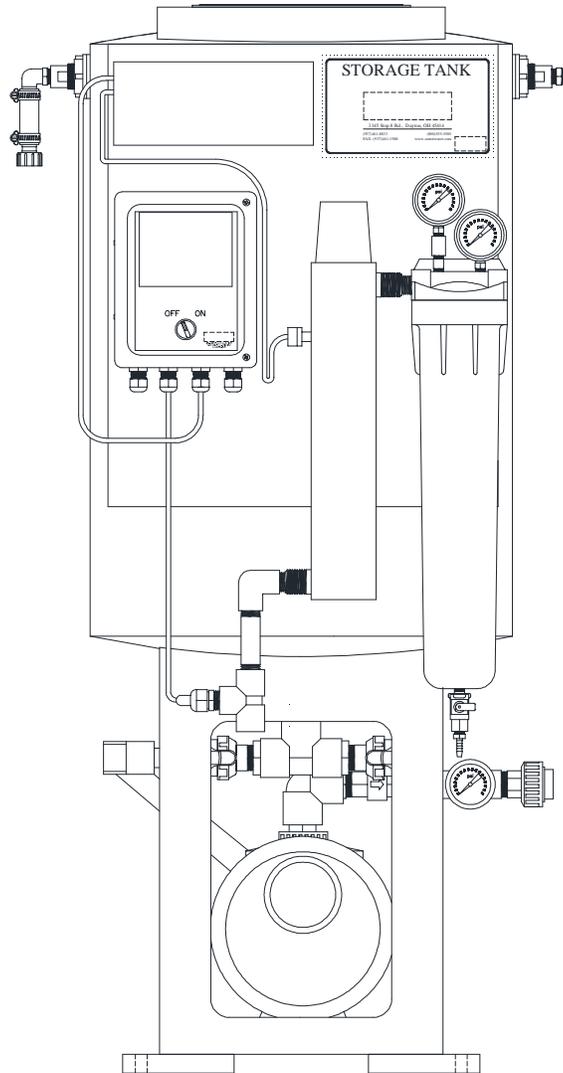




# LABORATORY STORAGE TANK INSTALLATION & OPERATION MANUAL



**Manufactured With Pride  
In The USA**

www.amerewater.com • 800-535-5585

AmeriWater • 3345 Stop 8 Rd. • Dayton, OH 45414

98-0123D



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## **1.0 Theory of Operation**

The reverse osmosis unit makes a limited amount of water at a time. It is therefore necessary to store it in a storage tank. The storage tank is equipped with float switches, which will turn the reverse osmosis unit off and on when the water reaches a predetermined point in the storage tank. The distribution pump will operate whenever there is flow coinciding with a pressure drop in the system. The pump will stop shortly after the flow decreases to 0.3 GPM or less.

