

# SALCOR INC

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## INSTALLATION, OPERATION & MAINTENANCE MANUAL



**Made in  
the USA**



## UV DISINFECTION UNIT MODEL 3G

October 2016

# SALCOR INC

## TWENTY-ONE SALCOR UV MODEL 3G 6-MONTH TESTS

*Since 1997, Manufacturers of 21 Treatment Units Have Partnered with the Salcor 3G UV Unit. Each Used the NSF Standard 40 and the Washington State Fecal Coliform Reduction Protocol for 26 weeks. Salcor's 3G UV Effluent Fecal Coliform Count Ranged From 2 to 35 per 100 ml. (Geometric Mean).*

The following is a list of the partnered manufacturers

**Aero-Tech**  
**AK Industries, Hydro Action**  
**ANUA (Bord na Mona)**  
**AquaKlear**  
**Bio-Microbics, FAST**  
**Clearstream**  
**Consolidated Treatment Systems, EnviroGUARD**  
**Consolidated Treatment Systems, MULTI-FLO**  
**Consolidated Treatment Systems, NYADIC**  
**Delta Environmental (Pentair), Whitewater**  
**Delta Environmental (Pentair), ECOPOD**  
**Ecological Tanks**  
**Enviro-Flo (NuWater)**  
**Fuji Clean USA**  
**Hoot Aerobic Systems**  
**Jet**  
**Lowridge On Site Technologies**  
**Norweco**  
**Orenco Systems**  
**Quanics**  
**Solar Air**

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## I. INSTALLATION INSTRUCTIONS

### **WARNING! Improper Connection of the APPLIANCE GROUNDING CONDUCTOR Can Result in the Risk of an Electric Shock.**

Check with a qualified electrician or service representative if you are in doubt about whether the appliance is properly grounded.

Open and carefully unpack the shipping carton. Check for any damage that may have occurred in shipping. If there are any problems, call **SALCOR INC.** at 760-731-0745 or Fax to **SALCOR INC.** at 760-731-2405 and explain the problem(s).

The following list describes the components that are contained in the shipping carton.

1. Disinfection chamber: 3-inch diameter ABS pipe with 4-inch inlet and outlet hubs.
2. Disinfection sub-assembly consisting of an anodized aluminum frame supporting a Teflon® sheath containing a pure fused quartz tube. This complete item is packed inside of the above listed 3-inch disinfection chamber.
3. Riser pipe: 4-inch diameter ABS pipe.
4. 1-inch white PVC handle which is used for inserting and removing the disinfection sub-assembly. It is bubble-wrapped inside of the above listed 4-inch riser pipe.
5. The Long Life UV lamp is bubble-wrapped and packed inside of the 1-inch white PVC handle.
6. Electrical sub-assembly junction box (rated NEMA 6P) with pre-wired alarm board, electronic ballast, and the lamp cable supplying power to the UV lamp.
7. Two 4-inch Schedule 40 ABS pipe couplings.
8. Watertight connection for bringing the power and alarm wires into the junction box. Flexible ***Watertight*** conduit should be used to connect to this fitting.
9. Dielectric Grease, to be used on the inside of the boot on the UV lamp socket.

#### **There will be some additional items to be supplied by the installer**

1. Teflon® tape for sealing PVC and Watertight connectors
2. ABS cement (also multipurpose cement if bonding to PVC pipe)
3. Isopropyl (rubbing) alcohol for cleaning the subassembly unit before installing
4. Glycerin (available from drug stores) for lubricating the gaskets of the subassembly
5. Power and Alarm Wires. **Wire all circuits with insulation rated 600 VAC min.**
6. Power and Alarm Wire Watertight Flexible Conduit for connecting to the Junction Box watertight connector
7. Irrigation Valve Box if the 3G Unit is to be installed at or above ground
8. Silicon Adhesive Sealant, also called RTV

### **WARNING! This Device Produces Potentially Harmful UV Light. Always Protect Your Eyes and Skin From Exposure to UV Light. Disconnect Power Before Replacing or Servicing the 3G Unit/Lamp.**

