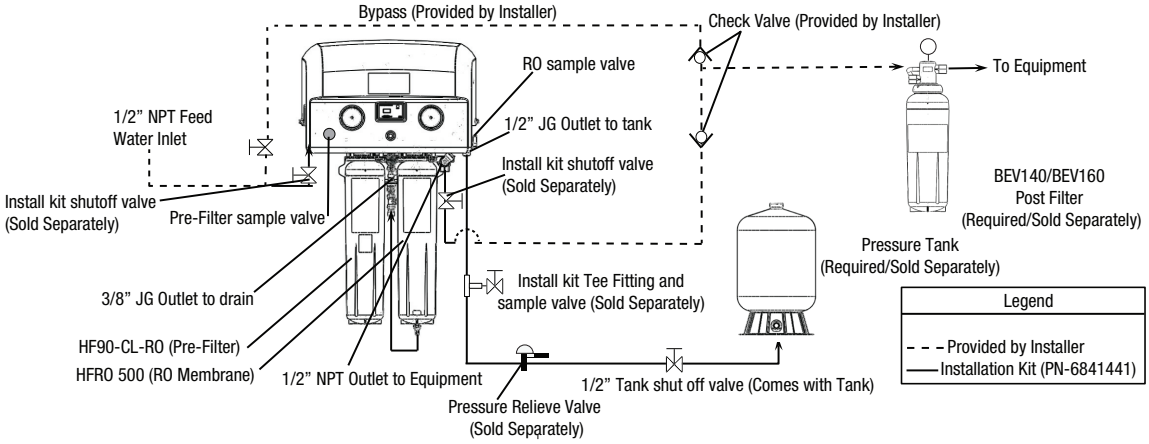
Equipment Location

Prior to installing the ScaleGard™ HP Reverse Osmosis System, carefully plan the installation location for all system components.

Position the ScaleGard HP reverse osmosis base unit and the pressure tank in desired locations as per (Figure 1).

1. Access to feedwater, drain line connections and electrical outlet is required.
2. The ScaleGard HP System must be accessible and have at least 3 inches (7.62 cm) clearance on all sides of the system to facilitate servicing. An additional 10" will be needed on both sides of the ScaleGard HP system to allow for the future installation of the SGHP Pre-EXP or the SGHP RO-EXP manifolds.
3. The pressure tank should be installed within 15 ft (4.6 m) of the ScaleGard HP reverse osmosis base unit and 0.5” or larger tubing diameter is required to complete installation.

Figure 1 — Plumbing Diagram



Wall Mounting the ScaleGard™ HP Base Unit (Mounting Template included with unit)

1. Draw a level line on the wall where the bracket is to be mounted. Hold bracket key holes on level line and mark locations for screws.
2. Install mounting screws (not included) into each of the initial key holes as shown in figure 2. Be sure to leave 1/8” to 1/4” (0.3 to 0.6 cm) space between the bottom of the screw head and the wall so that the bracket can be hung. (assume system weight of 57 lbs. (25.9 kg))

NOTICE
To reduce the risk associated with property damage due to water leakage or flooding: • Mount ScaleGard™ HP base unit in such position as to prevent it from being struck by other items being used in the area of installation. Ensure that the location and fasteners will support the weight of the system when installed.

IMPORTANT NOTES
• Allow a minimum of 3” (7.62 cm) clear space under filter to facilitate cartridge change.

3. Hang manifold from the mounting screws.
4. Once the bracket is hung, tighten the mounting screws so that the bracket is snug between the screw and the wall.
5. Install remaining mounting screws in locations as shown in figure 2.

