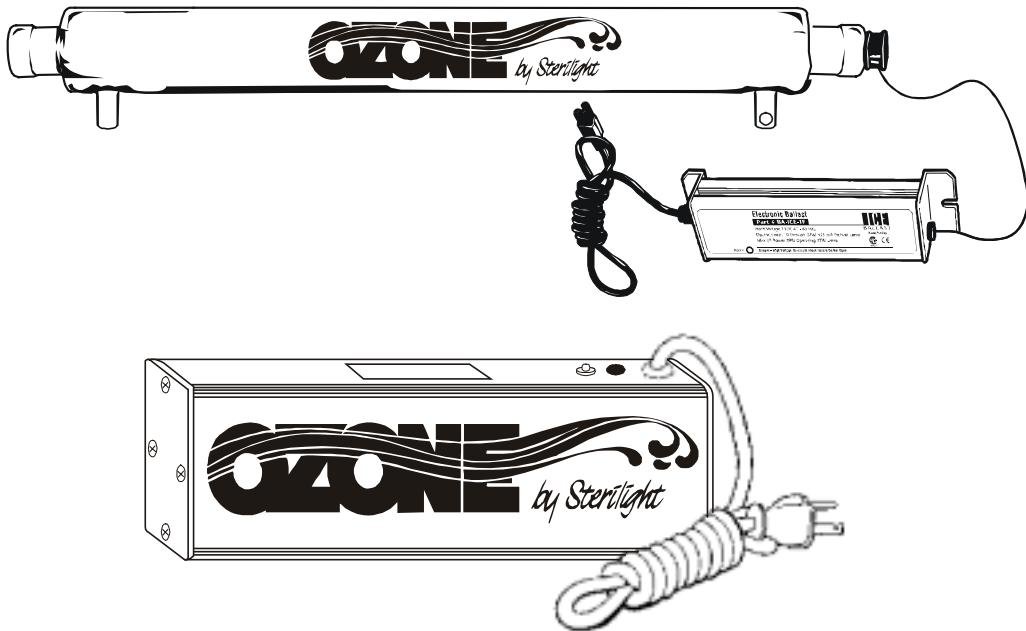


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INSTALLATION INSTRUCTIONS AND OWNERS MANUAL

P/N 520025

ULTRAVIOLET OZONE GENERATORS INSTALLATION INSTRUCTIONS AND OWNERS MANUAL

(Before proceeding with the installation of this equipment, please read this manual carefully and retain it for future reference)

INTRODUCTION

Ozone is nature's natural purifier. This naturally occurring product is produced during lightning and electrical storms as well as when solar ultraviolet rays strike the earth's upper atmosphere. It is this Ozone layer which protects us from the harmful UV radiation produced by the sun.

Ozone is generated when an oxygen molecule (O_2) is exposed to high energy. Ultraviolet (UV) light and is converted to an Ozone (O_3) molecule. This extra oxygen atom is what makes Ozone a highly "energetic" oxidizer.

Ozone's effects come when this "extra" oxygen atom is released and allowed to oxidize and destroy bacteria, viruses, as well as other organic matter in the pool or spa. Ozone also breaks down harmful chemicals and acts as a flocculent to coagulate various insoluble particles which can then be easily removed by the filtration system.

Ozone's powerful oxidizing abilities work in conjunction with your sanitizing agent to provide a healthier, cleaner bathing experience. As an oxidizer, Ozone eliminates objectionable chemical by-products such as chloramine or bromamine -- the result, a totally environmentally safe product.

FEATURES

§ All models include an audible alarm and an LED indicator light to indicate that the lamp is operating. The audible alarm will sound if the lamp fails to start.

§ The UV lamp is contained inside of a sealed stainless steel Ozone Generator cell which protects the electrical components and outer case from the oxidizing effects of Ozone.

§ 185nm ultraviolet lamps can be replaced or cleaned by simply removing the aluminum nuts from the ends of the stainless steel Ozone generating cell, removing the old lamp and re-installing or installing a new UV lamp.