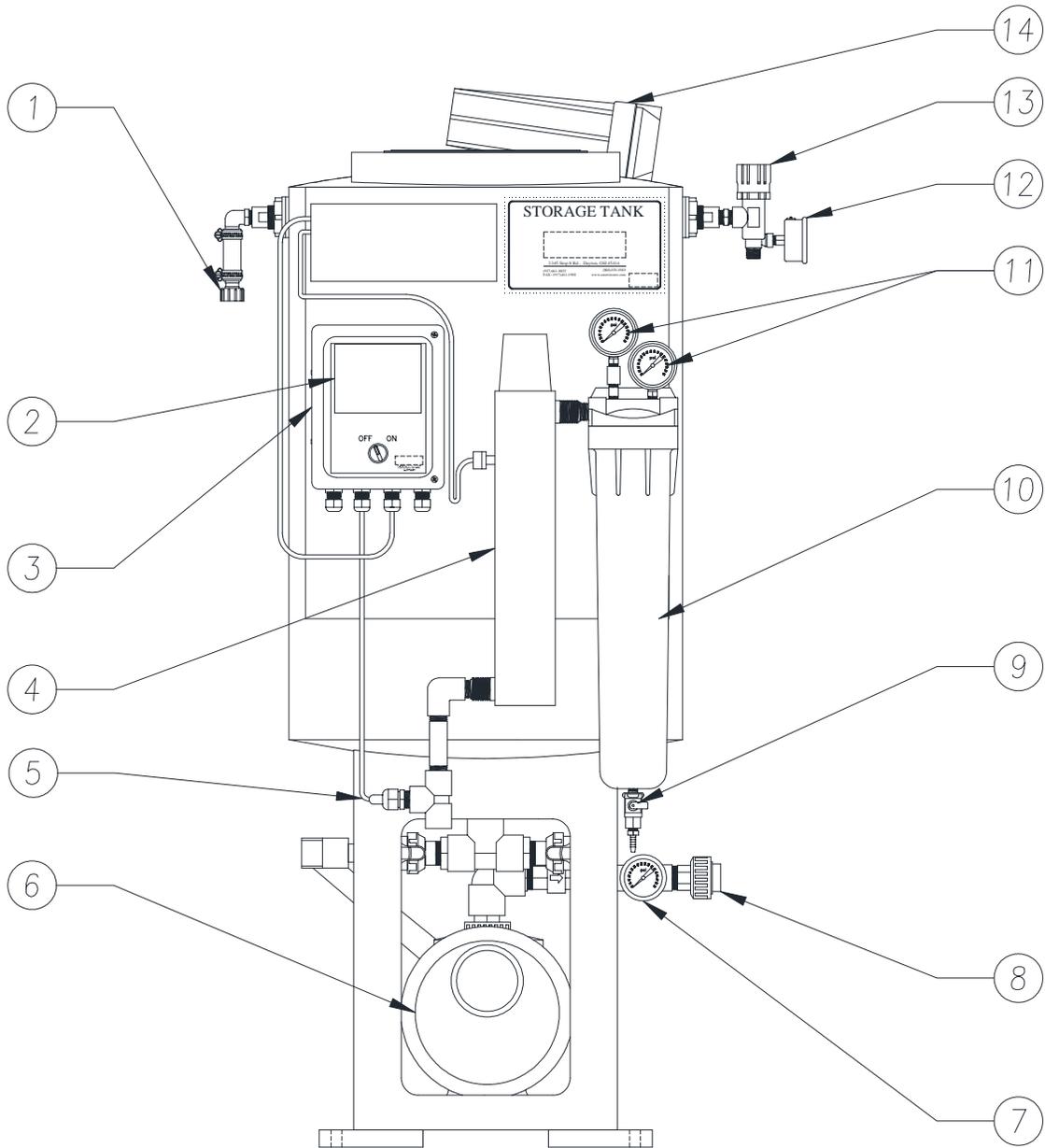
The pump sends the water to the DI process. After return from DI, the water will pass across a resistivity cell, through the UV disinfection and finally, through a filter. From here it will be sent to the point of use.

This tank is also equipped with a spray nozzle on the return loop side of the tank. This will continuously spray down the top of the tank with purified water to minimize bacteria growth. During disinfection, the spray nozzle allows disinfectant to reach all parts of the tank for faster disinfections.

The vent filter on the tank is designed to filter the air when water moves in and out of the storage tank. The filter must be immediately replaced if it gets wet.

**NOTE: Please read the Operations Manual before operating or servicing the system.** Contact AmeriWater Customer Service with any questions at 1-800-535-5585 Monday through Friday 8:00 a.m. to 5:00 p.m. eastern standard time. For after hours emergencies follow the instructions on the recorded message. Our on-call technician will return your call as soon as possible. This Operations Manual should be kept near the system and used as a reference and troubleshooting guide.

## 2.0 Component Identification



## **DESCRIPTION OF COMPONENTS**

1. **PRODUCT WATER INLET** – ¾” Female Garden Hose connection for the RO water.
2. **RESISTIVITY CONTROLLER** – Controller for the resistivity cell. This will display the resistivity of the water after the DI process.
3. **ELECTRICAL ENCLOSURE** – Enclosure that houses all electrical connections.
4. **UV DISINFECTION LIGHT** – Chamber that provides UV disinfection of the product water after the DI process.
5. **RESISTIVITY CELL** – Cell that measures the resistivity of the water after the DI process.
6. **DISTRIBUTION PUMP** - Operates whenever there is flow coinciding with a pressure drop in the system. The pump will automatically stop a few seconds after the flow stops.
7. **PUMP PRESSURE GAUGE** – Indicates the pressure provided by the pump.
8. **DISCHARGE TO DI PROCESS** – ¾” FPT connection provided for DI connection.
9. **PRODUCT SAMPLE PORT** – Sample port for verifying the product water.
10. **POST UV FILTER** – 0.2 micron filter for product water.
11. **FILTER GAUGES** – Indicate the pressure on the filter inlet and outlet. This allows for a quick check to determine if the filter needs changed.
12. **LOOP PRESSURE GAUGE** – Gauge provided to indicate the pressure from the loop.
13. **PRESSURE REGULATOR** – Regulates the flow& pressure returning from the loop.
14. **VENT FILTER** – Vents the tank while preventing contaminants entering the product water.

