LONGWAVE UV INC.

THE EXCLUSIVE MANUFACTURER
OF THE SALCOR 3G UNIT

Longwave UV, Inc.

The Salcor 3g unit from Longwave UV, Inc. is designed for residential, commercial, and municipal uses, and is UL-certified NEMA 6P Floodproof and NSF/Washington State Protocol six-month tested (with 21 upstream treatment systems). It inactivates pathogens, including superbugs. Rated at 9,000 gpd gravity flow, it is a reliable building block for large water recovery/reuse systems, according to the maker. When installed in 12-unit parallel/series arrays with ABS pipefittings, systems are disinfecting over 100,000 gpd. Gravity flow equalizes without distribution boxes. Identical modular units increase plant reliability and reduce the need for spare parts, facilitating plant expansion. Each unit has a foul-resistant Teflon lamp covering, two-year long-life lamp, allows for quick installation, requires minimal annual maintenance, and uses less than 30 watts of energy.

In the 90’s Jim Cruver focused on UV disinfection systems for water and waster. In 1997 he adapted the Salcor 3G UV disinfection system to treat 100,000+ gpd.

About UV Disinfection

UV Disinfection

Systems utilize **UV light** (a form of electromagnetic radiation present in sunlight) in order to kill bacteria and pathogens. UV-C disinfection refers to the use of UV light to kill the microbes and viruses on an object or in an environment. Ultraviolet (UV) light is a form of light that is invisible to the human eye

How does a wastewater UV Disinfection system work?

Unlike chemical approaches to disinfection, UV provides **rapid, effective inactivation of microorganisms through a physical process**. When microorganisms are exposed to the specific wavelengths of UV light, they are disinfected and rendered incapable of reproducing and infecting.

UV VS. CHLORINE

Chlorine gas is typically delivered to wastewater treatment plants in large cylinders mounted on trucks or trains. It must be transported and handled with extreme caution. Training programs, certifications and emergency preparedness must be in place and routinely practiced.

Sodium hypochlorite is a diluted liquid form of chlorine. It too must be handled and stored with caution, and containment and leak protection equipment must be in place.

UV VS. CHLORINE

Chlorine products can kill most harmful or disease-causing viruses and bacteria, but most disinfectants are **not** as effective as boiling for killing more resistant germs, such as the parasites *Cryptosporidium* and *Giardia*.

UV treatment systems are simple and straightforward to operate. Operation of a UV system requires no special training or certification, beyond standard start-up training.

Tasks for maintaining a UV system include replacing UV lamps, cleaning the quartz sleeves that house the lamps (though many UV systems now have automatic sleeve cleaning), and routine monitoring for treatment performance.

Pathogens/ Superbugs

Although some are beneficial, a few microorganisms called pathogens can make animals and humans sick. In order to cause disease, a pathogen must successfully invade some part of the body and either produce more of itself or produce a chemical (usually called a toxin) which interferes with normal body processes. Whether or not a pathogen is successful in causing disease depends on the health of the individual and the state of his or her immune system, as well as to the number of pathogen cells required to make the person ill. Some pathogens can cause disease when only a few cells are present. In other cases, many cells are required to make a person ill. Children and elderly persons are more susceptible to many pathogens than are young or middle-aged adults.

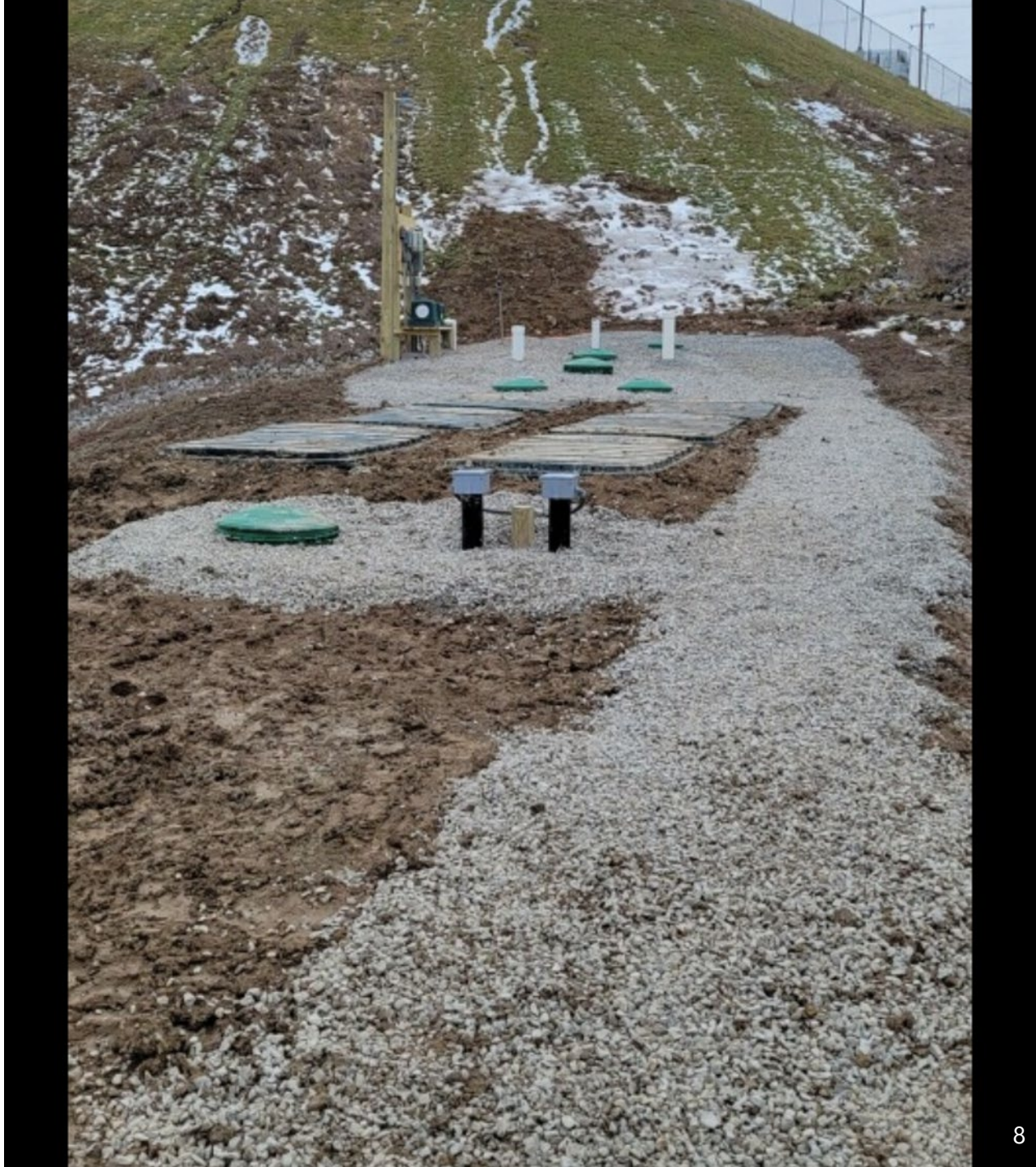
Waterborne pathogens include disease-causing algal toxins, bacteria, viruses, and protozoans that are transmitted to people when they consume untreated or inadequately treated water. Two such protozoans often seen in the news are *Giardia* and *Cryptosporidium*. Their consumption can lead to severe problems of the digestive system, which can be life-threatening to the very young, very old, or those with damaged immune systems.

