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OPERATION MANUAL



Total Wells
Pumps and Filtration

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PURO PRO 1800 SC Series Modular Reverse Osmosis System

September 2012 Version

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Installation and Operating Instructions for
PURO PRO SC Series Modular
Reverse Osmosis Unit

Model #:

_____ PURO PRO 1800 SC 1800 GPD RO System

Shipping Carton Description / unit:

# of cartons	Contents	Description
1	PURO PRO Module Frame	Modular RO Assembly
1	Filter Elements	(6) RO Membranes
1	Installation Accessories	Inlet Solenoid, (1) Float Control, Check Valve, Rubber Gloves, Silicone Packets

System Description:

The PURO PRO is a modular reverse osmosis filtration system for the reduction of Total Dissolved Solids (TDS) from water. The system consists in six (6) high-performance reverse osmosis membranes. The system is designed to operate with a pressurized (40 to 90 psi) feed and a vented storage tank for collection of the product water. An inlet normally-closed solenoid allows pressurized water to enter the system whenever it is activated by the level float which is installed in a water collection tank. See Figure 1. The modular assembly is constructed of non-corrosive Noryl®, polypropylene, and FRP materials. The reverse osmosis system is rated at a maximum working water pressure of 90 psi. The system has a fixed inlet flow control, and an adjustable drain restrictor control for achieving maximum efficiency.

Feed Water Requirements:

1. The feed water for the PURO PRO must meet the following requirements:

Feed Water Condition	Requirement
Pressure	40 psi to 90 psi
Temperature	40 to 100 degrees Fahrenheit
Total Dissolved Solids	50 to 2000 mg/l
Hardness	Less than 4 GPG
Iron	Less than 0.1 mg/l
Manganese	Less than 0.05 mg/l
Chlorine	Maximum 1.0 mg/l
pH	4.0 to 10.0

2. A feed water source which does not meet these requirements must be treated prior to the PURO PRO system.

Electrical Requirements:

1. Provide an 115v/60Hz properly grounded dedicated electrical outlet. (It's very important that the polarity be correct)
Avoid using outlets that are switch controlled.
2. Maximum amperage required is 5 amps.
3. Make sure the electrical service provides power 24 hours per day.
We recommend installing a **surge protector** to protect unit from power surges, which are not covered by warranty.

