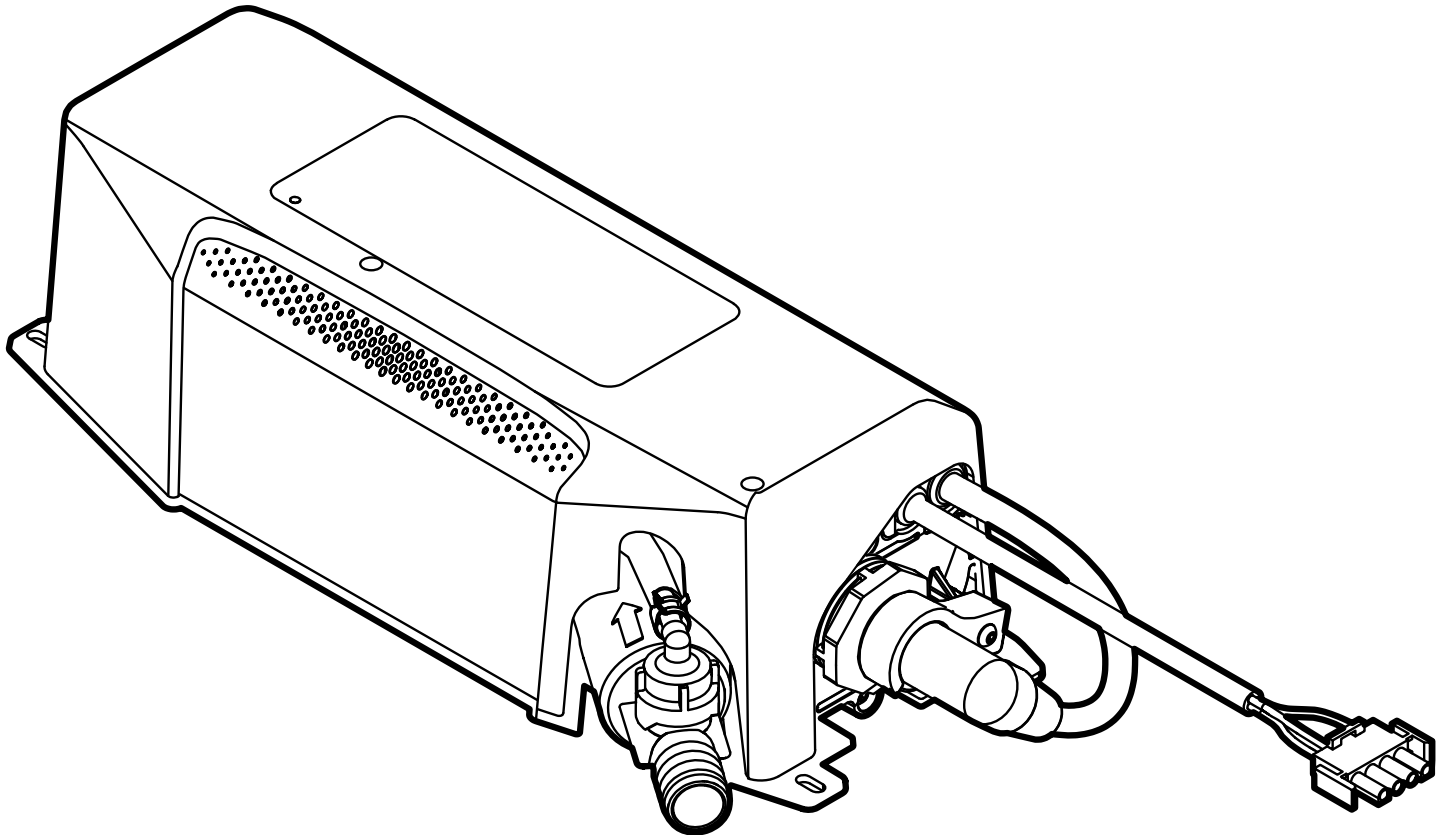




Installation and Operation Manual
Manuel d'installation et d'utilisation
Manual de instalación y operación



DEL AOP[®] Spa 2

Ozone + UV Spa Treatment

Models: 55000-000-909, 55007-000-909, 55167-001-909

⚠ WARNING

FOR YOUR SAFETY – This product must be installed and serviced by a contractor who is licensed and qualified in pool/spa equipment by the jurisdiction in which the product will be installed where such state or local requirements exist. The maintainer must be a professional with sufficient experience in pool and spa equipment installation and maintenance so that all of the instructions in this manual can be followed exactly. Before installing this product, read and follow all warning notices and instructions that accompany this product. Failure to follow warning notices and instructions may result in property damage, personal injury, or death. Improper installation and/or operation may void the warranty.