INSTALLING YOUR OZONE GENERATOR

NOTE § Both models S2ROZAP and S2Q-OZ will generate sufficient Ozone for most spa and hot tub applications subject to the wide variations that occur depending on operating conditions, chemical control and bather load.

§ Model S8ROZAP and S8Q-OZ are sufficient for smaller pools and can be used in parallel for larger applications. Sizing will also be dependant on a wide range of variations including

operating conditions, chemical control and bather load.

§ Choose a location for your generator that is accessible to an approved electrical outlet and where the indicator light is visible (if your unit comes equipped with one). Note : Electrical outlets within 10 feet of the tub must have ground fault protection.

§ Leave enough space to allow for removal of the cover and the stainless steel cell for UV lamp maintenance.

§ As UV lamps can be damaged in shipping and handling, check the lamp before installing your Ozone generator by plugging it into an electrical outlet for a moment. A bluish light should be evident at the ports and the LED indicator light on the S2ROZA and S8ROZA should also glow. **WARNING - DO NOT LOOK DIRECTLY INTO THE PORTS. ULTRAVIOLET LIGHT EMITTED BY THE LAMP CAN CAUSE BURNS TO UNPROTECTED EYES.**

Your OZONE GENERATOR should be located in a dry area that is accessible for servicing and two feet above the water level. If the unit can not be mounted at least two feet above the water level, the tubing connecting the generator to the inlet of the spa or pool must either be installed with a loop to raise it two feet above the water level or be fitted with an approved check valve (or both) for Ozone service to prevent water back flow into the generator. When using an optional venturi or venturi system to provide increased air flow, a check valve must be used to prevent back flow into the generator in case the outlet line is blocked.

Select a location two feet above the water level and with access to a properly grounded electrical outlet. The unit can be mounted vertically or horizontally with the connection ports facing down. Mount the cabinet to the wall with the mounting holes in the back of the cabinet and three size 10 screws. If mounting the unit to drywall, use a plug or an expansion butterfly nut to secure the unit.

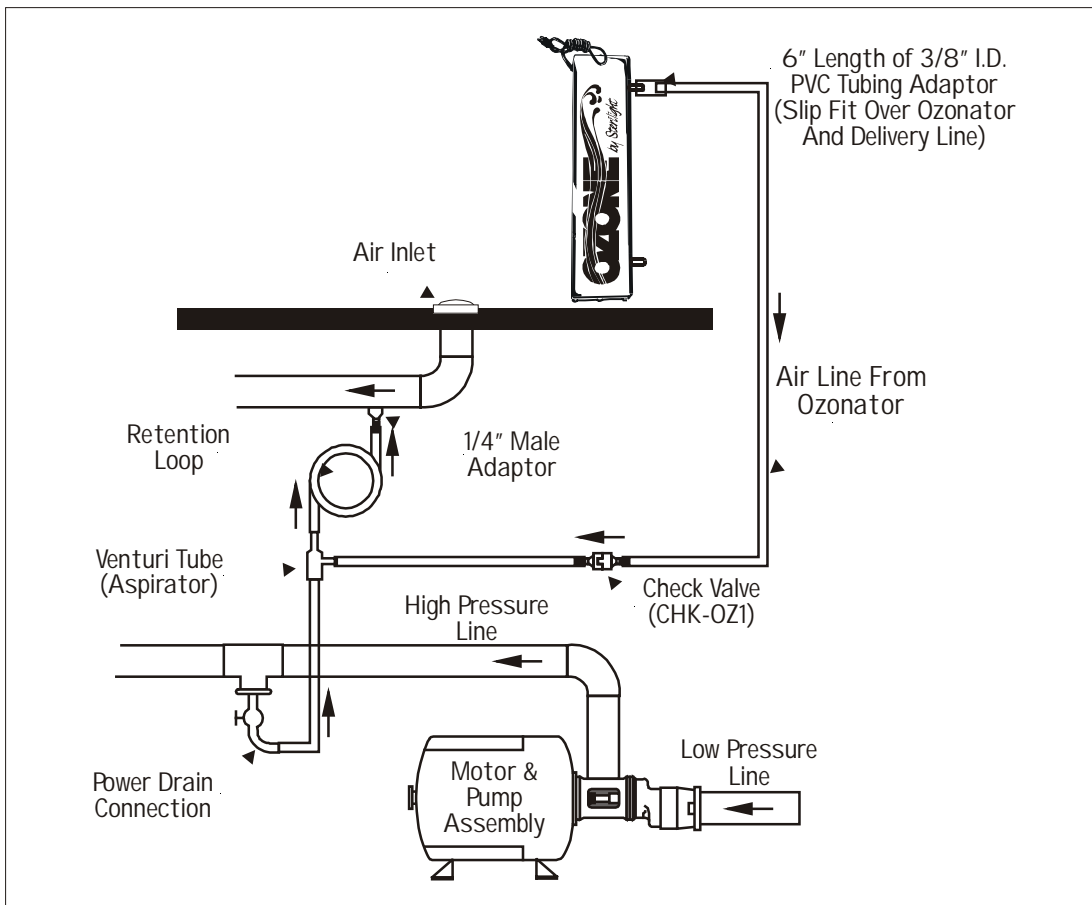
Some typical installation procedures are described in the following pages. More detailed information is provided in the attached diagrams.