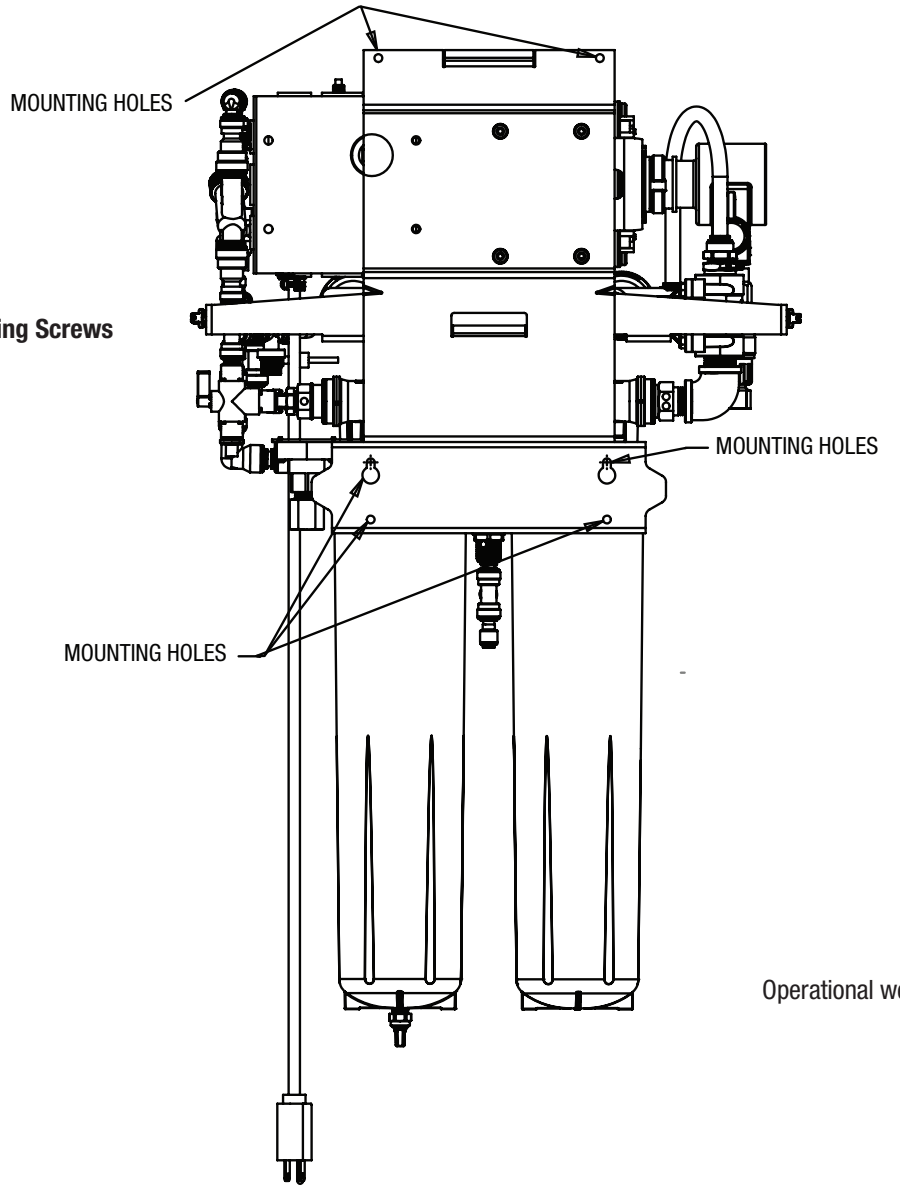


Figure 2 — Installing Mounting Screws

Operational weight - 57 lbs.

Plumbing Connections

1. Install feed water line to marked “Inlet” 1/2” NPT inlet connection.
2. Install RO water line from marked “Tank Outlet” to pressure tank (Sold Separately). Assemble and install pressure tank fittings per instructions provided with tank.
3. Install RO water line from marked “Equipment Outlet” to the foodservice equipment. Installation of a post filter is required downstream of the RO system (Required/Sold Separately).
4. Install drain line from marked “Drain Outlet” to the drain . An approved air gap must exist between the RO system reject drain line and the drain opening to comply with state and local plumbing codes.
5. Install 1/2" Bypass line as shown on Figure 1-Plumbing Diagram (if required).
6. Check air pressure on the pressure tank using the valve on the tank. With the tank empty, the pressure should read between 7-18 psi (48-124 kPa). Adjust as required.
7. Plumbing connections for the ScaleGard™ HP reverse osmosis system are now complete.

Install cartridge per instructions below.

Figure 3 - Installation Instructions

Step 1: Remove the plug from the 1/4" fitting at the bottom of the RO cartridge by pushing in the collet and pulling out the plug.

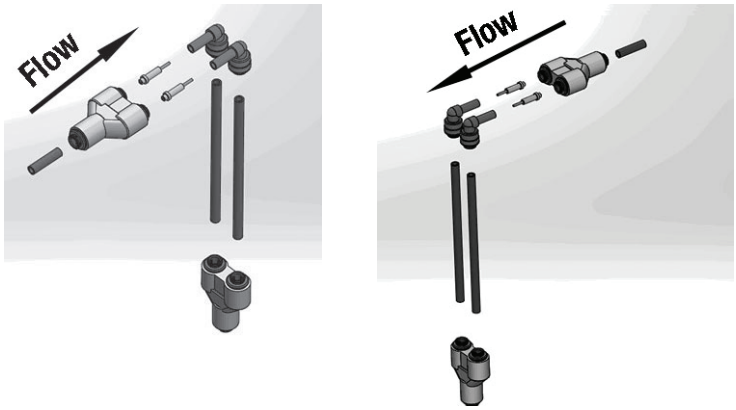
Step 2: Remove the Twin flow control assembly from the packaging.

Step 3: Firmly push the short tubing on one end of the twin flow control into the John Guest 1/4” NPT fitting at bottom of the RO cartridge.

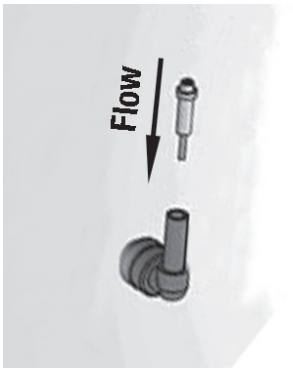
Step 4: Push the reject tubing into the fitting in the twin flow control assembly.

