



## LP-ES Series Reverse Osmosis System

# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

- LP-ES 50 Model**
- LP-ES 100 Model**
- LP-ES 200 Model**



### **IMPORTANT!**

Keep This Information For Future Reference.

CS501 07.07.11

***Please read this manual carefully before attempting installation.***



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For Reo-Pure LP-ES 50 to 200 Models

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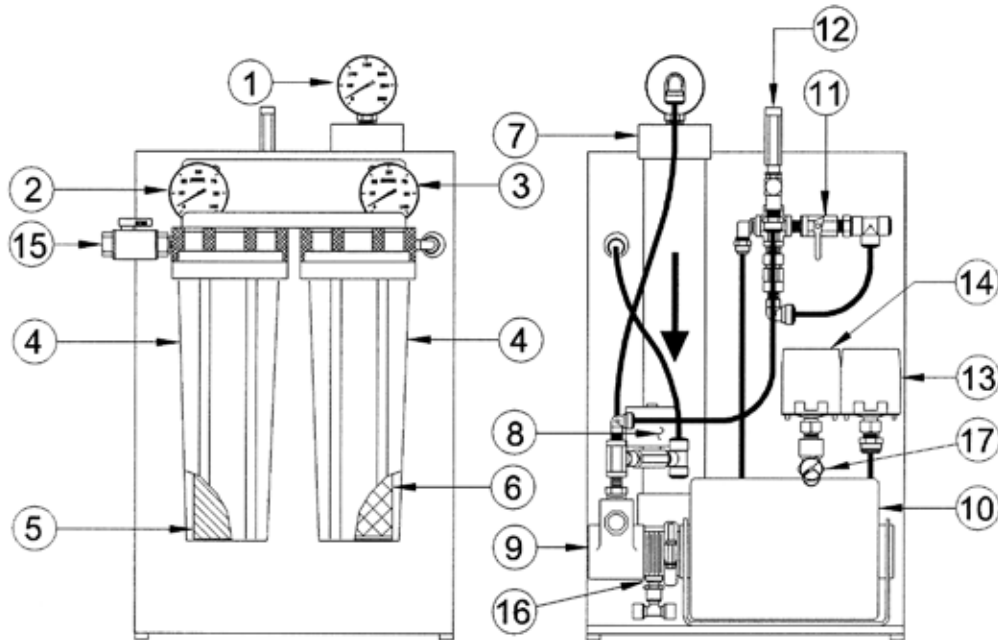
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## GETTING TO KNOW YOUR REO-PURE R.O. SYSTEM

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### LP-ES 50, 100 & 200 WITH STANDARD FEATURES

It is important that you familiarize yourself with your new LP-ES RO System. Pictured below is a front view and a rear view of the RO system with the main components identified. These components will be referred to throughout the manual. Noting their location will assist you in startup and maintenance of the RO system.



#### MAJOR COMPONENT LIST

1. SYSTEM OPERATING PRESSURE GAUGE
2. INLET PRE-FILTER PRESSURE GAUGE
3. OUTLET PRE-FILTER PRESSURE GAUGE
4. PRE-FILTER HOUSINGS
5. 5-MICRON SEDIMENT PRE-FILTER
6. 10-MICRON CARBON BLOCK PRE-FILTER
7. MEMBRANE PRESSURE VESSEL & ELEMENT
8. INLET SOLENOID VALVE
9. ROTARY VANE PUMP
10. MOTOR
11. MANUAL FLUSH VALVE (CLOSED POSITION)
12. SYSTEM PRESSURE REGULATOR
13. INLET FEED WATER LOW PRESSURE SWITCH
14. PRODUCT WATER PRESSURE SWITCH
15. INLET MANUAL FEED WATER SHUT-OFF VALVE
16. PRODUCT WATER CHECK VALVE
17. PRODUCT WATER PRESSURE RELIEF VALVE

**THIS MANUAL COVERS THE INSTALLATION, OPERATION AND MAINTENANCE OF THE LP-ES 50/100/200 REO-PURE SYSTEMS. IT IS IMPORTANT TO READ THIS MANUAL THOROUGHLY BEFORE INSTALLING YOUR SYSTEM. FOR UNITS EQUIPPED WITH OPTIONAL FEATURES, REFER TO THE APPROPRIATE OPTIONAL FEATURE INSERT SHEET LOCATED AT THE END OF THIS MANUAL.**

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# REO-PURE R.O SYSTEM INTRODUCTION

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Your Reo-Pure System has been designed to produce quality water for a variety of applications. We are confident that you will find Reo-Pure Systems provide quick and simple installation, hassle-free maintenance, and years of reliable and trouble free operation.

Reo-Pure Systems incorporate years of engineering experience, dedicated workmanship, and quality manufactured components. Each system is built with pride and is factory tested for superior performance.

As with all products, the customer has the responsibility to ensure that the Reo-Pure System is operated under proper conditions and within design limitations. All installation, startup and maintenance instructions must be followed carefully.

## HOW REVERSE OSMOSIS WORKS

Reverse osmosis is a separation process in which water is forced under pressure through a membrane in the opposite direction from normal. The membrane allows water to pass through, and blocks or hinders the passage of dissolved substances and suspended particles. This process reduces the dissolved salts, minerals, and suspended particles, while improving the taste, odor, and clarity of the water. The process is further enhanced by allowing the feed water to continuously pass over the surface of the membrane, sweeping away the concentrated salts, minerals and suspended particles.

The Reo-Pure membrane element divides the feed water into two streams: product water (permeate) which is now purer than before, and is the desired result; and concentrate water (reject or drain, plus recirculation) which carries the concentrated dissolved salts, minerals, and suspended particles that were rejected by the membrane element down the drain.

## DEFINITIONS

**Feed Water** -- The incoming water to be processed by the Reo-Pure System.

**Product Water**  $\text{B}$  (Permeate) -- That portion of the feed water that has passed through the membrane element. It is the desired result of a Reo-Pure System.

**Concentrate Water**  $\text{B}$  (Reject or drain water, plus recirculation) Used to describe that portion of the feed water that has flowed across the membrane (not through), and has not been converted to product water. This water now contains a higher concentrate of dissolved solids and may also contain organic matter and suspended particles rejected by the membrane. The concentrate is then split into two streams, reject and recirculation. The recirculated water is mixed with the feed water on the inlet side of the pump. The reject water is sent down the drain. This design is used as a way to minimize the amount of water sent to drain.

**Recovery** -- The percentage of feed water which becomes product water. The recovery rate is determined by the number of gallons (or liters) of product water divided by the total gallons (or liters) of feed water, and multiplied by 100.

**Percent Rejection** -- The percentage of dissolved solids in the feed water that does not pass through the membrane. The membrane prevents passage of dissolved solids and other contaminants into the product water.

**Conductivity** -- The property of a substance to conduct or transmit electricity. The unit of measure is in mhos and is commonly used to determine the purity or quality of water. In the water treatment industry, it is often converted to PPM TDS (Parts Per Million Total Dissolved Solids).

## FACTORS AFFECTING SYSTEM OPERATION AND PERFORMANCE

**Feed Water Temperature** -- The volume of product water increases with higher feed water temperatures, and decreases with lower feed water temperatures. Temperatures below 35<sup>0</sup>F could crack the membrane element, and temperatures above 90<sup>0</sup>F may cause rapid deterioration.

**Feed Water Pressure**  $\text{B}$  The recommended range is between 40 PSI and 85 PSI. This is the most common range of municipal water supplies.

**Hydrolysis**  $\text{B}$  The natural chemical breakdown of a membrane elements when in contact with water. This breakdown is accelerated when the water temperature is above 90<sup>0</sup>F, the pH is not within the tolerable range, or when hydrogen sulfide is present. Refer to the SYSTEM OPERATING SPECIFICATIONS. Additional pre-treatment may be required in these cases.

**Bacteria**  $\text{B}$  When R.O. Systems are operated intermittently, they will likely be exposed to bacteria. Following a shut-down or storage period, the system should be sanitized. Refer to the section in this manual regarding sanitization.

**Fouling or Surface Coating of the Membrane Element** -- Fouling is a common problem with membrane elements as a result of salts, hardness, iron, etc. collecting on the membrane surface. The pores and channels of the membrane element become plugged reducing the water production rate. Pre-treatment equipment, such as a water softener, iron filter, or activated carbon filter will reduce membrane element fouling and extend its life.