## Salcor 3G Disinfection Unit

NOTE: Not all dimensions to scale

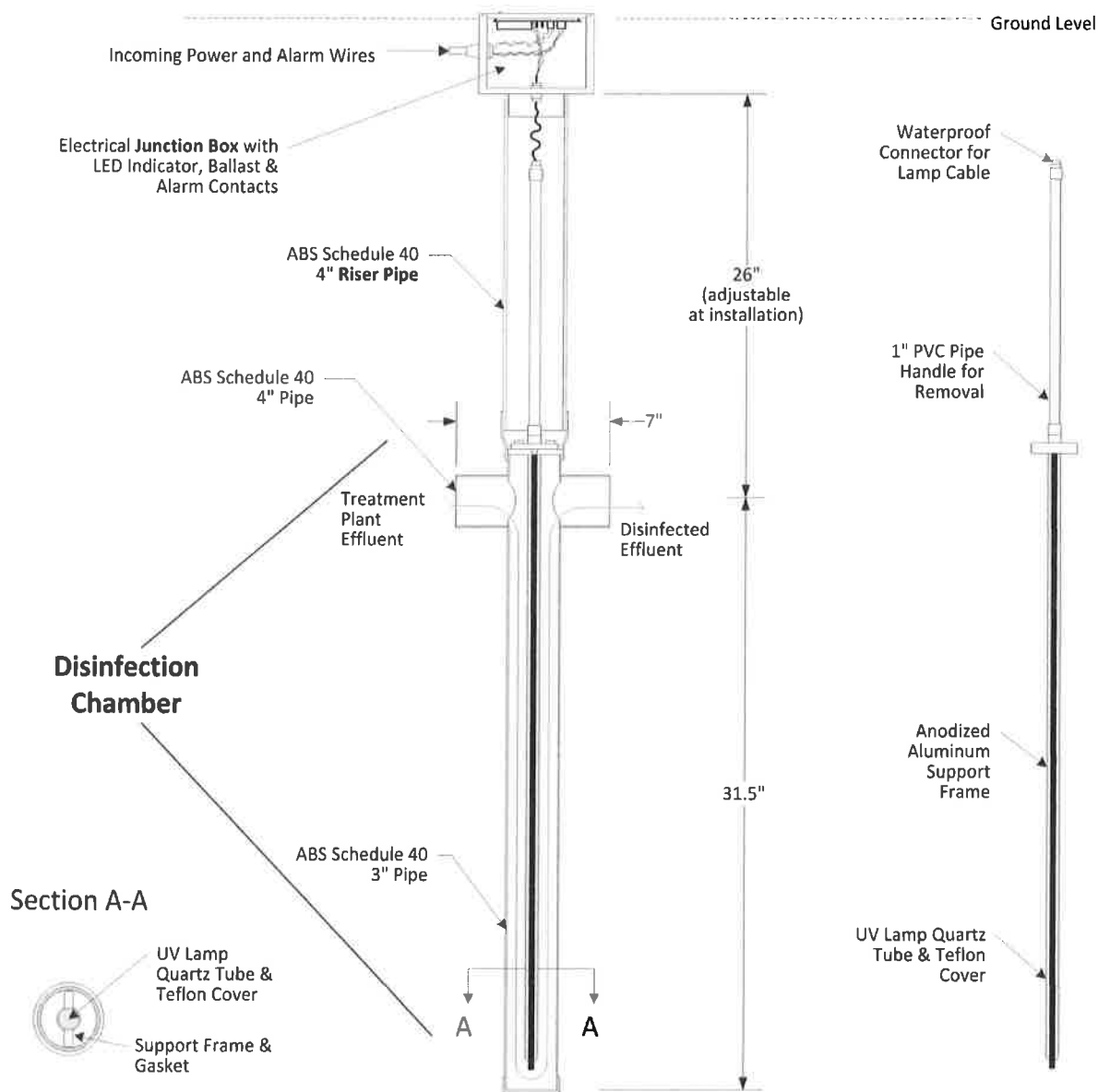


Figure 1

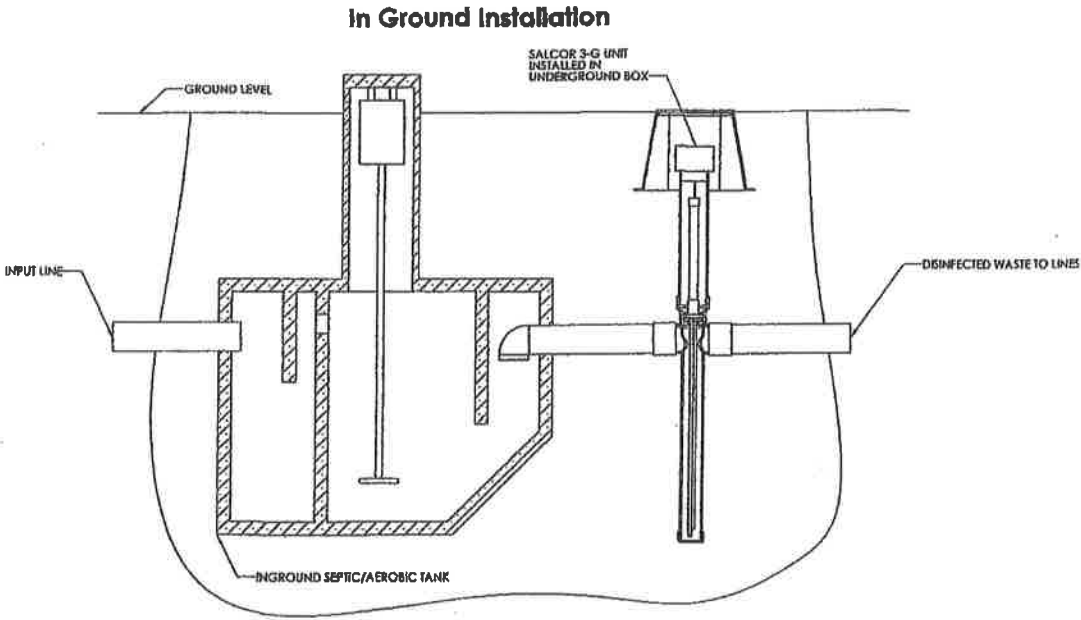


Figure 2

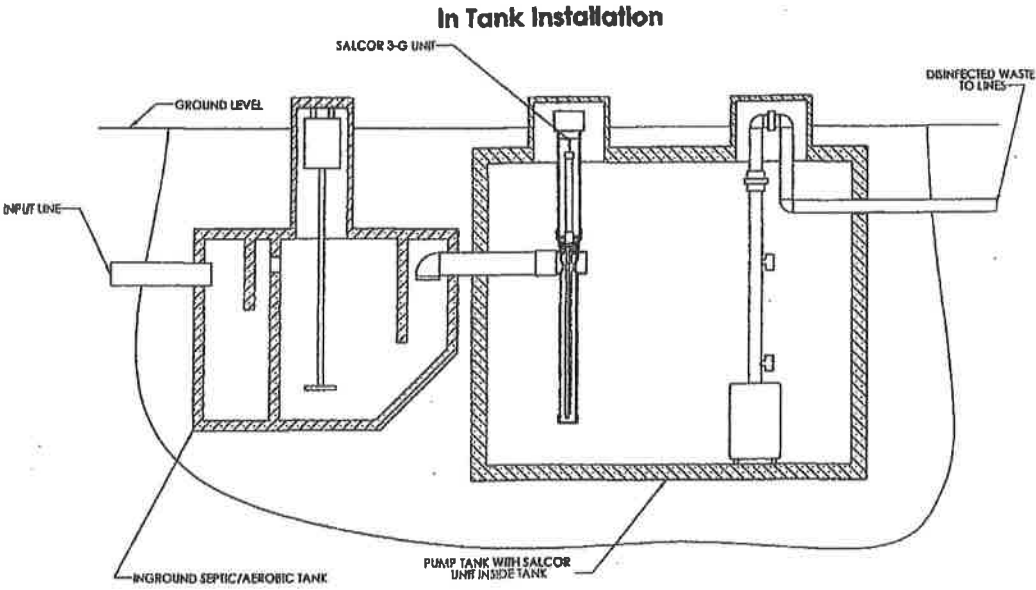


Figure 3

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## II. TWO INSTALLATION OPTIONS

1. In the Ground Installation: Couple the 4-inch inlet pipe to the exit pipe of the pretreatment unit, and couple the 4-inch outlet pipe to the drain field pipe. See **Figure 2** (Page 5).
2. In a Pump Tank Installation: Couple the UV Unit inlet pipe to the pretreatment unit exit pipe at the entrance of the pump tank. See **Figure 3** (Page 5).