## **3.0 Installation**

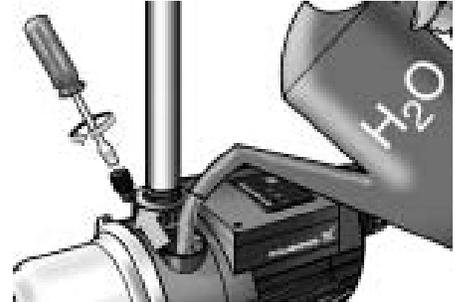
1. Locate the storage tank on a firm level floor. For seismic requirements, drill (4) 5/8" diameter holes into the concrete through the mounting holes in the storage tank feet a minimum of 4" deep. Install (4) 5/8" diameter, HILTI KB-TZ Expansion anchors through the 4 holes on the pads to anchor into the ground. A minimum of 4 threads for each anchor must be below the concrete prior to application of 60 ft-lbs of torque.
2. Connect the RO product hose to the storage tank's product water inlet.
3. Route the float wire quick disconnect to the RO and lock in place.
4. Connect the discharge from the pump to the DI process inlet (this is 3/4" FPT, hose barb adapters have been provided in 1/2 & 3/4" variants as well as a standard Silex connection.)
5. Connect the return from the DI process to the tee on the inlet of the UV Light (this is 3/4" FPT, hose barb adapters have been provided in 1/2 & 3/4" variants as well as a standard Silex connection).
6. Make a connection from the discharge of the filter to the point of use loop. (It is recommended that there be a shut off valve to facilitate maintenance.)
7. Connect the return from loop to the return fitting on the side of the tank. (It is recommended that there be a shut off valve to facilitate maintenance.)
8. Install the vent filter cartridge into the vent filter housing.
9. Install the post filter cartridge into the post filter housing.
10. Plug the line cord into a dedicated 20 amp 115VAC GFI outlet.
11. Disinfect the system per the instructions in section 4.0.

## **4.0 Disinfection**

1. Disconnect the storage tank from the DI process.
  2. Remove the 0.2 micron filter (if installed).
  3. Prepare DI process for disinfection:
    - a. If using the Silex deionizer, simply remove the packs from the system and set aside.
    - b. If using DI tanks, remove the inlet and outlet connections from the DI tanks and jumper these together.
  4. After preparing the DI process:
    - a. If disinfecting the loop, ensure that all devices downstream are off line and removed during the disinfection process.
    - b. If only disinfecting the tank, remove from the loop and install the short disinfection jumper hose between the filter outlet and return from the loop. It will be necessary to loosen the worm gear clamps during installation and removal to these connections. Ensure clamps are tightened prior to applying pressure to the system.
  5. Fill tank with 50 gallons of water from the disinfected RO.
  6. Add ½ gallon of bleach.
  7. Turn on the pump and allow this to re-circulate for 30-60 minutes.
- NOTE:** The introduction of the bleach solution in to the UV light will trigger a temporary low UV condition. This is due to the bleach “clouding” the water in the chamber.
8. Drain the water from the system and add 50 gallons of water from the disinfected RO.
  9. Allow this to re-circulate for a minimum of 30 minutes or until there is no chlorine detected at any of the points of use.
  10. Drain the tank and replace with a new 0.2 micron filter.
  11. Reconnect to the DI process and return to service.

## **5.0 Operation**

1. Verify that all connections have been made on the system.
2. Ensure that the drain valve on the bottom of the tank is closed and the valve to the pump inlet is open.
3. Start the RO to add water to the storage tank.
4. Prime the pump by using a slotted screwdriver to open the vent plug until water runs out. This step is only necessary when the system is first installed or allowed to dry.
5. Power on the system.
6. Allow the UV light and resistivity meter to complete the self diagnostic tests.
7. Turn on devices downstream from the storage tank.
8. Verify that the post filter inlet and outlet gauges have less than a 10 PSI drop across them.
9. Adjust the relief valve to obtain the desired flow during operation.



## **6.0 Reminder for Adjusting the Set-Point**

An alarm lock occurs when the water quality goes below the low set-point creating an alarm. For the alarm condition to clear, the water quality must rise above the high set-point. When adjusting the set-point, it is suggested to set the high set-point range 1 to 5 megohms above the low set-point to offset the alarm lock.

### **6.1 Setting Set-points on Resistivity Controller**

1. Press and hold the SET-POINT button on the resistivity controller and press the ADJUST button.
2. Release both buttons. –LO- will be displayed momentarily, followed by the current low set-point value.

3. The LCD's highest digit will be displayed first. To change this, press the SET-POINT button until the desired first digit is displayed.
4. Toggle to the next lower digit by depressing the ADJUST button.
5. Depress SET-POINT to change to the desired value and ADJUST to go to the next lowest digit.
6. Continue these sequences until the desired –LO- set point value is entered.
7. Press the ADJUST button. –HI- will be displayed momentarily, followed by the current high set-point value.
8. The value can be adjusted in the same manner as the –LO- set point.

## **6.2 Adjusting Relay Resistivity Time Delay**

The delay on the relay timer can be set from 0-120 seconds to allow for rinse up of the equipment. To modify the settings, take the following steps.