# LP-ES 50, 100 AND 200 SYSTEM SPECIFICATIONS

## SYSTEM OPERATING SPECIFICATIONS

<b>Production Rates:</b>	<b>LP-ES 50:</b>	50 GPD / 190 LPD*
	<b>LP-ES 100:</b>	100 GPD / 379 LPD*
	<b>LP-ES 200:</b>	200 GPD / 757 LPD*

*\*System production may vary depending upon incoming water temperature and chemistry.*

<b>Rejection Rate:</b>	Minimum 95%	Maximum 99%
<b>Low Feed Water Pressure Switch:</b>	System shuts down at 15 PSI decreasing pressure.	
<b>Product Water Pressure Switch:</b>	System shuts down at 45 PSI.	System starts At 25 PSI.
<b>Electrical:</b>	Standard -120V, 60Hz, 1Ph	Optional - 220V, 50Hz, 1Ph
<b>System Operating Pressure:</b>	150 PSI	

## FEED WATER PARAMETERS

**Systems are designed for use on potable water sources only.**

<b>Hardness:</b>	Maximum 10 GPG (Over 10 GPG should be softened)
<b>Iron:</b>	Maximum 0.5 PPM (Dissolved Only)
<b>Turbidity:</b>	Maximum 1 NTU
<b>Hydrogen Sulfide:</b>	Must be removed.
<b>Chlorine</b>	Maximum 0.1 PPM
<b>Inlet Feed Water Pressure:</b>	Minimum 35 PSI    Maximum 85 PSI
<b>pH Range:</b>	4 to 10
<b>Feed Water TDS:</b>	Consult your Reo-Pure Dealer if TDS is over 2,000 PPM.
<b>Temperature:</b>	Minimum 45°F.    Maximum 90°F.
<b>Max. Operating Pressure:</b>	180 PSI

## DESIGN TEST CONDITIONS

<b>Operating Pressure:</b>	150 PSI
<b>Feed Water TDS:</b>	500 PPM as NaCl
<b>Design Temperature:</b>	77°F (25°C)
<b>Membrane:</b>	Energy Saving, High Flow Composite Polyamide
<b>Design Recovery:</b>	50%

## DESIGN SPECIFICATIONS

Model	Operating Pressure	Inlet Conn.	Product/Reject Conn.	Filter Housing	Membrane Element	Motor 60 Hz	Motor 50Hz	Pump 60/50Hz
LP-ES 50	150 PSI	3/8"FPT	3/8"Tube	10" SL	2 x 12	1/4 HP	1/3 HP	60 GPH
LP-ES 100	150 PSI	3/8"FPT	3/8"Tube	10" SL	2 x 12	1/4 HP	1/3 HP	60 GPH
LP-ES 200	150 PSI	3/8"FPT	3/8"Tube	10" SL	2 x 12	1/4 HP	1/3 HP	60 GPH

## SYSTEM WEIGHT & DIMENSIONS

Model	LP-ES Shipping Dimensions							LP-ES Installation Dimensions					
	Wgt	Height		Width		Depth		Height		Width		Depth	
	Lbs	In	Cm	In	Cm	In	Cm	In	Cm	In	Cm	In	Cm
LP-ES 50	40	25	64	15	38	18	46	22	56	12	31	17	43
LP-ES 100	40	25	64	15	38	18	46	22	56	12	31	17	43
LP-ES 200	40	25	64	15	38	18	46	22	56	12	31	17	43

# SYSTEM INSTALLATION INSTRUCTIONS

For LP-ES 50, 100 and 200 Models

**IMPORTANT!** *Installation must comply with state and local plumbing, electrical, and sanitation codes.*

**IMPORTANT!** *Do not use this system to make safe drinking water from non-potable water sources. Do not use the system on microbiologically unsafe water, or water of unknown quality without adequate disinfection before or after the system.*

Reo-Pure RO Systems will operate most efficiently on filtered water with a pH of less than 6.5, an SDI of 5 or less, and hardness of less than 10 GPG. If the system is operated with levels higher than these, other forms of pretreatment may be necessary.

Feed water must not contain free chlorine, formalin, quaternary germicides, cationic surfactant, detergents containing non-ionic surfactant, such as ALL or Triton, or membrane element cleaners other than those approved for use.

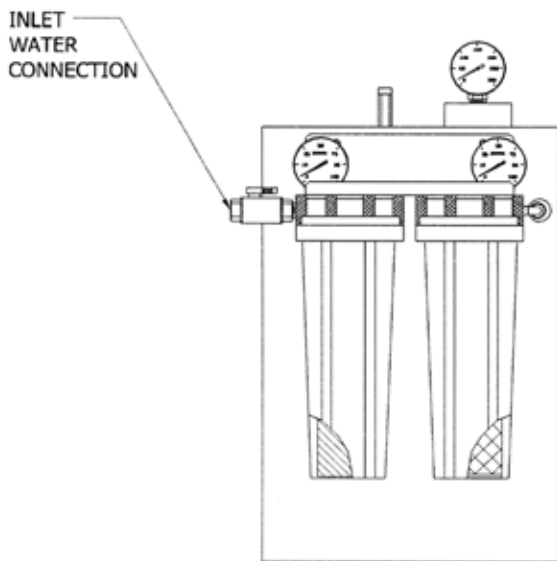
## UNPACK YOUR REO-PURE SYSTEM

Reo-Pure Systems are carefully inspected, tested, and packaged. They are shipped in proper working order and in excellent condition. Remove the system from the shipping carton/container and inspect it for signs of concealed damage which may have occurred during shipping. If damage has occurred, immediately contact the delivering carrier and file a claim for damages.

## LOCATE A DESIRABLE INSTALLATION SITE

Determine a desirable location for your Reo-Pure system. It should be mounted on a hard level surface capable of supporting the entire weight of the system. See SYSTEM SPECIFICATIONS for approximate weight and dimensions.

## FEED WATER SUPPLY CONNECTION



A cold water supply source must be located within close proximity to the system. This will be the inlet feed water supply. Feed water pressure must be a minimum of 35 PSI.

The manual feed water shut-off valve was shipped loose with the system. Wrap the male end of the valve with Teflon tape and screw it into the sediment pre-filter marked **INLET**. Connect the feed water supply source to the 3/8" FPT shut-off valve. We recommend using 3/8" pipe, 1/2" OD tubing, or 3/8" hose.

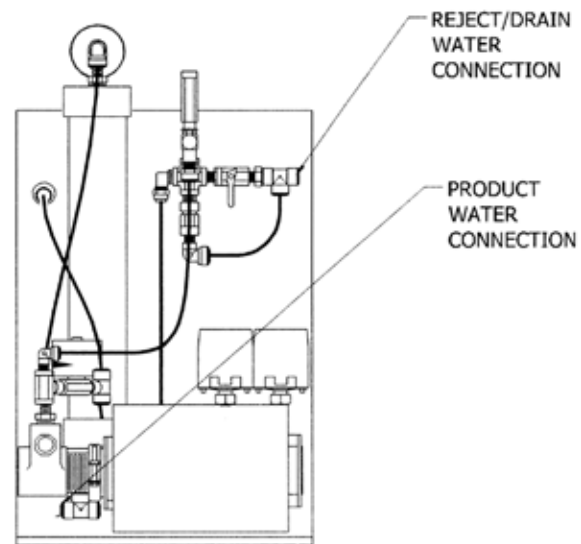
**CAUTION!** *Do not connect a hot water line to the Reo-Pure system. Feed water must be a cold water supply.*

## PRODUCT WATER CONNECTION

During the initial start-up procedure, after a membrane element replacement, or after sanitization of the system, you will want to divert the product water line to your wastewater drain. This can be done by either installing a 3-way valve in the line or by disconnecting the tubing to your storage tank. It is always important to divert the product water to drain for 30 to 60 minutes of operation, because membrane elements are treated with preservative solution that should be rinsed free.

If a pressurized storage tank is being used, the system is equipped with a product water pressure switch which will shut the system off when the pressure in the tank reaches 45 PSI. The system will turn on again when the pressure in the tank decreases to 25 PSI.

If an atmospheric storage tank is being used, a tank level float control switch and repressurization system (optional features) will be required to shut the system off and to pump the product water to your application.



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## SYSTEM INSTALLATION INSTRUCTIONS (continued)

For LP-ES 50, 100 and 200 Models

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Remove the plug from the product water outlet (marked **PRODUCT**) located in tee in the bottom of the membrane element pressure vessel. Connect a 3/8" OD product water line to the tee, but do not connect it to the storage tank at this time. There will be further instructions in the System Start-Up Section regarding additional steps required, prior to connecting the storage tank.

### **DRAIN / REJECT WATER CONNECTION**

A wastewater drain must be near the installation site. This will be your connection for the reject water (drain) which is carrying a high level of concentrated dissolved salts, minerals, and suspended particles that were rejected by the membrane element.

Remove the plug from the drain water outlet (marked **DRAIN**) located in the reject water assembly. Using 3/8" OD tubing, connect this outlet port to your wastewater drain.

**NOTE! We recommend installing an air gap connection designed to prevent wastewater back flow.**

### **ELECTRICAL CONNECTIONS**

A grounded electrical supply of the proper voltage for your system should be near the installation site. The system will be damaged if connected to a power source other than the voltage, phase and hertz specified in the final inspection report at the back of this manual. See the wiring diagram at the end of this manual for the correct power connections.