Step 5: Operating pressure will need to be reset (See Operating Pressure Adjustment instructions on page 14).

HFRO 33% Recovery Kit



HFRO 50% Recovery
(Use only if recommended by installer)



Pre-Filter and Post Filter Cartridge (blue label) Installation:

1. Remove red sanitary cap from new cartridge. Ensure o-rings are seated into their grooves and lubricate with water. Install with a quarter turn to the right until cartridge come to a complete stop. NOTE: Cartridges are keyed to fit in proper location only.

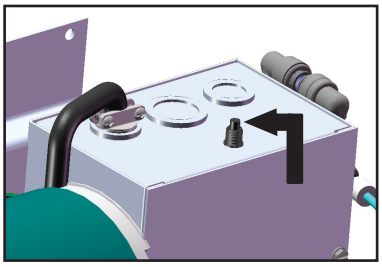
System Start Up

1. Open unit inlet shutoff valve (See Figure 1, page 7)
2. Turn ON the feedwater supply by plugging system into electrical outlet.
3. Open Pre-Filter flush valve to vent air from system and flush for 10 gallons (approximately 5 minutes). If error light turns ON during Pre-Filter flushing process then press reset button.
4. Close flush valve. Pre-Filter pressure gauge (left gauge) should read between 115-125 psi.(See Operating Pressure instructions to adjust)
5. Complete blending valve adjustment procedure below. (See instructions below)
6. Allow tank to fill until the RO unit turns OFF on full tank (See chart). Tank operating pressure for the 110-120VAC version is ON at 40 psi (276 kPa, 2.76 bar) and OFF at 60 psi (414 kPa, 4.14 bar) (right gauge). Tank operating pressure for the 220-240VAC is ON at 50 psi (345 kPa, 3.45 bar) and OFF at 70 psi (483 kPa, 4.83 bar).
7. Flush membrane by opening pressure tank sample valve and empty tank to drain. After flushing the system for at least 24 hours, close the tank sample valve.
8. Sanitize the Storage Tank and RO System according to the storage tank and RO system sanitizing instructions on page 11.
9. Allow tank to fill again. System is now ready for use.

Required (Sold Separately)

Part Number	Pressure Volume	Approximate Time to Fill
5598407	10 gallons (38 liters)	0.3 hours
5598408	20 gallons (76 liters)	0.6 hours
5598409	40 gallons (151 liters)	1.2 hours

Figure 4 (Reset Button)



Start-Up Test Checklist

Close tank-valve, Open the "sample valve" (available downstream of RO)

- Pump turns on √
- Water visually flows through "sample valve" and drain line √

Keeping tank-valve closed, close the "sample valve"

- Pump turns off √
- Water stops flowing through drain line √
- RO Feed Pressure" (Gauge 1) shows 0 psi (0 kPa, 0 bar) √
- "System Pressure" (Gauge 2) shows about 60 psi (414 kPa, 4.14 bar) for 110-120VAC systems and 70 psi (483 kPa, 4.83 bar) for 22-240VAC systems √

Open the "sample valve"

- Pump on and "RO Feed Pressure" (Gauge 1) shows 110-125 psi (758-862 kPa, 7.58-8.62 bar) √
- "System Pressure" (Gauge 2) shows 0 psi (0 kPa, 0 bar) √
- Permeate being rinsed for first 25 seconds √
- After 30 seconds of flow, check if measured production rate is as expected √
- After 30 seconds of flow, check if TDS reduction is as expected √

Close the "sample valve" and allow the tank to fill up

- Verify "System Pressure" (Gauge 2) increases slowly to 60 psi (414 kPa, 4.14 bar) for 110-120VAC systems and 70 psi (483 kPa, 4.83 bar) for 220-240VAC systems as tank fills up √
- Verify pump turns off and reject-flow shuts off when "System Pressure" (Gauge 2) is 60 psi (414 kPa, 4.14 bar) √

Blending Valve Adjustment Instructions:

IMPORTANT NOTES:

- Typical TDS (Total Dissolved Solids) values for coffee are 80-200 ppm (parts per million) and occasionally lower for espresso, depending upon taste preference. Typical TDS valves for steam and combi ovens are less than 50ppm.
- The blending valve should be set at start-up and checked periodically, for example when changing filter cartridges. The valve is a precision metering valve, that may be locked by tightening lock nut.
- To set blending valve use TDS monitor set in the "out" position.

