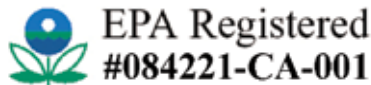




TRIDENT™
ULTRAVIOLET CORPORATION
A Trident Group USA, LTD Company

Series 2 Ultraviolet Sanitizer / Clarifier System OWNERS MANUAL



INSTALLATION INSTRUCTIONS

⚠ IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

⚠ WARNING

FOR YOUR SAFETY — This product should be installed by a professional service technician or similar person, qualified in electrical equipment installation. Improper installation and/or operation could cause serious injury, property damage or death. Improper installation and/or operation will void the Limited Warranty.

SAVE THESE INSTRUCTIONS

When installing and using this electrical equipment, basic precautions should always be followed, including the following:

IMPORTANT SAFETY INSTRUCTIONS

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. **WARNING** - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
3. **DANGER** - Risk of injury.
 - a) Replace damaged cord immediately.
 - b) Do not bury cord.
 - c) Connect to a grounded, grounding type receptacle only.
4. Do not use an appliance for anything other than its intended use. The use of attachments not recommended or sold by the appliance manufacturer may cause an unsafe condition.
5. **WARNING** - Risk of Electric Shock. Install at least 5 feet (1.5m) from inside wall of pool, hot tub or spa using nonmetallic plumbing.
6. This product shall only be connected to a power supply receptacle protected by a Ground Fault Circuit Interrupter.

SAVE THESE INSTRUCTIONS

GROUNDING - This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electrical current to reduce the risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER - Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personal if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the product - if it will not fit the outlet; have a proper outlet installed by a qualified electrician. Do not use any type of adapter with the product.

GROUND FAULT CIRCUIT INTERRUPTER PROTECTION

To comply with the National Electrical Code (NFPA 70) and to provide additional protection from the risk of electric shock, this unit should only be connected to a receptacle that is protected by a ground circuit interrupter (GFCI).

ENVIRONMENTAL NOTICE: Hg-Lamps Contain Mercury. Manage according to disposal laws. See: www.lamprecycle.org for disposal information

IMPORTANT: Follow the instructions **EXACTLY** and **IN THE ORDER LISTED**. Once installed, your UV unit will provide years of successful operation.

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1.0 Welcome – The Trident Series 2 UV Unit is designed for use in swimming pools, spas, fountains, water features, waterfalls, fish ponds and the like. It is not designed for use in potable (drinking) water installations. Use of this product in applications other than those indicated above will void your warranty and could be harmful to your health or the health of others.

2.0 General Product Information – Within the Trident UV Series 2 UV unit's (which we will refer to throughout this manual as SER 2), wet chamber (reactor) are one or more high intensity electrically energized Ultraviolet (UV) Lamps. These UV Lamps gives off Ultraviolet light wave emissions when lit. The Lamp's operating emission range is within the UV-C light wave spectrum for disinfection (253.7 nm of wavelength). This wavelength is such that when bacteria, algae spores, protozoa, viruses, or other single celled waterborne microorganisms located in the incoming water flow are exposed to the light waves of the UV Lamps for a proper period of time, the DNA of the microorganisms are altered or disrupted and this eradicates these unwanted contaminates and renders them harmless. Your SER 2 unit has been sized to produce these important UV rays in the same intensity as is required for Class A potable drinking water, which is 30,000 micro watts/cm² (30 mJ)

While you may see lesser competitive units with lower reactor or Lamp size claiming to work on larger ponds or pools, you will find that these units do not operate at the same high intensity as does the SER 2 unit and are unable to obtain the same level of killing power as the SER 2 unit. You should confirm the size unit your application needs by using the Sizing Charts shown in this manual, to obtain the proper maximum system killing power.

The filtered water to be treated, containing these unwanted contaminates, enters the SER 2 unit's reactor and is exposed to the light rays generated by the UV Lamp. The SER 2 unit has been designed to make allowance for some turbidity in the water, as turbidity will reduce the UV light wave transmission capability. Therefore, all SER 2 units are sized to allow for possible turbidity in the water and the reduction in the killing power of the UV Lamp(s) when they near the end of their useful life (EOL). When the incoming water flow is exposed to the Lamp(s) for the proper duration and intensity, the water exiting the unit will be near drinking water biological quality.

**CAUTION: THIS UNIT IS FOR USE ONLY ON VESSELS NOTED ABOVE.
DO NOT USE THIS UNIT FOR POTABLE (DRINKING) WATER SANITIZATION.**

3.0 UV System Sizing – In order to ensure that your SER 2 unit functions with the proper water exposure time to achieve the desired water sanitization, it is important to provide the proper water flow rate through the SER 2 unit. If water passes through the unit too quickly, the microorganism's exposure time to the UV Lamp(s) produced rays will not be sufficient to obtain the desired kill rate. The water flow rate through the UV unit is governed by the piping of your water vessel and the size and output of your circulation pump. There also needs to be consideration to the application for the UV unit. Fish ponds, as an example, have different requirements than do swimming pools, spas, water features, fountains, or waterfalls, as noted elsewhere in this manual

4.0 Pond Sizing Considerations – Most fish pond experts agree that there is no simple or set formula for the sizing of circulation pumps and UV systems for ponds. The size of the pond, its depth, the amount of plant coverage, the amount of sun exposure or shade, the ambient temperature, and the number of fish in the pond all contribute to determining what the circulation flow rate for a pond should be. The best advice is to consult a pond expert to determine what the flow rate for your pond should be. This is the best method of ensuring that your pond is being circulated properly. But absent of that, a general rule of thumb that can be used for ponds is that the water volume of the pond should be passed through the filter system every two hours or so. Thus, if you take the volume of your pond (in Gallons or Cubic Meters) and divide that by 120 (the number of minutes in 2 hours) you will have an approximate desired flow rate for your pond. Then, you select a pump and filter system that works properly at that flow rate. As an example, a 6000 gallon pond would have a desired flow rate of 50 gallons per minute (GPM) calculated at 6000 /120 = 50. To calculate the same pond in cubic meters (m³) capacity, you would have a 22,72 m³ pond and the flow rate would be 11,36 m³/hr.

4.1 Pond Sizing Chart

POND SIZING CHART

Trident Model	Maximum Flow Rate (GPM)	Maximum Flow Rate (m ³ /hr)	Max Pond Volume 2 Hr. Turnover (Gallons)	Max Pond Volume 2 Hr. Turnover (m ³)	Max Pond Volume 3 Hr. Turnover (Gallons)	Max Pond Volume 3 Hr. Turnover (m ³)
S2-11/S2-21	52	11.3	6240	22.6	9360	33.9
S2-12/S2-22	99	22.5	11880	45.0	17820	67.5
S2-13/S2-23	140	31.8	16800	63.6	25200	95.4
S2-14/S2-24	178	40.4	21360	80.8	32040	121.2

All capacities are nominal

Note: Multiple SER 2 units can be used for flow rates beyond those specified herein. (See Sec. 17.7)

5.0 Pool, Spa, Fountain, Water Feature, Water Fall Sizing Considerations – Swimming pools and similar water vessels are somewhat simpler than ponds to calculate for flow rates. In the case of swimming pools, most residential pools are designed to have the capacity of the pool turned over less than every 12 hours (maximum). Semi-commercial pools are normally designed for a 6 to 8 hour turnover flow rate. Check with your local jurisdiction for the required flow rate for your type of pool to be sure. Thus, as an example, using the same formula as above, a 20,000 gallon residential pool will need to have a pump capable of a minimum of 28 GPM flow rate (most pool pumps have larger flow rates) and a 25,000 gallon Semi-commercial pool will need to have a pump capable of 52 GPM to accomplish an 8 hour turnover. (This same mathematical formula shown above applies when using cubic meters for your calculations)

