SpectraPure®
INNOVATORS IN WATER TECHNOLOGY

Liquid Level Controllers

INSTALLATION MANUAL

SpectraPure®Inc. assumes no responsibility for water damage due to leaks. It is the user's responsibility to determine that the system is leak-free by monitoring installation for 72 hrs.

REV 01-22-2009

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SpectraPure®

- TERMS AND CONDITIONS OF SALE -

1. Shipping charges on units or parts submitted to our facility for repair or replacement must be borne by the registered purchaser. After repair or replacement, the factory will return the unit or part freight prepaid to the customer.

2. We assume no warranty liability in connection with our equipment other than as herein specified.

3. This warranty is in lieu of all other warranties expressed or implied, including warranties of fitness for a particular purpose.

4. We do not authorize any person or representative to assume for us any other obligation on the sale of our equipment. This is the exclusive remedy and liability for consequential damages under any and all warranties which are excluded to the extent exclusion is permitted by law.

5. Proof of original purchase date must accompany all warranty claims.

6. SpectraPure, Inc. reserves the right to change prices without notice when necessary. All prices in the catalog are quoted in US dollars.

7. Claims for error in quantity or condition must be made within 10 days of receipt of material. SpectraPure, Inc. will not be responsible for any claimed shortages not reported within 10 days. Returns other than warranty claims may be subject to 20% restocking fee.

8. SpectraPure, Inc. cannot be held liable for damage or loss to a shipment by a freight carrier. Check shipment for damage before acceptance or note on freight bill subject to inspection for concealed damage. Consignee must file claim. SpectraPure, Inc. will offer as much assistance as possible.

9. A complete credit check is required prior to shipping on a Net 30 or "C.O.D. - CUSTOMER CHECK ACCEPTABLE" basis. In the interim period during which credit references are being evaluated, all orders must be shipped "C.O.D. - CERTIFIED FUNDS" (cash, cashiers check or money order).

10. All returned checks (due to insufficients funds or closed accounts) will be subjected to a **$25 penalty charge.**

Invoices on Net 30 accounts not paid within 30 days of shipment will be considered delinquent and will accure Finance charges at the rate of 1.5% per month (18% per annum).

SpectraPure®

- LIQUID LEVEL CONTROLLER FOR SINGLE TANKS (LLC-S) -

The **Single Tank Liquid Replenisher Systems** are the most advanced means of controlling liquid levels on single reservoirs, and are ideal for replenishing evaporated water in aquariums or liquids in other constant level containers. An onboard air pressure-activated electrical switch opens a solenoid valve when the liquid level drops approximately 1" and closes it when the liquid level rises back to its original level.

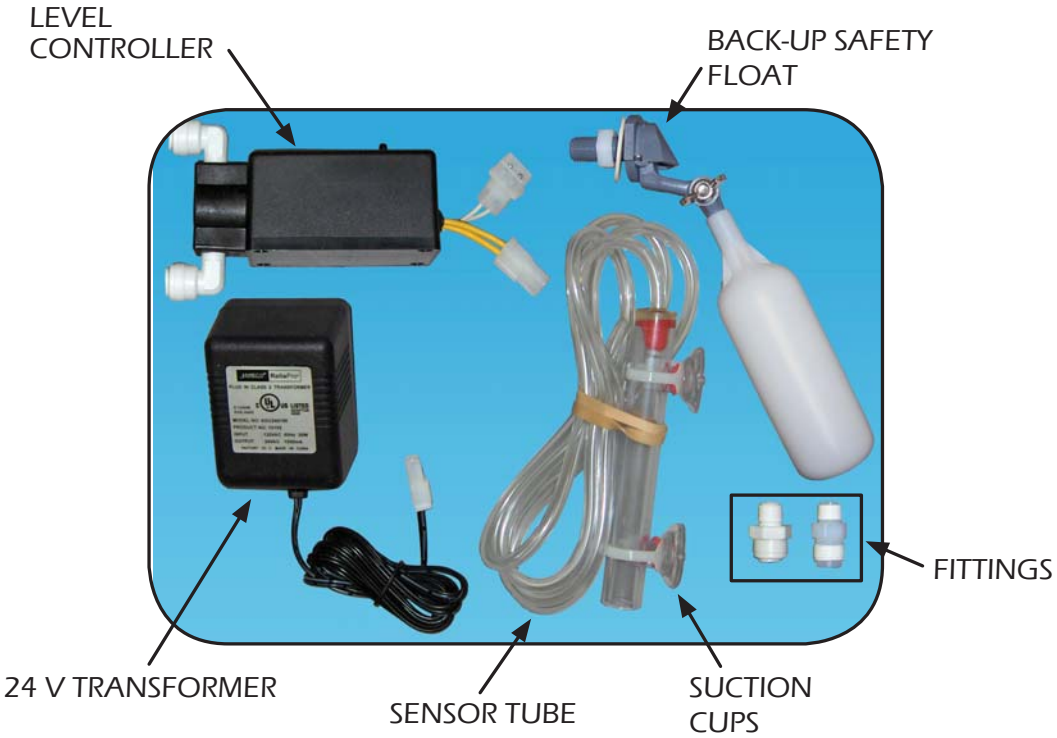
Research shows that the Single Tank Liquid Replenisher provides a significant advantage over conventional float and back-pressure activated automatic shut-off valves by maximizing the duration of membrane operation.

This minimizes the build up of impurities due to membrane creep (the small amount of impure water that is a characteristic of the membrane at the onset of pure water production).

All wetted components are constructed of inert and saltwater safe materials.

Power is provided by a plug-in 24 volt AC (UL listed and CSA approved) transformer.

The single reservoir model is provided with the controller, which includes a switched 24 volts AC outlet for controlling a booster pump or other 24 volt AC operated devices, compression fittings, and 10 feet of tubing for remote mounting of the sensor.



INSTALLATION INSTRUCTIONS FOR LLC-S ON **3-STAGE RO SYSTEMS**

1. (Refer to Figure 1). Locate the outport port of the carbon filter housing. This is the elbow on the right side of the system. Disconnect the tubing at this fitting.
2. Remove the elbow from the carbon filter housing and install the 1/4" x 1/8" reducer hex nipple. Leave two or three threads exposed. (You might have to un-screw the 8 screws that secure the housing caps to the bracket.)
3. Locate the port marked IN (or directional arrow) on the LLC BOX and thread it onto the hex nipple by turning the LLC clockwise. (In order to install the LLC BOX, the right end of RO membrane housing should be pulled up and out of its mounting clip.)
4. Locate the loose end of the tubing which is still attached to the RO membrane housing. Estimate the length of tubing required to connect to the elbow on the LLC BOX and cut the tubing.
5. Locate the transformer provided, insert the male connector into the female connector on the LLC BOX.
6. Locate the sensor tube with clear air line tubing attached to it and connect the loose end of the tubing to the 1/8" nipple on the back of the LLC Box. **WARNING:** Airline tubing MUST be connected to the 1/8" nipple on the back of the LLC Box BEFORE immersing the sensor probe in water.
7. Submerge Sensor Tube into water until you hear a "click" in the LLC Box. Mark that spot with a permanent marker. Slowly pull the tube out of the water until it clicks again. This is the turn off point. (Refer to Fig 2).
7. Mount the sensor tube with the suction cups provided by whatever means you prefer. Water will cover approximately half of the sensor tube when shut-off occurs. NOTE: A small dab of aquarium silicone sealant on each suction cup will prevent them from detaching.
8 Install the back up safety float at any convenient location which is above the shut off level of the LLC. ***Failure to install back-up float will void any warratny and may cause property damage***. (Refer to installation for float on page 7).