**Optional 50Hz, 220V, 1Ph Power** - If your system was ordered with the optional 50Hz, 220V, 1Ph feature, you will need to provide your own electrical plug. Attach the appropriate plug to the end of the 14-3 cord which is connected to the Inlet Feed Water Low Pressure Switch.

**CAUTION! A water softener should not be allowed to regenerate while the Reo-Pure System is operating, unless safeguards are used to be sure the system is shut-down or operating on an alternate source of softened water.**

### **INSTALL FILTER CARTRIDGES**

Refer to the section titled "Filter Cartridge Installation and Replacement" in this manual.

**CAUTION! CONNECTING THE SYSTEM TO A POWER SOURCE WHICH DOES NOT MATCH THE SYSTEM POWER RATING EXACTLY CAN DAMAGE THE SYSTEM AND VOID THE WARRANTY.**

**IMPORTANT! Prior to start-up of the system, visually inspect the inlet, drain, and product water connections completed. Check to be sure the system is connected to a properly grounded electrical power supply of the appropriate voltage, phase, and hertz.**

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# SYSTEM START-UP PROCEDURE

For LP-ES and LP-WMS 50 to 200 Models

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## INSTALLATION FOLLOW-UP

1. Visually inspect the water connections.
2. Be sure filter cartridges have been installed.
3. Confirm connection to the proper power source.

**NOTE!** *The membrane element(s) will have been installed in the system during the final testing procedures unless other arrangements have been made with the manufacturer.*

## DIVERT PRODUCT WATER TO THE DRAIN

During the initial start-up of the system, it is important to divert all of the product water to a wastewater drain. Membrane elements are treated with a preservative solution and should be thoroughly rinsed clean before water is retained for use.

## MANUALLY FLUSH THE SYSTEM

Open the inlet feed water shut-off valve and the manual flush valve. Plug the power cord into the wall outlet. The inlet solenoid valve will open, and the pump will start. When the system is turned on, the solenoid valve automatically opens. The valve will close when the system is turned off. The system will only start with sufficient feed water flow and pressure (minimum 35 PSI).

Allow the system to run approximately 3-5 minutes to bleed all trapped air and to flush the membrane element. Then, close the manual flush valve.

**IMPORTANT MAINTENANCE!** *The manual flush valve should be opened at least once weekly for 3-5 minutes to flush sediment from the membrane element.*

## ADJUST THE SYSTEM PRESSURE

Adjust the system pressure regulator so that the system pressure gauge reads 150 PSI. Turn the pressure regulator clockwise to increase the pressure, and counter-clockwise to decrease the pressure.

**CAUTION!** *Never allow the Reo-Pure system pressure to exceed 180 PSI.*

This Reo-Pure System was designed to operate at 50% recovery. The gallons per day of product water produced will vary based on the feed water TDS, feed water temperature, and the back pressure on the system.

Measure the amount of time in seconds it takes for the system to produce 1 quart of product water. Use the following formula to calculate the gallons per day: 21,600 divided by the seconds it took to produce one quart, equals the gallons per day.

**IMPORTANT!** *Frequently check the system for any leaks that may develop.*

## CHECK THE INLET LOW PRESSURE SWITCH

The inlet feed water low pressure switch is preset at the factory. Its purpose is to prevent damage to the system if there is inadequate feed water flow or pressure.

This step is to verify that it is functioning properly. Slowly decrease the inlet feed water supply by closing the manual feed water shut-off valve, while watching the pre-filter outlet pressure gauge. If the system shuts down when the pressure drops to approximately 15 PSI, then the inlet pressure switch is functioning correctly. If it is not functioning correctly, refer to the Section of this manual on System Pressure Switches.

## PURGE THE SYSTEM

Allow the system to operate approximately 30 to 60 minutes diverting the product water to drain. Once all of the membrane preservative is flushed from the system, product water may be retained for use.

## CHECK THE PRODUCT WATER PRESSURE SWITCH

Your system is equipped with a product water pressure switch, it is preset at the factory to shut the system down at 45 PSI, and restart the system at 25 PSI. Its purpose is to stop and start the system when a pressurized storage tank is used. If the product water pressure switch is not shutting down the system when the pressurized storage tank is full, refer to the section in this manual titled "System Pressure Switches."

## CONNECT PRODUCT WATER TO STORAGE TANK

For future convenience, we recommend installing a tank shut-off valve prior to the storage tank. The storage tank may take several hours to fill with product water.

## FINAL INSPECTION

Once the above procedures are completed, visually inspect all water connections. Check to be certain that all connections are tight and secure.

**CAUTION!** *A water softener should not be allowed to regenerate while the Reo-Pure system is operating, unless safeguards are used to be sure the system is shut-down or operating on a alternate source of softened water.*



# FILTER CARTRIDGE INSTALLATION & REPLACEMENT

For LP-ES & LP-WMS Two Filter Housing Systems

## FILTER CARTRIDGE INSTALLATION

This Reo-Pure System includes two pre-filter cartridges: the 5 micron sediment pre-filter cartridge which collects sediment, and the carbon block pre-filter cartridge which reduces undesirable tastes, odor and chlorine.

**NOTE!** *The sediment cartridge and the carbon block cartridge have been packaged separately and will need to be installed prior to start-up.*

1. Remove the filter cartridges from their packaging.
2. Remove the filter sumps by turning clockwise.
3. Place the sediment cartridge over the standpipe in bottom of the filter sump marked **Sediment Pre-Filter**, and place the carbon block cartridge over the standpipe in bottom of the sump marked **Carbon Pre-Filter**. (See diagram at right)
4. Replace the filter sumps on the filter housing caps, making sure that the labels on the sumps match the labels on the bracket above the caps. **DO NOT OVER TIGHTEN.**

**NOTE!** *The membrane element(s) have been installed in the system during the final testing procedures, unless other arrangements have been made with the manufacturer.*

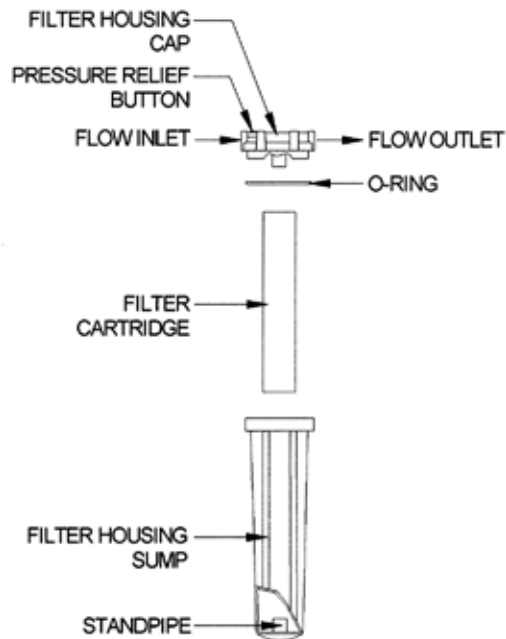
**CAUTION!** *It is important that the o-ring be properly seated each time the filter housing is reassembled or removed. Use only food grade silicone or glycerin to lubricate the o-rings. Do not use a petroleum based product such as Vaseline.*

## CHANGING FILTER CARTRIDGES

Filter cartridges have a limited service life and should be replaced if you experience noticeable changes in product water taste, color, odor, or flow rate. On average, filter cartridges should be replaced about every 3-6 months.

Your Reo-Pure System is equipped with pre-filter inlet and pre-filter outlet pressure gauges. An increase in the pressure difference of 10-12 PSI between the two gauges, is an indication that the filter cartridge may need to be replaced.

1. Turn OFF the feed water supply. The Reo-Pure System will shut down.
2. Relieve all the pressure from the system by opening the manual flush valve and pressing the pressure relief button. If your system is equipped with the Automatic Timed Flush feature, press the pressure relief button while the system pressure gradually decreases.
3. Disconnect the main power supply



**IMPORTANT!** *Before performing any maintenance on your Reo-Pure System, always disconnect the power supply!*

4. Remove the filter sumps by turning clockwise. Locate and remove the large o-rings, then wipe them clean of lubricant and set aside. It is common for the o-ring to lift out of the sump and stick to the cap. If the o-ring appears to be damaged or crimped, it should be replaced.
5. Remove and discard the used filter cartridges.
6. Rinse out the bottom of each sump and fill about 1/3 full of water. Add about two tablespoons of bleach and scrub the cap and housing with a non-abrasive cloth. Observe the precautions printed on the bleach container. Rinse thoroughly.
7. Lubricate o-rings with a food grade silicone or glycerin. Place o-rings back into the groove in the sumps and smooth into place with your fingers. This step is important to ensure a proper watertight seal.
8. Place the sediment cartridge over the standpipe in bottom of the filter sump marked **Sediment Pre-Filter**, and place the carbon block cartridge over the standpipe in bottom of the filter sump marked **Carbon Pre-Filter**. (See diagram above)

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## FILTER CARTRIDGE INSTALLATION & REPLACEMENT

For LP-ES & LP-WMS Two Filter Housing Systems

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9. Replace the filter sumps on the filter housing caps, making sure that the labels on the sumps match the labels on the bracket above the caps. **DO NOT OVER TIGHTEN.**
10. Turn on the feed water supply and allow the system to fill with water.
11. Press the pressure relief button to release the air from the filter housings.
12. Open the manual flush valve.
13. Reconnect the main power supply. The system should start. If your system has the Automatic Timed Flush feature, it will perform a one-minute flush at this time. Repeat if necessary.
14. Check for leaks.
15. Flush the system for approximately 3 to 5 minutes while diverting the product water to the drain.
16. Close the manual flush valve.