Using the method used when selecting filters for pools and ponds, the SER 2 unit needs to be properly sized by flow rate. Moving the water through the SER 2 unit’s reactor too fast will not allow enough exposure time of the water to be exposed to the UV Lamp rays for the required exposure time. The following chart shows the desired and maximum flow rates for your SER 2 unit. Make sure the flow rate of your circulation pump does not exceed the maximum allowable flow rate of the UV unit you have selected. (Consult your supplier, the pump manufacturer, or the Internet for the pump’s GPM or m³/hr rating if you are in doubt). If the pump output exceeds the maximum flow rate of the SER 2 unit you have selected, select an SER 2 model with a higher flow rate capacity rating or consider a multiple unit installation. The SER 2 system has the capability of being upgraded in the field to a larger flow rating should the pump output be more than expected, and this is accomplished by adding up to three more UV Lamps, quartz sleeves and ballast. (See Sec. 7.3)

5.1 Pool, Spa, Fountain, Water Feature, Water Fall Sizing Chart

POOL SIZING CHART

Trident Model	Maximum Flow Rate (GPM)	Maximum Flow Rate (m ³ /hr)	Max Pool Volume 12 Hr. Turnover (Gallons)	Max Pool Volume 12 Hr. Turnover (m ³)	Max Pool Volume 8 Hr. Turnover (Gallons)	Max Pool Volume 8 Hr. Turnover (m ³)
S2-11/S2-21	52	11.3	37440	135.6	24960	90.4
S2-12/S2-22	99	22.5	71280	270.0	47520	180.0
S2-13/S2-23	140	31.8	100800	381.6	67200	254.4
S2-14/S2-24	178	40.4	128160	484.8	85440	323.2

All capacities are nominal

Note: Multiple SER 2 units can be used for flow rates beyond those specified herein. (See Sec. 17.7)

6.0 First Step In Starting Your Installation – Before starting the installation of your system, PLEASE read this manual from cover to cover! A few moments spent initially becoming totally familiar with the SER 2 unit and its installation requirements will save a great deal of time (and possible additional expense) later. Visually inspect the product for a broken quartz tube before installation and if the quartz tube is broken / cracked, contact the manufacturer or your supplier for replacement. If you have questions that are not answered once you have completed the reading of this manual, contact your supplier, Trident’s web site or Trident Customer Service. We are ready to assist you at anytime and we want your installation to go smoothly and to have your system working properly.

6.1 Locating The Series 2 Unit – Once you have confirmed the sizing of your pond, spa, fountain, water feature vessel or pool, and compared that information against the flow requirements of your SER 2 unit by using the charts provided, it is now time to install your unit. The SER 2 unit comes with all internal components fully assembled and ready for installation. Only the Inlet/Outlet unions and opening plugs need to be installed to ready your unit for installation. All exterior exposed parts of the SER 2 units are UV inhibited polymeric material. Thus, your unit can be installed indoors or outdoors. Installing the SER 2 unit indoors or inside a covered area is preferred however, to keep your unit looking new.

Locating the SER 2 unit for electrical connection should also be considered. Check the silver product label on the SER 2 unit. Depending upon your countries electrical requirement, the SER 2 unit is manufactured to operate on one of two different electrical power sources. The SER 2 unit is not a dual voltage device and should only be connected to the voltage supply shown on the silver product label on the system. This means that the SER 2 unit will need to be powered from either a 120V/15A/50/60Hz or 230 V/15A/50/60Hz electrical circuit (which MUST match the unit power requirement noted on the silver product label on the SER 2 unit). **DO NOT CONNECT TO ELECTRICAL POWER NOT SPECIFIED FOR YOUR UNIT.** If the plug-in electrical outlet that your unit plugs into is outdoors and open to the weather, it will need to be an Outdoor type receptacle. The SER 2 unit comes with an eight foot (244 cm) long power cord. Do not use an extension cord unless it is at least a 16/3 size conductor waterproof type and is no more than twenty-five feet (7.5 meters) long.

6.2 Installing Inlet/Outlet Unions – The SER 2 unit comes with female PVC socket glue-in inlets and outlet openings. A proper ABS to PVC multipurpose cement should be used to glue fittings into the SER 2 body. The proper cement must be used to ensure a properly glued fitting. You will note that four inlet and four outlet openings are available. This is to provide the most versatile piping alternatives for the installer. The top openings are the Outlet openings and the bottom openings are the Inlet openings. As only two of the eight openings will be used for plumbing connections, the six unused openings will need to be plugged once the flow locations on the unit are determined. Packed with your SER 2 unit are six glue-in plugs and two identical Inlet and Outlet PVC unions with 2 in. socket fittings to accept your PVC circulation piping. Also packed with your SER 2 unit are two 63 mm union sockets. Should you be using metric piping, select 63 mm socket pieces and now the unions will fit your metric pipe. To install the unions on to the SER 2 unit, insert and glue the unions spigot end into the Inlet and Outlet opening selected. Then, using the six plugs provided, glue the plugs into the unused remaining six plumbing openings. Hand tighter the union nuts until snug. **DO NOT OVERTIGHTEN.** Hand tightening is sufficient. Over tightening may break the molded plastic parts of the unions. Once you are confident that you have installed the Inlet and Outlet union halves successfully, you will be ready to glue your plumbing into the union sockets once the SER 2 unit is mounted to the mounting surface.

6.3 Mounting The UV Unit On A Solid Base – Once you have determined the direction that your inlet and outlet piping will be coming from to the SER 2 unit, the next step is to secure the SER 2 unit to a concrete or wood base. Four mounting holes are located in the integral plastic mounting base of the SER 2 unit. These holes accommodate ¼ inch (6.36 mm) diameter size screws or bolts to mount the SER 2 unit in place. **FAILURE TO PROPERLY SECURE THE UNIT MAY CAUSE NOISE DUE TO VIBRATION DUE TO WATER PASSING RAPIDLY THROUGH THE REACTOR.** Secure the SER 2 unit (using bolts and anchors (not supplied) where necessary and appropriate for your installation. When the SER 2 unit is secured in place, the piping of the unit can begin.

6.4 Plumbing The Series 2 Unit – Your SER 2 unit will need to be plumbed into your vessel's circulation system. The Fig. 1 diagram below shows how the unit is to be plumbed. Note that the water is to be piped from the pressure side of the pump and after the filter, in and out of the SER 2 unit. The inlet for the water is at the bottom plumbing openings of the SER 2 unit, and the outlet is at the top plumbing opening of the SER 2 unit. Inlet and Outlet openings are marked on the reactor surface. If your pump exceeds the maximum flow rate of the SER 2 unit you have selected, installation of a plumbing bypass will be necessary to bypass some of the pump's flow around the SER 2 unit so the maximum allowable design flow rate that the SER 2 unit can accommodate will not be exceeded. A typical bypass arrangement is shown in Fig. 2