NOTE: Turn on the water supply to the RO System before plugging in the transformer.

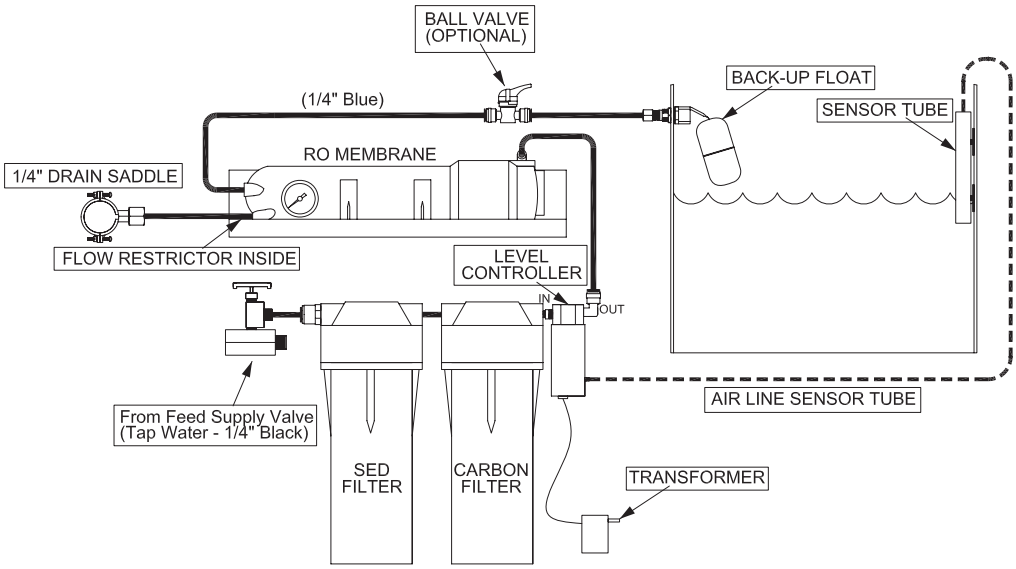
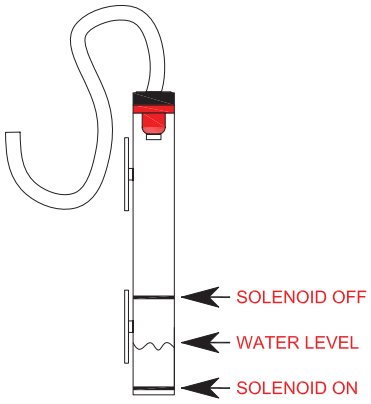


FIGURE 1: 3-STAGE LLC-S INSTALLATION



THE DISTANCE BETWEEN THE MARKS WILL BE APPROX 1"

FIGURE 2: SENSOR TUBING, (ON/OFF POINTS)

INSTALLATION INSTRUCTIONS FOR FLOAT

1. Drill a 1/2" hole (for adjustable float) or a 9/16" (for the standard float) into your sump or reservoir: If the thickness of the sump is too thick for the Float to install properly, you need to counter-bore the hole.

   - NOTE: If you are installing the Back-up Safety Float onto an acrylic tank we recommend using a new Fostner Bit to reduce the chance of cracking the acrylic.

STANDARD FLOAT
(old style)

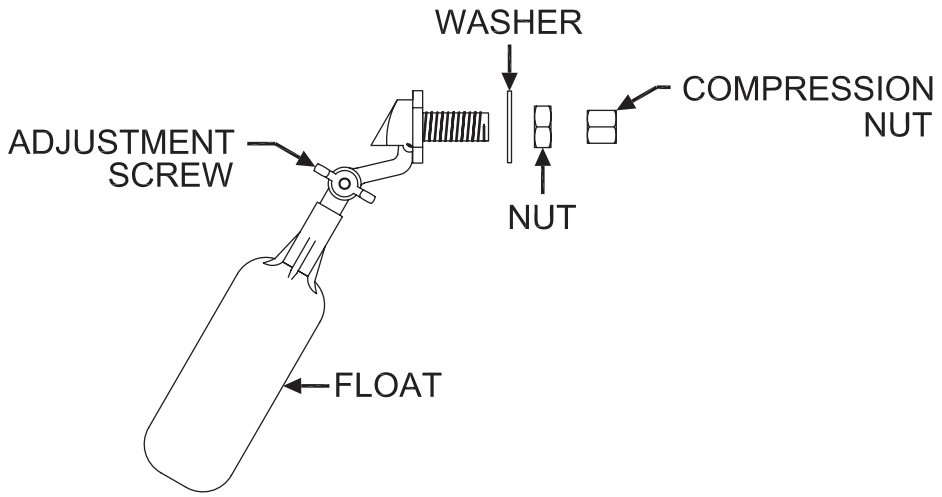
ADJUSTABLE FLOAT
(comes with kits)

2. Remove the Compression Nut from the float body.
3. Insert the 1/4" Blue Tubing into the 1/2" Compression Nut with the threads towards the end of the tube.
6. Unscrew the Nut from the float body.
7. Insert the float body and washer into the 1/2" hole and tighten the Nut, which securely tightens the float to the tank wall.
8. Push the Compression Nut towards the end of the tubing and screw the Compression Nut back onto the float body.
9. To tighten, use one 1/2" wrench on the flats of the plasic threads and another 1/2" wrench on the compression nut.

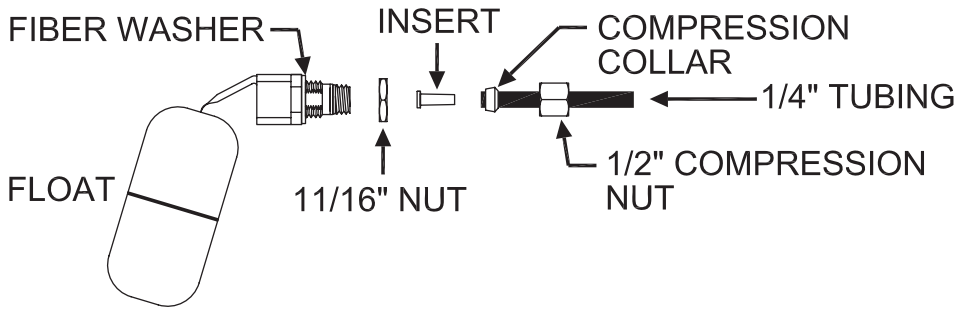
FLOAT ASSEMBLIES

THE SAFETY BACK-UP FLOAT MUST BE INSTALLED. FAILURE TO DO SO WILL VOID ANY WARRANTY AND POSSIBLY CAUSE PROPERTY DAMAGE.