Improper installation and/or operation can create unwanted electrical hazard which may cause serious injury, property damage, or death.

ATTENTION INSTALLER – This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner/operator of this equipment.

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Symbol(s)



- Read the instruction manual.

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

Read this manual completely before attempting installation. All permanent electrical connections should be made by a qualified electrician. Follow all applicable electrical codes. When installing the DEL AOP Spa 2, basic precautions should always be followed.

Read the maintenance instructions before opening the appliance. The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction. Children being supervised are not to play with the appliance. Appliance contains a UV-C emitter.

DANGER

Be sure the electrical power is shut OFF at the main circuit breaker before installing the DEL AOP Spa 2.

The appliance is to be supplied through a residential current device (RCD) having a rated residual operating current not exceeding 30 mA. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons to avoid hazard. The appliance shall only be connected to a similar non-transparent, non-metallic pipe to prevent radiation. After the installation, the UV radiation shall not escape from both ends of the pipes.

- ALWAYS disconnect power to spa before removing the DEL AOP Spa 2 for service. Failure to do so could result in severe injury or death.
- No part of the appliance is to be located above the tub during use.
- This device incorporates electrical components, so it must be located or fixed so that it cannot fall into the tub.
- This device contains live parts, so it must be inaccessible to a person in the tub.
- Connect to a ground, grounding type receptacle only.
- NEVER install this device yourself. This device must be installed by a qualified service professional or electrician.
- NEVER submerge device in water.
- NEVER use product with damaged power cord. Replace damaged cord immediately.
- Do NOT bury cord.
- NEVER allow children to use this product.
- NEVER mount product to spa exterior.

WARNING

- To reduce the risk of electrical shock, if the power cord is damaged, replace the entire unit immediately.
- Short term inhalation of high concentrations of ozone and long term inhalations of low concentrations of ozone can cause harmful physiological effects. Do not inhale ozone gas produced by this device.
- This appliance contains a UV-C emitter.
- Exposure to UV light from this device is harmful to skin and eyes. Do not attempt to remove or service the UV lamp while it is lit.

WARNING

- Precautions should be taken when replacing UV-C emitters.
- Do not operate the UV-C emitter when it is removed from the appliance enclosure.
- UV is emitted from this lamp. Skin or eye injury could result. Avoid exposure of eyes and skin to unshielded lamp.
- Unintended use of the appliance or damage to the housing may result in the escape of dangerous UV-C radiation. UV-C radiation may, even in little doses, cause harm to the eyes and skin.
- Appliances that are obviously damaged must not be operated.

⚠ WARNING

Prolonged immersion in hot water may induce hyperthermia. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 37 °C (98.6 °F). The symptoms of hyperthermia include dizziness, fainting, drowsiness, lethargy, and an increase in the internal temperature of the body. The effects of hyperthermia include:

- Unawareness of impending danger
- Failure to perceive heat
- Failure to recognize the need to exit spa
- Physical inability to exit spa
- Fetal damage in pregnant women
- Unconsciousness resulting in a danger of drowning

⚠ WARNING**To reduce the risk of injury:**

- The water in a spa should never exceed 40°C (104°F). Water temperatures between 38°C (100°F) and 40°C (104°F) are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when spa use exceeds 10 minutes.
- Since excessive water temperatures have a high potential for causing fetal damage during the early months of pregnancy, pregnant or possibly pregnant women should limit spa water temperatures to 38°C (100°F).
- Before entering a spa or hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature-regulating devices varies.
- The use of alcohol, drugs, or medication before or during spa or hot tub use may lead to unconsciousness with the possibility of drowning.
- Obese persons and persons with a history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa.
- Persons using medication should consult a physician before using a spa or hot tub since some medication may induce drowsiness while other medication may affect heart rate, blood pressure, and circulation.
- People with infectious diseases should not use a spa or hot tub.
- To avoid injury, exercise care when entering or exiting the spa or hot tub.
- Do not use drugs or alcohol before or during the use of a spa or hot tub to avoid unconsciousness and possible drowning.
- Pregnant or possibly pregnant women should consult a physician before using a spa or hot tub.
- Water temperature in excess of 38°C (100°F) may be injurious to your health.
- Before entering a spa or hot tub measure the water temperature with an accurate thermometer.
- Do not use a spa or hot tub immediately following strenuous exercise.
- Prolonged immersion in a spa or hot tub may be injurious to your health.
- Do not permit any electric appliance (such as a light, telephone, radio, or television) within 1.5 m (5 ft.) of a spa or hot tub.
- The use of alcohol, drugs or medication can greatly increase the risk of fatal hyperthermia in hot tubs and spas.