Note: **Figure 2** (page 5) indicates that the electrical junction box should be placed at ground level. The junction box could be placed below grade in an irrigation valve box. The Junction box is rated NEMA 6P. However, for safe continuous operation, the junction box should be protected from flooding.

For in-pump tank installations, special care should be taken to prevent flooding of the junction box.

## III. DETAILED INSTALLATION STEPS

1. Install the 3-inch disinfection chamber in place at the site.
  - a. Position the disinfection chamber in the ground or in the tank.
  - b. Connect the hubs to the inlet and outlet pipes.

*3-Inch Disinfection Chamber*



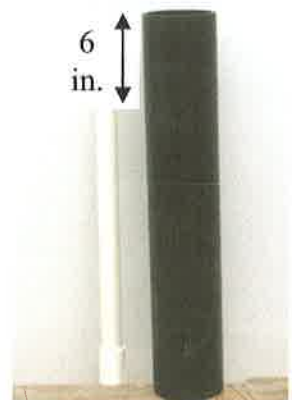
2. Cut the 4-inch riser pipe to meet the job needs. The 1-inch lamp handle may be cut to length after cutting the riser pipe.

- a. Use the 4-inch ABS inlet pipe connection to the pretreatment unit as a reference point.

See **Figure 1** (page 3).

- b. The lamp handle upper end should be cut so it will be approximately 6 inches from the top of the riser pipe.
- c. Bond the 4-inch riser pipe to the chamber sub-assembly.
- d. Bond the second PVC white threaded female adapter to the top or plain end of the white PVC pipe handle.

Riser Pipe & Lamp Handle



*White PVC Handle and  
4-inch Riser Pipe*

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- Carefully slide the lamp cable through the top of the white 1-inch PVC pipe handle. The lamp cable wire with the 4-pin lamp socket connector should extend out about 6 inches past the bottom end of the 1-inch white PVC handle which has a threaded female pipe adapter already bonded to it.

*Top End of PVC Handle with newly bonded adapter*



*Threaded Bottom End of PVC Handle*



- Carefully connect the 4-pin socket connector of the lamp cable to the UV lamp pins. Note: the pins are not arranged in a square formation.
  - Apply Dielectric Grease to the inside of the boot.
  - Push the 4-pin socket onto the pins on the UV lamp end. Make sure that the 4-pin socket connector is fully connected onto the pins. The socket to lamp pins connection is electrically critical to maintain the proper operation of the lamp. It is extremely important that there is a fully mated complete connection between the socket and the UV lamp pins.

*Lamp connector  
Pins are not  
Arranged in  
a square shape*



*Apply Dielectric  
Grease to the inside of  
the boot.  
Lamp Cord Connected  
and Lamp Inserted  
into the Aluminum  
Frame.*



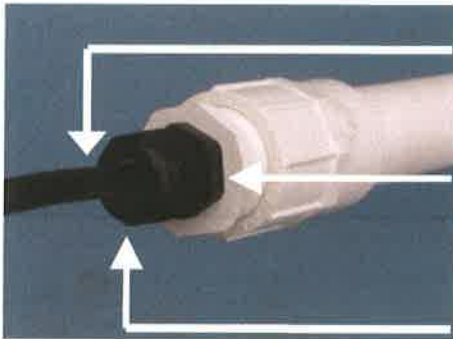
**CAUTION!! The UV Lamp, the Quartz Tube, and the Teflon® Sheath Covering *ARE ALL VERY FRAGILE*, So Handle Them With Care.**

- Carefully slide the UV lamp into the quartz tube in the frame assembly. Make sure that the UV lamp has **BOTTOMED OUT** in the Quartz Tube, that is, that the UV lamp is **FULLY SEATED** in the Quartz Tube. Do not force the UV lamp into the Quartz Tube, as UV Lamp may break the bottom of the Quartz Tube. Make sure that the UV Lamp is completely enclosed in the Quartz Tube.