New Adjustable Float



Standard Float

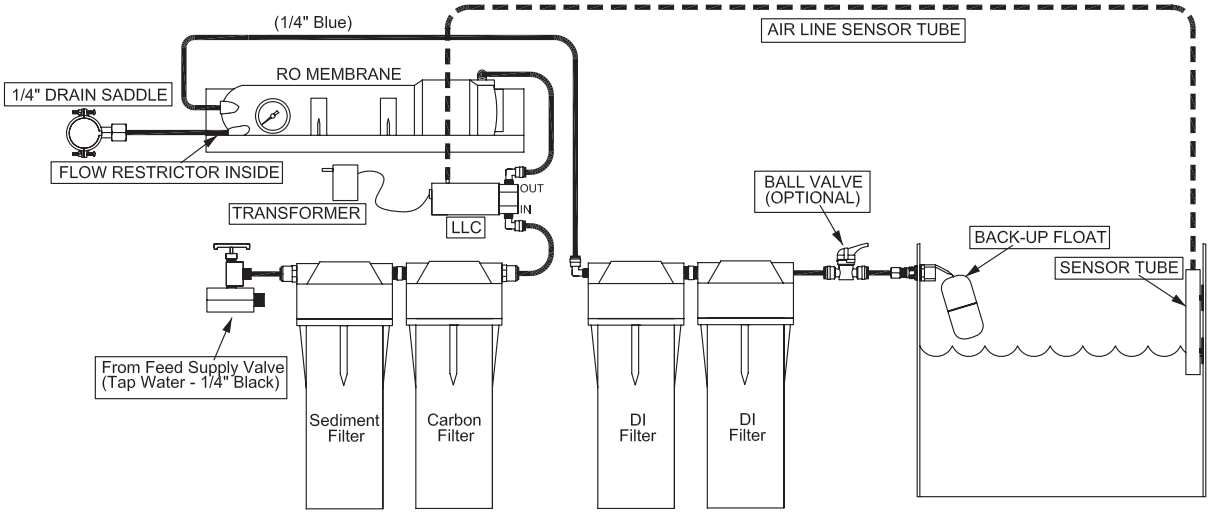


INSTALLATION INSTRUCTIONS FOR LLC-S ON 4 OR 5 STAGE RO/DI SYSTEMS

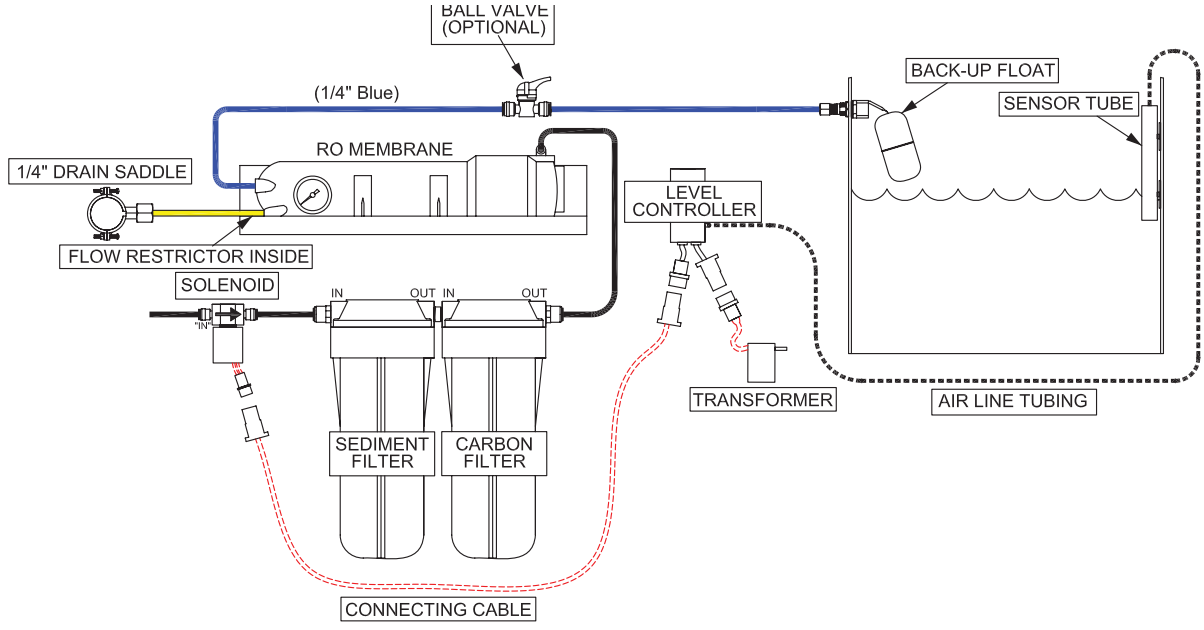
1. Refer to Figure 3. Locate the tubing connected between out port of carbon filter housing (center housing, under the bracket) and the input of the RO membrane housing (above the bracket). The LLC BOX will be installed on this tubing
2. There are two large holes in the bracket. Position the LLC BOX on top of the bracket with the straight inlet port over the hole which is near the left side as you look at the front of the system. Position the body of the LLC BOX towards the right.
3. Locate the tubing attached to the elbow on back of the center housing. Estimate length of tubing required to attach this tubing to the straight fitting (port marked IN or directional arrow) of the LLC BOX. Cut the tubing and attach it.
4. Locate the tubing which is attached to the input of the RO membrane housing. Estimate the length of tubing required to attach to the output elbow on the LLC BOX, cut the tubing and attach it to the fitting.
5. Locate the transformer, insert the male connector into the female connector on the LLC BOX.
6. Locate the sensor tube with the clear air line tubing attached to it and connect the loose end of the tubing to the 1/8" nipple on the back of the LLC Box. WARNING: Airline tubing MUST be connected to the 1/8" nipple on the back of the LLC Box BEFORE immersing the sensor probe in water.
7. Submerge Sensor Tube into water until you hear a "click" in the LLC Box. Mark that spot with a permanent marker. Slowly pull the tube out of the water until it clicks again. This is the turn off point. (Refer to page 7).
8. Mount the sensor tube with the suction cups provided or by whatever means you prefer. The water will cover approximately half of the sensor tube when shut-off occurs. NOTE: A small dab of aquarium silicone sealant on each suction cup will prevent them from detaching.
9. Install the back up safety float at any convenient location which is above the shut off level of the LLC. ***Failure to install back-up float will void any warratny and may cause property damage***. (Refer to page 7)
10. Install the blue product water tubing into the back up safety float.

. **NOTE:** The water supply to the system should be turned on before plugging in the transformer.