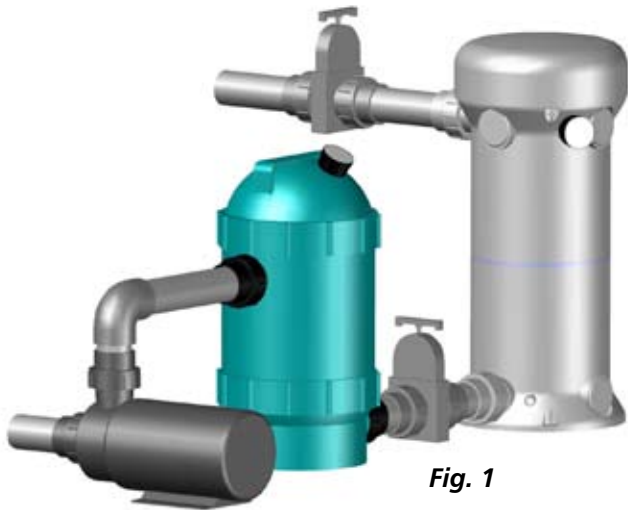


Fig. 1

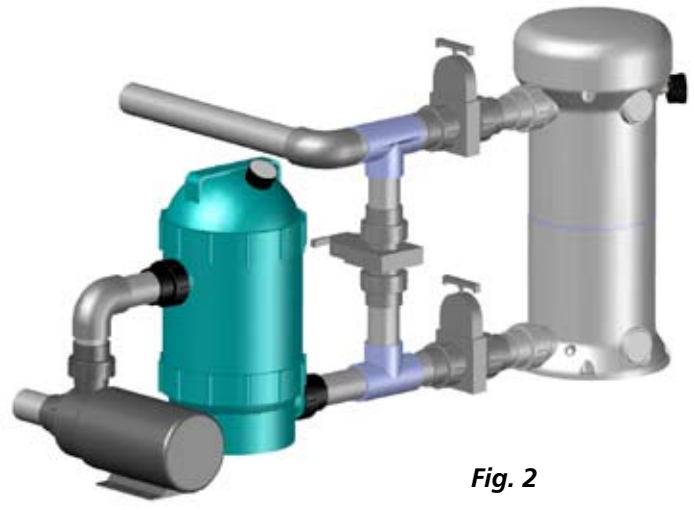


Fig. 2

6.5 Gluing Piping To The UV Unit – As noted earlier, two Inlet/Outlet PVC unions are supplied to accommodate either 63mm or 2" PVC pipe, depending on your countries custom. Select the union size that fits your piping and discard the second tail piece set. Your PVC supply piping should be glued into the PVC union tail pieces using an appropriate PVC primer and PVC cement, as recommended by your supplier. Inlet piping should be supported and should not rest solely upon the unions, to avoid stressing or breaking the unions. The installation of valves on the inlet and outlet lines attached to the UV unit is recommended. If the SER 2 unit is located with any portion of the unit below the surface of the pond or pool, then **INLET AND OUTLET VALVES ARE MANDATORY**, so you may winterize or remove the SER 2 unit without having to drain the water vessel. When you have completed the piping installation (including bypass if necessary), the final step is to plug the unit into its power source.

6.6 Providing Electrical Power To The Series 2 Unit – The electrical power rating for your SER 2 unit is shown on the silver label located on the outside of the unit. Check the label on your SER 2 unit for its power requirement before proceeding and make sure the supplied power meets the unit's electrical requirements. Connection to any power source other than that listed on the rating label will VOID your Limited Warranty.

If the electrical household power for your country is customarily 120V/50/60 Hz, then your units electrical plate should so indicate this voltage. At 230V, the power draw is 1.15 Amps maximum for a two Lamp system. This low power consumption makes operating your SER 2 unit very economical. Therefore, you will need a 15 Amp 120V or 230V receptacle for your SER 2 unit to plug into. Your SER 2 unit is supplied with a eight foot (244 cm) long weatherproof power cord terminating in either a 3-prong grounded NEMA plug, the plug customary in your country, or a blunt cut cord. It is recommended that a ground fault circuit interrupter (GFCI) be installed in the electrical outlet or in the breaker panel serving the SER 2 unit (subject to the electrical codes of your country). Note: Should the electrical power cord of your SER 2 unit become frayed or damaged in the future, unplug it from the power receptacle and replace it immediately. Note: Some countries do not allow cord connection of these types of appliances. Check your countries electrical code. If hard wiring is required, then this work is best done by a licensed electrical service person.

If your country requires 230V/50/60Hz electrical household power, than your units should indicate 230V/50/60Hz supply power on the electrical plate on the front of the unit. In some instances, your unit will be supplied with the electrical plug on the power cord that is common to your country, or with a blunt cut power cord. Use the plug supplied where plug-in appliances are allowed, or cut the plug or use the blunt cut cord to hard wire your 230V unit. Remember, you CANNOT operate your SER 2 unit on any power supply other than that indicated on the unit's electrical plate.

6.7 Electrical Bonding (Grounding) – As no metallic components are exposed to the user when the UV unit is in operation, no electrical bonding is required. Grounding of the electrical components in your system will be accomplished by the ground wire in the power supply cord, which is already connected internally. The electrical installation is now complete.

**DANGER - RISK OF ELECTRICAL SHOCK - RISK OF INJURY OR DEATH
IF ELECTRICAL INSTALLATION IS NOT DONE PROPERLY.**

If you are in doubt, have this important work done by a Licensed Electrical Technician!

6.8 Electrical Interlock Of Pump/Series 2 Unit – The SER 2 unit is equipped with a safety pressure switch that does not allow the UV Lamp(s) inside the unit to light unless there is at least 5 PSI (0.35 Bar). Operating pressure inside the UV reactor chamber. This is to ensure that the Lamp(s) will not create heat when the SER 2 unit is empty or water is not flowing through the reactor. Such excessive heat can shorten the life of the UV Lamp(s). Therefore, only when the pump is pumping water through the SER 2 unit's reactor will you be able to see the Lamp(s) glowing through the clear center band on the reactor body to confirm that the Lamp(s) is/are ON.

Note: Without the circulation pump operating properly, you will not see the Lamp ON indicator ring's bright glowing light just by plugging the SER 2 unit into its electrical outlet. Once the pump is pumping water through the SER 2 unit, as confirmed by the indication of pressure on the pressure gauge, the Lamp(s) will light if there is at least 5 PSI indicated on the gauge. To confirm that the Lamp(s) is/are indeed ON, you should view the actual individual Lamp(s) by viewing the lit Lamps through the clear indicator ring in the middle of the unit's reactor tank. Viewing the lit UV Lamps through the clear polymeric ring protects the eyes while viewing. This is the only location where you should attempt to determine if the Lamp(s) is/are lit, as looking at the lit UV Lamp(s) directly when lit can cause eye damage or possible blindness if viewed for a lengthy period of time. If the Lamp(s) glow is not visible after the pump is running and the pressure gauge indicates at least 5 PSI, check the Troubleshooting section at the end of this manual.

7.0 System Start-Up – Once you have completed all the preceding steps, it is important that you check and verify that the unit has no leaks anywhere, including checking for the possibility of a broken quartz tube damaged during transit. If no leaks are present, you are ready to place your unit into operation. Start-up is performed as noted below.

7.1 Circulation Pump Start Up – Once the pump is ON, be sure to drain all air from your plumbing system through the air relief valve on the filter, if so equipped. Once the pump is pumping consistently, make one final check for leaks in your piping, accessories, and under the unit's electrical enclosure cover. If any water leakage under the SER 2 unit's electrical enclosure cover is suspected (water dripping from the under side of cover), disconnect the SER 2 unit immediately, remove the cover (See Sec. 8.2) and verify that there is either (a) no leakage at the quartz tube or (b) leakage at the quartz tube gasket. If quartz tube leakage is encountered, follow the instructions in Sections 8.1 through 8.6 to remedy the situation before applying electrical power again to your SER 2 unit. Be sure to check the quartz tube sealing gasket.

7.2 Water Chemical Balance – If you have installed your SER 2 unit on any water vessel other than fish ponds or ponds with live plants, it is important that you check the chemical balance of the water and adjust the chemical balance as per your chemical suppliers instructions. - Remember, the SER 2 unit dramatically reduces the need for chemical sanitizers, but does not eliminate the need for proper chemical balance if such was need existed prior to the installation of your SER 2 unit.