1. Press and hold DELAY then press the ADJUST button.
2. Release both buttons. The display's hundreds digit will flash.
3. To change this digit, press DELAY button repeatedly until the desired number is achieved.
4. Press the ADJUST button to toggle to the tenths digit.
5. To change this digit, press the DELAY button repeatedly until the desired number is achieved.
6. Press the ADJUST button to toggle to the final digit.
7. Press the DELAY button repeatedly until the desired number is achieved.
8. The monitor will automatically return to its normal operating modes after a short interval. Any changes made will be automatically saved.

## **6.3 Using the Resistivity Relay**

The resistivity controller has an on-board single pole, double throw relay that is rated at 1 amp @ 28VDC and 0.5 amp at 120VAC. This has both normally open and normally closed contacts, allowing for control both above and below the set-points.

The relay acts simply as a switch. When the water quality is above the set-point (Green LED), the relay is in a de-energized state and there is a completed circuit between the COM and NC terminals of the relay. If the water quality is below the set-point (Red LED), the relay is energized completing the circuit between the COM and NO terminals, while simultaneously disconnecting the COM / NC circuit. FIGURE 1 shows the connection location for the relay in the resistivity controller.

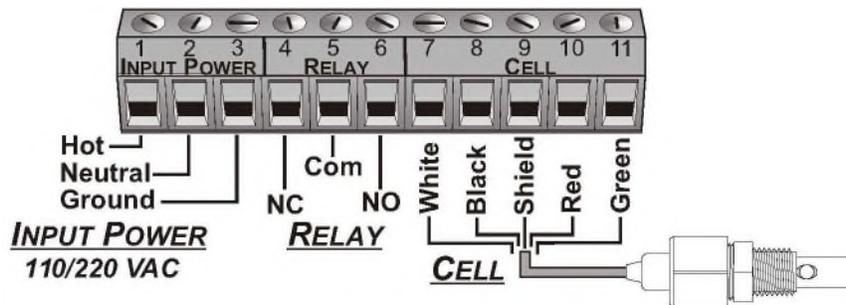


FIGURE 1

## **7.0 Maintenance**

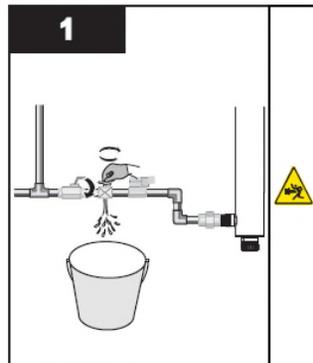
1. Replace the vent filter annually or when the filter cartridge gets wet or plugged.
2. It is recommended that a disinfection of the storage tank be performed as needed.
3. Replace the post-filter annually or whenever the pressure differential between the inlet and the outlet gauges reads 10 PSI or greater.

## 7.1 UV Lamp Replacement

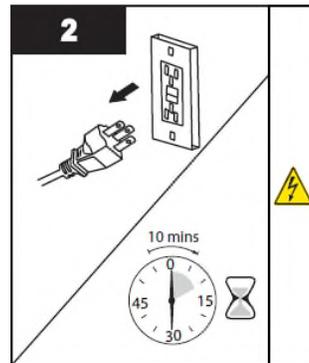
The UV lamp must be replaced after 9000 hours of operation or annually to ensure adequate disinfection. The controller on the UV light will indicate when it is time to change the lamp (FIGURE 2). Failure to change the UV lamp when indicated will result in inadequate disinfection.



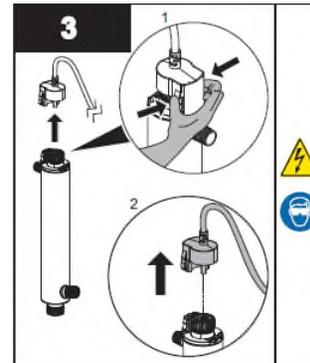
FIGURE 2



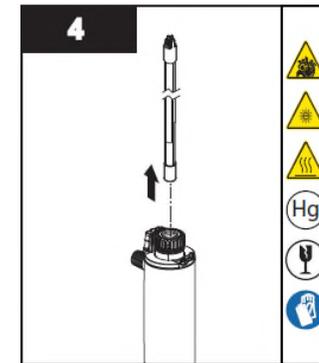
1  
Turn off the water from the system and relieve the pressure by opening the sample port on the bottom of the filter housing.



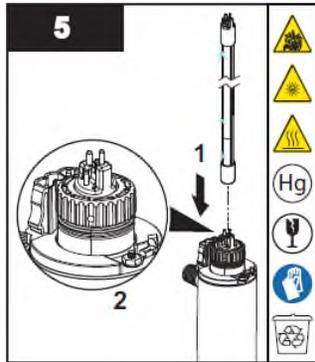
2  
Turn the unit off and remove the line cord from the power source.