FIGURE 3: INSTALLATION FOR RO/DI SYSTEMS WITH LLC-S-115



INSTALLATION FOR LLC-RM-115



SpectraPure®

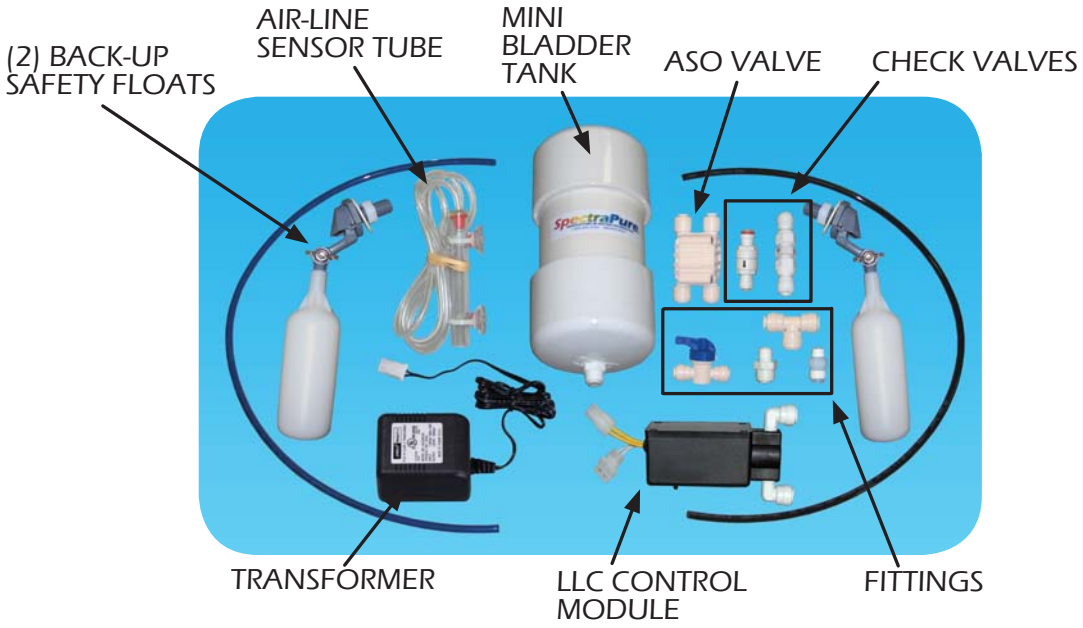
- LIQUID LEVEL CONTROLLER FOR MULTIPLE TANKS (LLC-M) -

The **Multiple Tank Liquid Replenishment Systems** are the most advanced means of controlling liquid levels on single or multiple reservoirs and are ideal for replenishing evaporated water in aquariums or liquids in other constant level containers. A sensitive air pressure switch opens a solenoid valve when the liquid level drops approximately 1" and closes it when the liquid level rises back to its original level.

Research shows that the Multiple Tank Liquid Replenisher provides a significant advantage over conventional float and back-pressure activated automatic shut-off valves by maximizing the duration of membrane operation. This minimizes the build up of impurities due to membrane creep (the small amount of impure water that is a characteristic of the membrane at the onset of pure water production). All wetted components are constructed of inert and saltwater safe materials. Power is provided by a plug-in 24 volt AC (UL listed and CSA approved) transformer.

The multiple reservoir model comes with a unit which includes a switched 24 volt AC outlet for controlling a booster pump or other 24 volt AC operated devices, compression fittings, 10 feet of tubing for remote mounting of the sensor, a Mini Bladder Tank, auto shutoff valve, ball valve, check valves and fittings, and one float valve for one additional reservoir.

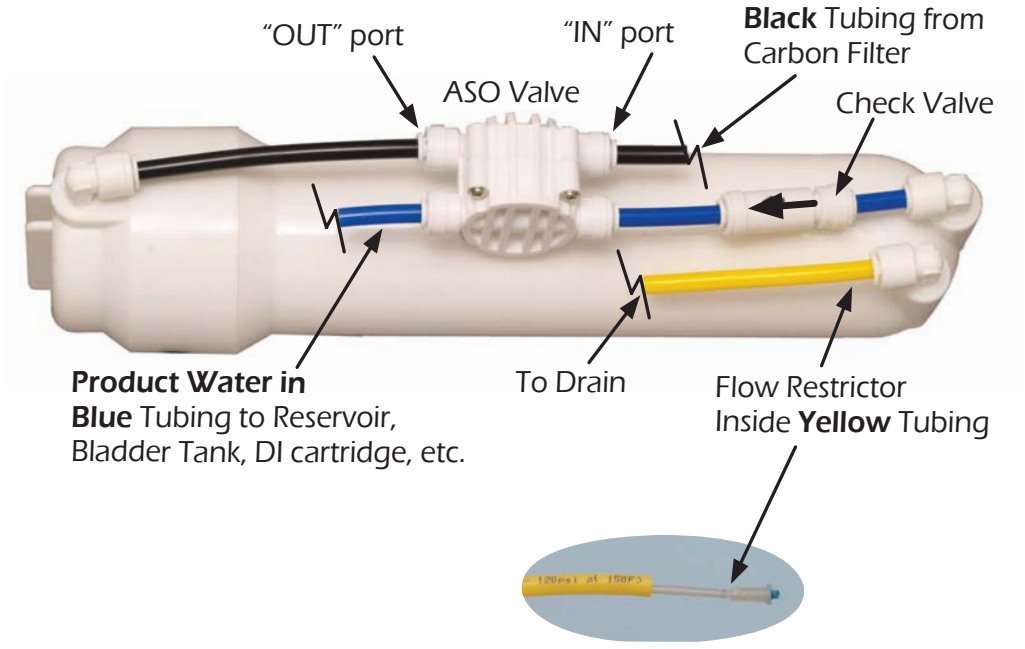
The system may be expanded to include more reservoirs by adding the optional Float Kit (SPFK). For additional overflow protection, a secondary mechanical float is also included with every Multiple Tank Liquid Replenisher.



INSTALLATION INSTRUCTIONS FOR LLC-M ON RO and RO/DI SYSTEMS

INSTALLATION OF THE AUTOMATIC SHUT-OFF VALVE

1. Locate the Black Tube between the Carbon Filter and the Membrane and cut in half.
3. Insert the cut end from the Carbon Filter into the IN Port of the ASO Valve.
4. Insert the cut end from the RO Membrane Housing into the OUT Port of the ASO Valve.
5. Locate the Blue Tube (product water) that leaves the RO Membrane Housing.
6. Cut the Blue Tube 1" from the membrane housing.
7. Using the 1 lb Check Valve, reconnect the two cut ends with the arrow pointing away from the membrane.
8. Position the Blue Tube along side the ASO Valve to determine where the blue tube needs to be cut. Then cut the blue tube and reconnect the two cut ends with the two remaining ports of the ASO Valve.



9. (Refer to Figure 4 or 5). Locate product line leaving the ASO Valve (for RO/DI system you will locate the line leaving the DI cartridge). Place a Tee on that line.
10. Connect one side of the tee to the LLC Box as shown in Fig. 4. Locate the port marked IN (or directional arrow) on the LLC BOX and connect product water (blue) line.
11. Locate the transformer, insert the male connector into the female connector on the LLC BOX.
12. Locate the sensor tube with the clear air line tubing attached to it and connect the loose end of the tubing to the 1/8" nipple on the back of the LLC Box.