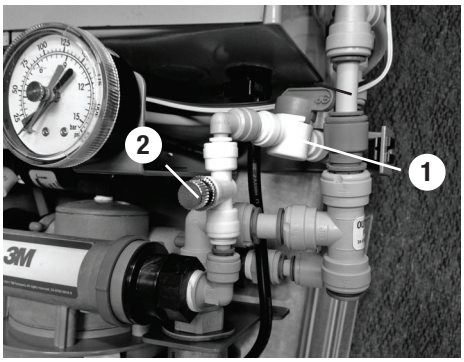
1. Open shut off valve in blending line.
2. Allow unit to run and fill tank for 5 min.
3. To adjust blending, rotate the blending valve to the left (counterclockwise) to increase the product water TDS and to the right (clockwise) to decrease the product water TDS (See Figure 5 item #2 below). The valve should be opened intermittently a quarter turn at a time. Check the TDS after each incremental adjustment and again two (2) minutes after the desired TDS value is reached. Re-adjust and check, as needed. (See Figure 5-item #2 below)
4. Lock the blending valve using the lock nut.
5. After TDS is set, drain RO tank. System is now ready for use.

IMPORTANT NOTE: The TDS Monitor is push-button operated and requires two (2) 357A batteries. (Included in TDS meter)

Membrane Flushing Instructions:

1. Open pressure tank sample valve and empty tank to drain.
2. Flush system for at least 24 hours.
3. Close tank sample valve

Figure 5



Storage Tank and RO System Sanitizing Instructions:

Sanitizing the storage tank requires:

- Common household bleach (5.25% non-scented) or sanitizing agent
- Eye dropper or plastic oral syringe

a.) Disconnect the 1/2” line from marked”Tank Outlet” to pressure tank.

b.) Insert 15ml (0.5 ounces) of bleach or sanitizing agent into 1/2” line to pressure tank.

c.) Reconnect the 1/2” line to pressure tank.

d.) Turn ON the feedwater supply by plugging system into electrical outlet.

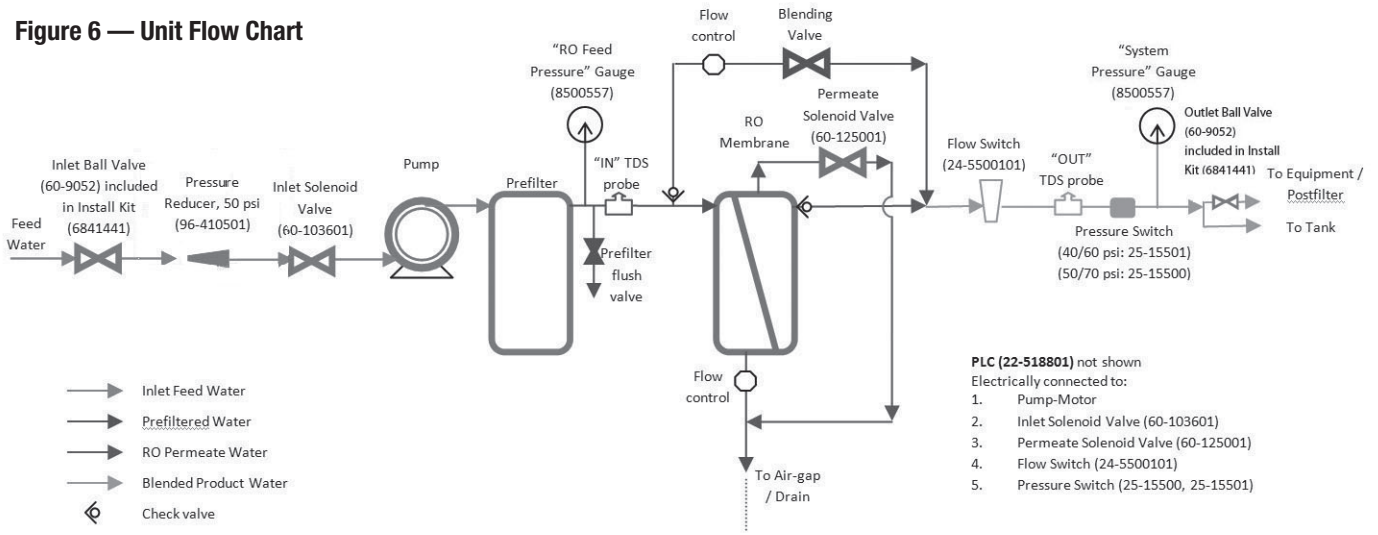
e.) Wait 4-5 hours.

f.) Open pressure tank sample valve and empty tank to drain.

g.) Sanitizing is now complete.

h) If there is any residual chlorine/bleach taste in the next tank full, drain tank completely a second time.