⚠ CAUTION

Do not operate the DEL AOP Spa 2 unless sufficient air flow is being drawn through the unit.

ATTENTION

- Make sure the water circuit this appliance is connected to is bonded to earth.
- The DEL AOP Spa 2 should be electrically connected to the spa controller, which should be protected by a Ground Fault Circuit Interrupter (G.F.C.I.).
- The DEL AOP Spa 2 must be mounted under the spa skirt, sheltered from environmental elements (rain, sun, sprinklers).
- Plastic ozone supply tubing is available with the DEL AOP Spa 2. Never replace this tubing with metal tubing.

SAVE THESE INSTRUCTIONS

Section 1. General Information

1.1 Overview

The DEL AOP Spa 2 is a UV and ozone water treatment unit designed for use in portable spas and is controlled by the spa's equipment pack.

Achieve the Complete Modern Spa by choosing compatible sanitizing products that work together, creating the best possible installation.

NOTE: As with all alternative supplemental spa treatment, it will not replace the chlorine residual you need to retain in your system to ensure the health of your swimmers. This product must be installed underneath the spa in the equipment compartment with extra care to ensure it is not exposed after installation.

1.2 Specifications

- Power Requirements: 120–240V | 50/60Hz | 271–207mA | 25W
- Operating Water Temperature: 41–104°F/5–40°C
- Max Operating Pressure: 30 PSI
- Flow Rate: 4–12 GPM
- IPX5