    WARNING: Airline tubing MUST be connected to the 1/8" nipple on the back of the LLC Box BEFORE immersing the sensor probe in water.
13. Submerge Sensor Tube into water until you hear a "click" in the LLC Box. Mark that spot with a permanent marker. Slowly pull the tube out of the water until it clicks again. This is the turn off point. (Refer back to Fig 2).
14. Mount the sensor tube with the suction cups provided or by whatever means you prefer. The water will cover approximately half of the sensor tube when shut-off occurs. NOTE: A small dab of aquarium silicone sealant on each suction cup will prevent them from detaching.
15. Install the Mini-Bladder Tank, 4 lb Check Valve, and tee on the other side of the tee as shown in Fig. 4 or 5.

    WARNING: Floats are for bulk storage only and are not recommended for evaporation replacement.
16. Refer back to page 7 for the installation of Back-up Safety Floats. ***Failure to install back-up float will void any warratny and may cause property damage***.

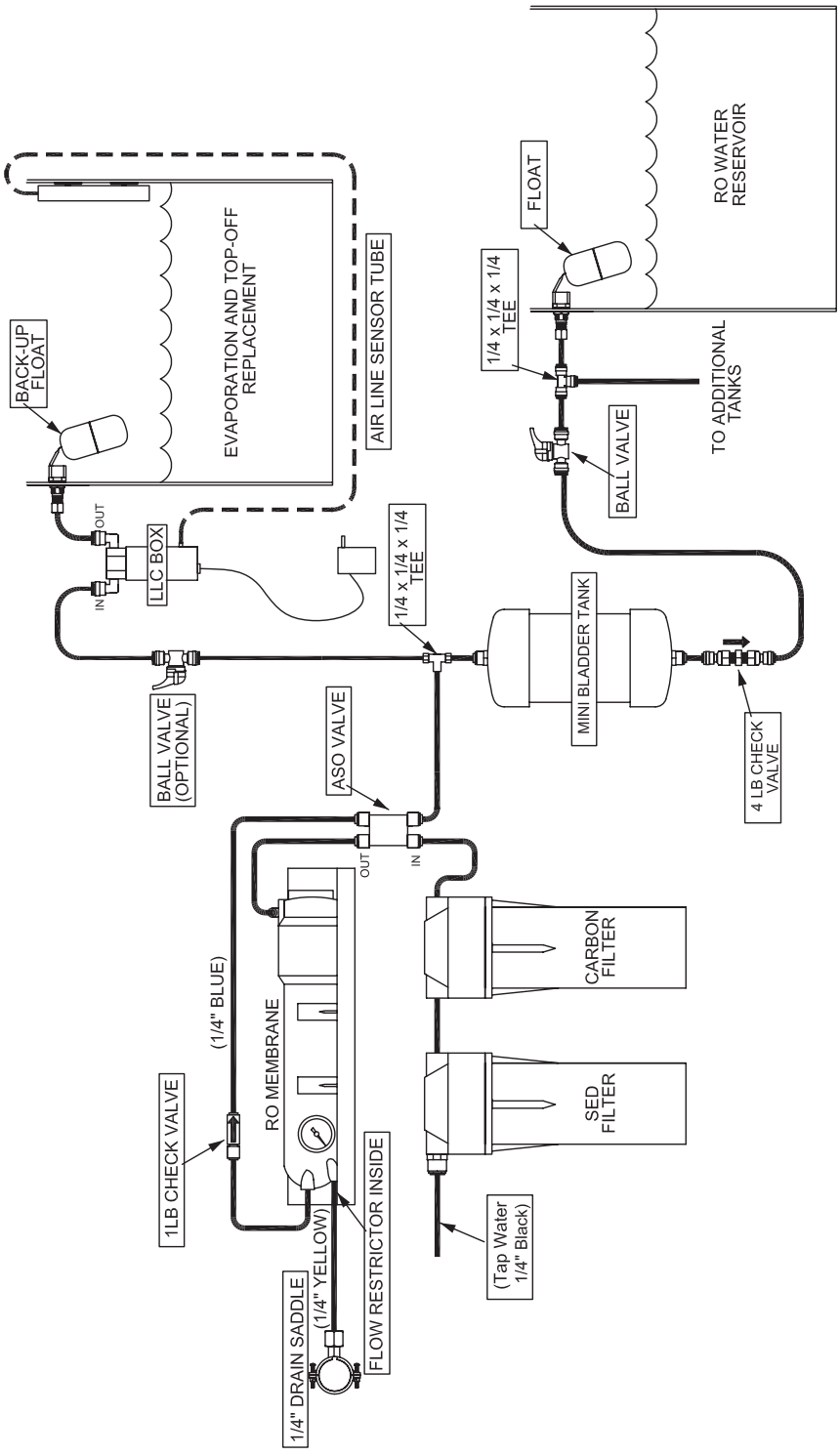


FIGURE 4: INSTALLATION FOR RO WITH LLC-M

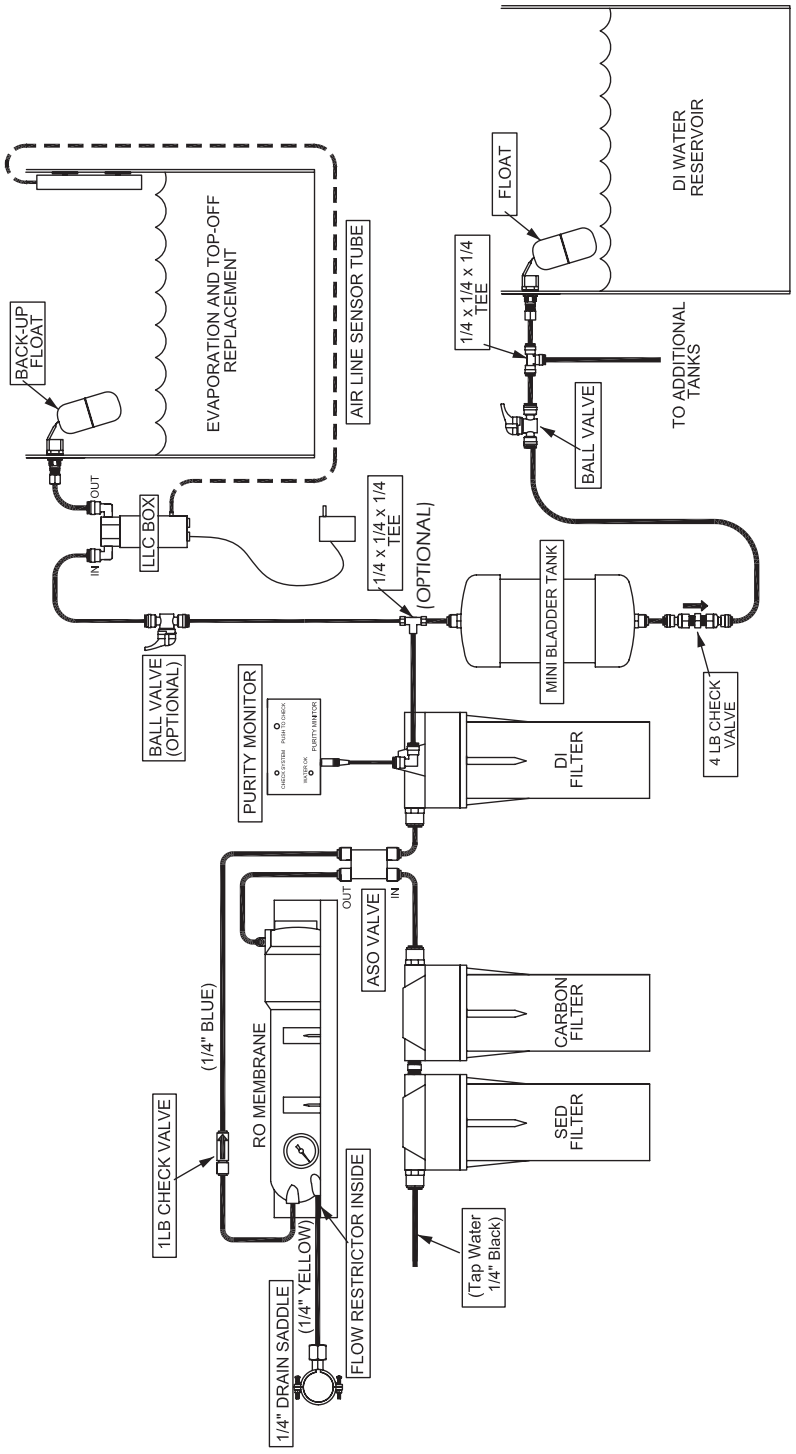


FIGURE 5: INSTALLATION FOR RO/DI WITH LLC-M

- ELECTRONIC TANK LEVEL CONTROLLER (LLC-E) -

(Only for Singe Tank Use)

The **Electronic Tank Liquid Replenisher Systems** is powered by an energy saving 24 volts coil that is strong enough to open at water pressures up to 100 psi.

The unique circuitry allows the 24 volts solenoid valve coil to operate without heat build up and without AC coil noise. The control circuitry is intergrated into the valve and is hermetically sealed for maximum reliability under severe operating conditions.