INSTALLATION

1. PRESSURE DIFFERENTIAL SYSTEM for OZONE EDUCATION SYSTEM #OE-001

Recommended for most spa installations. This simple pre-assembled system utilizes a combination of pressure differential, venturi and the spas existing air induction piping, offering the most efficient and economical Ozone mixing and distribution, virtually eliminating any gas off. You'll note from the attached illustration that water from the high pressure side of the pump is forced through an aspirator or venturi which causes air suction. This air suction pulls Ozone in from the Ozone Generator thereby mixing the Ozone and water at the aspirator where injection takes place. Then the mixed Ozone and water travels through a 3/8" tube to the spas air induction line. On the way back to the air line the Ozone and water is retained in a loop in the 3/8" line to cause thorough mixing and Ozone absorption in the water prior to injection into the spas air line. Reduce the water level until it is below the air induction line (if necessary) to avoid water leakage when making the connections. NOTE: Ozone may cause rubber seals in the system to degenerate. These parts should be replaced with "Viton" or other material resistant to Ozone. Your spa may have come equipped with a 1/4" NPT threaded inlet on the air line, if not you may be required to drill and tap a 1/4"

NPT hole to install the 1/4" NPT to barbed adaptor that comes with the OE-001 kit. The location for the Ozone injection point will be decided by where you choose to place the adaptor. Normally the placement of the adaptor will allow the Ozone to flow through only one side of the tub. If possible, choose the air line with the most attached jets to take full advantage of the injection points. If drilling, place the adaptor downstream of the air vent controls. Your spa may have also come supplied with a garden hose threaded tap on the HIGH PRESSURE SIDE of the pump, which is commonly referred to as a power drain. If your spa has no power drain, then the optional saddle clamp must be installed on the HIGH PRESSURE side of the pump as close to the pump as possible. If you are not sure which is the high pressure side, be sure to contact your dealer to avoid any irreversible drilling. After you have located or installed the barbed adaptor on the air line and the adaptor on the water line, simply hook up the eduction system as the diagram illustrates. Make sure all the connections are sealed so no leaking will occur.