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6. Wrap both ends of the threaded white PVC 1-inch lamp handle pipe pieces with Teflon® tape.

a. First, screw the bottom threaded end of the 1-inch lamp handle onto the top end of the aluminum frame assembly.



*Pull Extra Cable up  
Through the Gland Nut*

*Black Threaded  
Reducer*

*Tighten the Gland Nut*



*Top of the  
Aluminum Frame  
Assembly*

b. Second, screw the black threaded reducer into the top end of the handle pipe. It is important that Teflon® tape is used to seal all of the threads to maintain waterproof operation of the lamp.

c. Tighten the gland nut to approximately 22 in/lb to make the UV lamp chamber watertight. **CAUTION!! DO NOT OVER TIGHTEN!**

7. Inspect the Teflon® sheath.

a. If necessary, use a clean soft cloth and isopropyl (rubbing) alcohol to clean and remove any fingerprints from the Teflon® sheath.

b. Lubricate the rubber gaskets with either water or glycerin.



**Note: Do not use silicone or petroleum based lubricants on the gaskets.**

*PVC handle on the anodized aluminum frame assembly*

8. Gently insert the entire frame/handle assembly into the riser/chamber assembly using the white PVC handle. Make sure that the wide part of the sub-assembly is at right angles to the inlet and outlet pipes. The correct rotational orientation of the frame in the disinfection chamber is required for successful UV Unit operation. The frame must be at a right angle to the incoming effluent.



9. Tuck the extra lamp cord wire into the top of the riser pipe.

10. Place the round coupling on the bottom of the junction box into the top of the 4-inch riser pipe, and secure it with the setscrew.



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11. Install the Watertight Conduit connector to the side of the Junction Box and secure it with the nut on the inside. Use a little Silicone Adhesive Sealant, also called RTV, on the O-ring of the watertight conduit connector to assist in waterproofing.

*Installing Watertight Conduit Connector*



12. **Attention Installers!!** The SALCOR Model 3G Unit requires a specific separate independent 10-15-amp circuit breaker on the main electrical panel. *The Salcor UV Unit circuit breaker should be separate from the circuit breakers for the pumps, etc.*

**No other electrical unit should be connected to the Salcor 3G Unit circuit breaker.**

13. The UV Unit operates on 120 VAC single-phase (50 or 60 Hz) power and consumes 30 watts.

14. Bring the power wires and alarm wires into the junction box via the waterproof conduit connection. Seal the outside of the flexible conduit pipe to the waterproof connector with Silicone Adhesive Sealant. The *installer* is responsible for ensuring that the external flexible wire conduit connection(s) containing the power and/or alarm wires to the junction box are

**WATERTIGHT!!**

*Watertight Conduit Connector Nut Inside of the Junction Box*



15. Attach the power and alarm wires to the appropriate terminal block connections on the alarm board. See Figure 4 (Page 10).

The alarm contacts are compatible with external alarm circuit units furnished by others that use either normally open (N/O) or normally closed (N/C) contacts. Note: N/O means the contacts are **OPEN** when there is **NO POWER** to the alarm board relay. The contacts are rated for up to 240 volts and up to 2 Amps. Select the common connection terminal screw and then use either the N/C or N/O connection terminal screw that complies with the external receiving alarm circuit requirement.

16. Attach the lid to the junction box with 4 screws.

17. Allow the effluent to start flowing through the 3G Unit.

18. Turn on the circuit breaker at the main electrical control panel. The Green Indicator Light on the junction box lid should now be shining, indicating that the 3G Unit is operating properly. **The installation is now complete.**

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## IV. MAINTENANCE AND SERVICE

**It is recommended that the disinfection sub-assembly be removed and serviced (cleaned) a minimum of once per year to insure proper effluent disinfection.**

The Salcor Model 3G UV disinfection Unit is designed to provide a long service life; **It is recommended that the UV lamp be replaced every 2 years to insure proper disinfection.**