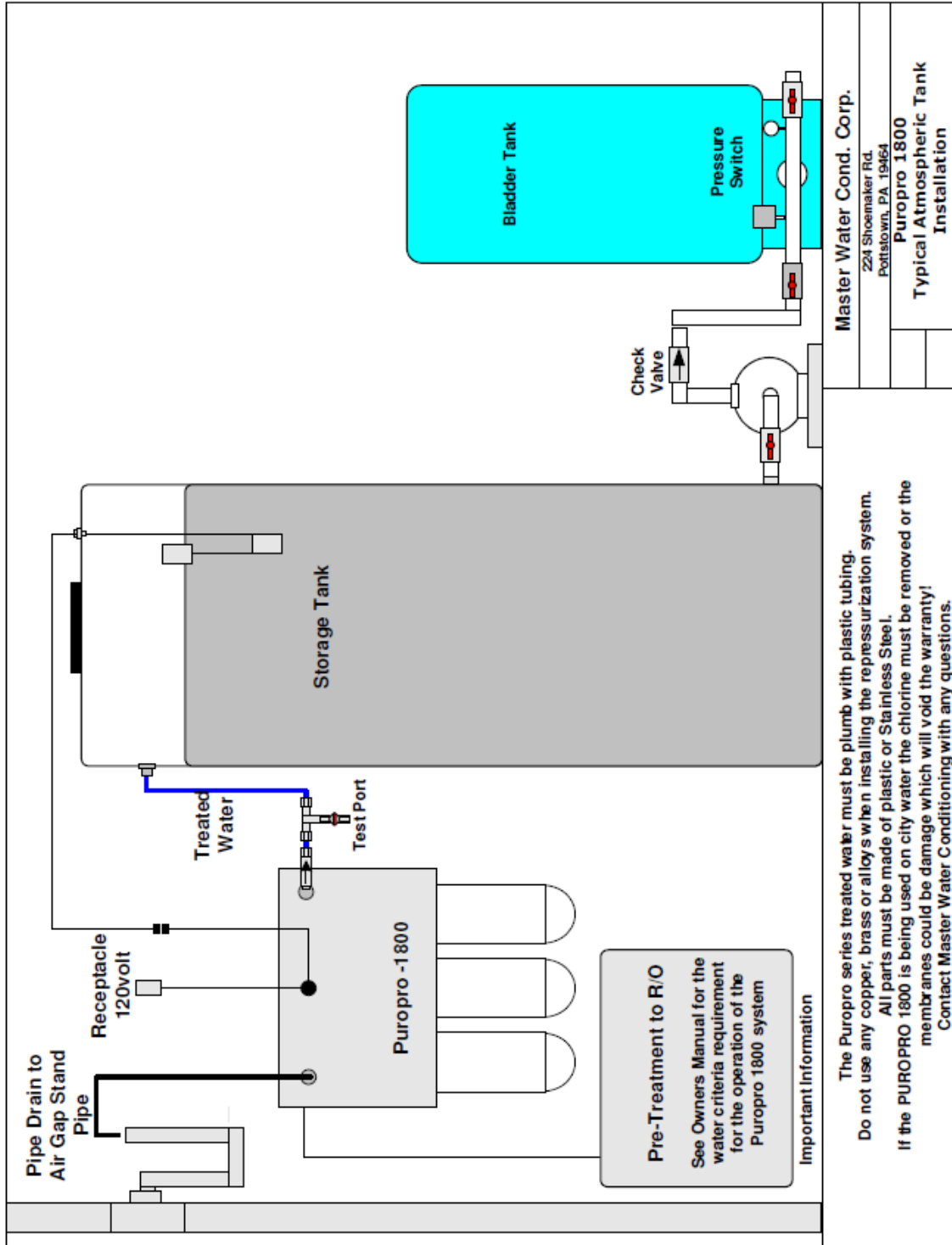


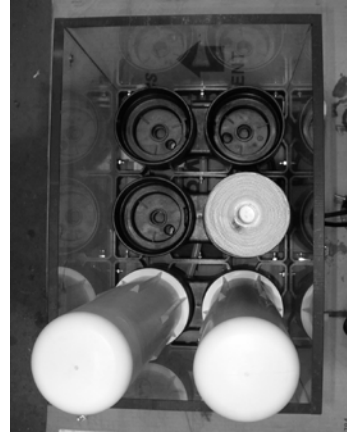
Figure 1. Typical PURO PRO Installation

PURO PRO Membrane Installation:

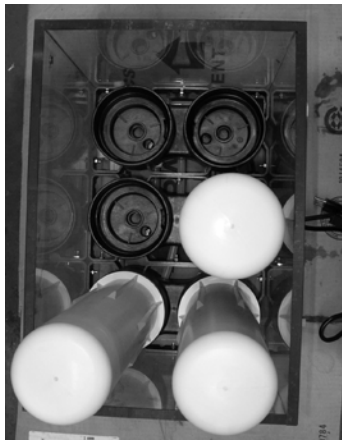
1. Rotate the Puro Pro so that the side where the membranes are to be installed is facing up, and resting on a flat surface.
2. The membranes must be installed inside cartridge housings.
3. The six membranes are installed in the manifolds with the single ring. Figure 2.
4. Use the plastic gloves (provided) when handling the membranes in order to prevent exposure to the membrane preservative.
5. Ensure that the O-Ring's on each housing and membrane has Silicone (only) Lubricant. Do not use petroleum lubricants.
6. Install two of the membranes in the top row.
7. To install the membranes, unwrap the membrane and place the nipple with the two o'rings into the manifold, making sure to align the nipple of the membrane with the center opening of the manifold. While supporting the membrane, slide the housing over the membrane and into the manifold opening. Screw the housing into the manifold using a strap wrench. Screw the housing all the way until the housing ring meets the manifold. See Figure 4.



Membrane



Placing Membrane In Manifold



Inserting Membrane Housing Into Manifold

8. Repeat with the second membrane in the middle row.
9. Install the remaining membranes using the procedure from steps 7 and 8 above.