Many communities routinely monitor streams, lakes, and beaches for bacteria that indicate a human health threat.

Superbugs are strains of bacteria, viruses, parasites and fungi that are resistant to most of the antibiotics and other medications commonly used to treat the infections they cause.

Wastewater used for Irrigation

Properly treated, the wastewater that flows through our sewers or septic systems is a valuable resource that can be used to irrigate and fertilize crops, and even to produce energy. Done properly, treatment of wastewater not only protects the environment, it protects human health and ensures that a vital resource is available to sustain communities with limited access to freshwater and energy supplies.



FACT

The Salcor 3g Unit is the most NSF tested Disinfection Unit on the market

Why Use the Salcor 3g Unit?

- Low Cost
- Easy to Install
- Easy to Maintain

Warnings!

A LICENSED ELECTRICIAN MUST INSTALL THIS UNIT!

WIRE ALL CIRCUITS WITH INSULATION RATED 600 VAC min.

THIS DEVICE PRODUCES POTENTIALLY HARMFUL UV LIGHT

ALWAYS PROTECT YOUR EYES AND SKIN FROM EXPOSURE TO UV LIGHT

MAKE SURE THE CONNECTOR MATES

COMPLETELY ONTO THE UV LAMP PINS

DISCONNECT POWER BEFORE REPLACING OR SERVICING THE 3G UNIT /LAMP

UV LAMP, QUARTZ TUBE AND TEFLON@ SHEATH ARE ALL FRAGILE

JUNCTION BOX SHOULD BE PROTECTED FROM FLOODING

DO NOT USE SILICONE OR PETROLEUM BASED LUBRICANTS ON THE GASKETS

Simple Design

Parts List

Disinfection chamber: 3-inch diameter ABS pipe with 4-inch inlet and outlet hubs-1

Disinfection sub-ilssembly consistingof an anodized aluminum frame supporting a --reflon ® sheath containing a pure fiised quartz tube-1