7.3 Upgrading The Output Of The Series 2 Unit – One of the exclusive features of the SER 2 system is the ability to increase the UV output of the unit by adding additional Lamps. Up to three additional Lamps can be added to a single Lamp system. This is accomplished easily by adding Lamps and changing or adding additional ballasts. Consult Sec. 16.0 to determine the proper ballast to use, based upon your voltage requirement and number of Lamps. Ballast change or replacement can easily be accomplished due to the SER 2 plug-in ballast design. Follow instructions in Sec. 9.0, 9.1 and 10.2 regarding additional Lamp and ballast installation.

8.0 Routine Maintenance – The SER 2 unit requires very little routine maintenance during the year. The UV Lamp(s) in the SER 2 unit is/are placed inside a single quartz tube to protect the Lamp from contact with the water in the SER 2 unit's wet reactor. This quartz tube can have its ability to transmit the UV rays from the Lamp through the quartz tube diminished if the quartz tube becomes dirty or laden with deposits. The quartz tube should be removed from the reactor every six (6) months and inspected to make sure it is clean and that deposits are not attached to the quartz tube. To remove the quartz tube, you should follow the steps described below.

8.1 Quartz Tube Maintenance or Replacement – Before proceeding, you must first unplug the SER 2 unit from its power receptacle or power source and then turn OFF the circulation pump so that no water is flowing in or out of the SER 2 unit. Once the pump is turned OFF, verify on the pressure gauge that the pressure inside the SER 2 unit is at ZERO. If any pressure is indicated on the pressure gauge, do not go to the next step until the pressure gauge shows ZERO. If you show any pressure on the pressure gauge, but feel that there is no pressure present inside the SER 2 unit, simply unscrew the top union nut 1-2 turns, This will relieve any pressure inside the reactor. With the union partially unscrewed, the pressure gauge should show ZERO. If it does not, replace the pressure gauge (Part # UV84-822340).

When you are absolutely sure that there remains no pressure inside the SER 2 wet chamber, you can proceed to the next step. Note: If your SER 2 unit is installed below water level, the bypass valves must all be CLOSED to prevent water from draining into the open SER 2 unit when a quartz tube is removed.

8.2 Remove The Plastic Electrical Enclosure Cover – NEVER REMOVE THE ELECTRICAL ENCLOSURE COVER WITHOUT FIRST UNPLUGGING THE SER 2 UNIT FROM ITS POWER SOURCE – DO NOT OPERATE THE SER 2 UNIT WITH THE COVER REMOVED - The electrical enclosure cover is removed by unscrewing the three mounting screws which hold the cover to the SER 2 unit. These screws are located around the outside of the electrical cover

8.3 Remove The UV Lamp – DO NOT HANDLE A HOT UV LAMP. – First allow the Lamp to cool before handling, to avoid burning your skin. With the electrical enclosure cover removed, unplug the UV Lamp by grasping the white Lamp connector plug that is attached to the ballast wires and gently pull the plug from the Lamp. With the electrical plug removed from the Lamp, slowly pull the UV Lamp out of the quartz tube by grasping the Lamp at the white ceramic prong end. DO NOT TOUCH THE UV LAMP GLASS WITH YOUR BARE HANDS! Use a soft clean cotton cloth or clean cotton gloves to handle the UV Lamp. Skin oils on your hands can attach to the Lamp glass and can cause hot spots on the Lamp, which can shorten the Lamp life. Repeat this process until all Lamps are removed and placed upon a clean dry and secure surface where the Lamp(s) will not fall. The quartz tube is now ready to be removed from the SER 2 unit for cleaning.

8.4 Remove The Quartz Tube Sealing Nut – Using your hands, or a large wrench, remove the plastic compression nut (Part # UV86-022301) sealing the quartz tube within the quartz tube mounting gland. Note that there is a brown 4-hole disk and a compression washer under the compression nut. Remove these parts as well, along with the large sealing O-Ring (Part # UV44-10200) around the quartz tube that seals the quartz tube to the mounting gland. Inspect the O-Ring for nicks or hardness and the compression washer for cracks and replace if necessary.

8.5 Remove And Clean The Quartz Tube – Do not handle a quartz tube until it cools. Grasp the quartz tube on the inside of the tube, and pull straight up to remove it from the SER 2 unit's reactor. The quartz tube can now be easily cleaned. The quartz tube exterior can normally be cleaned by mixing a mild solution of Muriatic Acid (available at all pool supply stores) with water in a ratio of four parts water to one part acid (4:1). CAUTION: Follow the directions for use and handling of Muriatic Acid on the acid bottle label, being careful to protect your eyes, wear rubber gloves, and avoid breathing acid fumes. DO NOT USE ABRASIVE CLEANERS as they can scratch the high quality quartz glass. If lime or hard water calcium deposits are encountered, household tub and shower lime removal products that are available in grocery stores can be used. These products will not harm the hard glass surface of the quartz tube. Complete the cleaning of the quartz tube, then wash it off and wipe it dry. Also, make sure the inside of the quartz tube is dry before placing the UV Lamp(s) back inside the quartz tube.

Lastly, carefully inspect the cleaned quartz tube for cracks. If any cracks in the quartz tube are found, the tube should be replaced (Part # UV58-602000). A broken quartz tube will allow water to enter the dry electrical chamber and attack the electrical components of the unit, which will cause them to fail and need to be replaced. BROKEN QUARTZ TUBES, OR WATER DAMAGE CAUSED BY BROKEN QUARTZ TUBES, ARE NOT COVERED UNDER YOUR LIMITED WARRANTY.

8.6 Quartz Tube Installation – The process of re-installing the quartz tube is just the reverse of the removal process. Place the quartz tube sealing O-Ring on to the quartz tube 3/8 in. (9.5 mm) from the open end of the quartz tube. Insert the quartz tube into the SER 2's reactor by carefully inserting it into the quartz tube sealing gland. Carefully seat the quartz tube down into the receptor at the bottom of the reactor. The quartz tube will not go all the way down into the reactor unless the rounded end of the quartz tube is seated in the receptor at the bottom of the reactor. Note that there is a spring in the receptor at the bottom of the reactor that the quartz tube rests against. Pressing the quartz tube downward and then seeing it raise slightly back upwards confirms that the quartz tube is properly seated against the spring in the quartz tube receptor at the bottom of the reactor.

8.7 Compression Washer And Sealing Nut Installation – Place the 4-hole round Lamp centering disk inside the compression washer and insert the two parts down onto the quartz tube. Screw the compression nut into the threads of the sealing gland, being careful not to cross thread the plastic nut. Tighten the compression nut with your bare hands. DO NOT OVERTIGHTEN. Over tightening could crack the sealing nut or the quartz tube, and the rubber O-Ring will not seal the quartz tube properly. You must next check your installation for leaks. To do so, turn the circulation pump ON and check the quartz tube seal for leaks. Correct any leak found by carefully tightening the quartz tube sealing nut turn. If the leak persists, remove the sealing nut, the compression washer, the Lamp centering disk and Lamp sealing O-Ring. Inspect the Lamp sealing O-Ring and replace if necessary. Follow previous procedures for installing the sealing nut, compression washer, Lamp centering disk and sealing O-Ring and recheck the SER 2 unit for leaks again. Turn the circulation pump OFF once you have confirmed that the quartz tube is not leaking.