**NOTE!** *The manufacturer of the filter housing recommends that the filter sump of all plastic housings be replaced every five years for a clear sump and every ten years for an opaque sump. Date the bottom of any new or replacement sump to indicate the next recommended replacement date.*

**IMPORTANT!** *Use sterile procedures when removing or replacing filters and membrane elements, or when working with the tubing containing product water. Contamination can result from bacteria on your hands, tools, or in the air.*

## SYSTEM PRESSURE SWITCHES

### INLET LOW PRESSURE SWITCH

**Preset to shut down system if inlet pressure is below 15 psi.**

An Inlet Low Pressure Switch is installed on every Reo-Pure System. The purpose of this switch is to prevent damage to the pump and/or motor if there is inadequate feed water flow or pressure.

#### **How To Verify The Inlet Low Pressure Switch Is Functioning Properly...**

To verify the setting, slowly decrease the inlet feed water supply by slowly closing the manual inlet shut-off valve while watching the pre-filter outlet pressure gauge. If the system shuts down when the pressure drops to approximately 15 PSI, then the Inlet Low Pressure Switch is functioning correctly.

**CAUTION! Disconnect the power any time the cover is removed from a pressure switch.**

#### **How To Adjust The Inlet Low Pressure Switch Set Point...**

If it is not set correctly, disconnect the power from the System and remove the black plastic cover of the pressure switch labeled "Inlet Low Pressure Switch". There are two screws for adjusting the switch settings. **Do not adjust the plastic screw.** Turn the brass screw clockwise to increase both the cut-in and cut-out pressure. Turn it counter clockwise to decrease both the cut-in and cut-out pressure. Turn the screw one half turn only. Temporarily replace the cover, reconnect the power and recheck the setting. Repeat as required.

#### **How To Tell If You Have A Bad Low Pressure Switch...**

Simply, close the inlet feed water valve, and if the System does not shut down, the pressure switch needs replacing.

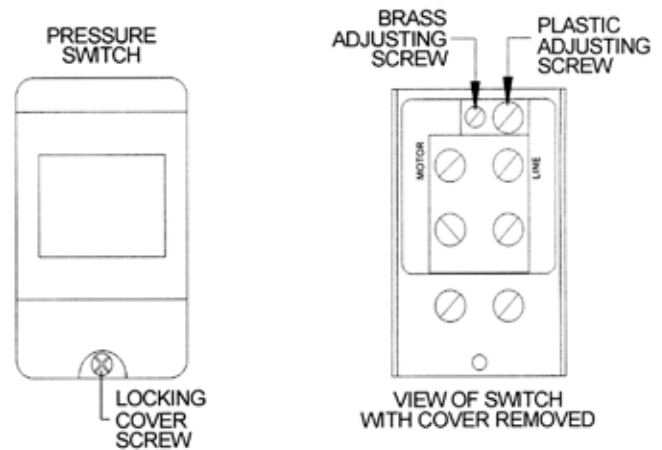
### PRODUCT WATER PRESSURE SWITCH

**Preset to cut-out at 45 psi and cut-in at 25 psi.**

A Product Water Pressure Switch is a standard feature on Reo-Pure LP-ES and LP-WMS R.O. Systems. Its purpose is to stop and start the R.O. system when a pressurized storage tank is used.

#### **How To Verify The Product Water Pressure Switch Set Point...**

You will need a ball valve and pressure gauge (0-100 psi) assembly with a tube connection the size of the R.O. system product tubing. You will also need a container to catch the product water.



Disconnect the power from the System. Close the pressurized storage tank shut-off valve. Open a valve down stream of the pressurized storage tank to relieve the pressure from the system. Disconnect the tubing from the tank shut-off valve. Connect the ball valve/pressure gauge assembly to this tubing. Open the ball valve and put it into the container. Close the down stream valve. Reconnect the power to the R.O. system. Slowly close the new ball valve. If the R.O. system shuts down when the pressure gauge reaches approximately 45 PSI, the Product Water Pressure Switch is functioning correctly.

#### **How To Adjust The Product Water Pressure Switch...**

If it is not set correctly, disconnect the power to the R.O. system and remove the black plastic cover of the pressure switch labeled "Product Water Pressure Switch". There are two screws for adjusting the switch settings. **Do not adjust the plastic screw.** Turn the brass screw clockwise to increase both the cut-in and cut-out pressure. Turn it counter clockwise to decrease both the cut-in and cut-out pressure. Turn the screw one half turn only. Temporarily replace the cover, reconnect the power and recheck the setting. Repeat as required. When the Product Water Pressure Switch is set, reinstall the cover and tighten the locking screw. Disconnect the power, remove the ball valve or ball valve/pressure gauge assembly, reconnect the System and open the tank shut-off valve.

#### **How To Tell If You Have A Bad Product Water Pressure Switch...**

The System does not shut down when the pressurized storage tank is full, the Product Water Pressure Switch needs replacing. You should also notice water leaking/spraying from the pressure relief valve.

# SERVICING THE MEMBRANE ELEMENT

For LP-ES and LP-WMS 50, 100, 200, and 500 Models

**NOTE!** Determining how long the membrane elements will last is nearly impossible. Normally, replacement is necessary whenever the **PRODUCT** water production decreases by 20% at the same operating pressure, or when the **PRODUCT** water TDS exceeds an acceptable level.

**IMPORTANT:** Maintain sanitary conditions when handling the Reo-Pure Membrane Element.

Membrane elements are sensitive and must not be allowed to dry out. The RO system must never be allowed to stand idle with water in the system while being exposed to freezing temperatures. Excessive pressure due to expansion of freezing water will rupture the membrane. If the system will be exposed to freezing temperatures while idle, it must be completely drained.

It is **IMPORTANT** to have inspected the filter cartridges **BEFORE** proceeding with this step.

The membrane element is found inside the Membrane Pressure Vessel which is the gray tube located on the back of the system.

**IMPORTANT!** Observe the arrow which shows the direction of flow through the vessel. Note that the arrow points down and the brine seal is at the top of the vessel.

## TO REMOVE AND REPLACE MEMBRANE ELEMENT

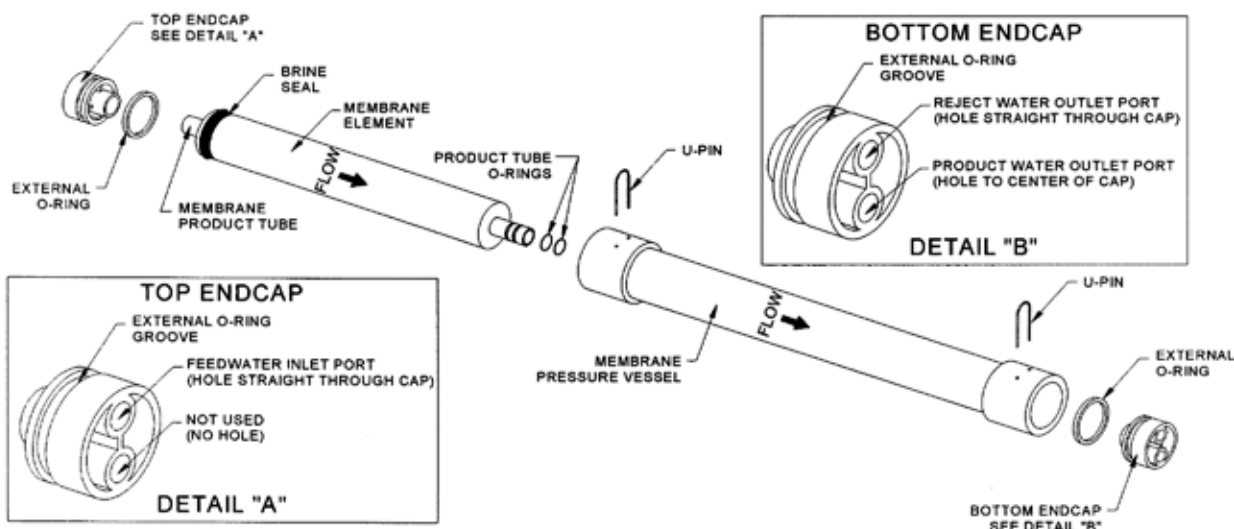
1. Turn OFF the feed water supply.
2. Disconnect the main power supply.
3. Relieve all pressure from the system by opening the manual flush valve.
4. Disconnect the product water tubing from the bottom end plug.