Riser Pipe- 4-inch diameter ABS pipe-1

1-inch white PVC Lamp handle-1

Long life lN Lamp- Bubble wrapped and packed inside the PVC handle-1

Electrical Sub-Assembly Junction Box (rated NEMA 6P) - 1

Alarm Board (pre-wired) - 1

Electronic Ballast-1

Lamp Cord-1

4-inch Schedule 40 ABS pipe couplings-2

Watertight connection-1

Dielctric Grease-1

Parts not Included

TEFLON@TAPE

ABS CEMENT

MULTI PURPOSE CEMENT

ISOPROPYL ALCOHOL

GLYCERIN

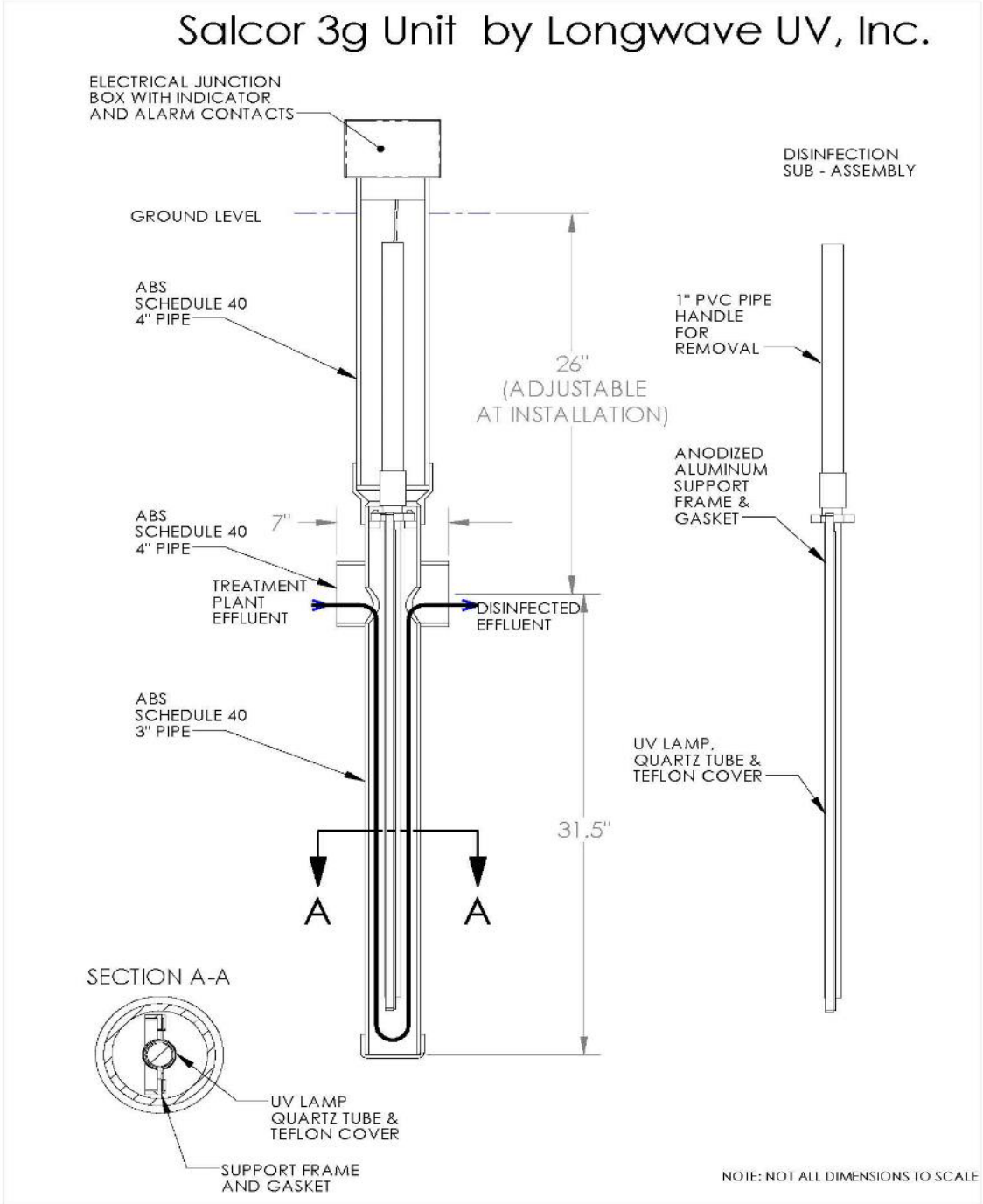
POWER AND ALARM WIRES

SILICONE ADHESIVE (R1V)

*IF INSTALLING ABOVE GROUND IRRIGATION VALVE

LONGWAVE UV INC.

Installation Steps



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.

White PVC Handle and 4-inch Riser Pipe

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.

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

The lamp handle upper end should be cut so it will be approximately 6 inches from the top of the riser pipe

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

Top End of PVC Handle with newly bonded adapter

Carefully slide the lamp cord through the top of the white 1-inch PVC pipe handle. The lamp cord 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.

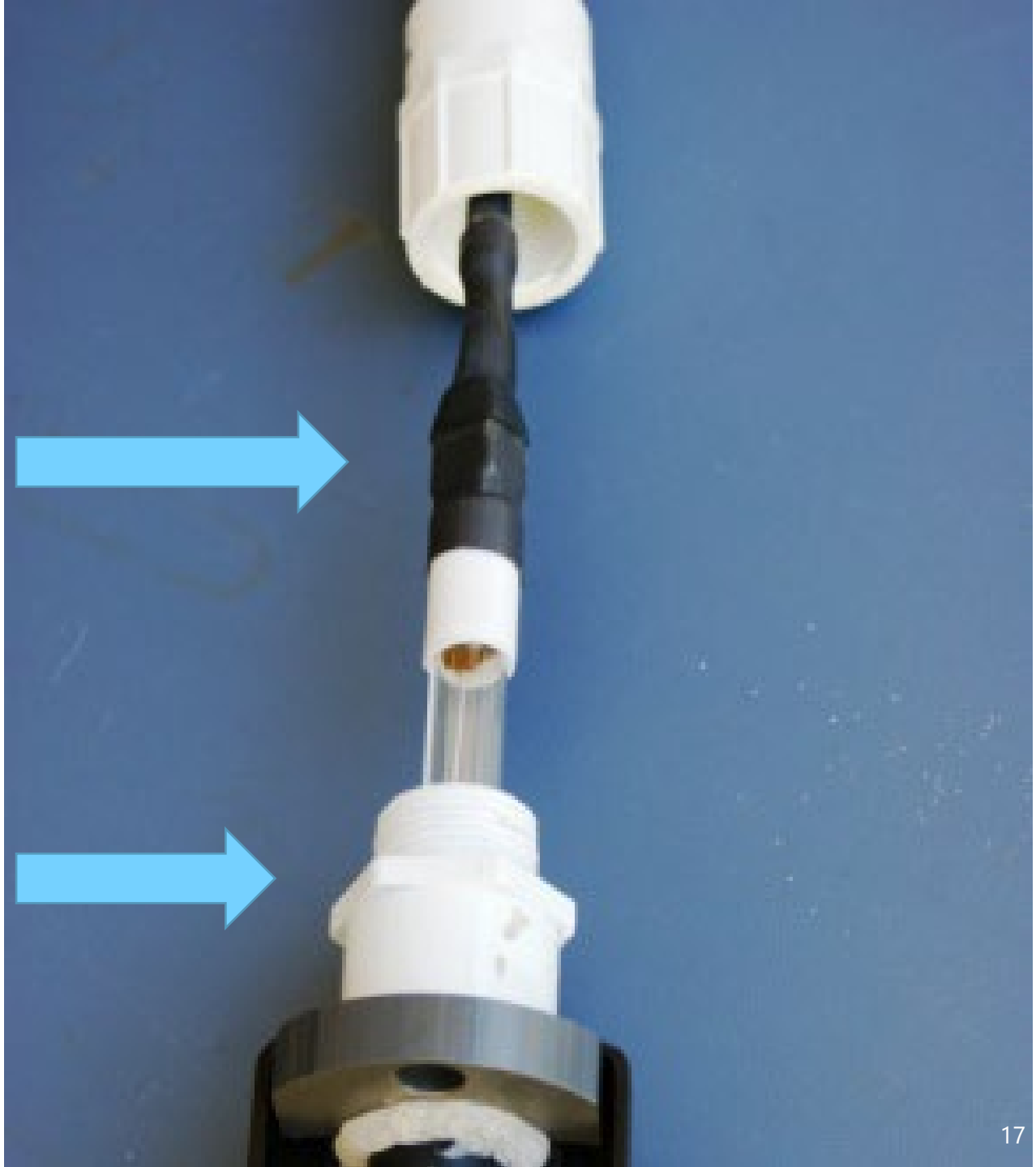
Threaded Bottom End of PVC Handle

Lamp connector pins are not arranged in a square shape

Carefully connect the 4-pin socket connector of the lamp cord 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.



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.

CAUTION

DO NOT OVERTIGHTEN!!