An additional switched 24 volts AC outlet is provided for controlling a booster pump or other 24 volts AC operated devices. The positive shut-off conserves water and extends the life of system components

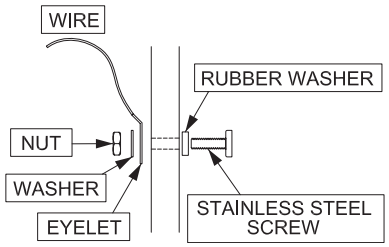
The Electronic Tank Level Controller comes complete with all fittings necessary for hooking it up to all RO systems.

IMPORTANT NOTE: The Electronic Tank Level Controller is not recommended for controlling high conductivity liquids such as salt water or very low conductivity water such as deionized water.

INSTALLATION INSTRUCTIONS FOR LLC-E ON RO Systems ONLY

1. Locate tap water line (black) . Cut line and reconnect with the Liquid Level Control Box. (Note the "IN" and "OUT" ports or directional arrow on the LLC's solenoid head for correct installation).
2. Locate the transformer and electronic sensors and connect as shown in Fig 6. (Each line is connected to an eyelet).

   * RED Sensor - High Level
   * BLACK Sensor - Low Level
   * GREEN Sensor - Common



3. You can install an optional Booster Pump if your tap pressure is below 40 psi.
4. Refer back to page 7 for the installation of Back-up Safety Float installation. ***Failure to install back-up float will void any warratny and may cause property damage***.

   WARNING: Floats are for bulk storage only and are not recommended for evaporation replacement.

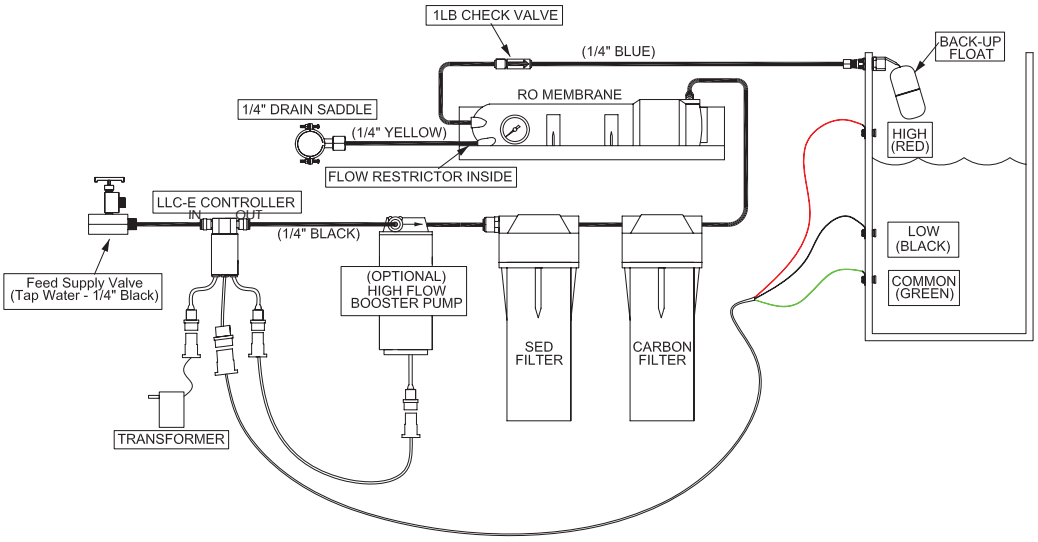


FIGURE 6: DIAGRAM INSTALLATION FOR LLC-E

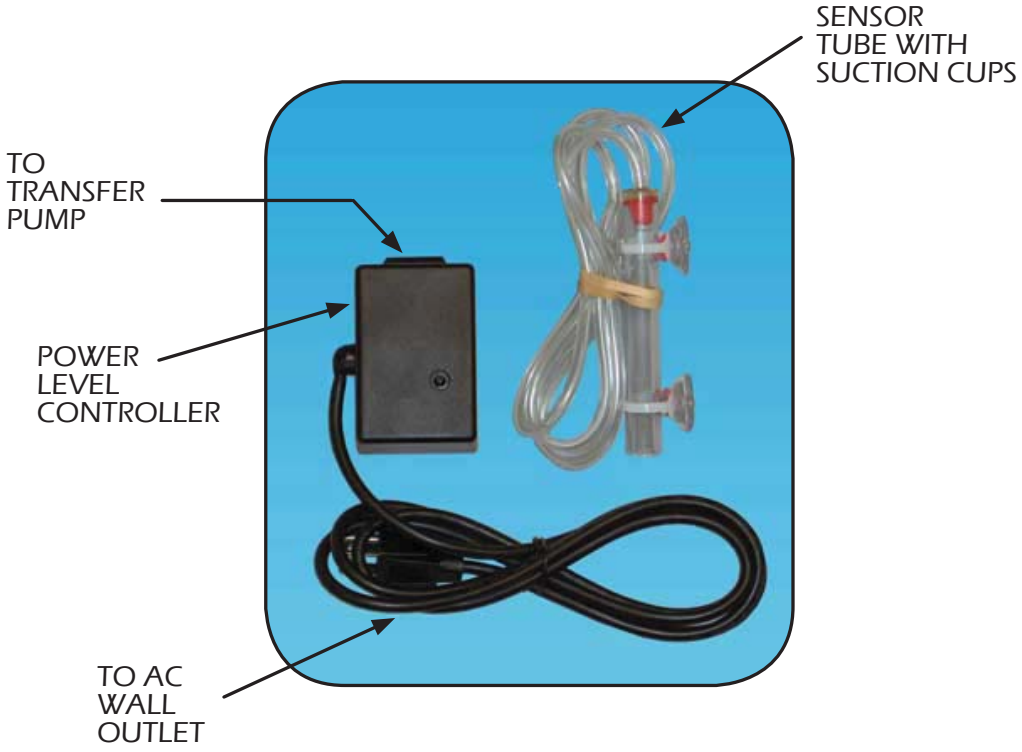
- POWER LIQUID LEVEL CONTROLLER (LLC-PH) -