5. Disconnect the tubing from the piping assembly which is threaded into the top end plug.
6. Remove the U-pin from the top of the pressure vessel.
7. Carefully remove the top end plug from the pressure vessel.
8. Remove the membrane element from the vessel by pulling on the membrane product tube. Normally this can be done by hand, but if additional leverage is required, use a pliers or other tool wrapped with tape or rubber and use extreme caution so as not to score the center (PRODUCT) tube.
9. Check external O-rings on the end plugs. If they are worn, they will need to be replaced.
10. Lubricate the brine seal and the O-rings on the membrane element with food grade Silicone or Glycerin.
11. Install the new membrane element in exactly the same manner as the previous membrane was removed.

**NOTE!** The membrane element must be inserted until the product tube bottoms out into the bottom end plug. The top end plug will not force the membrane element into the bottom end plug.

**NOTE!** The brine seal end must always face the high pressure inlet to the vessel.

12. Insert the top end plug until its top is below the U-pin holes. Be careful to keep the rubber O-rings in their grooves while inserting the end plug.
13. Replace the U-pin.
14. Reconnect the product water tubing to the bottom end plug.
15. Reconnect the tubing to the piping assembly which is threaded into the top end plug.
16. Proceed with startup procedure and allow the system to flush for approximately 5-10 minutes before using the product water. (See START-UP PROCEDURE)



MEM501

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## SANITIZING THE R.O. SYSTEM

For LP-ES and LP-WMS Models

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The following procedure is recommended for preventive maintenance. It is not intended to be effective in sanitizing highly contaminated systems which have been exposed to excessive amounts of bacteria, or systems which have foul-smelling membrane elements or filters. Such systems require extensive cleaning and sanitizing. Consult your Reo-Pure dealer for further information.

1. Turn off the feed water supply to the system.
2. Disconnect the main power supply.

**IMPORTANT! Before performing any maintenance on your Reo-Pure System, always disconnect the main power supply!**

3. Relieve the pressure from the system by opening the manual flush valve and pressing the pressure relief button. If your system is equipped with the AutoFlush Feature, press the pressure relief button while the system pressure gradually decreases.
4. Remove both filter housing sumps by turning clockwise.
5. Remove and discard the used filter cartridges.
6. Rinse out the bottom of each filter sump and fill about 1/3 full of water. Add about two tablespoons of household bleach and scrub the cap and sump with a non-abrasive sponge or cloth. **Observe the precautions printed on the bleach container.** Rinse the filter sumps.
7. Pour about one tablespoon (two tablespoons if system has AutoFlush Feature) of bleach into the **Sediment Pre-Filter** sump. Reinstall both filter sumps without the filter cartridges, making sure the o-rings are seated properly.

**NOTE! It is important that the o-ring be properly seated each time a filter housing is reassembled or removed.**

8. Empty the product water storage tank and temporarily shut-off the water supply line from the storage tank to the distribution system.
9. Reconnect the power supply.
10. Turn on the feed water supply
11. Close the manual flush valve. If your system is equipped with the AutoFlush Feature, a one minute flush will occur.

12. Run the system until the product water tank is full, at which point the system will shut off automatically.
13. Turn off the system and let it sit for 8 hours.
14. Turn off the feed water.
15. Empty the product water storage tank.
16. Disconnect the main power supply.
17. Remove the filter sumps as before. Empty them of all chlorinated water.
18. Remove the o-ring from each filter sump and wipe it clean. Lubricate it with food grade silicone or glycerin. Place the o-ring back into the groove in the sump and smooth it into place with your fingers. This step is important to ensure a proper watertight seal.
19. Place a new sediment pre-filter cartridge over the standpipe in the bottom of the sump marked **Sediment Pre-Filter**, and place a new carbon block pre-filter cartridge over the standpipe in the bottom of the sump marked **Carbon Pre-Filter**.
20. Replace the filter housing sumps on the filter housing caps by turning counterclockwise making sure that the labels on the sumps match the labels on the bracket above the caps. **DO NOT OVER TIGHTEN.**
21. Turn on the feed water supply and allow the system to fill with water.
22. Reconnect the power supply.
23. Run the system until the product water tank is full, at which point the system will shut off automatically.
23. Check for leaks.
24. Thoroughly flush the system of any residual chlorine by emptying the product water storage tank again and repeating the prior steps.
25. After the system and the storage tank have been thoroughly rinsed of any residual chlorine, you may reconnect your distribution system to the storage tank.

**NOTE! The ONLY time the membrane element should come into contact with chlorine is during this procedure.**

If the product water storage tank is heavily contaminated, it will need to be sanitized separately.

# MAJOR COMPONENT - REPLACEMENT PARTS LIST

For LP-ES and LP-WMS 50, 100 and 200 Models

PART NO.	DESCRIPTION	SYSTEMS	QTY
<b>MEMBRANE ELEMENTS</b>			
60181225	Membrane Element 2" x 12"	LP-ES & LP-WMS 50	1
60181250	Membrane Element 2" x 12"	LP-ES & LP-WMS 100	1
601812100	Membrane Element 2" x 12"	LP-ES & LP-WMS 200	1
<b>MEMBRANE PRESSURE VESSEL</b>			
12002012	Pressure Vessel Assembly PVC Gray 2" x 12"	LP-ES & LP-WMS 50/100/200	1
12002013	End Plug 2" For Gray PVC Vessel 1 Port	LP-ES & LP-WMS 50/100/200	1
12002014	End Plug 2" For Gray PVC Vessel 2 Port	LP-ES & LP-WMS 50/100/200	1
1300224	External O-Ring For 2" End Cap	LP-ES & LP-WMS 50/100/200	2
12002015	U-Bolt for 2" Gray PVC Vessel	LP-ES & LP-WMS 50/100/200	2
<b>FILTER HOUSINGS &amp; CARTRIDGES</b>			
158005-1	#10 Slim Line Filter Housing 3/8" w/pr, D&T outlet side	LP-ES & LP-WMS 50/100/200	1
158006-1	#10 Slim Line Filter Housing 3/8" wo/pr, D&T inlet side	LP-ES & LP-WMS 50/100/200	1
14815502	10" Sediment Cartridge 5 Micron	LP-ES & LP-WMS 50/100/200	1
147251010	10" Carbon Block Cartridge 10 Micron	LP-ES & LP-WMS 50/100/200	1
<b>PUMP &amp; MOTORS</b>			
3031501	Pump, Rotary Vane Brass 60 GPH W/V-Band Clamp	LP-ES & LP-WMS 50/100/200	1
3011113	V-Band Clamp for Pump (Replacement Part Only)	LP-ES & LP-WMS 50/100/200	1
3100257	Motor, 1/4 HP, 120V, 60Hz, 1Ph	LP-ES & LP-WMS 50/100/200 60Hz	1
3100337	Motor, 1/3 HP, 110/220-120/240V, 50/60Hz, 1Ph (Optional)	LP-ES & LP-WMS 50/100/200 50Hz	1
<b>SOLENOID VALVES</b>			
009014120E	Inlet Solenoid Valve w/Coil, 1/4", Brass, 115V	LP-ES & LP-WMS 50/100/200 60Hz	1
009014220E	Inlet Solenoid Valve w/Coil, 1/4", Brass, 220V (Optional)	LP-ES & LP-WMS 50/100/200 50Hz	1
<b>MISCELLANEOUS</b>			
17506902	Pressure Switch - Low Cut-Out	LP-ES & LP-WMS 50/100/200	1
17506905	Pressure Switch - Product Water	LP-ES & LP-WMS 50/100/200	1
316063	Product Water Check Valve, 1/4", PVC	LP-ES & LP-WMS 50/100/200	1
3140255	Inlet Feed Water Shut-off Valve 3/8" NPTF x 3/8" NPTM	LP-ES & LP-WMS 50/100/200	1
008001	Inlet & Filter Pressure Gauge, 0-100 psi, 2", Bottom Mount	LP-ES & LP-WMS 50/100/200	2
008002	System Operating Pressure Gauge, 0-300 psi, Center Back Mount	LP-ES & LP-WMS 50/100/200	1
31402546	Manual Flush Valve, 1/4" NPTM X 1/4" NPTF, Brass	LP-ES & LP-WMS 50/100/200	1
1720114	System Operating Pressure Regulator, 1/4" NPTM In 1/8" FPT Out	LP-ES & LP-WMS 50/100/200	1
0750375	In-Line TDS Monitor (Optional)	LP-ES & LP-WMS 50/100/200	1
0700708	Product Pressure Relief Valve, 1/4" NPTM Brass	LP-ES & LP-WMS 50/100/200	1
4931322	Flow Control Body 1/4"	LP-ES & LP-WMS 50/100/200	1
4934676	Flow Control Adapter 1/4"	LP-ES & LP-WMS 50/100/200	1
4934067	Flow Control Screen 1/4" & 3/8"	LP-ES & LP-WMS 50/100/200	1
491612	Flow Control Orifice Plate (50 gal. per day)	LP-ES & LP-WMS 50	1
491616	Flow Control Orifice Plate (100 gal. per day)	LP-ES & LP-WMS 100	1
491624	Flow Control Orifice Plate (200 gal. per day)	LP-ES & LP-WMS 200	1

# INLINE TDS TEST MONITOR (OPTIONAL FEATURE)

## THE INLINE TDS TEST MONITOR

The INLINE TDS TEST MONITOR takes the guesswork out of determining system servicing requirements. By pressing a button, owners may determine if their system is effectively reducing dissolved solids in the water. If dissolved solids rise above acceptable limits, a red light indicates that service is required.