### UV LAMP REPLACEMENT PROCEDURE

1. Turn off the dedicated circuit breaker located on the main electrical control panel that supplies power to the UV Unit.
2. Remove the electrical junction box from the 4-inch riser pipe by loosening the junction box to riser pipe setscrew. Then carefully set the junction box aside.
3. Using the white PVC handle connected to the disinfection sub-assembly, lift the sub-assembly out of the disinfection chamber/riser pipe and set it aside.
4. After pulling out the sub-assembly, check the disinfection chamber to make sure there is no mud, debris, or other flow-impeding non-liquid material present at the bottom of the disinfection chamber.
5. If there is non-liquid material present in the bottom of the disinfection chamber, use a shop vacuum cleaner to vacuum out the excess material. Do not let the material flow downstream.
6. Loosen the lamp cable cord grip at the top of the white PVC handle so that the lamp cable can move through the cable grip and thus allow the handle to move away from the top of the aluminum frame assembly.
7. Unscrew the bottom threaded end of the 1-inch white PVC handle from the upper end of the aluminum frame assembly. Separate the handle from the assembly.
8. Disconnect the four pin socket connector attaching the lamp cable to the UV lamp. Remove the old UV lamp.
9. Use dielectric grease on the boot of the connector. Connect the 4-pin socket connector to the new lamp.

*Apply Dielectric Grease to the inside of the boot.*

*Lamp Cord Connected*

*Lamp Inserted into the Aluminum Frame*



- Make sure that the connector mates **COMPLETELY** onto the UV lamp pins.
10. Lower the new UV lamp into the quartz tube of the UV sub-assembly, making sure it bottoms out in the quartz tube. Do not use force that would break the quartz tube.

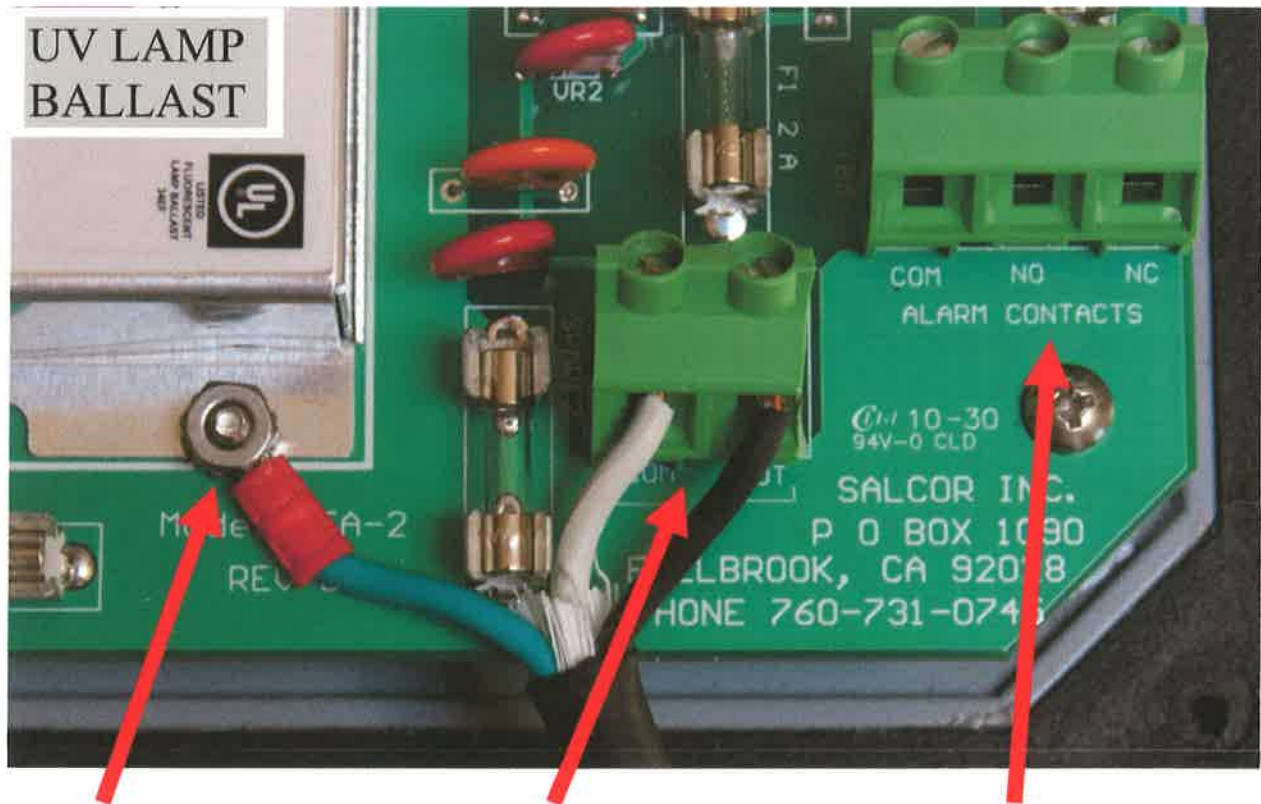
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11. Screw the bottom threaded end of the 1-inch lamp handle onto the upper end of the aluminum frame assembly. Use Teflon® tape to ensure a waterproof connection.
12. Using the white PVC handle, gently insert the entire frame/handle assembly into the riser/chamber assembly. Make sure that the wide part of the sub-assembly is at right angles to the inlet and outlet pipes.
13. Tuck the remaining lamp cable into the top of the riser pipe. Tighten all cord grips.
14. Put the junction box back onto the riser pipe. Tighten the setscrew.
15. Turn on the power to the UV Unit.
16. Check the green indicator light on the lid of the junction box for proper operation.
17. If the green indicator light is on, the installation procedure is finished.