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

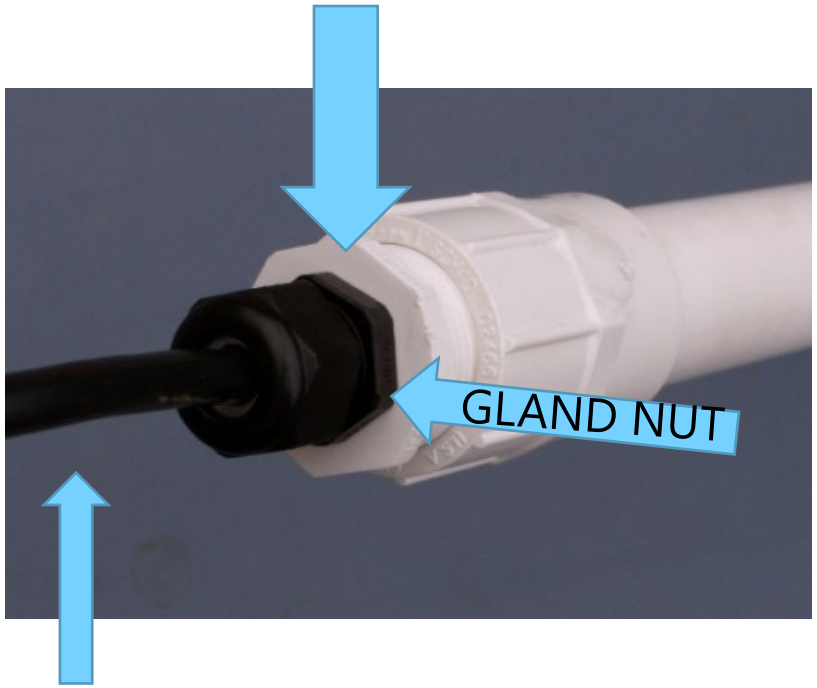
screw the bottom threaded end of the 1-inch lamp handle onto the top end of the aluminum frame assembly

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.

Pull Any Extra Cord up Through the Gland Nut.

Tighten the gland nut to approximately 22 in/lb to make the UV lamp chamber watertight

Black threaded reducer at the top of the lamp handle



EXTRA LAMP CORD

Top of the Aluminum Frame Assembly

Anodized Frame Assembly

Inspect the Teflon® sheath

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

Lubricate the rubber gaskets with either water or glycerin.

PVC handle on the anodized aluminum frame assembly

Caution

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

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

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.

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

Attention Installers!!

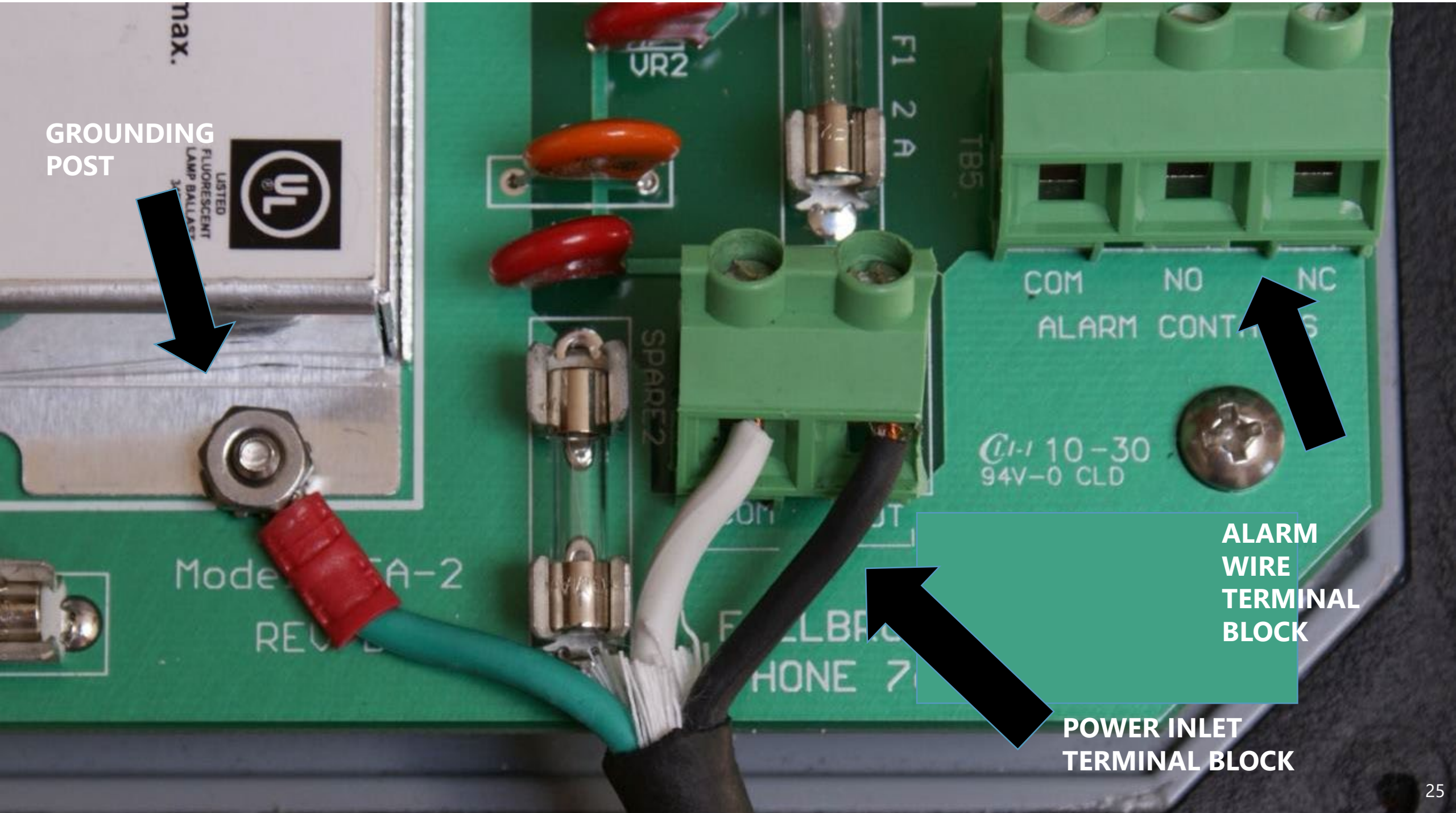
The LONGWAVE UV INC. Model 3G Unit requires a specific separate independent 10-15-amp circuit breaker on the main electrical panel. ***The LONGWAVE UV INC.UV Unit circuit breaker should be separate from the circuit breakers for the pumps, etc.***

No other electrical unit should be connected to the LONGWAVE UV INC.3G Unit circuit breaker.

The UV Unit operates on 120 VAC single-phase (50 or 60 Hz) power and consumes 40 watts.