**NOTE! The monitor measures the conductivity of the product water. It will not detect the presence of organic contaminants**

### INSTALLING THE TDS MONITOR PROBE

1. Locate the 3/8" tubing to the faucet. Cut the tube approximately midway with a sharp knife or razor blade.

**CAUTION! DO NOT CUT THE TUBING AT AN ANGLE.**

2. Position the tee connector between the cut tubing and firmly insert the tubing into either side of the tee connector.

3. Locate the black cable included with the Monitor Kit. Insert the probe end into the center of the tee connector.

4. Remove the screw on the back of the TDS monitor and remove the back cover.

5. Unwrap and install the 9-volt battery (included) and connect battery to the battery plug.

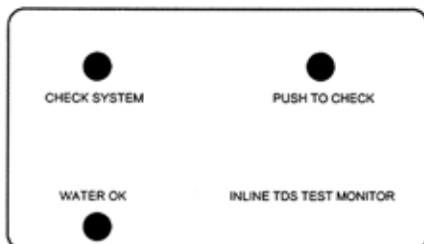
6. Locate the eight-position selector switch inside of the box. Each position corresponds to a specific TDS setting (See Chart).

7. Push the desired switch setting to "ON". Only one switch should be set to "ON".

**Definitions:** TDS - Total Dissolved Solids  
PPM - Parts Per Million

The Inline TDS Test Monitor should be set based upon raw (feed) water characteristics and expected system performance.

For Example: Your municipal water supply has a TDS rating of 200 PPM. You expect to reduce that rating to approximately 10-30 PPM. You would then set the TDS Meter to alert you if the TDS reading was to reach 50 PPM or above. To do so you would set dip switch 1 to the on position.



## SELECTING THE PROPER TDS SETTING

RAW WATER TDS	PRODUCT WATER TDS AT 85%-95% REJECTION	SUGGESTED ALERT SETTING (PPM) *	DIP SWITCH NUMBER
100 PPM	5-15 PPM	50	1
200 PPM	10-30 PPM	50/75/100	1, 2, or 3
300 PPM	15-45 PPM	75/100	2 or 3
400 PPM	20-60 PPM	100/150/200	3, 4, or 5
500 PPM	25-75 PPM	100/150/200	3, 4, or 5
600 PPM	30-90 PPM	150/200/250/300	4, 5, 6, or 7
700 PPM	35-105 PPM	200/250/300	5, 6, or 7
1000 PPM	50-150 PPM	300/500	7 or 8

\* Settings may vary according to area and dealer's recommendations.

Switch No.	1	2	3	4	5	6	7	8
Setting PPM	50	75	100	150	200	250	300	500

8. Replace the back cover and fasten it with the screw.  
9. Place the monitor in an easy access location. The only limitation is the length of the cable. Affix the monitor by peeling the tape from the back, then pressing onto desired mounting surface.

10. Plug the cable into the socket on the bottom of the monitor. Bundle the excess cable using the enclosed tie strap.

## OPERATING THE TDS MONITOR

Before operating the TDS Monitor, run at least one cup of water from the drinking water faucet. To test, depress the red "Push To Check" button on the front of the monitor. Hold button for three seconds.

If the **GREEN** light glows, the level of dissolved solids is below the monitor set point.

The **RED** light will glow if the level of TDS exceeds the monitor's set point. Drain the holding tank completely and allow it to refill. Then re-test, using the procedure above. If the Red light continues to glow, the unit may require servicing, or the membrane element may need to be replaced. Contact your Reo-Pure Dealer for assistance.

If no light glows, replace the monitor battery. For best results, replace the 9-volt battery once a year.

TDS001

# TANK LEVEL FLOAT CONTROL SWITCH (OPTIONAL FEATURE)

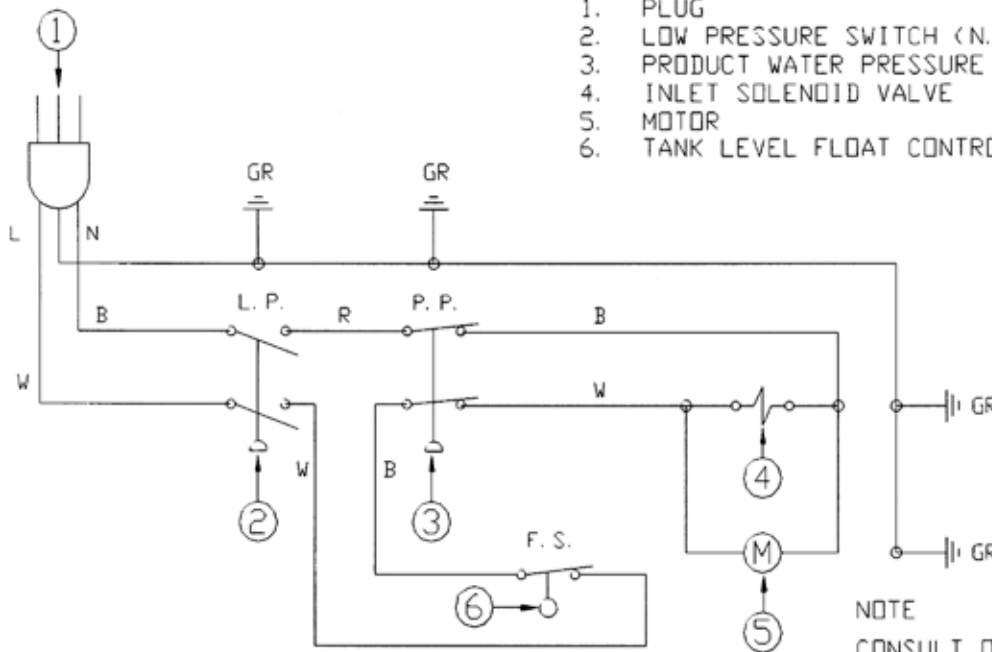
For Use With An Atmospheric Storage Tank Application

**CAUTION! DISCONNECT ALL POWER FROM THE LP OR LP WMS REO-PURE SYSTEM BEFORE PROCEEDING.**

1. Install Tank Level Float Control Switch in the atmospheric storage tank using the directions that came with the Float Switch.
2. Remove the covers from both the Inlet Low Pressure Switch and the Product Water Pressure Switch by loosening the locking screws, tilting the covers away from the screw and lifting them off.
3. Locate and remove the RED jumper wire between the upper MOTOR terminal on the Inlet Low Pressure Switch and the upper LINE terminal on the Product Water Pressure Switch.
4. Remove approximately 6" of the Tank Level Float Control Switch cord jacket.
5. Loosen the cord grip screw on the cable connector on the Inlet Low Pressure Switch and bring the Tank Level Float Control Switch cord into the switch along side the power cord.
6. Connect the BLACK wire from the Tank Level Float Control Switch cord to the upper MOTOR terminal on the inlet Low Pressure Switch. Pull the WHITE wire from the Tank Level Float Control Switch cord through the chase nipple between the two switches and connect it to the upper LINE terminal on the Product Water Pressure Switch. The use of #8 x 16/14GA insulated fork terminals is recommended. Securely tighten the terminal screws to insure good connection.
7. Tighten the cord grip screw on the cable connector on both cords. Reinstall the covers on the pressure switches and tighten the locking screws.
8. Connect the power to the Reo-Pure system. Follow the Start-Up procedures found in the Reo-Pure R.O. System Installation, Operation and Maintenance Manual.
9. The Tank Level Float Control Switch will now start and stop the Reo-Pure R.O. System based on the level in the atmospheric storage tank.