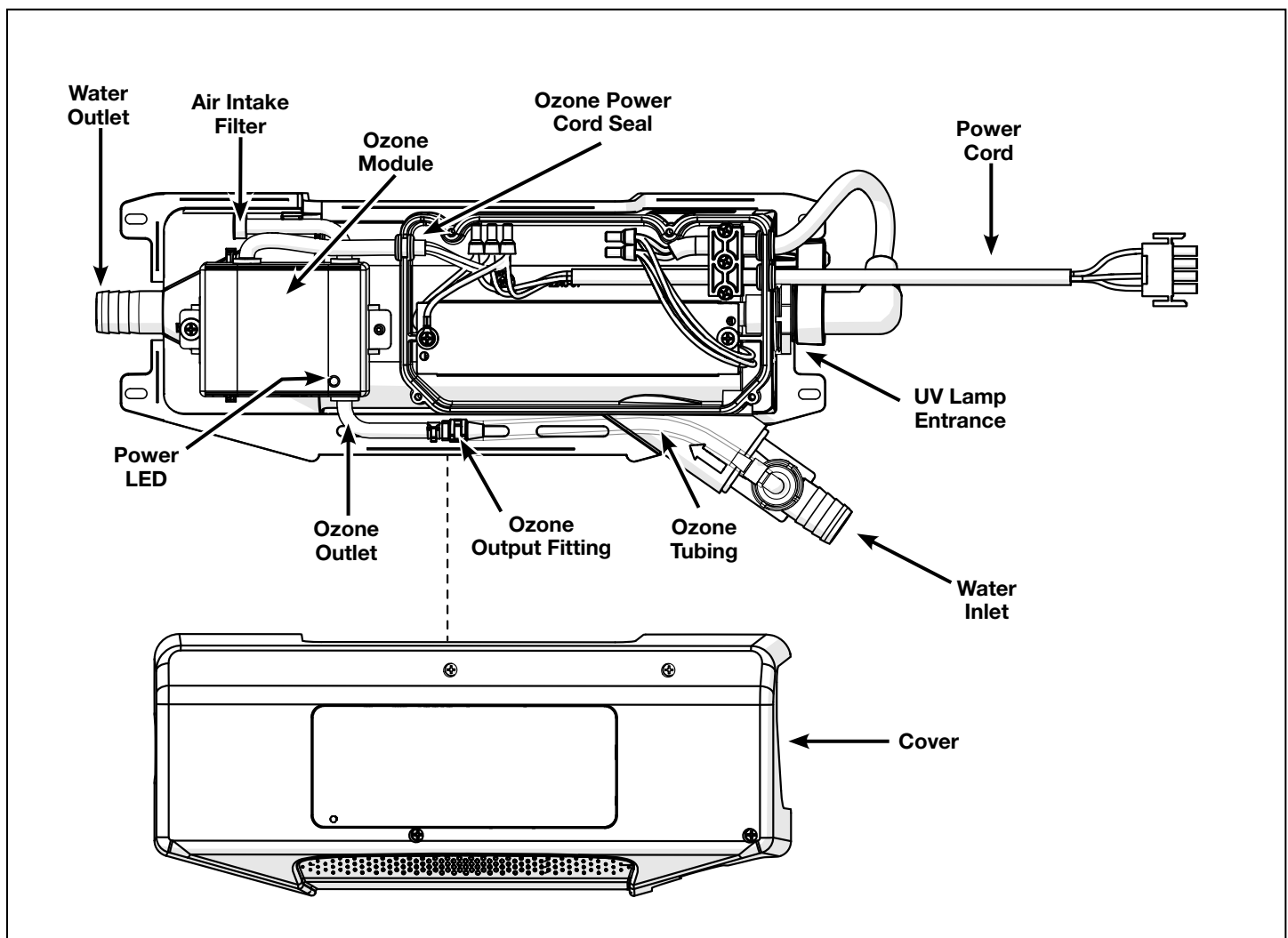


Figure 1. DEL AOP Spa 2 Components

Section 2. Installation

2.1 Mounting

ATTENTION

- DO NOT mount the unit vertically with the water outlet pointed down.
- Visually inspect the product for broken quartz tube before installation. Replace if cracks are found.

Mount the DEL AOP Spa 2 to the spa frame using the mounting holes located on either side of the unit with #10 hardware (not included).

- Any orthogonal mounting orientation—other than vertically with the water outlet pointed down—is allowed. The most common mounting orientation is horizontal, as shown in Figure 2.
- Mount the unit as high as possible.
- Allow at least 12" of clearance for lamp removal.