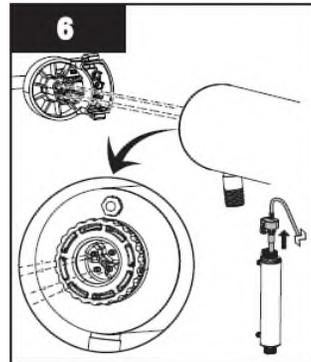
3  
Remove the lamp connector by squeezing the plastic locking tabs on the side of the connector.



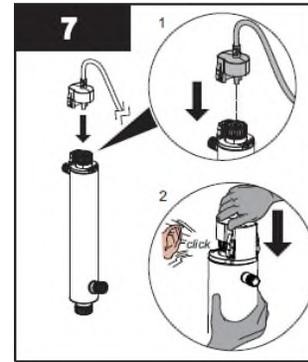
4  
Remove the lamp in upward direction from the chamber and lamp connector base. Always hold the lamp at the ceramic ends.



Carefully insert the lamp into the reactor vessel

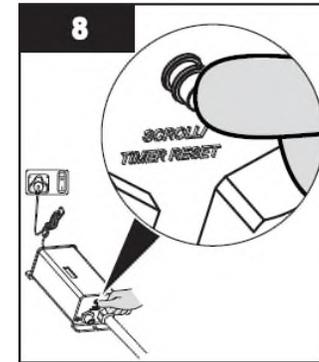


Attach the connector to the lamp and note that the connector will only allow correct installation in one position.



Ensure that the connector is fully seated onto the UV lamp.

Push the lamp connector against lamp connector base together until an audible click is heard. Re-pressurize the system to check for leaks.



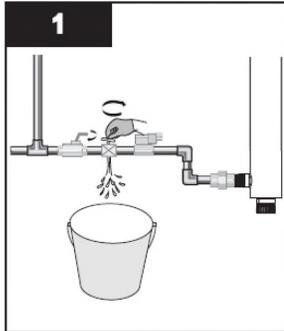
Close the sample port on the filter housing and turn the water source back on.

Replace the line cord into the power source.

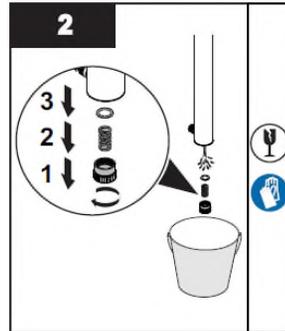
Hold down the timer reset button and reapply power to the controller until you see rSET, then release timer reset button. A 5 second delay will occur until you hear an audible tone and LED display will read once again 365

Disinfect per the instructions in section 4.0.

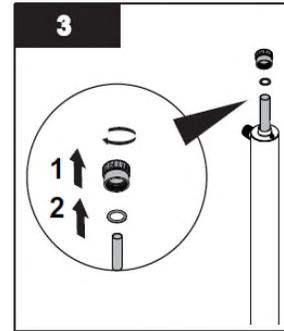
## 7.2 UV Quartz Sleeve Cleaning / Replacement



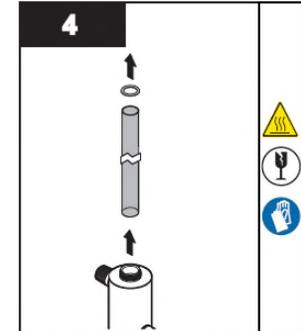
1 Drain the chamber by using the drain port.



2 Remove the bottom retaining nut, floating spring, and O-ring.



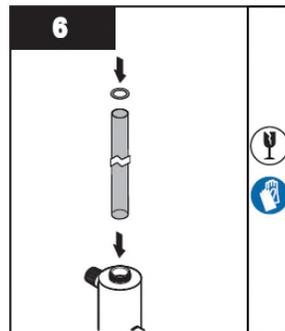
3 Remove the top retaining nut and O-ring.



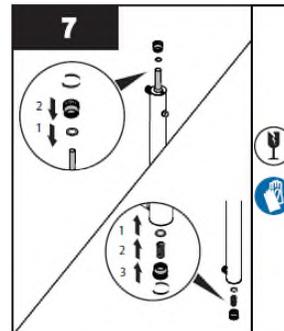
4 Carefully, remove O-ring adhering to the quartz sleeve. Remove the quartz sleeve.