Watertight Conduit Connector Nut Inside of the Junction Box

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!!


GROUNDING POST
VR2
F1 2A
TB5
COM
NO
NC
ALARM
10-30
94V-0 CLD
SPARE2
ALARM WIRE TERMINAL BLOCK
POWER INLET TERMINAL BLOCK

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

Attach the lid to the junction box with 4 screws

Attach the lid to the junction box with 4 screws

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


YOUR
INSTALLATION IS
COMPLETE

TWO INSTALLATION OPTIONS

IN GROUND INSTALLATION

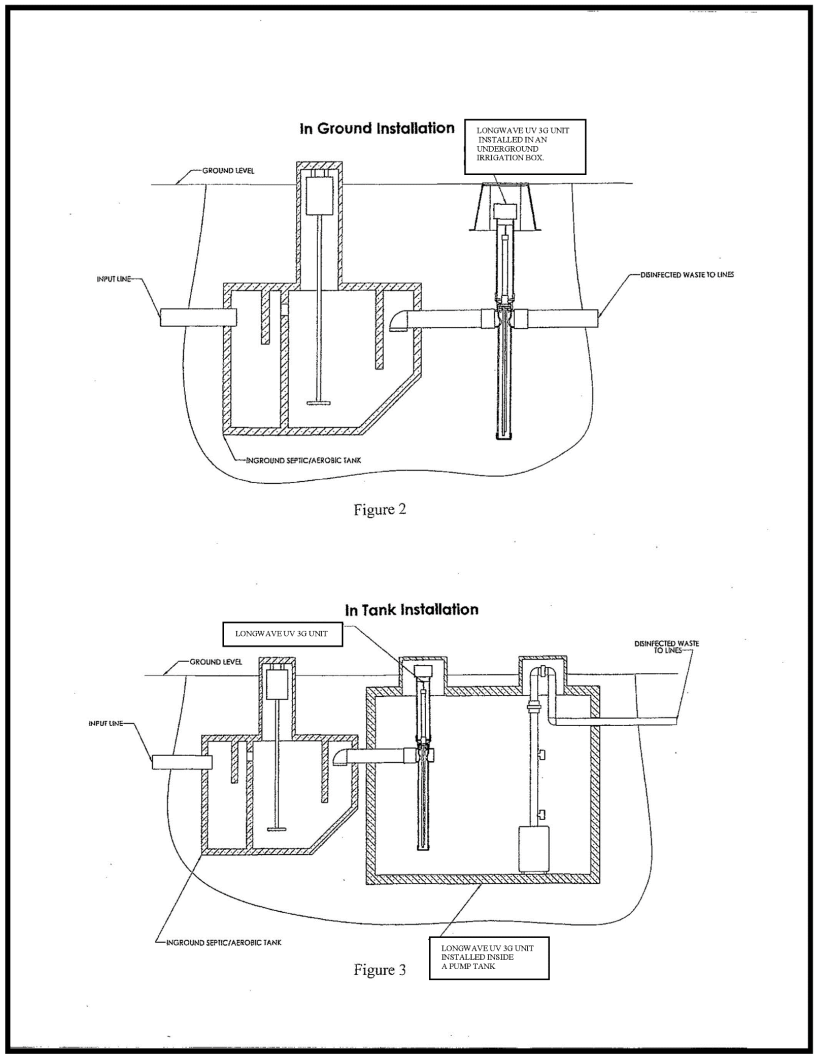
IN TANK INSTALLATION

**NOTE TIIE JUNCTION BOX CAN BE PLACED BELOW GRADE IN AN IRRIGATION VALVE BOX. TIIE BOX SHOUW BE PROTECTED FROM FLOODING*.

ILLUSTRATION

Couple the 4-Inch inlet pipe to the exit pipe of the pretreatment

unit and couple the 4-inc outlet pipe to the drain field pipe.