9.0 Re-installing The UV Lamp – DO NOT TOUCH THE UV LAMP GLASS WITH YOUR BARE HANDS. Oils on your hands transfer to the Lamp glass and cause hot spots on the Lamp surface. If you have touched the Lamp with your bare hands, you must wipe the Lamp glass off with Denatured Alcohol using a clean soft cotton cloth before inserting the Lamp back into the quartz tube. Slowly lower the Lamp down into the quartz tube until the bottom of the Lamp enters the Lamp centering disk located inside the quartz tube at the bottom of the tube. CAUTION: DO NOT INSTALL THE ELECTRICAL SOCKET FROM THE BALLAST TO THE FOUR PINS ON THE END OF THE LAMP AT THIS TIME. DOING SO NOW WILL CAUSE THE LAMP TO LIGHT WHEN THE PUMP IS TURNED ON AND EXTENDED VIEWING OF THE LIT LAMP(S) WHILE THE ELECTRICAL COVER IS REMOVED CAN CAUSE EYE INJURY OR BLINDNESS. DO NOT LOOK DIRECTLY AT A LIT UV LAMP AT ANY TIME.

9.1 Making Electrical Connection To Lamp(s) – Once you have verified that the quartz tube seal is not leaking, TURN OFF YOUR PUMP IF YOU HAVE NOT DONE SO PREVIOUSLY. Then, WITH THE PUMP OFF, connect the electrical socket from the ballast to the four pins on the Lamp by pushing the socket down on to the pins. NOTE: The socket will only install on the Lamp pins in one of the two opposite orientations. The pins are not equally spaced in both directions, so check the pin alignment before pushing down on the electrical socket. Once you are sure that the socket openings mate up to the pins, you can push the socket down onto the pins. DO NOT force the socket onto the pins. If force is needed, it means you have not aligned the pins to the socket.

Once the electrical connector has been installed onto the Lamp pins, you must install the plastic electrical cover on the top of the SER 2 unit and secure the cover to the electrical enclosure base utilizing the three screws previously removed. Tighten the screws using a Phillips screwdriver. Lightly tighten the screws. Turn the circulation pump ON and verify that the Lamp(s) is/are ON by viewing the Lamp's through the clear plastic ring on the center of the reactor body. You will be able to see each Lamp and confirm its ON status. The system is now ready for service.

NOTE: The Lamp will not light until the pump is turned back ON due to the pressure switch remaining open until pump pressure inside the reactor is sensed, This verifies the presence of water flowing through the SER 2 reactor.

10.0 Scheduled UV Lamp(s) Replacement – In addition to cleaning the quartz tube every six (6) months, periodic replacement of the UV Lamp(s) is required. The High Output Long Life UV Lamps have a useful life of approximately 13,000 hours of operation, which is about eighteen (18) months of continual use. 13,000 HOUR LAMP REPLACEMENT IS MANDATORY (Part # UV70-114100) Even though the Lamp(s) may be glowing after 13,000 hours of operation, do not operate your SER 2 unit longer without replacing the Lamp(s), as the Lamp(s) will have reached the end of its/their useful life and will no longer be able to provide the necessary sanitizing dose due to the diminished power output at the end of the useful Lamp life. Lamp replacement is best done at the same time as quartz tube cleaning (every third quartz tube cleaning) to minimize your maintenance efforts. This can be accomplished more easily with a little advanced planning. You should schedule every third quartz tube cleaning to take place at the required 13,000 hour (18 months) Lamp replacement time.

NOTE: If you start and stop your circulation pump frequently, such as by multiple daily time clock operations, you will cause the Lamp to be more susceptible to burning out more quickly than if used continually. (Two to three daily ON/OFF cycles will not shorten Lamp life). This shortened life is caused by the same phenomenon you see when you turn on a Lamp and it flashes and burns out. The momentary inrush of billions of electrons that occurs when a Lamp is first energized has a detrimental effect on the filament of all Lamps, thus the cause for a potentially shorter Lamp life. The worse thing you can do is to turn the system ON and OFF rapidly and repeatedly, which will dramatically shorten your Lamp(s) useful life.

10.1 Lamp Replacement Reminder – It is recommended that you mark your calendar for Lamp replacement fourteen or fifteen months from the initial date of installation of your SER 2 UV unit. This will give you ample time to obtain new Lamp(s) from your supplier before re-lamping is required. If your application is critical, as in a Koi pond, where you absolutely do not want to have your SER 2 unit out of service for any period of time, it is suggested that a spare set of Lamp(s) (either 1, 2, 3, or 4 Lamps depending upon your particular system) be kept on site so you can change out the Lamp(s) immediately in the future when replacement is needed. Lamp replacement is accomplished as indicated below.

10.2 Lamp Replacement Procedure – First, disconnect your SER 2 unit from its power source. This is a MUST before you remove the electrical enclosure cover for any reason. Follow the instructions in Sec. 8.2 for electrical enclosure cover removal. With the cover removed, follow the steps noted for Lamp removal and replacement during quartz tube removal (Sec. 8.3) to remove the old Lamp and complete the installation of a new Lamp.

11.0 Additional Series 2 System Maintenance – While not required for the function of your SER 2 unit, you can keep your SER 2 unit looking new by periodically applying a light coat of car wax or fiberglass cleaner to the exterior of the unit at initial installation, then periodically thereafter as required. Be careful not to damage the silver product identification label, as any SER 2 units returned for service with missing or mutilated labels will not be warranted. All other components not mentioned previously do not require any preventive maintenance. Should any component be needed, you can identify the component part number in Sec. 16 of this manual and obtain it from your original supplier.

12.0 Results To Expect From Your Series 2 System – Ponds, swimming pools, fountains, waterfalls and water features have different disinfection and clarification needs than fishponds. The SER 2 unit provides those needs in the same manner equally effectively, for all types of water environments specified herein. When installed on properly sized and installed pond installations, you can expect to correct green water condition in 3-5 days of continuous operation after start-up. Remember, only water that enters the SER 2 reactor is exposed to the UV rays of the Lamp, so algae that clings to the sides and bottom of a pond will not be affected by installing an SER 2 unit. This is normal and the retention of biologicals outside the SER 2 unit and is desired for proper bio-filtration. Thus, the SER 2 unit will not harm your bio-filtration, fish population or pond ecosystem.

In the case of SER 2 installation on properly sized and installed Swimming Pools, Spas, Fountains, Water Features and Fountains, you will see a significant improvement to the water clarity and the “chlorine odor” should disappear in 2-4 days of continual operation after start-up. Remember, as noted before, the SER 2 unit will dramatically reduce the reliance on sanitizers and algae control products, but will not eliminate them completely. Many users of UV units report a 70%-85% reduction in their chemical use. This is not only desired due to reduced operating costs, but the major reduction of sanitizer levels makes for a more healthier bathing environment. IMPORTANT: You must continue to check your water chemistry regularly as required for your water vessel, and some sanitizing chemicals will still be necessary to treat the water until it reaches the SER 2 reactor, where all UV sanitation takes place.

13.0 Winter Operation Of Your Series 2 Unit – Your SER 2 unit can be damaged if it is allowed to freeze. The substantial pressure inside the reactor that can be caused by ice forming inside the reactor can break the glass quartz tube as well as the reactor shell itself. Therefore, you must protect your SER 2 unit from freezing. Damage due to freezing, including breakage of glass components, the reactor, or water damage to other components or surrounding areas caused by freezing is not covered under your Limited Warranty.