## **TO CLEAN THE TEFLON® SHEATH AND DISINFECTION SUB-ASSEMBLY**

1. Use a soft sponge and detergent to clean the surfaces, especially the Teflon® sheath. Be careful when cleaning the Teflon® sheath, as it is *Very Fragile*.
2. Use a soft cloth with isopropyl alcohol to remove difficult stains such as finger prints or other films from the Teflon® sheath.

## **V. ELECTRICAL CONNECTIONS ON THE ALARM BOARD**



**Grounding Post    Power Inlet Terminal Block    Alarm Wire Terminal Block**

***Figure 4***

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The Printed Circuit Alarm Board is permanently mounted on the Junction Box Lid. The power and alarm terminal blocks are mounted on the Printed Circuit Alarm Board. The ballast is mounted on the Printed Circuit Board. When necessary, an inoperative ballast may be replaced by qualified maintenance personnel.

Note: N/O or N/C describes the contact configuration when there is **NO POWER** APPLIED to the relay.

Another way of designating the N/O or N/C condition is that the relay contacts are Normally Open or are Normally Closed when the relay is: **NOT ENERGIZED!**

1. Connect the alarm wires as needed for your specific alarm circuit requirements to Alarm Board TB5
2. Connect the power wires to the Power Inlet Terminal Block, TB4. The Terminal Block is labeled with connection points for the com and hot wires. The ground wire connects to the ground stud on the ballast.

## **VI. DECLARATION OF CONFORMITY**

Salcor Inc. declares that the Salcor Model 3G UV Disinfection Unit conforms to the applicable provisions of the Code of Federal Regulations (CFR) requirements including, Title 21, Chapter 1, Subchapter J, Radiological Health.

## **VII. PARTS LIST FOR SALCOR MODEL 3G UV UNIT**

Part No.	Part Description
1010	New Electrical Subassembly: Includes NEMA 6P Junction Box with Printed Wiring Alarm Board and Ballast Mounted on the NEMA 6P Junction Box Lid, a Lamp Cable, and a UL Waterproof Electrical Conduit Fitting
1011	UV Lamp Ballast
1012	Lamp Cable
1014	Anodized Aluminum Frame Divider with a Quartz Tube and its Teflon Cover
1014 R	Frame Divider Rebuild: Replacement of the Quartz Tube and Teflon Cover within an Existing Anodized Aluminum Frame
1015	ABS Plastic Disinfection Chamber
1016	Long Life (Two Year) UV Lamp