## ELECTRICAL COMPONENT LIST

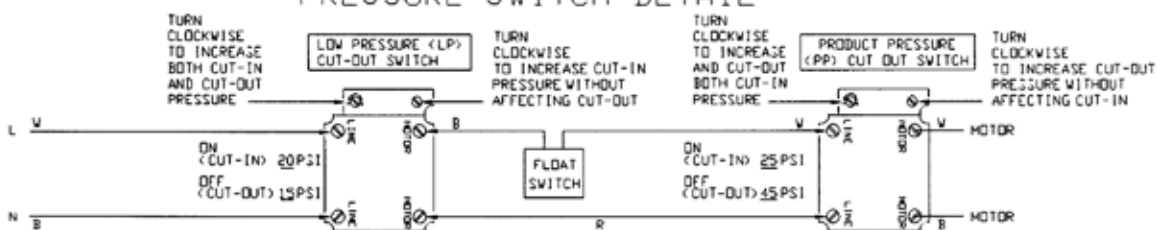
1. PLUG
2. LOW PRESSURE SWITCH (N. D.)
3. PRODUCT WATER PRESSURE SWITCH (N. C.)
4. INLET SOLENOID VALVE
5. MOTOR
6. TANK LEVEL FLOAT CONTROL (N. C.)



NOTE

CONSULT OPERATING SPECIFICATIONS FOR PROPER VOLTAGE

## PRESSURE SWITCH DETAIL





# REO-PURE SYSTEM

## LIMITED WARRANTY

Great Lakes International, Inc. warrants that each REO-PURE system is free of defects in material and workmanship and has been factory tested to perform in accordance with published specifications at the time of shipment. Great Lakes International, Inc. further warrants that the REO-PURE system will continue to operate for a period of one (1) year from start-up, or 15 months from purchase, whichever is shorter, provided that the user supplies feed water meeting minimum standards stated in the REO-PURE Operating Manual and adopts and implements the maintenance program recommended in the REO-PURE Operating Manual.

Parts which are sold but not manufactured by Great Lakes International, Inc. are subject to the warranty of the manufacturer. Expendable or consumable products, filter cartridges, chemicals, etc., which by nature have a shorter life expectancy than twelve months, are not covered under this warranty.

The Great Lakes International, Inc.'s liability under this warranty is limited to the repair or replacement at Great Lakes International, Inc.'s discretion of systems or components, F.O.B. Great Lakes International, Inc.'s factory, found defective solely as to materials or workmanship during the warranty term. Great Lakes International, Inc. will not be liable for any cost for removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. This warranty does not extend to any system or components which failed due to; 1) Damage from mishandling, misuse, abuse, abnormal operating conditions, improper maintenance procedures, accident, unauthorized modification, or neglect, 2) Improper installation or, 3) Incorrect electrical supply. This warranty is void if serial numbers are mutilated or missing.

Great Lakes International, Inc.'s membrane elements are guaranteed to operate within specifications when used for general water treatment for a period of 12 months from date of purchase providing that the membrane element has not been misapplied or used with feed water that does not meet the minimum standards stated in the REO-PURE Operating Manual.

A membrane element, which fails to perform satisfactorily within the first 30 days after receipt, has not been mishandled or misapplied, and is returned prepaid to Great Lakes International, Inc.'s factory, will be replaced free of charge except for freight and local labor. If a membrane element fails to perform satisfactorily during the balance of the warranty period, and is returned prepaid, Great Lakes International, Inc. will replace the membrane element with a new membrane element and will charge the returner for the portion of the 12 months that the membrane element was used plus the return freight. The pro rata charges will be based on the price prevailing at the time of warranty consideration. Membrane elements must be kept damp at all times and must be clean and bagged in a watertight bag before returning.

To obtain warranty consideration, the defective product must be returned to Great Lakes International, Inc. prepaid together with proof of purchase, installation date, failure date and supporting technical data. All documentation supporting the warranty claim and a Returned Goods Authorization (RGA) number must be included.

GREAT LAKES INTERNATIONAL, INC.'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PART. GREAT LAKES INTERNATIONAL, INC. ASSUMES NO LIABILITY WHATSOEVER FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES OR EXPENSES ARISING FROM INSTALLATION, USE OR ANY OTHER CAUSES. THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.

Great Lakes International Inc.  
Racine, Wisconsin, U.S.A.

## REO-PURE LP-ES & LP-WMS SYSTEM TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
RO SYSTEM WILL NOT START	No electrical power Storage tank full Low feed water pressure Pump/motor malfunction Pressure or float switch defective	Check power supply Drain portion of water out of tank Must be minimum of 35 psi Check, replace if necessary Check, replace if necessary
LOW FEED PRESSURE	Feed water valve OFF Low inlet water pressure Filters clogged Obstructed feed line Inadequate upstream pretreatment	Check, open feed water shut-off valve Check, install booster pump if necessary Check pressure on inlet and outlet filter pressure gauges Check inlet tubing Check if sized correctly or fouled
LOW OPERATING PRESSURE	Pressure regulator needs adjustment Operating pressure gauge broken Pump impellers worn Pump/motor coupling broken Low water volume to pump Malfunctioning pump Membrane element brine seal is folded or not sealed against housing wall Inlet solenoid valve not opening Membrane element fouled Manual flush valve open	Check and adjust if necessary. Check, replace if necessary Check, replace if necessary Check, replace if necessary Check, install booster pump if necessary Check, replace if necessary Check brine seal, use care when reinstalling the membrane into the vessel Clean solenoid valve or replace Check, clean or replace Close manual flush valve
THE PUMP DOES NOT RUN	Pump is bound Pump/Motor coupling damaged	Manually check pump rotation, replace if necessary. Remove pump from motor. Check, replace if necessary.
LOW OR NO REJECT WATER / HIGH PUMP PRESSURE	Restricted orifice Clogged drain line Membrane element clogged or fouled	Check and clean Check and clean Check, clean or replace
LOW OR NO PRODUCT WATER	Operating pressure low Membrane element clogged or fouled Water temperature too low Product check valve damaged Tank over - pressurized Membrane element installed backward or brine seal damaged/rolled	Check and adjust Check, clean or replace Check, consult dealer if necessary Check, replace if necessary Check tank air pressure. Relieve to 10 PSI if necessary Check, use care when reinstalling the element into the housing.
BAD TASTING WATER	Increase in feedwater TDS Filter cartridges exhausted Tank and system contaminated Tank contaminated Tank diaphragm ruptured Membrane not flushed completely	Check feed water TDS Replace filter cartridges Replace filter cartridges and membrane, sanitize system and tank Re-sanitize tank Replace tank Flush one or two tanks of product water to drain
CLOUDY WATER	Dissolved air in feedwater concentrated in product water	Usually clears up as condition of feedwater changes. Letting water stand will allow dissolved air to dissipate
HIGH TDS IN PRODUCT WATER	Membrane element expended Insufficient brine flow rate Increase in feed water TDS Product tube o-rings damaged or out of place	Check, replace if necessary Check, reject flow must be at least equal to product flow Check inlet TDS, see Operating Specifications for rejection rate. Remove membrane element from housing. Re-install or replace o-rings on membrane element product tube