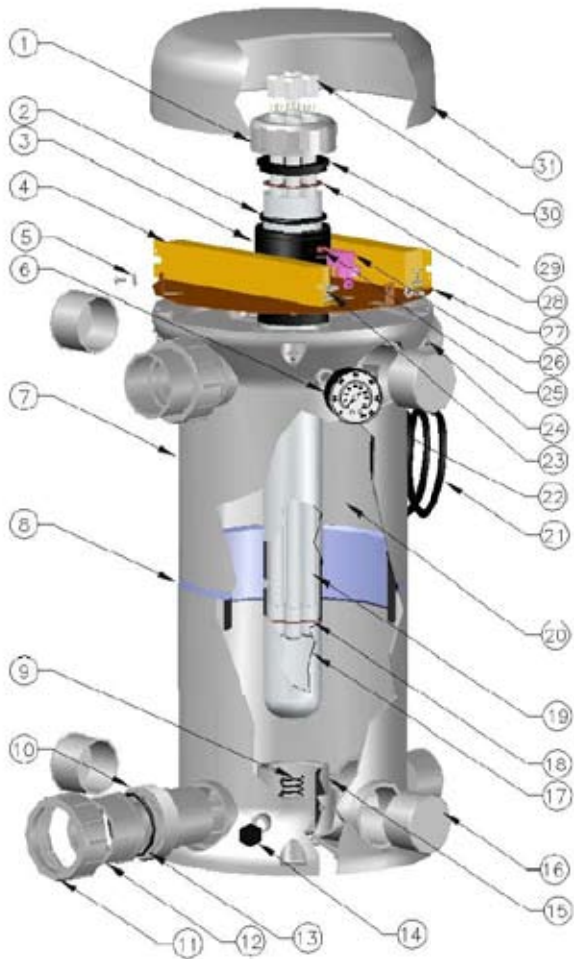
Freeze damage can be avoided by keeping the water flowing through the SER 2 reactor at a minimum of 5 PSI (0.35 Bar) pressure (as noted on the pressure gauge) at all times, without interruption during freezing temperatures. All time clocks must be placed in “Continuous Run” mode so the circulation pump will run without interruption. Freeze damage can also be avoided if the pump and SER 2 unit are maintained inside a warm enclosure.

If you do not plan to operate your SER 2 unit during freezing temperatures, you must take precautions to make sure all water is removed from inside the SER 2 reactor(s) so water does not freeze inside the reactor and damage the SER 2 unit or its components. This can be accomplished by first closing any valves on lines in the plumbing system and then opening the drain plug and inlet union at the bottom of the SER 2 unit so that the water is drained out from inside the reactor tank. A safe precaution is to remove the SER 2 unit from the circulation piping and place the SER 2 unit in a warm location during freezing temperature times of the year. CAUTION: A drain valve and piping to carry water away from the SER 2 unit must be installed in the supply piping if drainage of the SER 2 unit will cause water damage to the area surrounding the SER 2 installation.

14.0 Continued Use Of Chemicals – Your SER 2 unit does not add any chemicals to your vessel’s water. The SER 2 unit’s task is to kill bacteria, parasites, microorganisms and algae that come into contact with the UV rays inside the SER 2 unit’s reactor. While it is important to maintain a chemical regiment as directed by your builder or chemical supplier, in addition to the SER 2 unit, you will notice a dramatic decrease in chemical usage. This is one of the side benefits of the SER 2 unit as it attacks the mono-chloramines that form in chlorinated water when sanitizing chemicals are inadequate or when bathing loads are heavy.

15.0 How To Obtain Product Support – In the unlikelihood that technical assistance or parts is required, you should first contact your supplier and the supplier can advise the best method of providing the services you need. In some instances, the supplier will handle the required service themselves, including the ability to supply any necessary parts. In other instances, the supplier may chose to refer you to Trident Customer Service, who can assist you as well. Please read the Limited Warranty in this manual for your SER 2 unit. It explains fully what is and what is not covered under the Limited Warranty and the warranty periods.

16.0 Series 2 System Exploded View – The following diagram shows all replaceable components of your SER 2 unit.



MATRIX							
VOLTAGE	BALLASTS				PARTS		
	UV70-101101	UV70-101102	UV70-101201	UV70-101202	#19	#23	#30
120V – 1 LAMP	1				1	2	1
120V – 2 LAMPS		1			2	2	2
120V – 3 LAMPS	1	1			3	4	3
120V – 4 LAMPS		2			4	4	4
230V – 1 LAMP			1		1	2	1
230V – 2 LAMPS				1	2	2	2
230V – 3 LAMPS			1	1	3	4	3
230V – 4 LAMPS				2	4	4	4

ITEM	DESCRIPTION	QTY	PART#
Q1	ENCLOSURE TOP – GRAY	1	UV86-022700
Q2	LAMP SOCKET	SEE MATRIX	UV52-021000
Q3	QUARTZ O’RING COMPRESSION WASHER	1	UV86-022500
Q4	LAMP CENTERING DISK – QUARTZ TUBE OD – TOP	1	UV86-032000
Q5	METAL TOP BASE PLATE	1	UV82-040000
Q6	PRESSURE SWITCH	1	UV70-023040
Q7	WYE PUSH ON TAB – BRASS	1	UV52-021011
Q8	SCREW 10-32X1/2” PFMS-S/S (SEE NOTE 2)	7	UV40-061050
Q9	SCREW 10-32X1/4” PFMS-S/S	SEE MATRIX	UV40-061025
Q10	PICOTAL STRAIN RELIEF	1	UV56-061000
Q11	POWER CORD – 96” NEMA (SEE NOTE 1)	1	UV64-001000
Q12	INNER REFLECTOR	2	UV82-500200
Q13	UV LAMP 58W 21” LONG	SEE MATRIX	UV70-114100
Q14	LAMP CENTERING DISK – QUARTZ TUBE ID – BOTTOM	1	UV86-033000
Q15	QUARTZ TUBE 2-3/8”X21”	1	UV56-602000
Q16	BLANKING CAP – GRAY	6	UV86-022600
Q17	QUARTZ TUBE END CUP – GRAY	1	UV86-022400
Q18	WINTERIZING DRAIN PLUG	1	UV86-121000
Q19	UNION SEAL O’RING	2	UV44-100200
Q20	UNION HALF 0.375” SKT – GRAY	2	UV00-110000
Q21	UNION HALF 2” SKT – GRAY	2	UV86-110002
Q22	UNION NUT – GRAY	2	UV86-022301
Q23	UNION 2” SPIGOT MALE THREADS – GRAY	2	UV86-020208
Q24	QUARTZ TUBE SUPPORTING SPRING	1	UV40-501100
Q25	JOINER RING – CLEAR	1	UV86-022100
Q26	WATER CHAMBER HALF – GRAY	2	UV86-022200
Q27	PRESSURE GAUGE	1	UV84-022340
Q28	FLAT WASHER #10 – S/S	11	UV40-080100
Q29	BALLAST ASSEMBLY	SEE MATRIX	
Q30	QUARTZ TUBE SEALING INSERT	1	UV86-022300
Q31	QUARTZ TUBE SEALING O’RING	1	UV44-102000
Q32	QUARTZ TUBE SEALING COMPRESSION NUT – GRAY	1	UV86-022301

NOTES: 1. CONSULT YOUR SUPPLIER FOR LOCAL POWER CORD CONFIGURATIONS
2. SECURES BALLASTS #4 AND ENCLOSURE TOP #31

17.0 Common Questions – Here are a number of FAQs that will answer some of the most common questions.

17.1 Is the Series 2 UV Unit Designed For Use In Salt Water Applications? – While the ability of the SER 1 unit is not affected by salt water, the harsh environment found in salt water ponds and aquariums is not recommended for the SER 2 units equipped with optional stainless steel reactor reflectors, which are susceptible to salt water corrosion of the stainless steel reactor reflector. However, Trident’s all plastic Series 2 units (without the optional stainless steel reactor reflectors) are fully compatible with all salt water (sea water) environments.