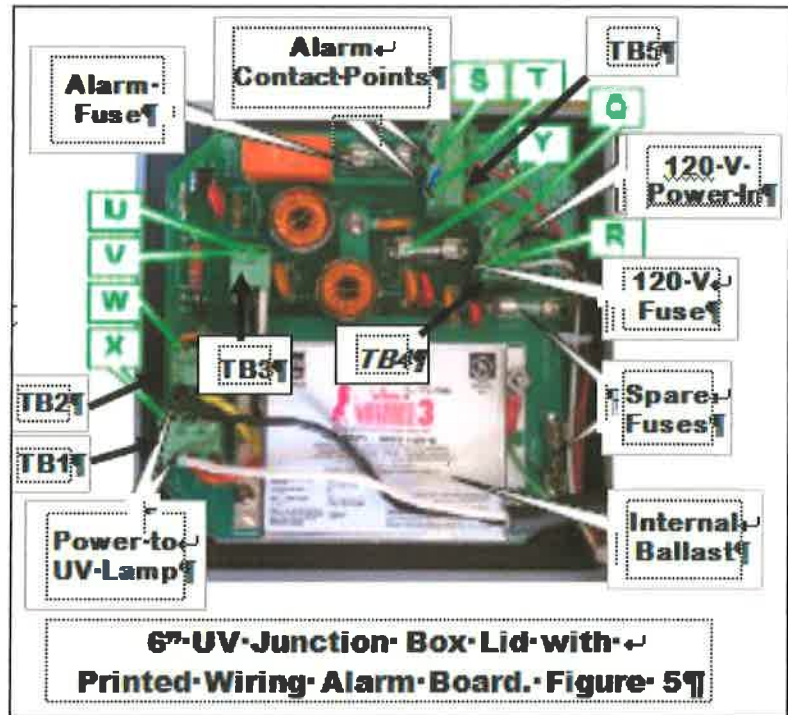
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## VIII. DESCRIPTION OF THE FUNCTIONAL OPERATION OF THE SALCOR MODEL 3G UNIT ALARM BOARD

The 120 VAC power is fed into the junction box and connected to the Printed Wiring Alarm Board at points Q & R of terminal block **TB4**. The power is then routed through the fuse at point Y and on to points U and V of terminal block **TB3**. The ballast wires are connected to points U and V of terminal block **TB3**. The ballast establishes proper power operation for the UV lamp. The regulated output power from the UV ballast is then routed through the alarm board circuitry for monitoring and then on to the UV lamp via the UV lamp cable connected to points W & X of terminal blocks **TB1** and **TB2** on the printed circuit alarm board.

The Green Indicator light indicates when there is correct lamp current.

The alarm relay contact terminal block **TB5** is shown as having connection points S & T.



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## LIMITED WARRANTY

### SALCOR MODEL 3G UV DISINFECTION UNIT

This warranty is given by SALCOR Inc. for the benefit of the first purchaser of the product to which the warranty applies. The warranty applies only to those parts which are manufactured and delivered by SALCOR Inc.

The warranty is that the parts manufactured and delivered by SALCOR Inc. will be free from defects in the material or workmanship under normal use and service according to the Installation and Operating Instructions for the time specified below.

In the event of a failure of a part due to such a covered defect, SALCOR Inc. will repair or replace, at its option, the defective part at its factory located at 447 Ammunition Road, Suite E, Fallbrook, CA 92028. At the option of SALCOR Inc, repairs or replacement may be made at the site of equipment installation.

The part must be returned to the factory at the expense of the person claiming the benefit of the warranty unless SALCOR Inc. elects to repair or replace the defective part at the installed site.

The warranty shall be for a period of twenty four (24) months after the date of delivery of the product, or the specified service life of the product, whichever period is the shortest. All products for which warranty claims are filed must be returned as provided above to the factory within thirty (30) days from the date of the claimed malfunction in order for this warranty to be effective. The only entity authorized to do any warranty repairs is SALCOR Inc.

The repairs or replacement by SALCOR Inc. will be accomplished within twenty (20) days from receipt of the defective parts at the factory.

This warranty is expressed in lieu of all other warranties, expressed or implied, including the implied warranty of fitness for a particular purpose, and of all other obligations or liabilities on the part of SALCOR Inc., and it neither assumes nor authorizes any other persons to assume for SALCOR Inc. any other liabilities in connection with the sale of the products.

This warranty does not cover parts of products made by others, or products or any part thereof which have been repaired or altered, except by SALCOR Inc., which shall have been subjected to misuses, negligence, or accident.

SALCOR Inc. shall not be liable for damage or delay suffered by the purchaser regardless of whether such damages are general, special, or consequential in nature whether caused by defective material or workmanship, or otherwise, or whether caused by SALCOR Inc. negligence, regardless of degree.