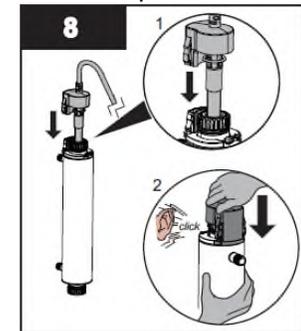
5 Clean the quartz sleeve with a cloth soaked in CLR, vinegar or some other mild acid and then rinse with water.  
**Note:** If sleeve cannot be cleaned completely or it is scratched or cracked, then replace the sleeve.



6 Reinstall the quartz sleeve in the chamber allowing the sleeve to protrude an equal distance at both ends of the chamber. Slide supplied O-rings onto each end of the quartz sleeve.



7 Reinstall the top and bottom retaining nuts, floating spring, and O-rings respectively. • When service is complete, assemble the prerequisites in the reverse order of disassembly. Plug in controller and verify the POWER-ON LED display is illuminated and controller power-up sequence operates.



8 Push the lamp connector against lamp connector base until an audible click is heard. Re-pressurize the system to check for leaks.

## 7.3 UV Sensor Cleaning / Replacement

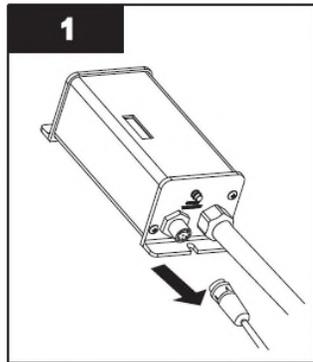
Mineral deposits and sediment may accumulate on the sensor window over time, decreasing the UV energy detected. If the UV controller indicates that the UV intensity is low, one cause may be a stained quartz sleeve and / or sensor window.

**WARNING:** The UV sensor is an extremely sensitive and fragile instrument. Extreme care is required when handling. The sensor window is constructed from quartz, which is extremely fragile. Use caution when handling the sensor to ensure that you do not chip or break this quartz window.

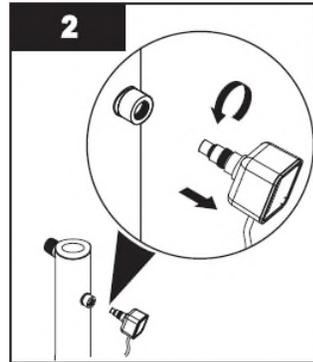
### Prerequisites:

Remove and clean the quartz sleeve.

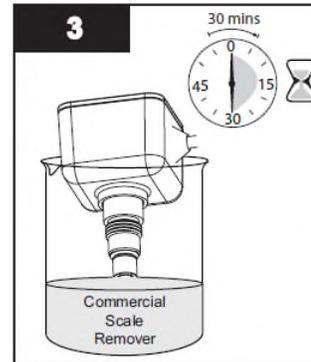
**Note:** The quartz sleeve and UV sensor should be cleaned at the same time.



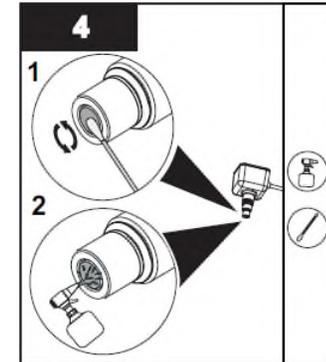
1  
Disconnect the UV sensor from the controller by disconnecting the sensor cable.



2  
Remove the UV sensor by grasping the body of the sensor and rotating it counter-clockwise.



3  
Submerge only the end of the sensor in the commercial scale remover for 30 minutes.



4  
Clean the sensor with a cotton swab and spray with water.

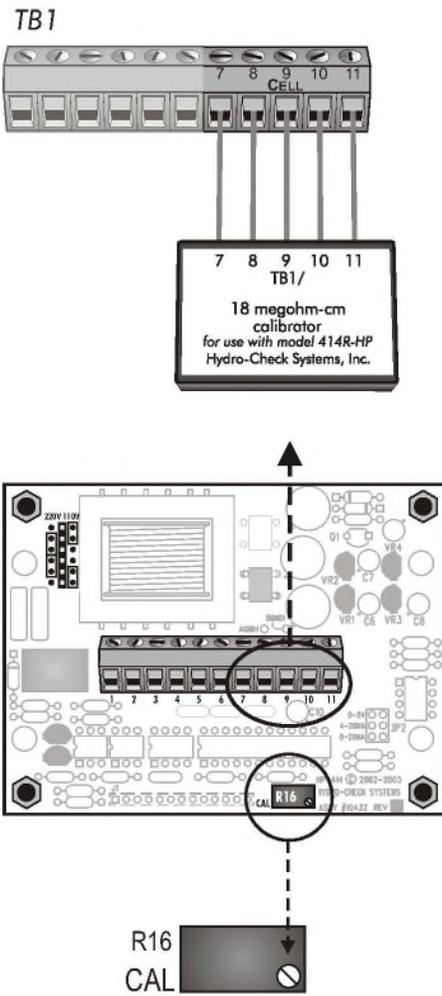
Re-insert the UV sensor until a water-tight seal is achieved.