NOTE: In swimming pool applications where a salt chlorination system is present, all SER 2 system models can be used with no problem, but the quartz tube may be more susceptible to fouling due to the salt content of the water.

17.2 Do I Need To Turn My Series 2 Unit OFF When I Clean My Filter? – No, the flow sensing pressure switch that is part of your SER 2 unit will automatically shut the UV Lamp(s) OFF until proper water flow inside the SER 2 reactor is re-established. Should you need to turn your unit OFF for any reason, this is accomplished by simply unplugging the SER 2 unit from its power outlet, or turning OFF the electrical breaker serving the SER 2 unit.

17.3 Will A Time Clock On My Pool Shorten My Lamp Life? – Some shortening of the Lamp life can be expected when the SER 2 unit is turned off and back on frequently. Two or three daily on/off cycles will not create a major Lamp life issue, however frequent on/off cycles within a short period should be avoided.

17.4 Is There Any Residual Effect From UV? – No, UV light is used for bacteria control and is applied only to the water that passes inside the SER 2 reactor in visual contact with the UV light wave transmission from the UV Lamp. Nothing is imparted into the water and transported out of the reactor vessel.

17.5 Can The Series 2 Unit Be Mounted Horizontally? – No, vertical mounting is required to maintain the weatherproof integrity of the electrical enclosure cover.

17.6 Can The Series 2 Unit Be Installed Below The Vessel's Waterline? – The SER 2 unit has a pressure switch that controls the ON/OFF cycle of the UV Lamp(s) when the pump stops or starts. If the SER 2 unit is installed below the vessel waterline, (example, in a vault below the waterline of a pond or pool), a static head of water pressure may be sufficient to cause the pressure switch to remain closed, which means that the UV Lamp(s) will remain ON at all times while the SER 2 unit is plugged into its power source. To check your pressure switch to see if it functions properly, or to allow for below waterline installations, follow the instructions given in Sec. 18.1.

17.7 Can Multiple Units Be Used Together For Larger Systems? – Yes, you can add any number of SER 2 units to a plumbing bypass manifold system to allow for larger outputs and flow rates beyond the capacity of a single Series 2 four Lamp unit. Contact your supplier or Trident UV to obtain a drawing showing the proper method of plumbing multiple SER 2 units for larger applications. Note: Trident Ultraviolet also manufactures two larger capacity commercial UV systems, the Series 4 and Series 5 UV Systems. Visit the Trident web site www.tridentuv.com for information on these larger commercial systems.

17.8 Must I Use A GFCI (Ground Fault Circuit Interrupter) With My UV Unit? – Yes, in some countries. You should check your countries electrical code to determine if this is called for in your countries electrical code. However, if your countries electrical code requires GFCI devices, a GFCI must be used. You can install a GFCI in the electrical receptacle that is used to power your SER 2 unit in some countries, or possibly you can install it in the electrical panel (GFCI breaker) that services the electrical circuit of your SER 2 unit.

18.0 Identifying and Correcting System Problems – The list below will help guide you through any problems you may have at time of initial installation or in the future. For additional assistance, contact your supplier or Trident UV at the address, or by E-mail, fax or phone as shown at the end of this manual.

18.1 The UV Lamp(s) Will Not Come ON - If this occurs upon initial start-up, the problem could be caused by a number of issues.

- a. The pressure switch is open. This is caused by low pressure in your system. Make sure the pump is ON (the UV Lamp(s) will only light when there is 5 PSI (0.35 Bar) water pressure inside your SER 2 unit's reactor). Verify that the pressure gauge reads 5 PSI or more. If it does not read at least 5 PSI, reduce the flow exiting the SER 2 unit by partially closing the valve on the discharge piping exiting the SER 2 unit. This will increase the pressure inside the SER 2 reactor. To check the pressure switch operation, turn the SER 2 unit OFF, view the Lamp(s) through the clear center band on the reactor to confirm that the Lamp(s) is/are OFF, then turn the SER 2 unit back ON and check the Lamp(s) again to confirm that they are ON. Each Lamp can be viewed individually through the clear viewing band in the center of the reactor.
- b. The UV Lamp(s) has/have become disconnected from the Lamp connector(s). Disconnect the power servicing the SER 2 unit, open the electrical enclosure cover and confirm the Lamp connector(s) is/are firmly in place on the end of the Lamp(s). At the same time, check all exposed wires for a possible loose connections. Plug the electrical cord back into the electrical outlet ONLY after the electrical enclosure cover has been re-installed on the SER 2 unit.
- c. Verify that the electrical cord is plugged into an energized electrical outlet or properly connected to the power source. Test the electrical outlet. You should confirm the availability of the same power as indicted on the electrical label on your SER 2 unit.
- d. Make sure you have not plugged your unit into any power source other than that specified on your unit's electrical label. If you have done so in error, the ballast(s) has/have been damaged and need(s) to be replaced. Contact your supplier for the correct replacement ballast(s). (Not warranted)

18.2 The UV Lamp(s) Is/Are No Longer ON – If this occurs after the unit has been operating successfully for a period of time.

- a. One or more Lamps have burned out. Replace the UV Lamp(s).
- b. A ballast has burned out. Contact your supplier or Trident UV for assistance in obtaining a new ballast.
- c. Verify that the electrical outlet where the SER 2 unit is plugged into has the proper voltage and the cord is securely plugged into the outlet or connected to the power source.
- d. Verify that the GFCI has not tripped. To verify the operating state of the GFCI, trip the GFCI manually and reset it manually. The GFCI should reset. If it does not, it indicates a fault to ground in the electrical circuit or the SER 2 unit itself. Contact your supplier for assistance.

18.3 The UV Lamp(s) Stays ON When The Pump Is OFF – The SER 2 unit is equipped with a safety pressure switch that turns the UV Lamp(s) OFF when the pump is turned OFF. This function guards against having the Lamp(s) lit accidentally when the electrical enclosure cover is removed and the electrical power to the SER 2 unit is still ON. This also serves to ensure that there is water flowing in the SER 2 unit's reactor chamber to cool the Lamp(s) and extend Lamp life, before the Lamp(s) is/are turned ON.

- a. If the SER 2 unit is located below the water level of the pond or pool, there is a static head of water that causes pressure to be found inside the wet chamber. This static head of pressure closes the pressure switch and the Lamp(s) stays lit even when the pump is OFF. In this instance, you need not utilize the pressure switch, as the Lamp(s) will always be operating with the reactor full of water. The pressure switch may be jumpered by first unplugging the SER 2 unit from electrical power, removing the electrical enclosure cover, then moving the insulated wire pressure connector attached to the bottom tab of the pressure switch to the unused tab of the brass two prong tab on the top of the pressure switch. This then bypasses the pressure switch. Power can be restored to the SER 2 unit once the electrical cover is reinstalled on the unit. CAUTION: With the pressure switch removed from the electrical circuit, only remove the electrical enclosure AFTER the power has been removed from the SER 2 unit, as the Lamp(s) will remain ON until electrical power is removed from the SER 2 unit.
- b. If the SER 2 unit is located above the water level of the pool or pond and the Lamp(s) stay(s) lit when the pump is OFF, replace the pressure switch. (Part # UV70-023040)

18.4 The Water Is Green – Green water is an indication that the UV rays generated by the SER 2 unit are not effective or are not being generated by the UV Lamp(s).