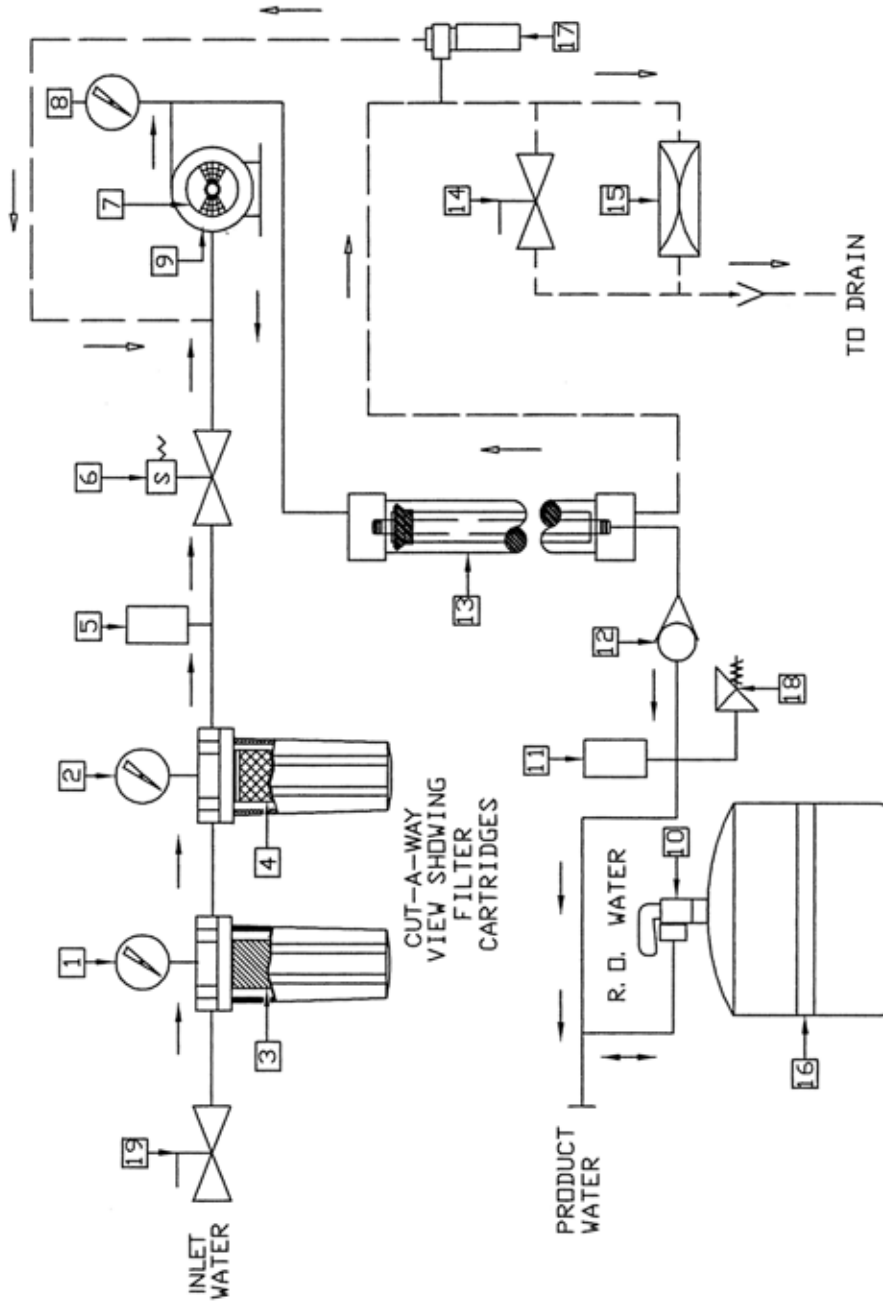
# SYSTEM LOG

MODEL # \_\_\_\_\_ OPERATOR: \_\_\_\_\_  
 SERIAL # \_\_\_\_\_ FROM \_\_\_\_\_ TO \_\_\_\_\_

DATE	PRE-FILTER INLET PRESSURE PSI	PRE-FILTER OUTLET PRESSURE PSI	OPERATING PRESSURE PSI	FEED WATER TEMP TEMP	PRODUCT WATER FLOW	REJECT WATER FLOW	FEED WATER TDS PPM	PRODUCT WATER TDS PPM	SEDIMENT PRE-FILTER CHANGE DATE	CARBON PRE-FILTER CHANGE DATE	MEMBRANE ELEMENT CHANGE DATE	FEED WATER HARDNESS GPG	FEED WATER pH	FEED WATER CHLORINE PPM	FEED WATER IRON PPM	NOTES

COMPONENT LIST

1. INLET PRESSURE GAUGE
2. FILTER PRESSURE GAUGE
3. SEDIMENT PRE-FILTER
4. CARBON BLOCK PRE-FILTER
5. INLET LOW PRESSURE SWITCH
6. SOLENOID VALVE W/COIL
7. HIGH PRESSURE PUMP
8. OPERATING PRESSURE GAUGE
9. HIGH PRESSURE PUMP MOTOR
10. TANK ADAPTER (OPTIONAL)
11. PRODUCT WATER PRESSURE SWITCH
12. PRODUCT WATER CHECK VALVE
13. MEMBRANE ELEMENT AND PRESSURE VESSEL
14. MANUAL FLUSH VALVE
15. REJECT FLOW CONTROL ASSEMBLY
16. PRESSURIZED STORAGE TANK (OPTIONAL)
17. PRESSURE REGULATOR
18. PRODUCT PRESSURE RELIEF VALVE
19. MANUAL INLET SHUT-OFF VALVE



REVISIONS		BY	
No.	DATE	No.	DATE
Δ	10/06/04	JLS	
Δ	10/25/04	JLS	
Δ	11/22/04	MAV	
Δ			
Δ			

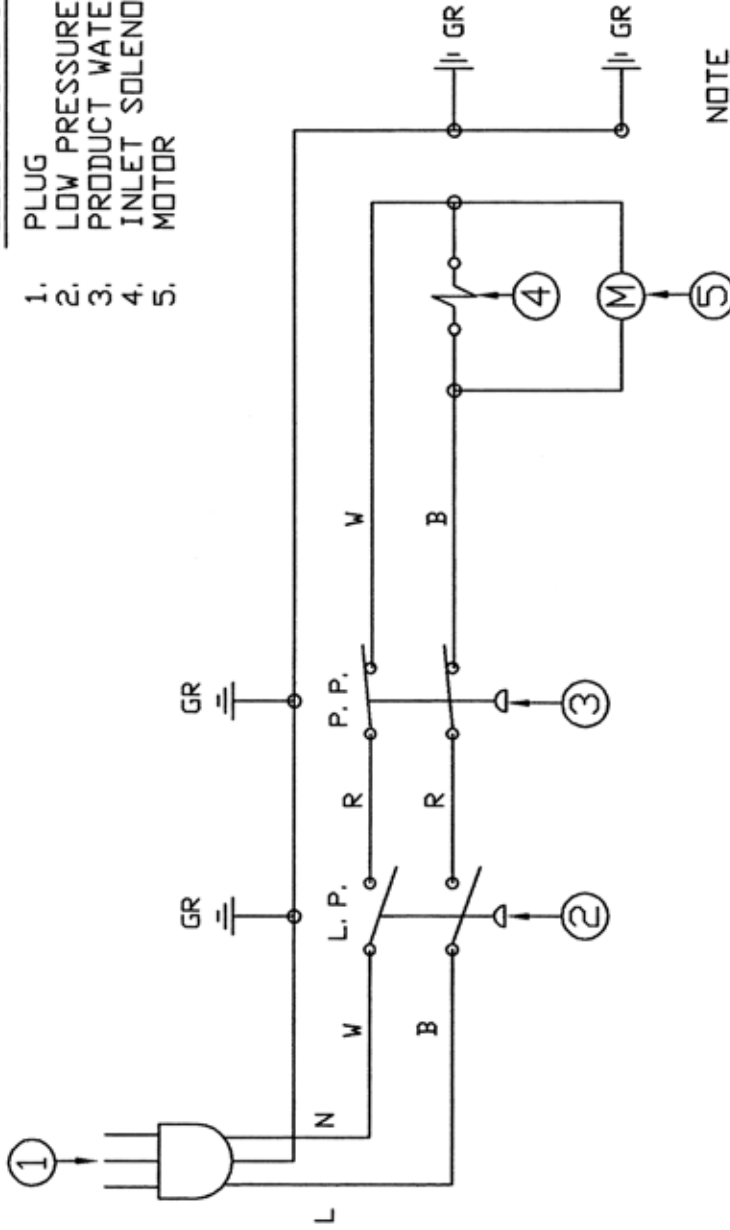
**GREAT LAKES INTERNATIONAL INC.**  
 1905 KEARNEY AVENUE RICHMOND VICENTIN 50400 U.S.A.

**FLOW DIAGRAM**  
 LP-ES 50/100/200

DESIGN BY: MEB	SCALE: NTS	DRAWING NO.
CHECKED:	DATE: 5/12/03	50-200PF
TRACED:	APP'D:	

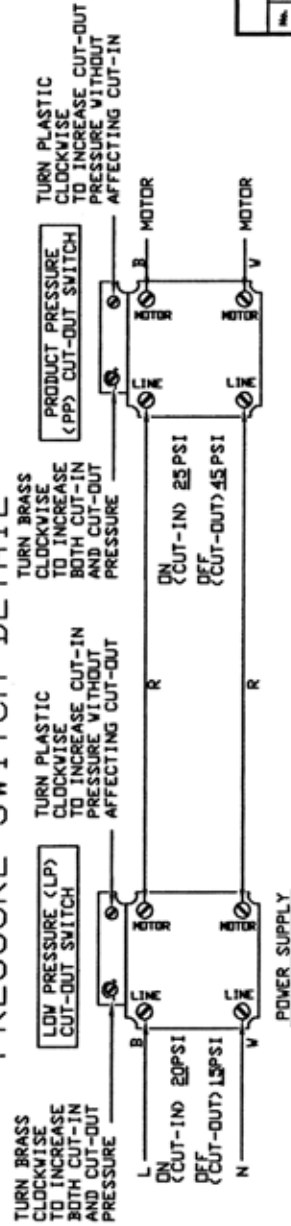
ELECTRICAL COMPONENT LIST

1. PLUG
2. LOW PRESSURE SWITCH (N. O.)
3. PRODUCT WATER PRESSURE SWITCH (N. C.)
4. INLET SOLENOID VALVE
5. MOTOR



NOTE  
CONSULT OPERATING SPECIFICATIONS  
FOR PROPER VOLTAGE

PRESSURE SWITCH DETAIL



REVISIONS		BY	
NO.	DATE	NO.	DATE
1		EGB	
2	10/07/04	JLS	
3			
4			
5			

GREAT LAKES INTERNATIONAL INC.  
1905 KEARNEY AVENUE RACINE WISCONSIN 53403 U.S.A.

LP-ES  
WIRING SCHEMATIC

DRAWN BY	EGB	SCALE	NTS
CHECKED		DATE	7/14/00
THROD		APPRO	
			94EL1