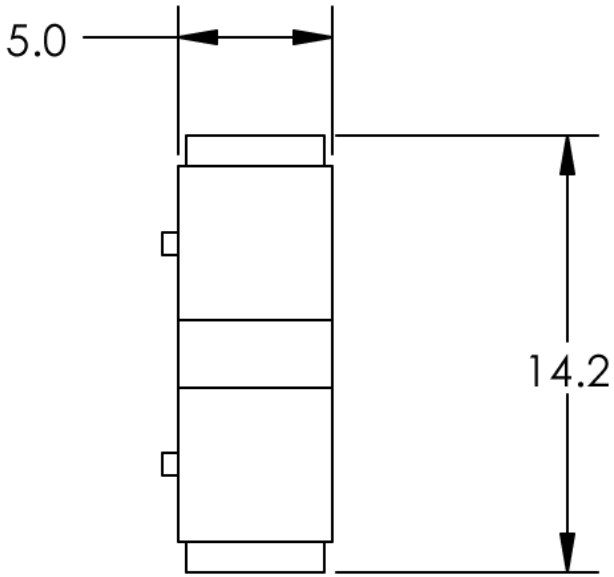


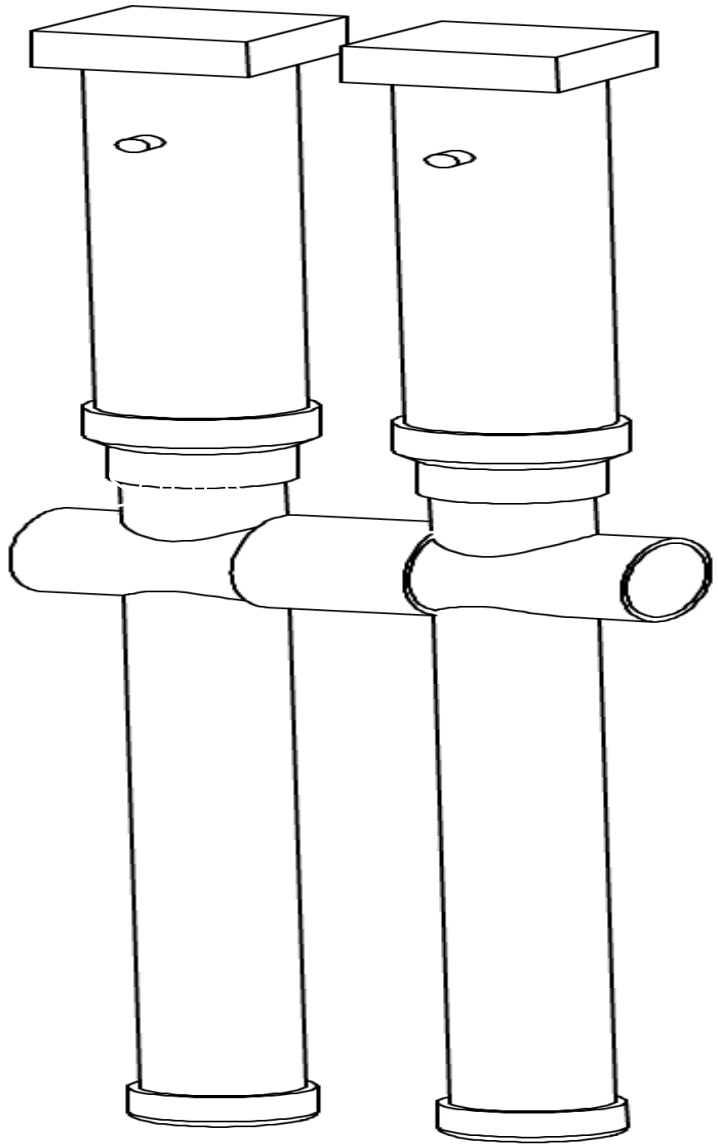
COUPLE THE 3G UNIT INLET PIPE TO THE PRETREATMENT

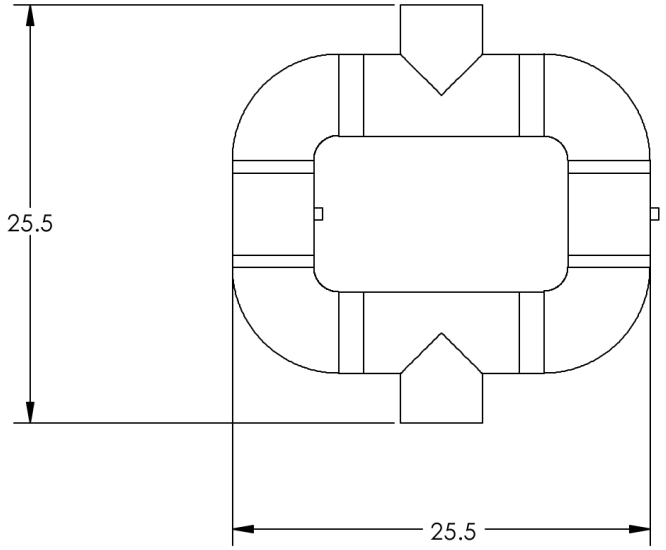
UNIT EXIT PIPE AT THE ENTRANCE OF THE PUMP TANK.