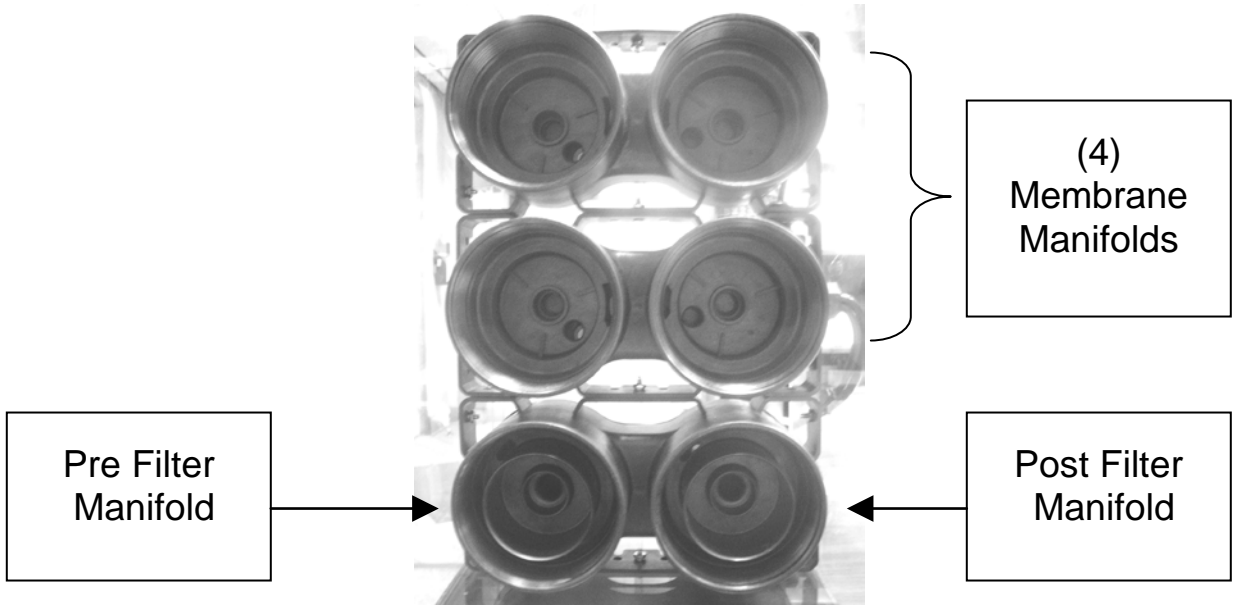


Figure 2. Manifold

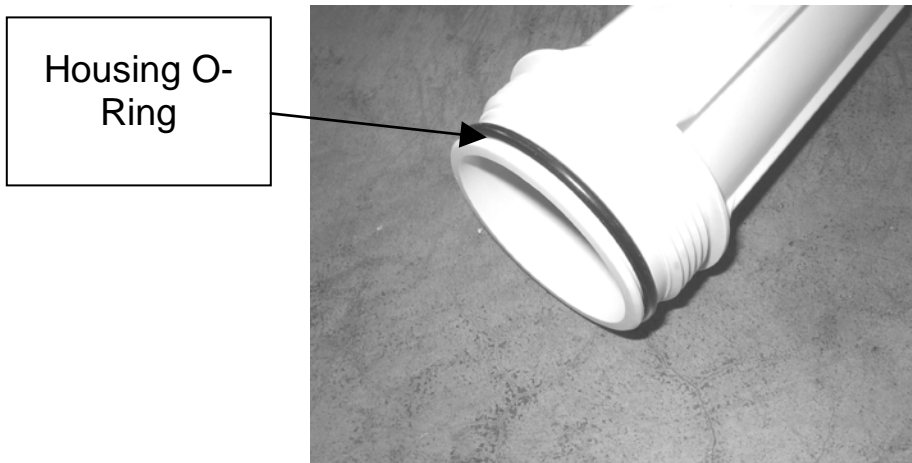


Figure 3. Housings

Properly
installed
Housing is
Flush

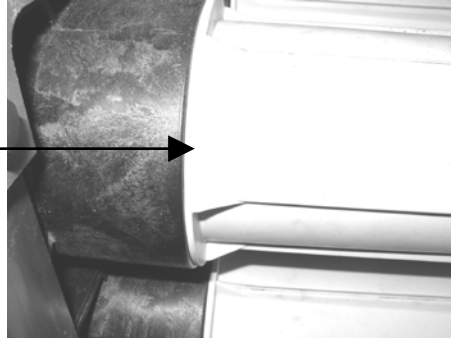
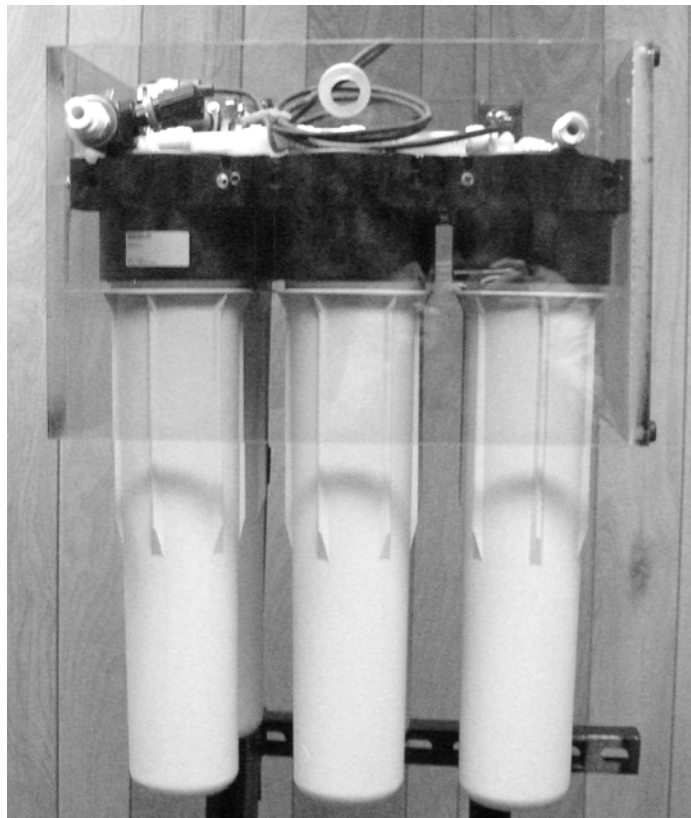


Figure 4. Tightening the Housings

PURO PRO Positioning:

1. Wall mount the PURO PRO. There are holes drilled into the plastic housing to be used for wall mounting. If using the PURO PRO on the ground, make sure to place a support under the bottom sumps.



2. Place the PURO PRO in desired position, immediately following any prescribed pretreatment, and far enough from walls and other obstructions to allow for servicing the unit. Note that 14 inches of horizontal clearance are required on the open end for changing the filters.
3. Place the PURO PRO within reasonable access to a grounded 115V/60 HZ circuit and a legal drain line connection.
4. This system will weigh about 70 pounds when full of water.

NOTE: When changing membranes, water will spill on the floor, so installing near a floor drain or unfinished floor area is preferred.

PURO PRO Hydraulic Connections (Figure 5):

1. Pipe Puro Pro into the service lines, the inlet is ½ " NPT and the outlet is ½" OD tube compression. We recommend using an inlet, outlet, and bypass valve in installation piping for future servicing of unit. Always follow local plumbing codes when installing our water treatment equipment. When using PVC make sure to follow the proper primer and solvent instructions.
2. Connect a pressurized feed water source to the inlet solenoid. The solenoid has a ½ -inch NPT connection. This water source should be consistently pressurized, either from a well pump pressure (bladder) tank or from a municipal water source.
3. Install ½" OD tube from the Puro Pro check valve to the inlet of your atmospheric tank.
4. Install a ½ " drain line from the ½ " NPT drain connection to a legal air gap. Follow local plumbing codes.