- a. Check the Lamp(s) to make sure all Lamps in your system are ON (by viewing the Lamp(s) through the clear viewing band on the center of the reactor. If all Lamps are not ON, follow the procedures above regarding the UV Lamp not lighting.
- b. Run your unit longer. If your unit is operating on a time clock, run the circulation pump longer to allow the SER 2 unit to function fully.
- c. Clean the quartz tube(s).
- d. Replace the UV Lamp(s) nearing the 13,000 hour useful Lamp life. At 13,000 hours of operation, the UV Lamp(s) are only 80% as effective as when new. This is normal for all Long Life low-pressure type UV Lamps, which are the longest useful life Lamps available for this type of application.
- e. If your SER 2 unit is installed on a swimming pool, shock the pool with the sanitizing chemical you normally use and balance the pool water as per your chemical manufacturer's specifications.

18.5 The GFCI Has Tripped – If you have installed a GFCI on your SER 2 application, the GFCI will protect the SER 2 unit and any other equipment on the same electrical circuit from any fault to ground, the same as the electrical breaker protects the total electrical circuit from a short. When the GFCI trips, it is an indication that there is an electrical problem that must be corrected to provide a safe operating environment for your installation. Follow the instructions of the GFCI manufacturer for more information on correcting the issue if the problem is with the GFCI.

a. If you suspect that the problem is with the SER 2 unit, disconnect the SER 2 unit from the electrical receptacle. Reset the GFCI at the breaker panel or at the receptacle. If the GFCI does not reset, replace the GFCI. If the GFCI does reset, first run the circulation pump, and if no GFCI trip is encountered, plug the SER 2 unit into the electrical receptacle and make sure the pump is ON. If the GFCI trips, it is an indication that there is a ground fault inside the SER 2 unit. Follow the instructions previously given for opening the electrical enclosure cover and inspecting the SER 2 unit.

b. If water is present inside the electrical enclosure cover, it will trip the GFCI. Following instructions given previously to remove the quartz tube(s), inspect for quartz tube cracks or breakage or for a bad quartz tube seal. Re-seal the quartz tube.

c. If the SER 2 unit trips when performing the test noted in Sec. 18.5 (a) above, you can check to determine if a UV Lamp is the GFCI trip cause by unplugging the individual Lamp from the Lamp connector, then place the electrical enclosure cover back on the SER 2 unit and power up the circulation pump. If the GFCI does not reset, then the problem is either with the remaining Lamp(s) or with a Ballast. Remove all the Lamp connectors and reset the GFCI after replacing the electrical enclosure. If the GFCI still trips, unplug all ballasts. If the GFCI resets, then plug in first one ballast, and if your unit has two ballasts, then the second ballast after the first ballast has been tested. If either ballast trips the GFCI, then replace that ballast. Refer to Sec. 16 for the proper ballast part number.

Reset the GFCI and if it does not trip, attach the electrical plug to a UV Lamp. (One at a time if multiple Lamps are present in your SER 2 unit.) If it trips with the Lamp lit, it indicates that a UV Lamp is causing the fault to ground. Replace the UV Lamp.

18.6 The Series 2 Unit Makes Noise When Operating – This is an indication of the SER 2 unit not being properly attached to a firm mounting base of wood or concrete using bolts (not supplied) placed through the mounting holes in the SER 2 unit base. Attach the SER 2 unit correctly to a firm base as described in Sec. 6.3

18.7 Water Is Dripping From The Electrical Enclosure Cover – Water exiting the unit through the electrical enclosure cover can be attributed to either (a) a bad quartz tube seal, or (b) a broken or cracked quartz tube. Check the quartz tube seal and quartz tube as instructed in Sec. 8.5 through 8.7

19.0 Specification Notice – Due to Trident’s commitment to continual product improvement, all product descriptions or specifications noted herein are subject to change without notice.

20.0 Limited Warranty – Trident’s Ultraviolet Systems are covered under a generous Limited Warranty, see page 16. You may also obtain a copy of Trident’s Limited Warranty by visiting our web site at www.tridentuv.com where you can download the Limited Warranty.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

TRIDENT ULTRAVIOLET CORPORATION
SERIES 2 UV SANITIZING SYSTEM
LIMITED WARRANTY

Trident Ultraviolet Corporation (Trident) warrants to every Original End User (User) of Trident's Series 2 Ultraviolet system, that the product will be free from defects, as defined herein, for a period of eighteen (18) months. If at any time during the Limited Warranty period, any defect, as defined herein, prevents the product from performing correctly in an application for which it was designed, Trident will repair or replace the product (at Trident's option) as outlined herein:

COVERED PRODUCT LIMITED WARRANTY ITEMS:

This Limited Warranty *DOES* cover the UV unit, its components, and defects thereof against:

- Manufacturing Defects
- Material Defects
- Internal Housing Corrosion Causing Leakage
- Plastic Component Degradation
- Lamp Failure (Pro-Rated)

NON-COVERED PRODUCT ITEMS:

This Limited Warranty *DOES NOT* cover the following UV unit defects or component failure when caused by any of the following:

- Mechanical Abuse
- Glass Component Breakage
- Improper Installation
- Improper Operating Voltage
- Lamp Failure After 18 Months Of Operation
- Acts of War or God
- Operation At Pressures Greater Than 45 PSI (3 Bar)
- Freeze Damage
- Any Failure Not Indicated As "Covered Warranty Item" Herein

Note 1: During the duration of this Limited Warranty, should any failure occur, the unit should be inspected at the site to determine the cause of failure, and if that failure is shown to be a covered item, the User must request a written Return Goods Authorization (RGA) from Trident prior to any product return. Any returned unit is to be accompanied by Trident's RGA and is to be returned freight prepaid to Trident for Limited Warranty evaluation. The User is responsible for any freight damage associated with such return. Unit failures, or components thereof, found to be covered under this Limited Warranty will be repaired or replaced (at Trident's option) without cost to the User and will be returned to the User via UPS Surface Freight or other Surface Freight carrier (at Trident's option), at the User's expense. Trident shall be the sole judge in determining the cause of failure of any UV unit. Units arriving in broken condition will not be warranted.

The term "Original End User" (User) shall mean the person or company that was in possession of the physical location where the UV unit was originally installed, at the time of first installation, as evidenced by an original invoice from the selling company to the User at the location where the unit is to be returned. A photo copy of said original invoice must accompany the UV unit RGA paperwork. UV units received unaccompanied by the required documentation will not be accepted by Trident for Warranty evaluation and will be returned to the User in the same condition as received, freight collect (COD) if the User fails to provide the required documentation within ten (10) days from date of notification of missing documentation from Trident. Any unit returned to Trident COD or freight collect will be rejected when received from the freight carrier.

Note 2: This Warranty is Limited in that it does not cover any monetary reimbursement for freight charges, for removal and/or installation labor, or any other incurred costs by any other person(s) or firm(s), including (but not limited to) any consequential damage or loss of use that might be claimed. The Limited Warranty period shall commence upon the date of sale to the User, but in all cases no later than one hundred twenty (120) days after the date of manufacture of the UV unit, as shown on the Trident date code located on the product identification label, whichever occurs first. UV units received with factory identification missing, mutilated or altered, or units received containing components not supplied by Trident or modified in any way, will not be warranted under any circumstances. This Limited Warranty is subject to the laws of the United States of America, state of California. Any legal proceedings to enforce any provision of this Limited Warranty shall be brought in the California State Superior court in Los Angeles County.

OTHER RIGHTS - This Limited Warranty supersedes any and all previous Limited Warranties for this product, gives you specific legal rights, and you may have other rights which vary from state to state.



CORPORATE OFFICES
4270 Promenade Way - Suite D • Marina del Rey, CA 90292

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4270 Promenade Way, Suite D, Marina del Rey, CA 90292 USA
Phone: (310) 577-7060 • Fax (310) 577-5211
www.CustomerService@TridentUV.com