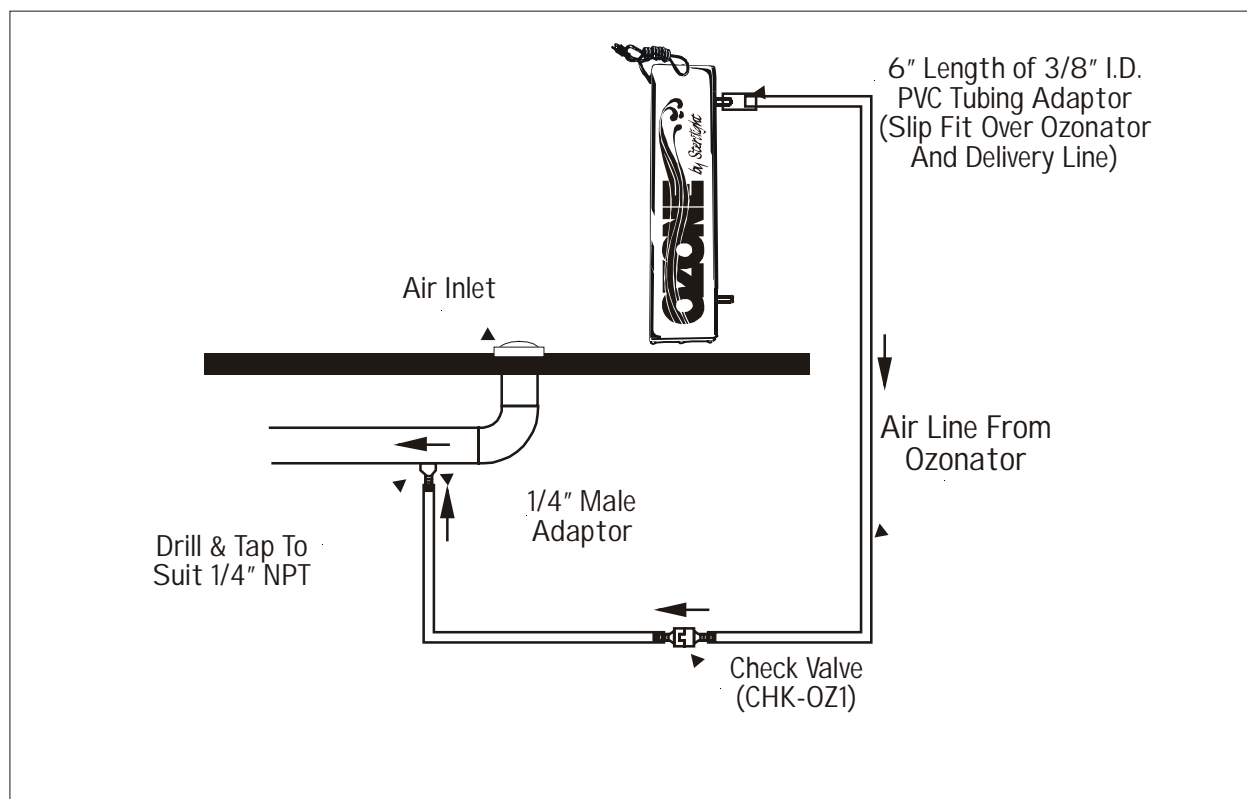


After all the water connections have been made you must choose a location for your Ozonator. If you are locating the Ozonator below the water level an approved check valve (model #CHK-O1B) must be used the Ozone induction air line from the Ozonator be hooked into an approved ground fault protected electrical supply. After the system is totally installed, re-fill the tub. When tub level is correct, thoroughly inspect the system for leaks. If your spa was equipped with a power drain, remember you must turn on the tap to allow water to pump through the system. If no leaks are found turn the power on to the tub and open the jet that has the Ozonated water connected to it and re-check for leaks. When the unit is on high speed you should be able to detect suction at the inlet on the Ozonator. If it can't be detected, take the air line off at the venturi to check the air draw into the venturi at high speed. At low speed the air draw will be dramatically reduced,

don't be alarmed, there should only be a slight air draw at low speed. The retention loop has been incorporated to keep the Ozone in contact with the water prior to induction into the spa. This will cause excellent Ozone absorption and mixing. If you have a dominant Ozone smell on high speed you simply need to increase the number of loops with an optional connector until the Ozone smell is almost eliminated. You should smell a slight hint of Ozone at the jet that is introducing the Ozone. If you have no smell at all, simply cut the loop number back until you do smell a hint of Ozone at high speed. Ozone has a distinct fresh or pungent odour.

2. SPA AIR INDUCTION SYSTEM INSTALLATION: BASIC INSTALLATION KIT #INKIT-OZ1

(i) Drain the tub or spa until the water level is below the air induction line connection point so the pipe can be cut to make the necessary connections. NOTE : Ozone may cause rubber seals in the system to degenerate. These parts should be replaced with Kynar, Viton or other material resistant to Ozone.