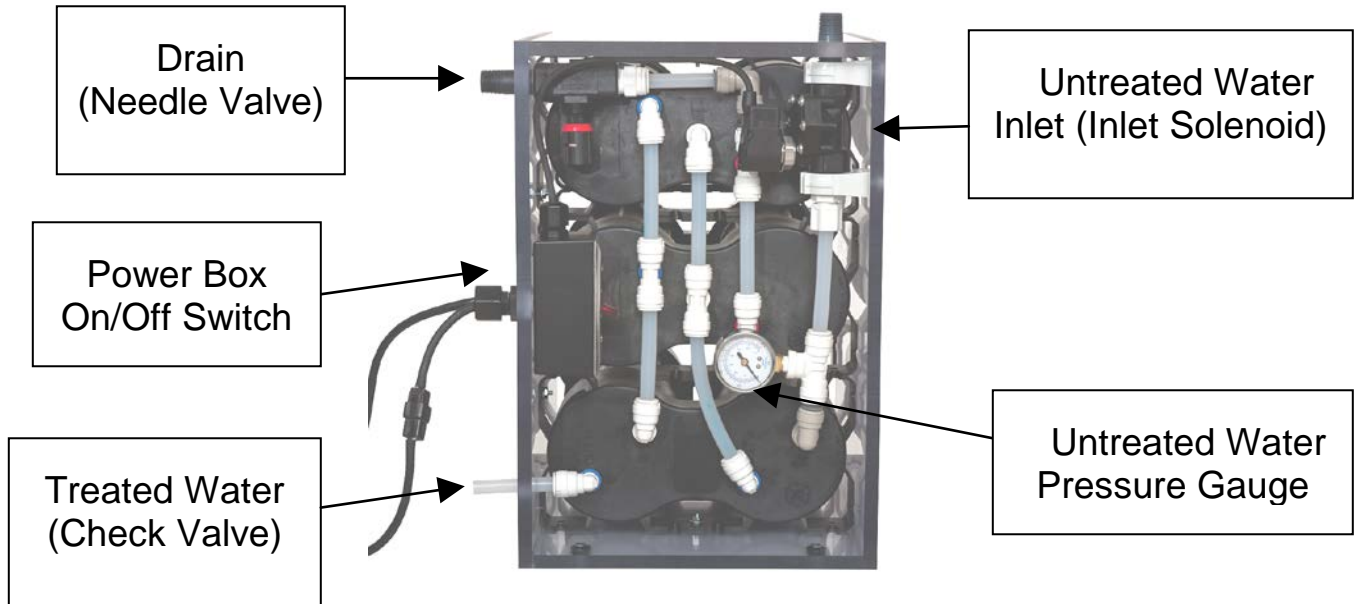


Figure 5: Front of Unit

PURO PRO Electrical Connections:

1. Attach the float switch to the vented storage tank so that the float raises to the horizontal position when the storage tank is full of water. The float switch will provide an open circuit (i.e., no power) to the solenoid when in a vertical (unfloating) position; the float switch will provide a closed circuit (i.e., powered) to the solenoid when in the horizontal (floating) position. See Figure 1.
2. Connect the float switch to the power box with the electrical connector provided. See Figure 6.
3. The inlet solenoid is already connected to the power box. The inlet solenoid is normally closed: When the circuit is open the inlet solenoid will be closed and no water will flow into the PURO PRO unit. When the circuit is closed the inlet solenoid will open and water will flow into the PURO PRO unit.