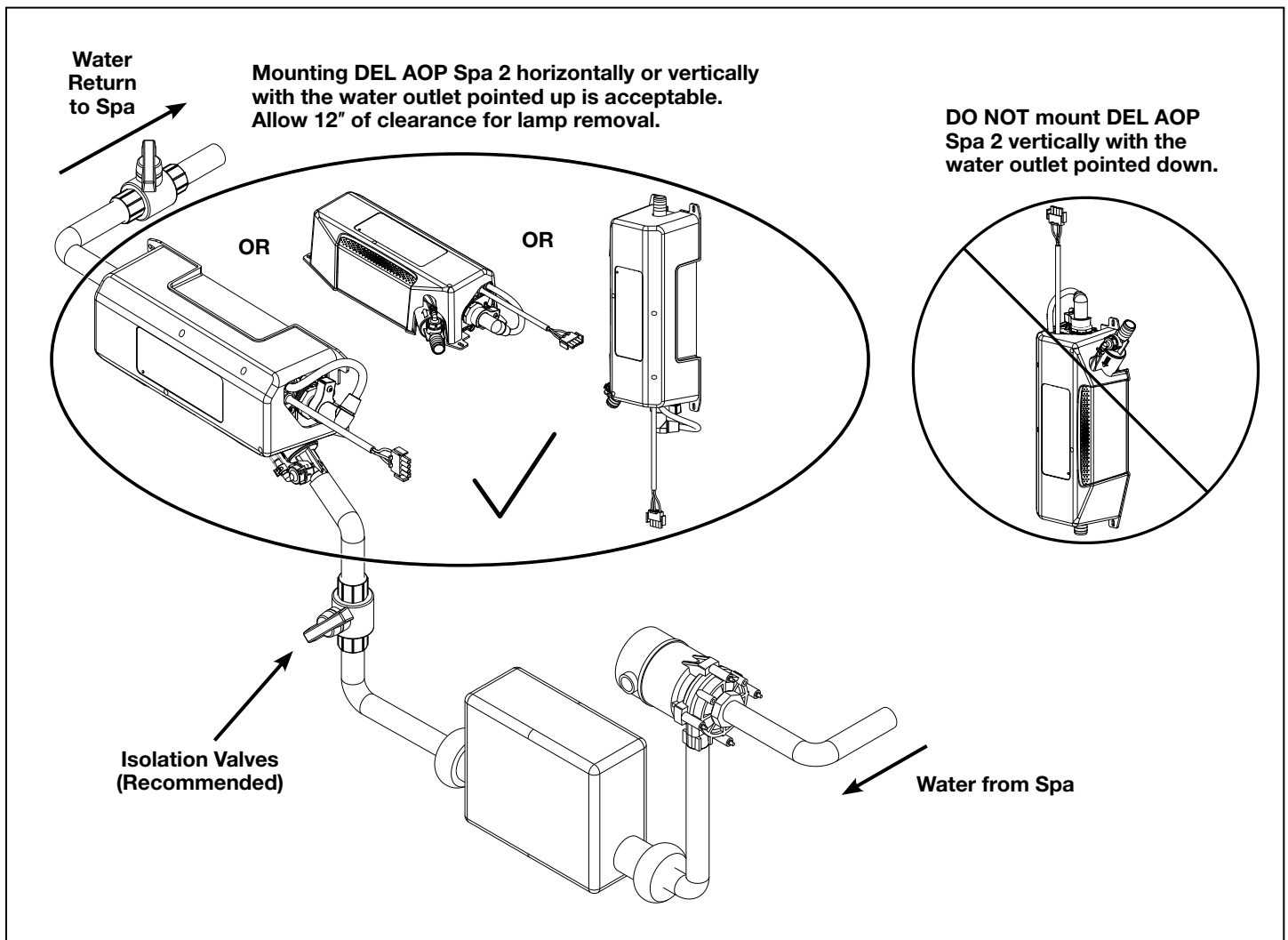


Figure 2. DEL AOP Spa 2 Plumbing Diagram

2.2 Plumbing

The ozone injector is preinstalled on the DEL AOP Spa 2 so the ozone can pass through the UV reactor. This interaction leads to advanced oxidation process, which will improve sanitation.

1. Connect a 3/4" hose with incoming water flow to the water inlet port on the preinstalled injector.
2. Connect a 3/4" hose for outgoing water flow to the water outlet port.

NOTE: The water inlet and outlet are molded in a PVC material. PVC primers and solvents may be used to attach flexible PVC hoses.

Section 3. Operation

If installed correctly, the DEL AOP Spa 2 will turn on and off as required by the spa controller. After installation, turn the spa on and verify that the power LED is illuminated. Repair any leaks in the water or ozone lines and verify that small bubbles can be seen in the return flow. Finally, turn the spa off and make sure that the power LED is not illuminated.

Section 4. Maintenance

⚠ DANGER
<p>Risk of Personal Injury! Read the maintenance instructions before opening the appliance.</p> <p>DANGER ULTRAVIOLET RADIATION. The appliance must be disconnected from the supply before replacing the UV-C emitter.</p>
⚠ WARNING
<ul style="list-style-type: none"> • Before performing any maintenance on the DEL AOP Spa 2, make sure the spa is turned off. • Disconnect the appliance from the supply before carrying out maintenance. • UV emitted from this lamp. Skin or eye injury could result. Avoid exposure of eyes and skin to unshielded lamp. • NEVER look at the UV lamp when powered on. • NEVER breathe in or ingest the nitric acid crystals for any reason. Crystals from nitric acid can accumulate in the air lines of the spa ozonator. Wear protective gear when working on the ozonator. Nitric acid will cause chemical burns on skin, if unprotected. • NEVER blow into the spa ozonator or connected plumbing for any reason. • NEVER inhale concentrated ozone gas produced by this device for any reason because it can cause serious harmful effects. • NEVER place tubing connected to this device in your mouth for any reason. • When providing maintenance to the DEL AOP Spa 2 that requires removing the cover, ensure that the Ozone Power Cord Seal is properly placed when the cover is reattached. See Figure 1.
ATTENTION
<p>SAFETY: Product Safety Agency Ratings</p> <p>The DEL AOP Spa 2 has been tested and designed for safety and is third party certified to the applicable UL, CSA, EN/IEC, and AS/NZS standards. If properly installed, ozone performs its oxidizing function and separates before off gassing.</p>