Salcor 3G Unit can be stacked in multiple Arrays

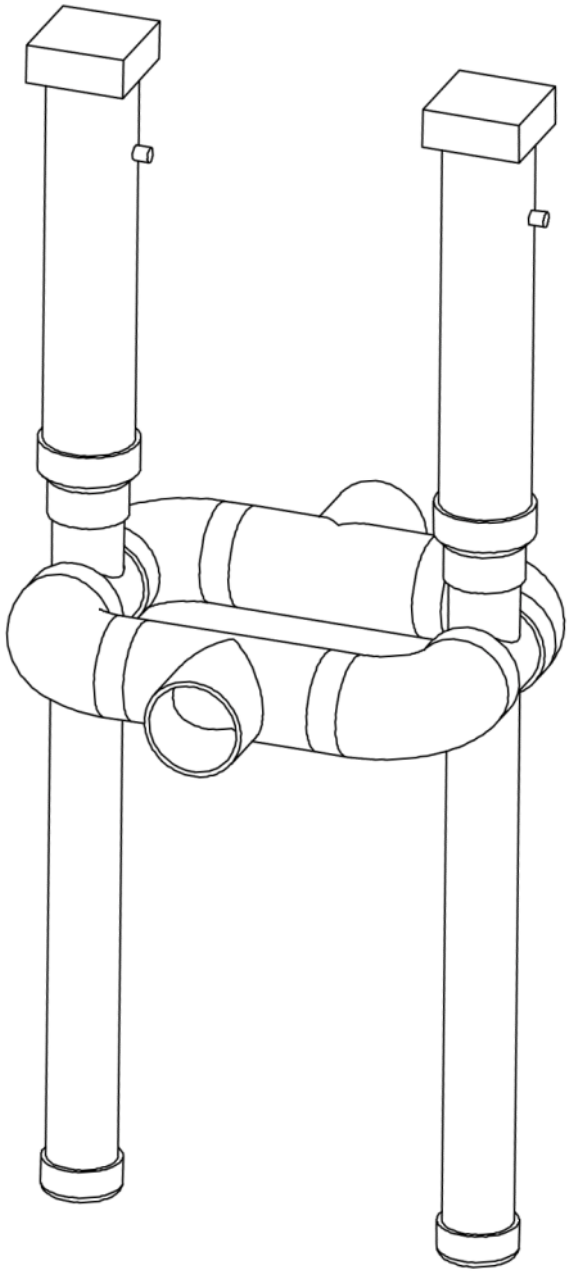
2 UNITS IN SERIES





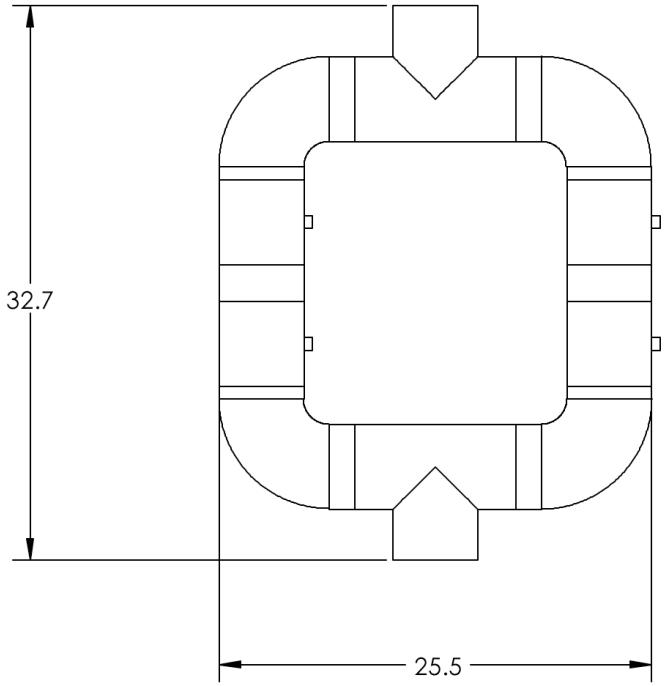


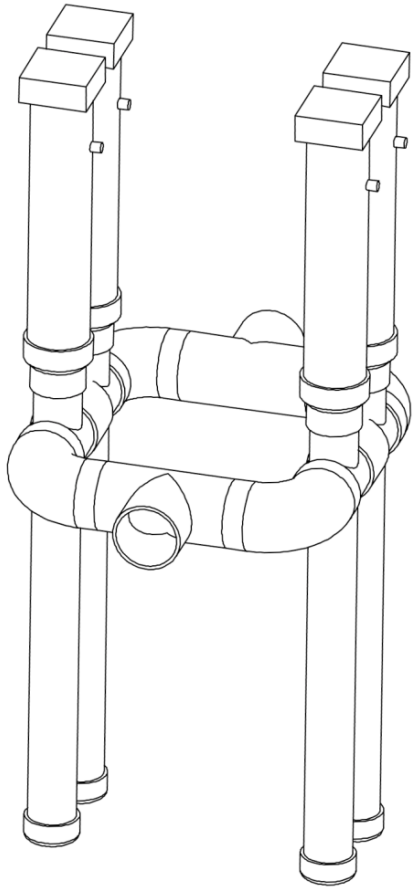
2 UNITS IN PARALLEL



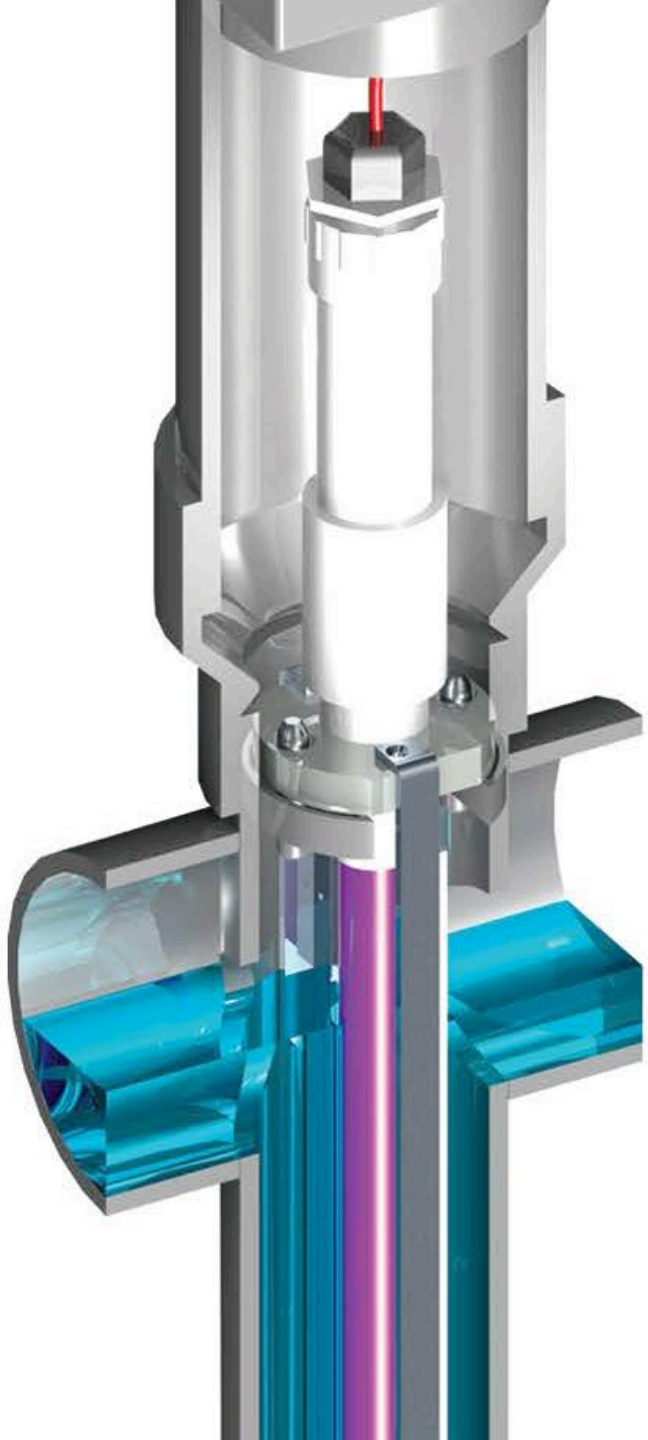
4 UNIT

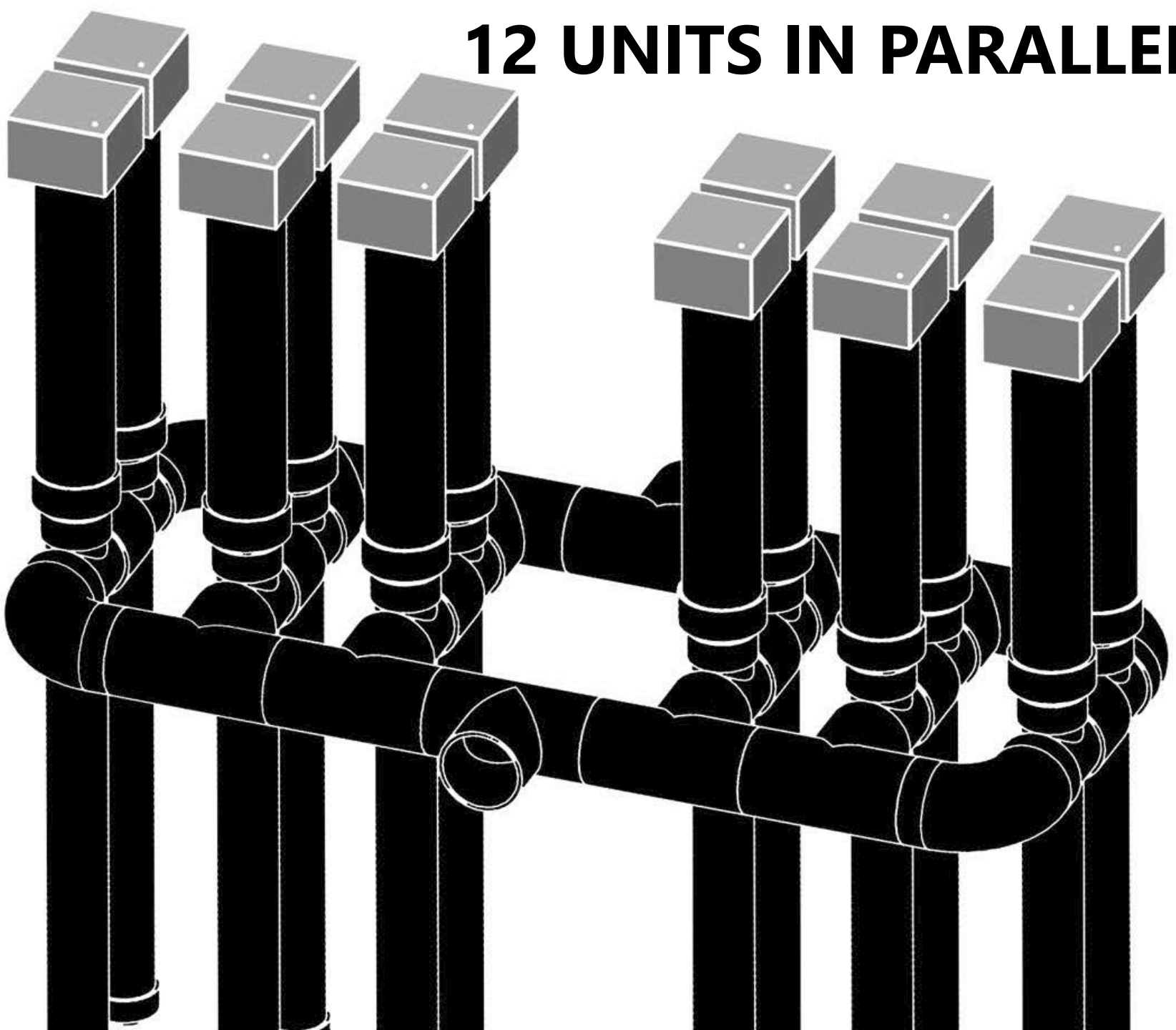
SERIES AND PARALLEL





12 UNITS IN PARALLEL





Maintenance

UV LAMP REPLACEMENT PROCEDURE

STEP 1

Turn off the dedicated circuit breaker located on the main electrical control panel that supplies power to the UV Unit.

STEP 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.

STEP 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.

STEP 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.

STEP 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

STEP 6

- Loosen the lamp cord grip at the top of the white PVC handle so that the lamp cord can move through the cord grip and thus allow the handle to move away from the top of the aluminum frame assembly

STEP 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

STEP 8

- Disconnect the four pin socket connector attaching the lamp cord to the UV lamp. Remove the old UV lamp

STEP 9

- Use dielectric grease on the boot of the connector. Connect the 4-pin socket connector to the new lamp

STEP 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.

STEP 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.

STEP 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

STEP 13

Tuck the remaining lamp cord into the top of the riser pipe. Tighten all cord grips.

STEP 14

- Put the junction box back onto the riser pipe. Tighten the setscrew.

STEP 15

- Turn on the power to the UV Unit