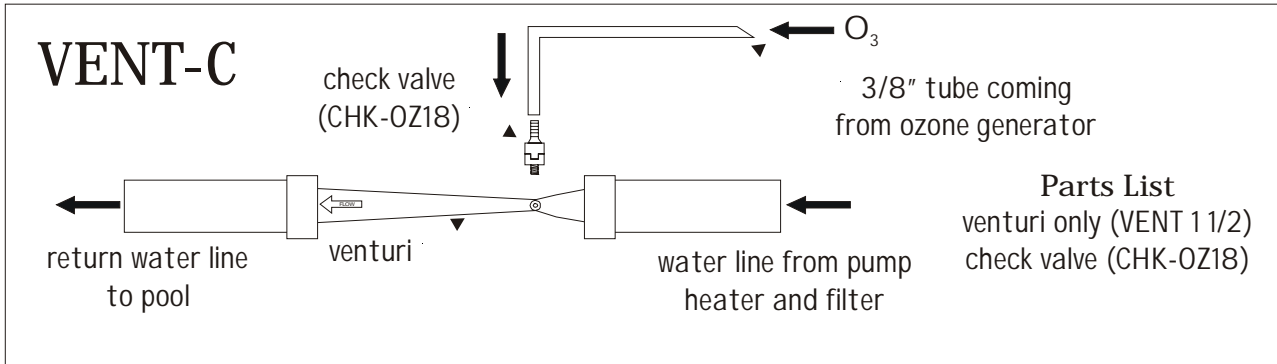
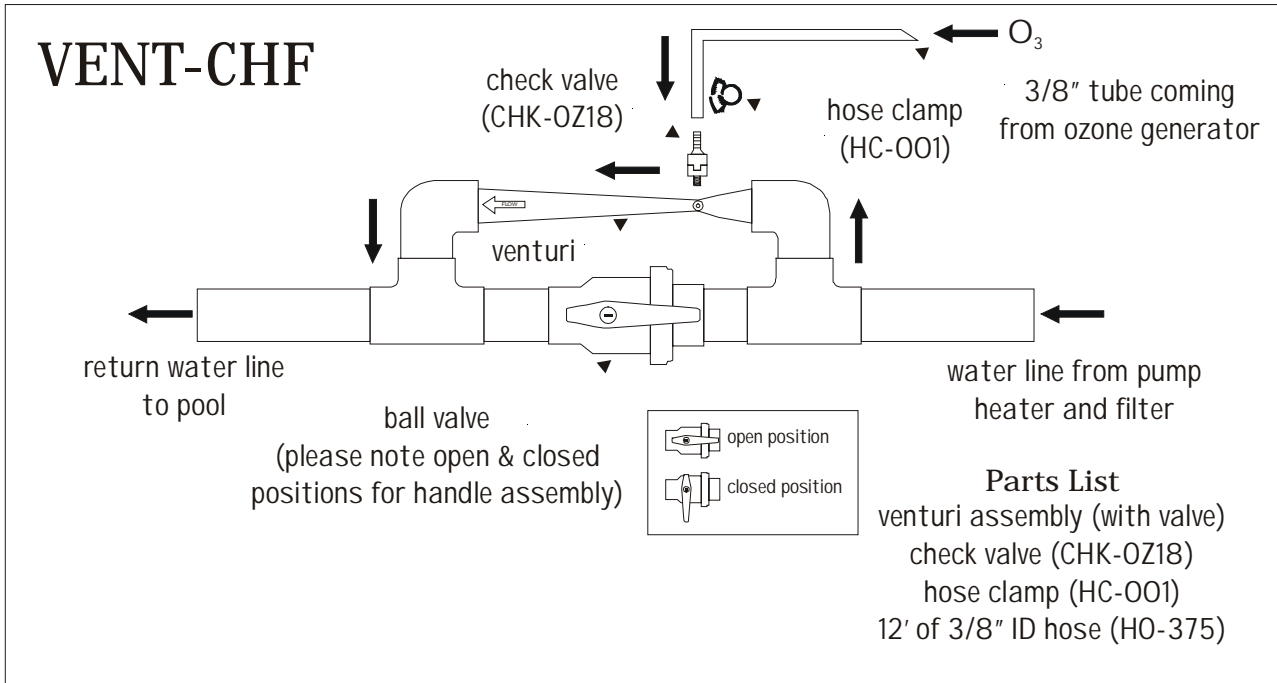
(ii) Use 3/8" inside diameter tubing for connecting the Ozone Generator to the air induction lines. This connection can be made by cutting the existing induction line and installing a plastic tee fitting and 3/8" hose adaptor. Connect the other end of the tubing to the Ozone generator port and secure tight with a hose clamp (the clamp should be tightened with pliers). A check valve in the connecting tubing, located at the tee is recommended for all installations. The generator or a loop of the hose should be at least two feet above the normal water level, otherwise an approved check valve must be installed in the tubing between the spa and the generator.