2.3 Electrical

ATTENTION
<p>Electrical wiring shall be in accordance with all applicable local electrical, building, and installation codes, and wiring rules.</p>

1. Verify that there is no power to the spa.
2. Connect the DEL AOP Spa 2 cord to the mating connector(s) on the spa controller.
3. Where possible, route the DEL AOP Spa 2 power cord away from other electrical lines. Avoid routing the power cord parallel to any low-voltage signal wires.

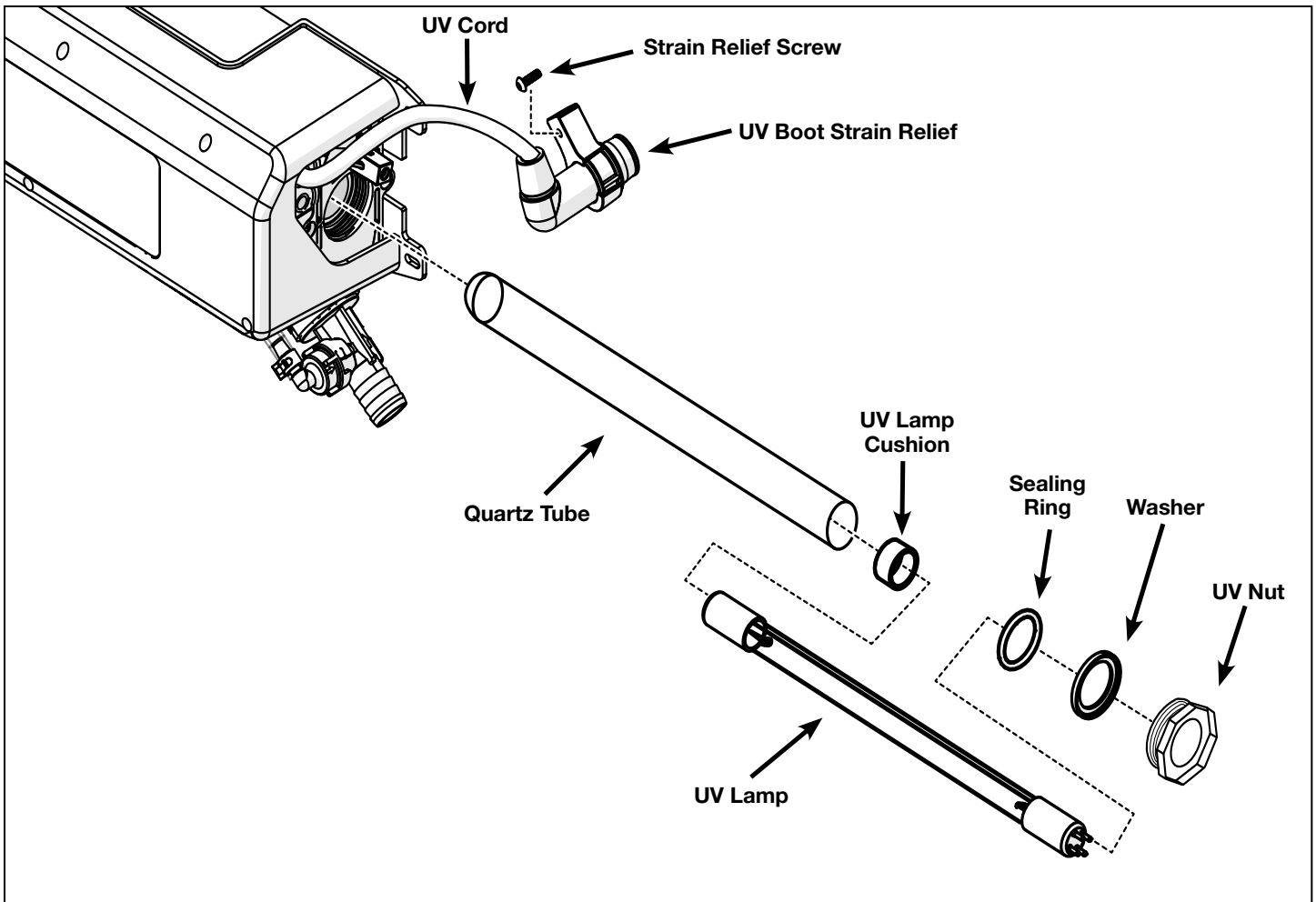


Figure 3. UV Reactor Contents

4.1 UV Lamp Removal

NOTE: Do not touch the UV lamp with your bare hands. Oils on your skin may damage the UV lamp.