(Used for turning on 120v AC pumps)

The **Power Tank Liquid Replenisher Systems** uses a sensitive air pressure switch to energize or de-energize an AC outlet which can be used to switch a power head or a 115 volts pump up to 3 amps continuous duty.

The unit can be set to turn a pump on or off with changing water level and is extremely useful for continuous water change systems.

- For Automatic replenishment of evaporated liquid on systems which require AC electrical control.
- Controls up to 3 amp continuous duty pumps and other 115 volts power heads.
- Extremely useful for continuous water change systems and other level control applications.



INSTALLATION INSTRUCTIONS FOR LLC-PH

1. Connect Power Level Controller to Transfer Pump and plug into an AC wall outlet. (As shown in Fig 7)
2. Locate the sensor tube with the clear air line tubing attached to it and connect the loose end of the tubing to the 1/8" nipple on the back of the LLC Box.

   WARNING: Airline tubing MUST be connected to the 1/8" nipple on the back of the LLC Box BEFORE immersing the sensor probe in water.
3. Submerge Sensor Tube into water until you hear a "click" in the LLC Box. Mark that spot with a permanent marker. Slowly pull the tube out of the water until it clicks again. This is the turn off point. (Refer back to Fig 2).
4. Mount the sensor tube with the suction cups provided or by whatever means you prefer. The water will cover approximately half of the sensor tube when shut-off occurs. **NOTE:** A small dab of aquarium silicone sealant on each suction cup will prevent them from detaching.

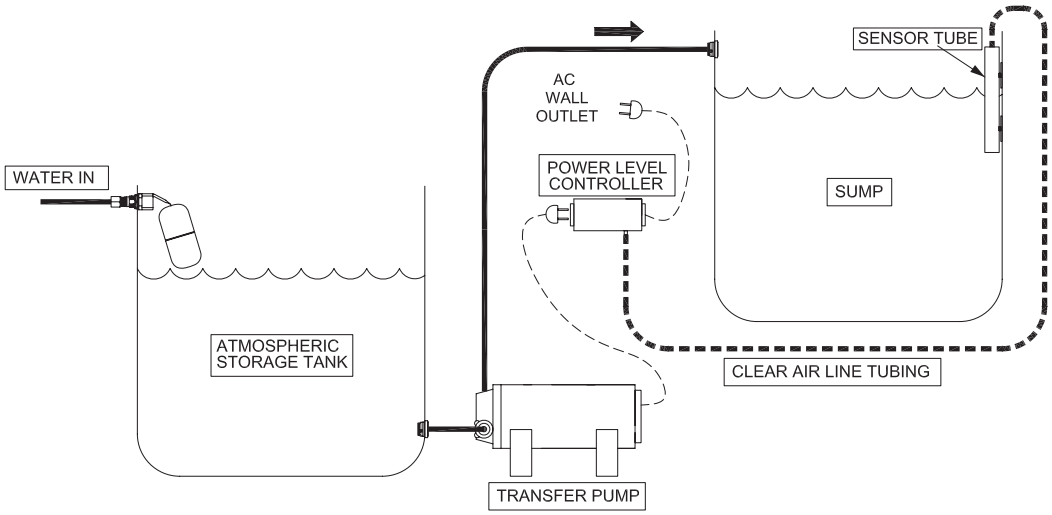


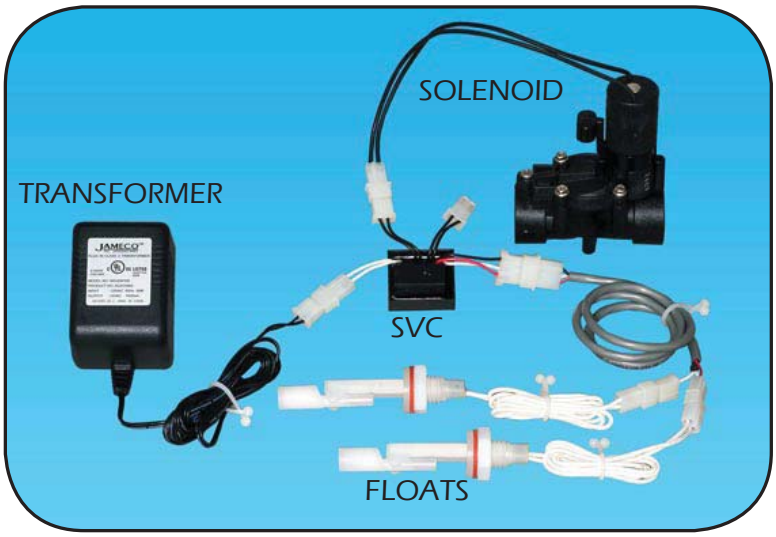
FIGURE 7: DIAGRAM INSTALLATION FOR LLC-PH

- SOLENOID VALVE CONTROLLER (LLC-SVC) -

The **Solenoid Valve Level Controller** is the most powerful and reliable Level Controller. The solenoid is electrically activated when the "low" float becomes dry. Once the"high"float becomes wet, the solenoid closes.

The unit can be set to turn a pump on or off with changing water level and is extremely useful for continuous water change systems.

- NOTE: Floats are to be mounted horizontal when dry and float up when wet. In most instances we recommend locating the low float approx. half way down your reservoir. DO NOT OVERTIGHTEN when installing the floats.



Float Installation:

1. Install both the High and Low Floats onto a open container like a Rubber Maid™ trash can. The floats can be mounted by drilling a 5/8" hole. (The High Float shuts down the system, while the Low Float turns the system on).

2. Connect the floats to the grey electrical extension cable and then to the 3-socket connector on the S.V.C.

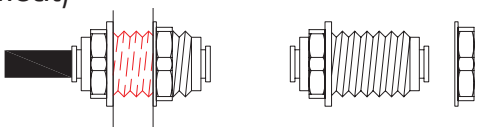
Solenoid Installation:

3. Install the solenoid between the carbon filter and the RO membrane. This prevents the solenoid from plugging up with sediment. (Arrow on Solenoid points in the direction where the water flows). PAGE 22.

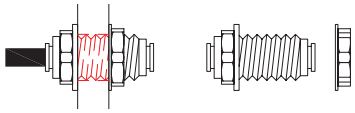
5. Connect electrical cable from the solenoid to the S.V.C. and then connect the transformer.