STEP 16

Check the green indicator light on the lid of the junction box for proper operation

STEP 17

- If the green indicator light is on, the installation procedure is finished.

THE END

- FINISHED

TO CLEAN THE TEFLON SHEATH AND DISINFECTION SUB-ASSEMBLY

- 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***.

- Use a soft cloth with isopropyl alcohol to remove difficult stains such as fingerprints or other films from the Teflon® sheath.

2 Year Limited Warranty

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

The warranty is that the parts manufactured and delivered by LONGWAVE UV 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, LONGWAVE UV 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 LONGWAVE UV 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 LONGWAVE UV 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 LONGWAVE UV INC.

The repairs or replacement by LONGWAVE UV INC. will be accomplished within thirty (30) 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 LONGWAVE UV INC., and it neither assumes nor authorizes any other persons to assume for LONGWAVE UV INC. any other liabilities in connection with the sale of the products.

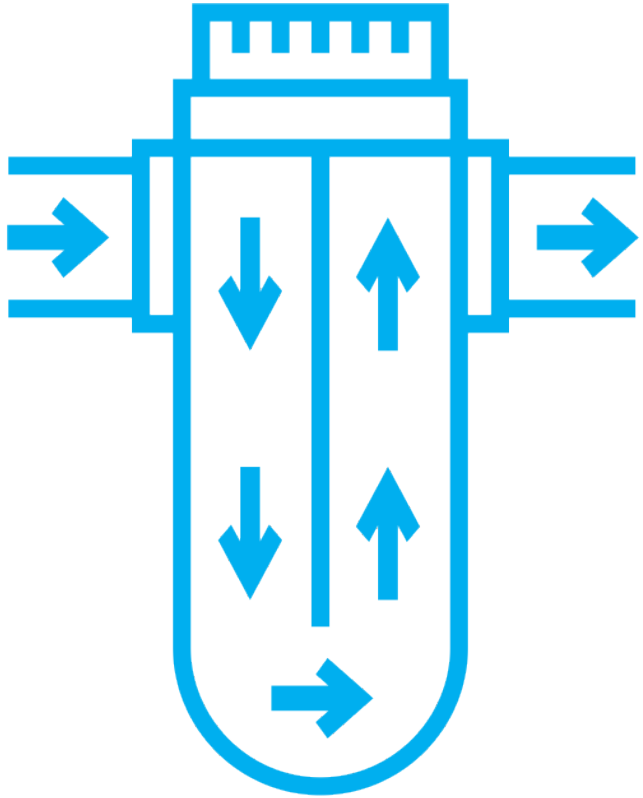
This warranty does not cover parts or products made by others, or products or any part thereof which have been repaired or altered, except by LONGWAVE UV INC., which shall have been subjected to misuses, negligence, or accident.

LONGWAVE UV 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 LONGWAVE UV INC. negligence, regardless of degree.

LOW COST

EASY INSTALLATION

EASY MAINTENANCE



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