If the power indicator is on, but the UV lamp is not illuminated, the UV lamp needs to be replaced. For maximum UV effect, replace the UV lamp after every 16,000 hours of run time, even if the lamp continues to shine.

1. Disconnect the unit from power and ensure the lamp has cooled before starting maintenance.
2. Loosen the UV boot strain relief by removing the screw.
3. Slide the UV boot strain relief off the mounting post (the UV boot strain relief does not need to be removed from the UV cord).
4. Pull the UV cord and connected UV lamp away from the unit until the ceramic end of the UV lamp is exposed.

5. Disconnect the UV lamp from the UV cord by grasping the ceramic end of the UV lamp and pulling straight on the UV cord.
6. Once disconnected, slide the UV lamp out of the unit.

NOTE: The UV lamp cushion may come out during this step. Retain the UV lamp cushion for later reinstallation.

7. If discarding the UV lamp, dispose of in accordance with disposal laws.

ATTENTION

UV lamp CONTAINS MERCURY. Manage in accordance with disposal laws. See www.lamprecycle.org.

4.2 UV Lamp Installation

NOTE: Do not touch the UV lamp with your bare hands. Oils on your skin may damage the UV lamp.

1. Handle the new lamp by the ceramic endcaps. If necessary, wipe off the UV lamp with alcohol and a lint free cloth before installing.
2. Carefully slide the UV lamp into the quartz tube inside the unit far enough to connect with the UV cord.
3. Align the UV cord with the UV lamp and fully connect them together.

NOTE: The UV lamp has four pins arranged in a slightly rectangular pattern. Rotate the lamp to ensure correct alignment.

4. Slide the connected UV lamp and UV cord fully into the unit.
5. Align the UV boot strain relief to the mounting post, reinstall the screw, and tighten to secure.

4.3 Quartz Tube Removal and Cleaning

The UV lamp is housed in a quartz tube. If the quartz tube becomes dirty, its ability to transmit rays from the UV lamp will be diminished and decrease system performance.

The quartz tube should be removed from the UV reactor at least once a year or during a routine spa water change for inspection and cleaning. More frequent cleaning may be necessary depending on water conditions.

⚠ CAUTION

- Wear proper eye and skin protection for servicing glass components.
- If broken glass is trapped in the spa system, do not operate the spa. Contact a service professional to have the glass removed.

ATTENTION

Damage caused by broken quartz tubes is not covered under the DEL AOP Spa Limited Warranty.

1. Make sure the spa is shut down and the system has cooled before performing maintenance on the quartz tube. If you have installed isolation valves, close them before servicing. If you do not have isolation valves, the spa must be drained below where the DEL AOP Spa 2 is mounted.
2. Remove the UV lamp as described in section 5.1.

3. Loosen the UV nut with a wrench.

ATTENTION

Any water remaining in the system above the level of the DEL AOP Spa 2 will flow out of the UV housing once the lamp retainer is removed.

4. Grasp the inside of the quartz tube and pull it out of the unit. Make sure the sealing ring and washer do not get lost during quartz tube removal.

NOTE: If the quartz tube is difficult to remove, carefully insert a blunt tool into the exit fitting of the unit to help push it out.

5. Inspect the quartz tube for cracks and replace if cracks are found. Inspect the sealing ring for nicks or hardness and replace if necessary.
6. Clean the quartz tube exterior with a mild solution of muriatic acid and water in a ratio of four parts water to one part acid (4:1). **DO NOT USE ABRASIVE CLEANERS.**
7. After cleaning the quartz tube, wash it off with water and wipe dry with a soft towel.
8. Make sure the inside of the quartz tube is dry before installing the UV lamp.