Figure 6 — Unit Flow Chart



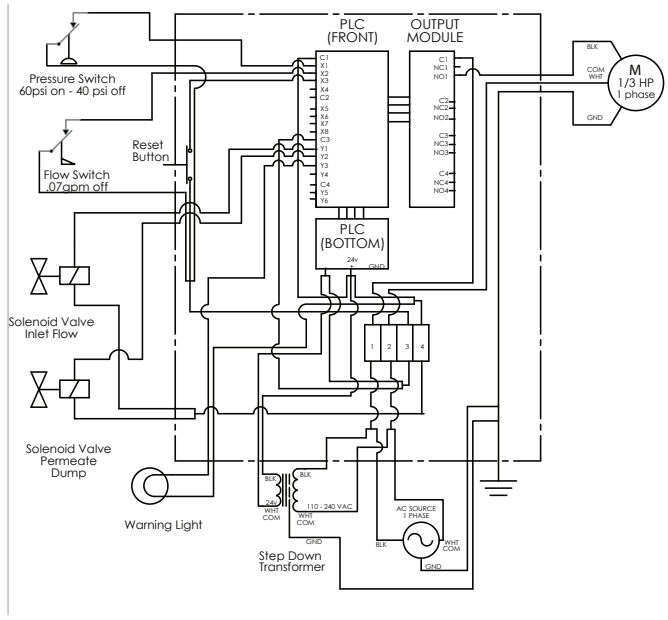


Figure 7 — Electrical Diagram 110V

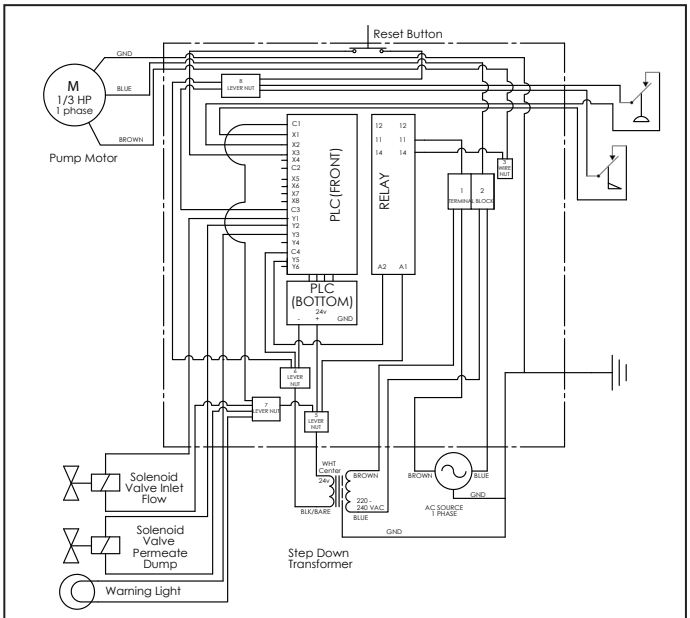


Figure 8 — Electrical Diagram 220V

Advanced Diagnosis for Certified Technicians ONLY
Caution/Warning: High Voltage in the Control Box

Output	LED Color	Meaning	Normal Running Condition
PWR	Green	On when the units power cord is plugged in	ON
RUN	Green	On if PLC is powered with switch in run position	ON
ERR	Green	On when PLC is not functioning properly	OFF
X1	Green	On when the pressure-switch is closed telling PLC to make water	ON
X2	Green	On when the flow-switch is closed signaling good flow	ON
X3	Green	On when the reset button is being pressed down	OFF
Y1	Red	On when the Inlet solenoid is being signaled by PLC to open (make RO-water)	ON
Y2	Red	On when the permeate rinse solenoid is being signaled by PLC to open (rinse)	On for 25 seconds then OFF
Y3	Red	On when The service indicator light is being signaled by PLC to turn on	OFF
NO1 (110-120VAC)	Red	On when the motor/pump is being signaled by PLC to turn on (make RO water)	ON
Y5 (220-240VAC)	Red		

ScaleGard™ HP PLC (Programable Logic Controller) Program Version 9.8 Sequence of Operation

Plug unit in, both the Power and Run LED's are Green

A. If Tank Switch is > 60 psi (414 kPa, 4.14 bar) for 110-120VAC systems or 70 psi (483 kPa, 4.83 bar) for 220-240VAC systems, the unit is off on full tank

1. Unit will cycle on when tank switch senses < 40 psi

B. If Tank Switch is < 40 psi

1. Inlet solenoid valve and permeate rinse solenoid open
2. 2 second delay, motor / pump start
3. 25 second delay permeate rinse solenoid closes
4. Monitoring of the flow switch starts

a. If flow switch is closed (flow detected) unit continues to operate filling the tank

1. Tank switch senses pressure > 60 psi (414 kPa, 4.14 bar) for 110-120VAC systems or 70 psi (483 kPa, 4.83 bar) for 220-240VAC systems
2. Motor / pump shut down
3. 5 second delay inlet solenoid valve shuts off
4. Unit is shut down on full tank.
5. When pressure in tanks fall below 40 psi (276 kPa, 2.76 bar) for 110-120VAC systems or 50 psi (345 kPa, 3.45 bar) for 220-240VAC systems,return to B.1

b. If flow switch is open (no flow detected)

1. No flow signal is ignored for 15 seconds and the "TOGGLE CYCLE" starts

"TOGGLE CYCLE"

1. Motor / Pump stop
2. 2 second delay the inlet solenoid closes
3. 1 second delay the inlet solenoid opens
4. 1 second delay the motor / pump start
5. 12 second delay check flow for three consecutive readings at 2 second intervals

Note: The "TOGGLE CYCLE" can/will repeat 4 times.