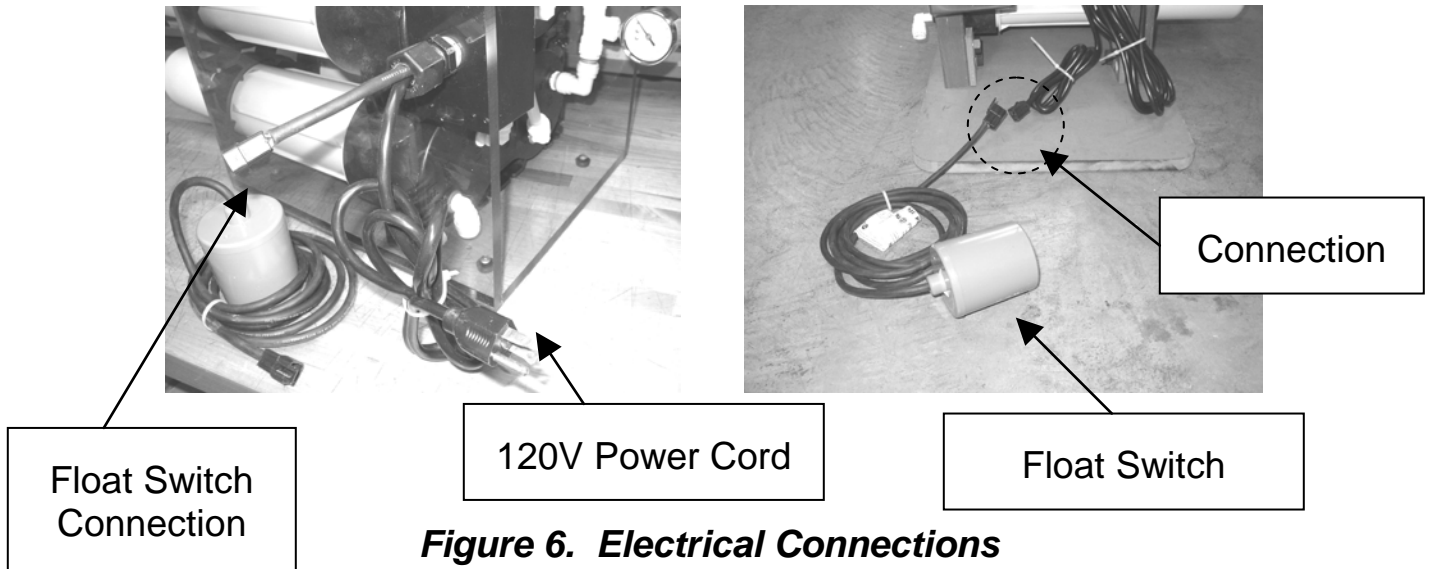
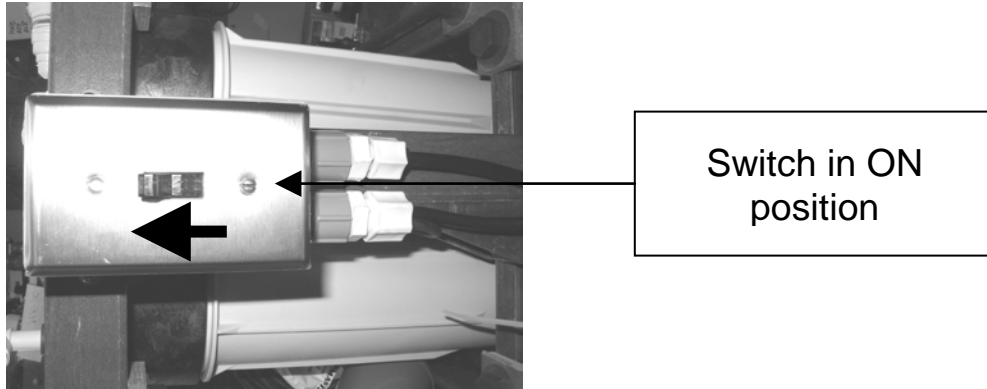


Figure 6. Electrical Connections

4. For the inlet solenoid to open, two conditions must be met: The power box switch must be in the ON position, and the float switch must be in the vertical (tank not filled) position. If either of these conditions is not met, the inlet solenoid will remain closed.
5. The normal operating condition is for the power box switch to be in the ON position. In this condition, the solenoid will open and allow the PURO PRO to treat inlet water only when the storage tank is not full (the float switch is in the vertical position). Whenever the storage tank is full (the float switch is in the horizontal floating position), the solenoid will be closed.

PURO PRO Power Switch Operation:

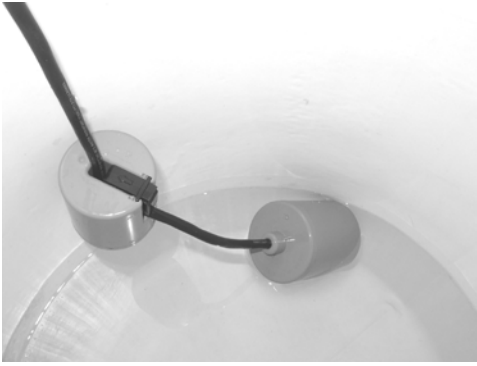
1. The power switch has an ON and OFF switch position to indicate whether 120 VAC power is being applied to the PURO PRO system.
2. In the OFF position, no power is being applied to the N/C solenoid, and the system will not operate. In the ON position, power is being applied to the PURO PRO system. However, the N/C solenoid will only open, and the PURO PRO system will only produce treated water when the float switch is in the vertical (Tank-not-full) position.