(iii) The air is drawn through the generator by the suction in the air induction pipe because of the venturi jets. Make certain the inlet to the generator is clear. After installation is complete, refill the tub and start up

the pump. Check the suction by holding a small piece of paper (about 1" square) to the air inlet port of the generator. There should be enough suction to hold the paper in place. Don't forget to remove the paper! The amount of Ozone introduced into the spa can be controlled by adjusting the air control valve. The air control valves should normally be closed on low speed operation of the spa and open on high speed.

3. WATER VENTURI SYSTEM for POOLS and SOME LARGE SPAS

A venturi draws air by forcing a set amount (or flow rate) of water through a pipe that gradually reduces in size and at the smallest point in the pipe the venturi action (or air suction) is created. A venturi or venturi system (see diagrams) must be selected to match the pump flow. Install the venturi on the discharge side of the pump and after the filter. On large systems, the venturi may create an unacceptable pressure drop, if so, a by-pass ball valve or spring loaded check valve can be installed. To increase the draw with a venturi system that incorporates a ball valve, simply adjust, or slowly close the ball valve. This will create a back pressure in the bottom pipe (see diagram) which will force water up to and through the venturi, thereby increasing draw (or suction). A spring loaded by-pass check valve is suggested for two speed pump systems (usually used on spas) to provide an automatic flow adjustment. The optional one inch venturi has a flow rating of 20 gpm and the 1 2 inch venturi is rated for 60 gpm with a 5 psi pressure drop. A ball valve by-pass is required for flows over the rated flow of the venturi. A ball valve by-pass venturi system (see diagram) is recommended for any pool installation, to offer a full range of adjustability.



4. AIR COMPRESSOR for SPECIAL INSTALLATIONS

A small air compressor may also be used to provide air flow through the Ozone Generator. The compressor pressure must be sized to overcome the pressure drop of the connecting tube and the static pressure from the depth of water in the spa. The compressor is connected to the Ozone inlet port and the Ozone outlet is connected to the water distribution piping at the spa or pool. In order to fit the tubing on the inlet port, the protective shield may need to be removed. Install a check valve between the Ozone Generator and pipe connections. The Ozone is distributed into the pool or spa by the circulation of the water. After installation is complete be sure to follow the next steps prior to operation. Plug in the electrical connection and check to see that the blue light from the UV lamp is visible. The LED indicator light should be glowing brightly. If the light does not come on or continue to glow steadily, remove the end screws, open the cover and check that there is a good electrical connection at each end of the UV lamp. When operating, a blue light will be visible at the connection ports. **NEVER LOOK DIRECTLY INTO THE PORTS**

OPERATING AND MAINTENANCE INSTRUCTIONS

A. Regularly inspect your Ozone Generator unit to ensure that the lamp is still working.

B. The ultraviolet output of the UV lamp gradually reduces with usage. However, there is a wide variation in the actual amount of Ozone required because of differences in the volume of water and the number of people using the hot tub or spa. The condition of the water is a reasonable indicator to tell when a new lamp or maintenance is needed. A large increase in the amount of treatment chemical or a change in the water colour or scum on the inside of the tub are all indications that more Ozone is required. As dust on the lamp will also reduce output, the lamp should be cleaned first to verify that the lamp needs to be replaced. (see para. D for cleaning instructions). As a general guide, lamp replacement is suggested after 12 to 18 months of continuous operation.