## **7.4 Resistivity Meter Calibration**

The resistivity meter should never require calibration. It is recommended to verify the accuracy of the resistivity meter annually by comparing the value shown on the meter against a sample from the post filter sample port and analyzing this with a known good hand meter. In the event that the reading cannot be verified within 5% accuracy, calibration can be performed as follows.

1. Power down the device and remove the line cord from the power source.
2. Open the access door to the electrical enclosure and remove the 4 screws on the rear of the resistivity meter.
3. Remove the cover and locate the calibration trimmer (FIGURE 16), CAL / R16, on the lower edge of the circuit board.
4. Locate TB1 and the 5 cell wires leading to positions 7-11.
5. Loosen the screws and disconnect the 5 cell wires.
6. Insert the pins of the cal module (see section 9.0 for part #) in the same position as the cell wires with the label facing up.
7. Secure the screws to the cal module.
8. Plug in the device and turn the unit on, allowing the resistivity display to stabilize.
9. If the displayed reading differs from the rating of the cal module, turn the cal trimmer, R16, with a small fine screwdriver until the reading agrees.
10. Power down the unit and remove the line cord from the power source.
11. Remove the cal module and re-install the resistivity cell.
12. Replace the enclosure's rear cover and close the electrical enclosure.
13. Plug the device line cord back into the power supply and turn on the device.

Figure 16



## 8.0 Troubleshooting Guide

| Symptom                                    | Possible Cause                                 | Correction   |
|--|--|--|
| High Bacteria Counts                       | UV light quartz sleeve dirty                   | <ul style="list-style-type: none"> <li>• Clean sleeve with scale cleaner</li> <li>• Replace quartz sleeve</li> </ul>   |
| Water Appears “Milky”                      | Air in water line                              | <ul style="list-style-type: none"> <li>• Run water until air is purged</li> </ul>  |
| “Lamp Life Expired” Error on UV Controller | Lamp expired                                   | <ul style="list-style-type: none"> <li>• Replace UV lamp</li> </ul>  |
| “Sensor Failure” Error on UV Controller    | No signal to UV controller                     | <ul style="list-style-type: none"> <li>• Ensure sensor cable is properly connected to controller</li> <li>• Disconnect sensor for 5 seconds to re-set sensor</li> <li>• Replace UV sensor</li> </ul>   |
| “Interlock Open” Error on UV Controller    | Lamp connector not fully seated                | <ul style="list-style-type: none"> <li>• Ensure that the lamp connector is fully seated</li> <li>• Verify locking clip is in place</li> </ul>  |
| “Lamp Failure” Error on UV Controller      | Lamp is not providing signal to the controller | <ul style="list-style-type: none"> <li>• Verify engagement of the lamp to the lam connector</li> <li>• Lamp connection contacts are corroded</li> <li>• Lamp expired - replace</li> </ul>  |
| “Low Level UV” Error on UV Controller      | Insufficient UV for adequate disinfection      | <ul style="list-style-type: none"> <li>• Clean quartz sleeve and sensor lens</li> <li>• Replace UV Lamp</li> <li>• Replace UV sensor</li> </ul>  |
| Red Alarm Light Illuminated on Pump        | Pump has an alarm condition                    | <ul style="list-style-type: none"> <li>• Pump has ran dry – add water to storage tank</li> <li>• Pump is over temperature – allow to cool then re-start</li> <li>• Overloaded motor – will attempt to restart every 30 minutes for a 24 hour period. Replace if not corrected.</li> <li>• Seized up pump - will attempt to restart every 30 minutes for a 24 hour period. Replace if not corrected.</li> </ul> |

## **9.0 Replacement Parts**

| Description                                    | Part Number |
|--|-------------|
| Filter Cartridge, Tank Vent                    | 20-3021     |
| Filter Cartridge, 0.2 Micron, 2-½" x 20", Doe  | 20-3022     |
| Float Switch Assembly W/Spiral                 | 0167-0017   |
| Pressure Gauge, 0 – 100 PSI, Center Back Mount | 43-0021     |
| Pressure Gauge, 0 – 60 PSI, Bottom Mount       | 43530703    |
| Pump   | 80-0002     |
| Regulator Valve                                | 45760178    |
| Resistivity Cell                               | 72510734    |
| Resistivity Controller                         | 72510731    |
| Resistivity Meter Cal Module                   | 71-0003     |
| UV Quartz Sleeve                               | 76-0019     |
| UV Replacement Bulb                            | 76-0016     |
| UV Sensor                                      | 76-0017     |

## **10.0 Replacement Instructions**

### **10.1 Preparation**

1. Power down unit and remove the line cord from the power source.
2. Turn off the incoming water to the storage tank.
3. Close the outgoing and return valves on the loop.
4. Relieve the pressure in the system by opening the relief valve on the post filter sample port.
5. Drain the tank (if necessary).