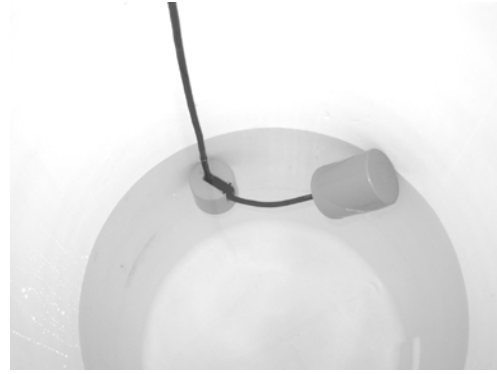
3. The Power Switch Light (red) will be lit whenever the N/C solenoid is open and the PURO PRO system is producing treated water for the storage tank. At all other times, the Power Switch Light will be off.

Float Switch Operation:

1. The float switch operates by the orientation of the float. In the up and vertical or near-vertical position, the electrical circuit is open, no power is passed, and the inlet solenoid is closed. As the float is lowered by the water level and reaches just below the horizontal position, the electrical circuit is closed, power is passed and the solenoid valve is opened, allowing the Modular Pro to produce treated water.
2. This function can be tested by holding the float, adjusting the orientation, and listening for the switch to open and close.
3. For proper functioning, the float requires a stationary axis for rotation. This can be accomplished by a weight in the float cable, or by anchoring the float cable just below the intended fill level for the storage tank.
4. The arc created between the float and the stationary point determines the range of operation for the Modular Pro from the ON to the OFF position.
5. Install the float switch so that the OFF position corresponds to the intended fill level for the storage tank.



Low Water; Switch On



High Water; Switch Off

WEIGHT METHOD

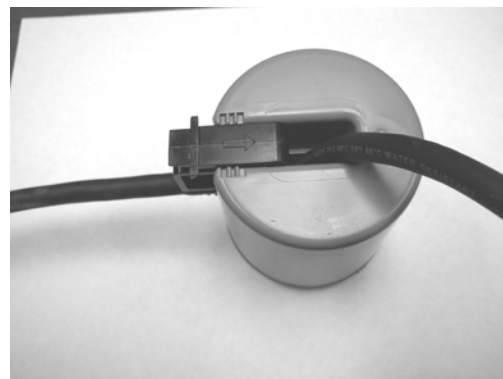
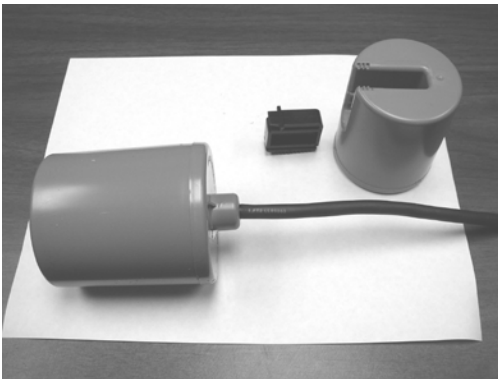


Low Water; Switch On



High Water; Switch Off

ANCHOR POINT METHOD



WEIGHT DEVICE

Filling the PURO PRO with Water and Start-Up:

1. Once all hydraulic and electrical connections are completed and the power box is plugged into a 120V power source, close a feed water inlet valve, and crack it open about $\frac{1}{4}$.
2. Switch the power box switch to ON, and water will enter the PURO PRO. Let the water continue to fill all of the housings at this reduced flow rate until water flows freely out the drain.
3. Open the feed water inlet valve until the feed water pressure gauge is about $\frac{1}{2}$ open.
4. The membranes are packaged in preservative material. This fluid should be flushed to drain for at least one hour before connection to the storage tank.
5. Once this is completed, the system should be connected to the storage tank for pure water production.
6. Observe the operation of the float switch to ensure that the water level is as required. Adjust the float rotation point as necessary.