C. The Ozone Generator should be on whenever the pump is operating. Ozone generation requires a continuous air supply through the cell. The air suction can be produced in various ways, as discussed earlier in the installation section. Although the UV lamp may be left on without the pump operating, there would be no appreciable Ozone generation since there would be no air flow in the cell. If the pump is to be off for an extended period of time, the Ozone Generator should also be shut off. Unlike filters where the amount of water passed through determines the life expectancy, UV Ozone Generators are effected by the number of hours the lamp burns. Frequent switching off and on can also reduce lamp and ballast life. If your spa experiences heavy bather loads the Ozonator jets should be left on high speed for 2 to 5 minutes after use with the spa cover closed, this will increase the amount of injected Ozone thereby reducing the organic load. However, if the water gets very cloudy the organic load may be past the Ozonators threshold and you may need to shock after use with a concentrated chemical. If a concentrated shock is even necessary, one treatment will normally suffice.

D. To remove or replace the UV lamp, **FIRST DISCONNECT THE OZONE GENERATOR FROM THE ELECTRICAL SUPPLY.** Remove the end cover screws and the cover. Lift the stainless steel cell from the holder clip beside the electrical box and twist the cell to remove it from the other holder clip. This sequence is reversed when replacing the cell. Gently remove the retainer nuts from each end of the stainless steel cell and remove the lamp. Carefully clean the lamp with a clean, lint free wiper dampened with vinegar.

New lamps should also be wiped clean to remove dust. Do not handle the UV lamp with bare hands to avoid marking the quartz glass. Gently insert the lamp into the cell and slide the aluminum nut with the O-ring over one end of the lamp. Wet the O-ring first to help slide it over the lamp end. Turn the aluminum nut on to the threaded end of the cell and hand tighten. Next slide the other aluminum nut over the exposed end of the cell (wet the O-ring first) and turn on to the threaded end. Do not over tighten the nuts to avoid damaging the lamp ends. Adjust the lamp position so it is evenly spaced at both ends.

Next, push the lamp connectors on to the lamp end pins and fit the cell back into the bottom cell holder clip first. Plug in the electrical cord to check for proper operation. A blue light will be evident at the ports and the indicator light on should glow. **DO NOT LOOK DIRECTLY INTO THE PORTS.** Use the same procedure when removing the UV lamp for cleaning. Replace the cover and install the cover holding screws.

E. Water Chemistry

Although your Ozone Generator is a very effective oxidizer, proper water chemistry must still be maintained. For optimum results drain spa and start with fresh water prior to the installation of the Ozone Generator.

§ **TOTAL ALKALINITY** should be maintained between 80-120 ppm. TA is an important factor in stabilizing pH and should therefore be adjusted prior to adjusting pH.

§ **pH** of 7.4 - 7.6 should be maintained in the pool/spa water. Ozone is pH neutral and will not cause the pH value of the water to fluctuate; however bather load probably has the most effect on the pH balance, therefore pH should be checked regularly. If pH needs to be adjusted, it is recommended to adjust it slowly. Contact your dealer for their recommendations.

§ **CALCIUM HARDNESS** in the range of 200 -250 ppm is ideal and in most cases will be determined by local water conditions.

F. Since Ozone is such a powerful oxidizer, proper maintenance of the filtration equipment is essential. The filter cartridges will become "dirty" much more rapidly than the same system operating without an Ozone Generator. It is a good idea to have an extra filter cartridge on hand so that one may thoroughly clean the "dirty" cartridge. We recommend using TSP (trisodium phosphate) in conjunction with cold water and allowing the cartridge to soak overnight. Thoroughly rinse the cartridge and reinstall so that all seals or gaskets are seated properly.