1. RETURN to NORMAL OPERATION If the flow switch closes (sensing flow) for 3 consecutive readings during any of the "toggle cycles", the unit will return to normal operation (B.1)

2. TOGGLE SHUT DOWN If the flow switch closes (sensing flow) at any time during the toggle cycle the unit will go into the TOGGLE SHUT DOWN mode

"TOGGLE SHUT DOWN"

1. Motor / pump shut down
2. 5 second delay the inlet solenoid valve closes
3. ERROR light blinking
4. After 10 minutes the unit returns to operation (B.1)

The unit will count the number of toggle shut downs.

If the unit shuts down in the 10 minute toggle mode 10 times the shut down time is increased to 60 minute shut down.

The unit will shut down in the 60 minute shut down mode 1 time and the shut down mode will return to the 10 minute mode with the counter reset and counting to 10 again.

3. <u>ERROR SHUT DOWN</u> If the flow switch stays open (no flow) after the 4th repeat the unit will shut down in “ERROR SHUT DOWN”.

1. The motor / pump shut down
2. 5 second delay inlet solenoid valve closes
3. ERROR light on solid red.
4. Unit will have to manually be restarted.

The unit can/will be reset back to normal operation during the toggle mode by:

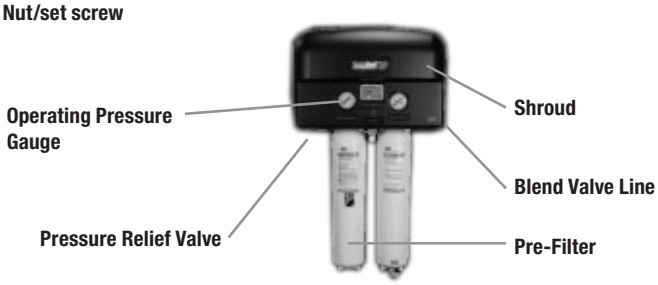
1. Unplugging the unit or pressing the reset button on the top of the PLC box
2. Unit cycles off on full tank

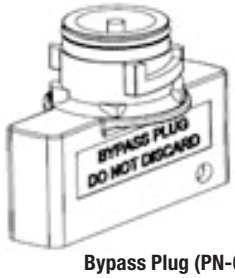
Operating Pressure Adjustment Instructions

1. Turn off / unplug the ScaleGard™ HP Reverse Osmosis Unit.
2. Remove the shroud from the unit. (See diagram)
3. Open the pressure relief valve on the left side of the manifold to relieve the water pressure in the manifold (See diagram). If the water continues to flow out of the pressure relief valve, the inlet water solenoid needs to be serviced. Right gauge (tank gauge) will not lose pressure.
4. Remove the prefilter cartridge from the left cartridge head on the manifold. (See diagram)
5. Install bypass plug (3M part # 6217402) into the left hand cartridge head on the manifold. (Note: Operating pressure can't be set/adjusted with used pre-filter cartridges)
6. Close the pressure relief valve.
7. Close the shut off valve in the blend valve line (see diagram).
8. Remove the pressure adjustment lock nut on the water pump to access the set screw (see diagram).
9. Turn on / plug in the SGHP RO unit.
10. Reading the left hand gauge on the unit, use the set screw to adjust the operating pressure to 115 psi +/- 5 psi and not to exceed 120 psi.
11. Turn the set screw in to increase the pressure, out to decrease the pressure. Note: A small amount of water may leak around the set screw, this is normal.

To reduce the risk associated with property damage due to water leakage or flooding:
Notice: Take care when using pliers or pipe wrenches to tighten plastic fittings, as damage may occur if over tightening occurs.

12. When the operating pressure is set, replace the lock nut and recheck the operating pressure, readjust if necessary. (Do not over tighten lock nut). Check for water leaks, repair as necessary.
13. Turn off / unplug the SGHP RO unit.
14. Open the pressure relief valve on the left side of the manifold to relieve the manifold water pressure.
15. Remove the bypass plug and reinstall the pre filter cartridge.
16. Close the pressure relief valve.
17. Open the blend valve line shut off valve.
18. Replace the shroud on the unit.
19. Turn on / plug in the SGHP RO unit Note: if the operating pressure is lower than the adjusted pressure, DO NOT READJUST. The reduced pressure is due to a restriction in the prefilter cartridge. It is recommended to change the prefilter cartridge.
    <u>Important: If pressure drops below 80 psi with prefilter installed, Pre-Filter **MUST** be replaced.</u>





Bypass Plug (PN-6217402)

Routine Maintenance Cartridge Change-out Instructions (Pre/ Post Filter and RO Membrane Cartridge)

⚠ WARNING

Read entire manual. Failure to follow all guide and rules could cause personal injury or property damage.