### **10.2 Pump Replacement**

1. Prepare for replacement by following the instructions in section 10.1.
2. Remove the 4 bolts that secure the pump to the base of the storage tank and set aside for use on the replacement pump.
3. Place a small catch basin beneath the union on the pump discharge and detach this from the pump, allowing the water to drain.
4. Detach the union from the pump inlet.
5. Remove the fittings from the pump for re-use on the replacement pump.
6. Remove all packing material from the replacement pump and place on the base of the storage tank in the same orientation as the original pump.
7. Prepare fittings removed from the original pump with Teflon tape and install into the replacement pump.
8. Connect the unions to the pump inlet and discharge.
9. Secure the pump to the base with the original bolts.
10. Close the sample port on the filter housing, open all valves to the loop and return water to the device.
11. Return the line cord to the power source.

12. Fill the storage tank with 50 gallons of water and prime the pump.
13. Disinfect per the instruction in section 4.0.

### **10.3 Resistivity Cell Replacement**

1. Prepare for replacement by following the instructions in section 10.1.
2. Open the controller cover to gain access to the resistivity controller.
3. Loosen the 4 screws on the rear panel of the access cover to gain access to the terminal strip.
4. Remove 5 wires for the resistivity cell from terminals 7-11 on the terminal strip.
5. Loosen the strain relief on the controller and pull the resistivity cell wires out of the box.
6. Remove the resistivity cell from the tee at the base of the UV light.
7. Prepare the threads of the replacement cell with Teflon tape and install into the tee.
8. Route the wires through the strain relief and into the resistivity controller.
9. Install the wires into the terminal block in the following order:
  - White to terminal 7
  - Black to terminal 8
  - Shield to terminal 9
  - Red to terminal 10
  - Green to terminal 11
10. Replace the access cover on the resistivity meter and tighten the strain relief.
11. Close the access panel and return the line cord to the power source.
12. Close the sample port on the post-filter, open all valves to the loop and return water to the device.
13. Disinfect the system per the instructions in section 4.0.

## 10.4 Resistivity Controller Replacement

1. Power down the unit and remove the line cord from the power source.
2. Open the controller access cover.
3. Loosen the 4 screws on the rear panel of the resistivity meter access cover to gain access to the terminal strip.
4. Remove the resistivity cell wires and pull free from the resistivity controller.
5. Remove the input power lines from the terminal strip and pull free from the controller.
6. Loosen the fasteners used to hold the controller into the electrical enclosure and slide out.
7. Install the replacement controller into the existing opening on the electrical enclosure and fasten in place.
8. Remove the rear access panel from the controller.
9. Router the wires from the resistivity cell as well as main power into the controller to facilitate convenient connection to the terminal strips.
10. Place the main power to the terminal strip in the following order:
  - Hot wire to terminal 1
  - Neutral wire to terminal 2
  - Ground wire to terminal 3.
11. Install resistivity cell wires into the terminal block in the following order:
  - White to terminal 7
  - Black to terminal 8
  - Shield to terminal 9
  - Red to terminal 10
  - Green to terminal 11
12. Replace the rear access panel and close the electrical enclosure.
13. Reinstall the line cord to the power source.
14. Close the sample port on the post-filter, open all valves to the loop and return water to the device.

## **11.0 Warranty**

The buyer has a one year warranty on all equipment and parts, excluding non-durable components (e.g., UV light, micron post-filter); provided that the system is not subject to abuse, misuse, alteration, neglect, freezing, accident or negligence; and provided further that the system is not damaged as the result of any unusual force of nature such as, but not limited to, flood, hurricane, tornado lightning, or earthquake. The warranty covers the replacement of equipment and/or parts only. The warranty does not cover labor charges or travel expenses resulting from the service of equipment. The manufacturer is excused if failure to perform its warranty obligations is the result of strikes, government regulation, materials shortages, or other circumstances beyond its control.

To obtain warranty service, notice must be given to the manufacturer within 30 days of the discovery of the defect.

There are no warranties on the system beyond those specifically described above. All implied warranties, including any implied warranty of merchantability or of fitness for a particular purpose are disclaimed to the extent they might extend beyond the above periods. The sole obligation of the manufacturer under these warranties is to replace or repair the component or part which proves to be defective within the specified time period, and the manufacturer is not liable for consequential or incidental damages. No dealer, agent, representative, or other person is authorized to extend or expand the warranties expressly described above.

**Some states do not allow limitations on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damage, so the limitations and exclusions in the warranty may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.**