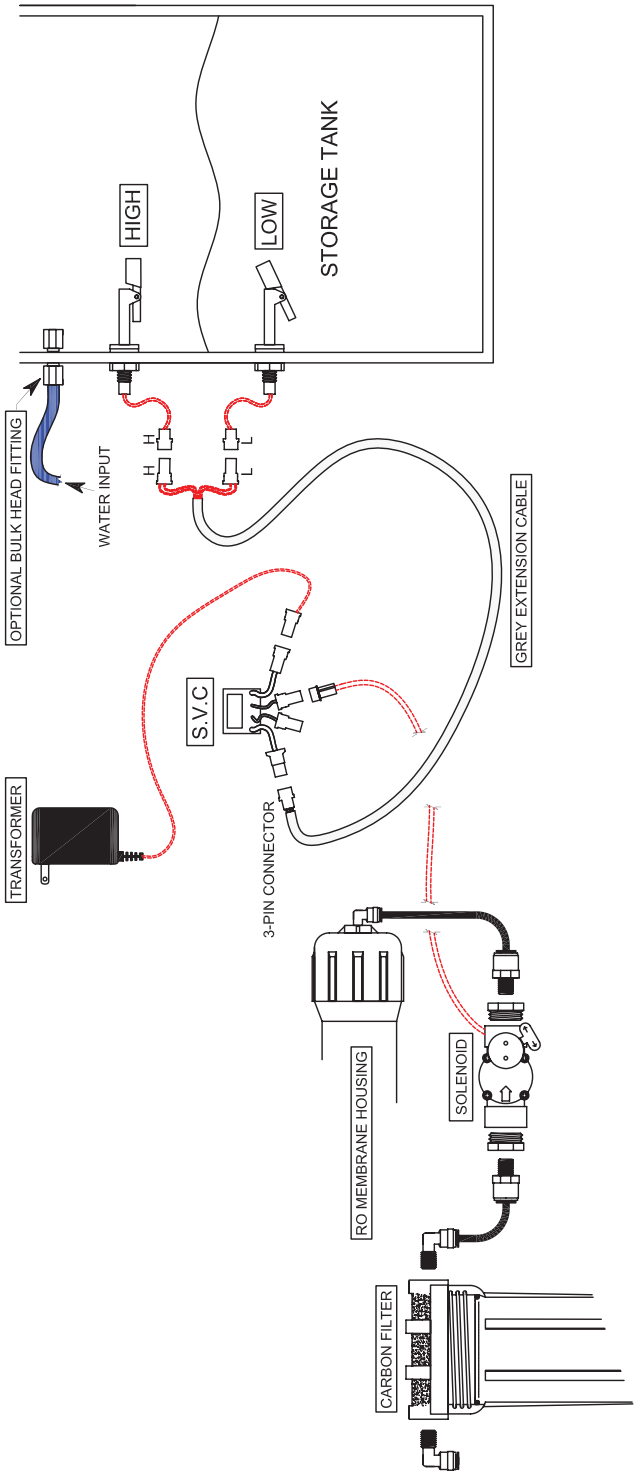
6. Product Water Connection (optional item):
This kit does not provide a means to connect the product water to a container. A bulk head fitting can be used:

- 3/8" BULK HEAD FITTING: Use a paddle bit and carefully drill a 13/16" hole for installation at the top of the reservoir (above the high level float)



- 1/4" BULK HEAD FITTING: Use a paddle bit and carefully drill a 5/8" hole for installation at the top of the reservoir (above the high level float).




STORAGE TANK
HIGH
LOW
OPTIONAL BULK HEAD FITTING
WATER INPUT
H
L
H
L
GREY EXTENSION CABLE
S.V.C
TRANSFORMER
3-PIN CONNECTOR
RO MEMBRANE HOUSING
SOLENOID
CARBON FILTER

TROUBLE SHOOTING GUIDE

Problems, Causes and Corrective Actions

1. LLC System not working (overflow, system not shutting off, etc.)	
a. Defective pressure switch	i. Replace it.
b. Water in the clear air-line tubing.	ii. Disconnect the tubing and blow air through it to get the water out.
c. Defective solenoid valve.	iii. Replace it.
d. Dirt or corrosion on solenoid valve.	iv. Clean or replace valve.
2. Solenoid will not turn on.	
a. Water pressure above 80 psi.	i. Contact SpectraPure for special solenoid valve.
b. No power.	i. Check power outlet and transformer.

SpectraPure®

ONE YEAR MANUFACTURERS WARRANTY

Effective on products purchased after March 10, 2005.

SpectraPure, Inc.® warrants the product to the original owner only to be free of defects in material and workmanship for a period of one years from the date of receipt. SpectraPure's liability under this warranty shall be limited to repairing or replacing at SpectraPure's option, without charge, F.O.B. SpectraPure's factory, any product of SpectraPure's manufacture. SpectraPure will not be liable for any cost of removal, installation, transportation or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by SpectraPure are subject to the warranty provided by the manufacturer of said products and not by SpectraPure's warranty.

SpectraPure will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair or, if the product was not installed in accordance with SpectraPure's or other manufacture's printed installation and operating conditions, or damage caused by hot water, freezing, flood, fire or acts of God. SpectraPure will not be responsible for any consequential damages arising from installation or use of the product, including any water or mold damage due to flooding which may occur due to malfunction or faulty installation, including, but not limited to failure by installer to over- or under-tighten fittings, housings, and/or push-style fittings, or improper installation of push-style fittings. Consumable items such as pre filters and membranes are not covered under the two year warranty. SpectraPure warrants (pro-rated) the performance of tested SpectraSelect™ RO membrane elements only, for one year from date of receipt by the buyer, providing that the loss of performance was not caused by fouling , neglect or water conditions exceeding the feed water parameters listed in the applicable product manual (refer to detailed membrane warranty information). SpectraPure will, on confirmation of loss of performance during the warranty period, credit the pro-rated amount of the current catalog price of the element. The disposable filters and cartridges are not covered under the warranty.

To obtain service under this warranty, the defective system or components must be returned to SpectraPure with proof of purchase, installation date, failure date and supporting installation data. Any defective product to be returned to the factory must be sent freight prepaid; documentation supporting the warranty claim and a Return Goods Authorization (RGA) number must be included. SpectraPure will not be liable for shipping damages due to the improper packaging of the returned equipment and all returned goods must also have adequate insurance coverage and a tracking number. SpectraPure will not pay for loss or damage caused directly or indirectly by the presence, growth, proliferation, spread or any activity of "fungus", wet or dry rot or bacteria. Such loss or damage is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the loss. We will not pay for loss or damage caused by or resulting from continuous or repeated see page or leakage of water, or the presence or condensation of humidity, moisture or vapor, that occurs over a period of 14 days or more. "Fungus" and "fungi" mean any type or form of fungus or Mycota or any by-product or type of infestation produced by such fungus or Mycota, including but not limited to, mold, mildew, mycotoxins, spores, scents or any biogenic aerosols.

SpectraPure will not be liable for any incidental or consequential damages, losses or expenses arising from installation, use, or any other causes. There are no expressed or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

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