- Check with your local public works department for plumbing codes. You must follow their guidelines as you install the water filtration system.
- Your water filtration system will withstand up to 125 pounds per square inch (psi) water pressure. If your water supply pressure is higher than 80 psi, install a pressure reducing valve before installing the water filtration system.

To reduce the risk associated with choking:

- DO NOT allow children under 3 years of age to have access to small parts during the installation of this product.

To reduce the risk associated with the ingestion of contaminants:

- DO NOT use with water that is microbiologicaly unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.

NOTICE

To reduce the risk associated with property damage due to water leakage or flooding:

- Read and follow Use Instructions provided with the original system prior to use of this replacement cartridge.
- Change the disposable filter cartridge at the recommended interval; the disposable filter cartridge MUST be replaced every 24 months or sooner.
- Failure to replace the disposable filter cartridge at recommended intervals may lead to reduced filter performance and failure of the filter, causing property damage from water leakage or flooding.
- Protect from freezing, remove filter cartridge when temperatures are expected to drop below 33° F (4.4° C).
- DO NOT install systems in areas where ambient temperatures may go above 110° F (43.3° C).
- DO NOT install on hot water supply lines. The maximum operating water temperature of this filter system is 100°F (37.8°C).
- DO NOT install if water pressure exceeds 125 psi (862 kPa). If your water pressure exceeds 80 psi (552 kPa), you must install a pressure limiting valve. Contact a plumbing professional if you are uncertain how to check your water pressure.

IMPORTANT NOTE:

The RO membrane cartridges have green labels and will only fit into the head on the right side of the manifold (head has a green 3M label).

Shut-Off procedure:

RO membrane cartridge will need to be changed at least every twenty four (24) months. Pre and Post Filter cartridges must be replaced every six (6) months.

1. Unplug system from the wall outlet, which will shutoff feedwater to RO system.
2. Open Pre-filter sample valve until flow stops and left pressure gauge reaches 0 psi to relieve pressure.

Pre-Filter and Post Filter Cartridge (blue label) Replacement:

1. Push and hold yellow tab to release cartridge locking mechanism while simultaneously rotating cartridge to the left.
2. Using both hands and holding the cartridge from the bottom, rotate the cartridge a quarter turn to the left and gently pull down.
   NOTE: A small amount of water will drain from manifold as cartridge is removed.
3. Remove red sanitary cap from new cartridge. Ensure o-rings are seated into their grooves and lubricate with water. Install with a quarter turn to the right until cartridge come to a complete stop. NOTE: Cartridges are keyed to fit in proper location only.

RO Membrane Cartridge (green label) Replacement:

1. Remove the reject tubing and the elbow from the RO membrane cartridge. (See Figure 1).
2. Push and hold yellow tab to release RO membrane cartridge locking mechanism while simultaneously rotating RO membrane cartridge to the left.
3. Using both hands and holding the RO membrane cartridge from the bottom, rotate the RO membrane cartridge a quarter turn to the left and gently pull down. NOTE: A small amount of water will drain from manifold as cartridge is removed.

Routine Maintenance Cartridge Change-out Instructions (Pre-Filter and RO Membrane Cartridge)

RO Membrane Cartridge (green label) Replacement Cont.:

4. Remove sanitary cap from new RO membrane cartridge. Ensure o-rings are seated into their grooves and lubricate with water. Remove plug from new RO membrane cartridge. Install with a quarter turn to the right until RO membrane cartridge comes to a complete stop.
   NOTE: RO membrane cartridges are keyed to fit in proper location only.
5. Remove the old flow control from the elbow and discard. Install the new flow control, included with the new RO membrane cartridge, in the elbow (See Figure 2)
6. Connect reject tubing with elbow to RO membrane cartridge.
7. Flush membrane by opening pressure tank sample valve and empty tank to drain. After flushing the system for at least 24 hours, close the tank sample valve.

System Start Up

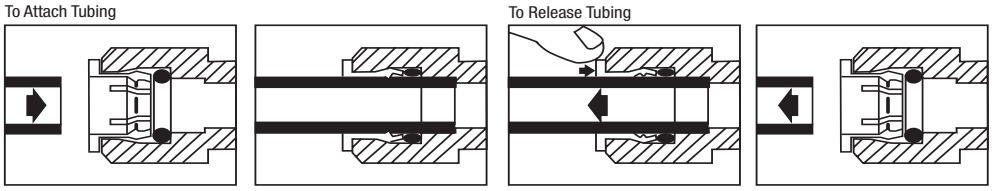
Refer to System Start Up procedure (See page 10)

Figure 9 (How to Use "Push-in" Connectors)

This product is outfitted with a user friendly 'Push In' connector at the vent valve. Proper use of the connectors is shown in the figure below. It is most important that the tubing selected for use with these connectors be of high quality, exact size and roundness, and with no surface nicks or scratches. If it is necessary to cut the tubing, use a plastic tubing cutter or sharp razor knife. Make a clean square cut. Should a leak occur at a "Push-In" connector, the cause is usually a problem with the tubing.