G. To monitor the lamp life, record the date for each lamp replacement.

TROUBLE SHOOTING GUIDE

MECHANICAL

Problem	Cause	Solution
1. Ozone lamp is not lit	1. No power to unit 2. Defective lamp. 3. Improper lamp connection 4. Defective ballast.	1. Check power source. 2. Replace lamp. 3. Check lamp connection. 4. Repair ballast.
2. Ozone lamp is lit, no evidence of ozone in the pool/spa	1. Incorrect venturi alignment. 2. Defective/plugged venturi. 3. Cracked/plugged tubing. or clogged tubing.	1. Make sure water flows in the direction of the arrow located on venturi. 2. Replace or clear debris from venturi. 3. Repair/replace any defective

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| | <ul style="list-style-type: none"> 4. Incorrect check valve positioning. away from generator. 5. No suction to unit. tubing, or venturi. | <ul style="list-style-type: none"> 4. Check to see if ozone flows away from generator. 5a. Repair/replace check valve, tubing, or venturi. 5b. Clean/replace filter cartridge. 6. Replace lamp. 7. Clean ozone lamp. |
| <ul style="list-style-type: none"> 3. Strong ozone smell in immediate area of generator. | <ul style="list-style-type: none"> 6. Lamp is beyond its effective life. 7. Ozone lamp is dirty. | <ul style="list-style-type: none"> 1. Check o-ring for debris or abrasions and re-install. 2. Ensure proper connection is made. |
| <ul style="list-style-type: none"> 4. Alarm is sounding (audible alarm units only) | <ul style="list-style-type: none"> 1. Retaining nuts not sealing properly. 2. Incorrect tubing connection on outlet side of generator. | <ul style="list-style-type: none"> 1. Replace lamp. 2. Ensure proper power connection is made. 3. Please contact authorized dealer. |

WATER CHEMISTRY

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> 5. Cloudy water. | <ul style="list-style-type: none"> 1. Total dissolved solids level is too high. 2. Incorrect pH levels. 7.4-7.6 | <ul style="list-style-type: none"> 1. Clean or replace filter 2. Adjust pH to between 7.4-7.6 |
| <ul style="list-style-type: none"> 6. "Green" water. 2. High metal content. | <ul style="list-style-type: none"> 1. Excessive algae build-up. 2. Replace water. | <ul style="list-style-type: none"> 1. Shock water. |

REPLACEMENT PARTS

S2ROZAP, S2ROZAP/2

S2ROL..... UV lamp
 BA-ICE-3F electronic ballast (100-250V./50-60Hz. switchable)
 PG-010 rubber washer
 RN-001 aluminum gland nut
 OR-315 o-ring

S8ROZAP, S8ROZAP/2

S8ROL-4P UV lamp
 BA-ICE-3F electronic ballast (100-250V./50-60Hz. switchable)
 PG-010 rubber washer
 RN-001 aluminum gland nut
 OR-315 o-ring

S2Q-OZ, S2Q-OZ/2

S415ROL..... UV lamp

BA-ICE-11F electronic ballast (100-130V./50-60Hz.)
BA-ICE-12F electronic ballast (200-250V./50-60Hz.)
PG-010 rubber washer
RN-001 aluminum gland nut
OR-315 o-ring

S8Q-OZ, S8Q-OZ/2

S8ROL-4P UV lamp
BA-ICE-11F electronic ballast (100-130V./50-60Hz.)
BA-ICE-12F electronic ballast (200-250V./50-60Hz.)
PG-010 rubber washer
RN-001 aluminum gland nut
OR-315 o-ring

MANUFACTURERS WARRANTY

The Manufacturer herein called the "warrantor", warrants the UV Ozone Generator to be free from defects in material and workmanship for a period of one (1) year from the date of purchase by the original owner. If the ozone generator is defective due solely to faulty materials or workmanship, and the consumer so notifies the warrantor in writing, the warrantor will at its option and expense, either repair or replace such units subject to the following conditions. No warranties are, or have been made by the warrantor with respect to the ozone generators other than those expressly included in this one year warranty.

1. This warranty does not apply to any ozone generators which have been altered or repaired by any person other than the warrantor or by a person authorized by the warrantor, nor to any ozone generators which have damaged by misuse, neglect or accidents.
2. Warrantor shall not be liable for any incidental or consequential damages.
3. This warranty excludes the cost of labour in removing or re-installing the ozone generator and applies only to an ozone generator when returned to the warrantor at the consumer's sole expense.

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