PURO PRO Operation and Maintenance:

1. To ensure proper maintenance it is recommended that a production data sheet be established for each system. A Baseline Performance should be established at the initial installation. This Baseline is then compared to subsequent production performance at each six-month interval thereafter. Significant variances are cause for maintenance activity.
2. See page 15 for a recommended production data sheet. If production specifications change more than 20 percent, then some action is normally suggested.
3. Normal maintenance activities include replacing the membranes.
4. The membranes (6) may require replacement every two years. This frequency may vary based upon feed water quality and upon changes to the production rate of treated water.
5. Each time a membrane module is removed, the housing should be rinsed with a dilute bleach solution and then fresh water before being replaced.

6. If the module frame structure becomes loose, tighten the FRP Bolts located at the frame corners.

PRODUCTION DATA RECORD

DATE	Primary Pressure	Product Rate Measurement*	Product Quality	Action Taken

- Product measurement criteria is selected based upon the configuration of the system. For example, an appropriate criteria may be gallons per hour or inches (of tank height) per hour. Use whatever production rate measurement is easiest to routinely measure.

Troubleshooting

Symptom: PURO PURE fails to make any pure water.

Possible Cause	Solution
Power supply to PURO PRO has been interrupted.	Determine reason for power interruption and correct.
Water pressure lost.	Restore water pressure.
Drain control is closed.	Review and repeat Start-Up procedure.
Storage Tank is full.	Recheck when water level decreases.
Filters and/or membranes have become severely fouled.	Replace and re-start.

Symptom: PURO PRO has greatly reduced production.

Possible Cause	Solution
Water pressure is decreased below 60 psi.	Restore water pressure.
Drain control is improperly set.	Review and repeat Start-Up procedure.
Filters and/or membranes have become severely fouled.	Check and replace prefilter, post filter and then membranes until production resumes.
Feed water temperature has decreased to below 45 degrees F.	Raise feed water temperature.
Feed water TDS has increased to over 2000 ppm.	Consider high-pressure reverse osmosis system.

Symptom: Continuous water to drain.

Possible Cause	Solution
Inlet solenoid has failed.	Replace inlet solenoid.

Symptom: Storage Tank Overflows

Possible Cause	Solution
Float Switch has failed.	Replace float switch.
Inlet Solenoid has failed	Replace the inlet solenoid.

PURO PRO PARTS

Membrane (Each)	1238342
Inlet Solenoid	3020434
Float Switch	3020439

WHOLE HOUSE R.O. DRINKING WATER SYSTEM

ONE YEAR LIMITED WARRANTY

Master Water Conditioning warrants its Commercial R.O. Drinking Water System to be free of defects in materials and workmanship for a period of one year from the date of purchase when installed and operated within recommended parameters.

Master Water Conditioning will repair or replace at its discretion any defective component. This warranty does not cover the disposable sediment and carbon filters whose service life depends on feed water conditions. The reverse osmosis membrane is warranted for one year. If the required pre-filter conditions to the membrane are not followed, the membrane will not be warranted.

CONDITIONS OF WARRANTY

The above warranty shall not apply to any part of the Master Water Conditioning Commercial R.O. Drinking Water System that is damaged because of occurrences including but not limited to neglect, misuse, alteration, accident, misapplication, physical damage, or damage caused by fire, acts of God, freezing or hot water.

All replacement filters and membranes must be Master Water Conditioning filters and membranes or the warranty is void. If the unit is altered by anyone other than Master Water Conditioning the warranty is void.

To obtain warranty service: (A) contact your local dealer who supplied the unit, or (B) contact the factory for the dealer nearest you. It is the obligation of the owner to pay for shipping or travel charges to return the defective part.

This is the sole warranty made by Master Water Conditioning with respect to the R.O. Drinking Water System. No other warranties, expressed or implied, are given including merchantability or fitness for a particular purpose, incidental or consequential damages, or other losses.

This exclusion applies to the extent exclusion is permitted by law.

No person or representative is authorized to assume for Master Water Conditioning any liability on its behalf, or in its name, except to refer the purchaser to this warranty.

This warranty gives you specific legal rights, you may also have other rights which vary from state to state.



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