To Fix:

1. Relieve pressure
2. Release tubing
3. Cut off at least 1/4" from end
4. Reattach tubing
5. Confirm connection is leak free



Troubleshooting Guide

Technical Support - 1-866-990-9785

Problem	Possible Cause	Solution	Notes
Unit Runs Low or Out of Water	Undersized tank for store demand	Install additional storage tank capacity	Contact Dealer
	RO production is to low for store demand	Install RO add-on head and cartridge	Contact Dealer
		Upgrade from HFRO 500 to HFRO 700 Cartridge	
	Slow leak in the distribution line	Repair leak	The unit produced RO water slowly. A dripping leak can prevent the tank from filling.
	RO membrane flow control improperly installed or missing	Properly install RO membrane flow control	Note: Reference RO cartridge change-out instructions
System shuts down and "service" indicator light turns on blinking	Pre-Filter plugs left hand gauge reads less than 90	Replace Pre-Filter	—
	Low production rate	Wait for 10-60 minutes to see if system restarts	
	RO membrane fouls, low production	Replace RO membrane	
System shuts down and “service” indicator light turns on solid	Pre-Filter plugs left hand gauge reads less than 90	Replace Pre-Filter	A more frequent schedule change-out may be needed (Refer to Challenge Water Recommendations on page 6)
	RO membrane fouls (normal conditions)	Replace RO membrane	Check for: 1. feedwater pressure, 2. production flow rate, 3. drain flow rate before replacing RO membrane
		Ensure drain line is not kinked or plugged. Replace if needed.	
	RO membrane fouls (high feed water hardness/TDS)	Install RO add-on head and cartridge	Contact Dealer
		Install a HFRO 33% Recovery Kit	
		Install water softener upstream	
	RO membrane fouls (high particle load in incoming water)	Install prefilter and RO expansion heads and cartridges	
	Interrupted feedwater supply	Press Reset button on top of electrical enclosure	Reference system startup procedure
	Water temperature below 50 °F	Install RO expansion head and cartridge	
	Low feedwater pressure (below 30 psi)	Contact plumber to resolve problem	Reference system startup procedure once low feed water problem is resolved
	Iron or Manganese in incoming water	Contact your dealer/distributor to install specific iron or manganese reduction system	
TDS of product water too low	Blend too low	Re-adjust blending valve to allow more blending	Reference Blending Valve Adjustment
TDS of product water too high	Blend to high	Re-adjust blending valve to allow less blending	Reference Blending Valve Adjustment
TDS of product water too high with no blending	RO membrane needs to be replaced	Replace RO membranes	—
TDS monitor not operating	Low battery	Replace TDS monitor batteries	—

Replacement Parts

Part Number	Description
96-410501	Pressure Reducer/Regulator (Contact Dealer)
60-9052	Inlet ball valve (Contact Dealer)
22-518801	Pre-programmed PLC for 5629101 and 6239301 (Contact Dealer)
25-212401	Relay Output Module for 5629101 and 6239301
22-518802	Pre-programmed PLC for 6239302, 629303, 6239304 (Contact Dealer)
22-115401	Relay Output Module for 6239302, 6239303, and 6239304
8500557	Pressure Gauge (Contact Dealer)
60-125001	Permeate Solenoid (Contact Dealer)
85-9274	Shroud (Contact Dealer)
89-3220101	Pump Head (Contact Dealer)
89-2302	Pump Motor (Contact Dealer)
5613529	HF90-CL-RO Pre-Filter
5626903	HFRO 500 Cartridge
5626904	HFRO 700 Cartridge
50-93201	HFRO 33% Recovery Kit
6232631	TDS Monitor
24-500101	Flow Switch
25-15501	Pressure Switch (40/60 psi)
25-15500	Pressure Switch (50/70 psi)
60-103601	Inlet Solenoid (Contact Dealer)
6217402	Bypass Plug
5613303	Post Filter HF40 Replacement Cartridge for BEV140 (Required/Sold Separately)
5613403	Post Filter HF60 Replacement Cartridge for BEV160 (Required/Sold Separately)

Notes

Product Use:

Many factors beyond 3M Purification Inc.'s (3M's) control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. User is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

Warranty, Limited Remedy, and Disclaimer:

3M warrants that this product (excluding filter cartridge or filter membrane) will be free from defects in material and manufacture for the period of (1) year from the date of purchase. The filter cartridge or membrane is warranted to be free from defects in material and manufacture for one (1) year. No warranty is given as to the service life of any filter cartridge or membrane as it will vary with local water conditions and water consumption. **3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE.**

If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability:

Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

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