4.4 Quartz Tube Installation

1. Wet the sealing ring.
2. Place the sealing ring on the quartz tube 3/4" from the open end.
3. Reinstall washer onto quartz tube with the flat face towards the sealing ring.
4. Insert the quartz tube into the unit until fully bottomed out. Thread the UV nut into place and tighten to 5.5–6.0 N·m (49–53 lb-in).
5. After spa is refilled, turn the spa ON and check the seal around the lamp retainer for leaks.
6. If the unit leaks, please contact customer support at 1-800-733-9060.
7. **SHUT DOWN** the spa once you have confirmed that there are no leaks.
8. Install the UV lamp as described in section 5.2.
9. The unit is now ready for normal operation.

4.5 Broken Glass Removal

⚠ CAUTION

- If broken glass is trapped in the spa system, do not operate the spa. Contact a service professional to have the glass removed.
- All maintenance and service must be performed by a qualified spa professional or personnel with sufficient experience in spa equipment installation, maintenance, and service so that all of the instructions in this manual can be followed exactly.
- Wear proper eye and skin protection for servicing glass components.

4.5.1 Broken Quartz Tube

1. Remove the unit from the spa.
2. Remove the end cap from the unit.
3. Thoroughly empty the UV reactor of broken quartz.
4. Install a new quartz tube with a Quartz Tube Kit by following the steps in section 5.4.

4.5.2 Broken UV Lamp

⚠ CAUTION

UV lamp CONTAINS MERCURY. Manage in accordance with disposal laws. See www.lamprecycle.org.

1. Remove the quartz tube from the unit by following the steps in section 5.3.
2. Thoroughly empty the quartz tube of UV lamp parts.
3. Install a new lamp with a UV Lamp Kit by following the steps in section 5.2.
4. Discard the UV lamp parts in accordance with disposal laws.

4.6 Annual Maintenance

4.6.1 Check Valve

⚠ WARNING

Trace amounts of nitric acid may be present in the ozone tubing. Wear proper safety equipment (gloves and eye protection) and avoid direct contact with any condensation in the line.

NOTE: The check valve is preinstalled in the ozone injector. To access the check valve, remove the ozone tubing and the injector cap.

Inspect ozone tubing and check valve. If water is evident on the ozone module side, replace the check valve immediately. Otherwise, replace annually.

When replacing the check valve, ensure the check valve cartridge is facing the correct direction. The flow arrow should face away from the injector cap, as shown in Figure 4. Also ensure that the 2 included O-rings are installed, one on each end of the check valve cartridge.

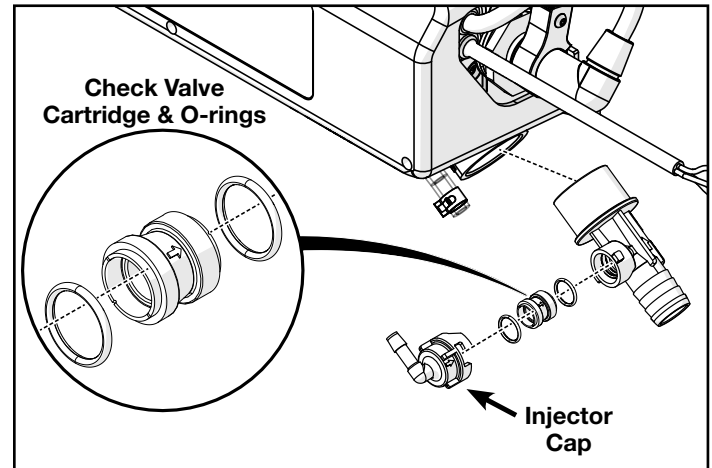


Figure 4. Check Valve Cartridge Orientation

4.6.2 Air Filter

Replace the air filter as needed.

The air filter is installed on the air inlet of the ozone module. To access, remove the unit's cover and inspect the air filter at the air inlet.

4.6.3 Ozone Tubing

Replace the ozone tubing by following these steps:

1. Squeeze tubing clamp and remove ozone tubing and clamp from injector cap.
2. Squeeze tubing clamp and remove ozone tubing and clamp from ozone output fitting.
3. Install new ozone tubing and clamps by reversing steps 1 and 2.

4.7 Winterization

NOTE: Winterize and drain the spa before winterizing the DEL AOP Spa 2.

1. Turn the power off to the unit.
2. Disconnect the unit from the spa control.
3. Disconnect the unit from the spa plumbing.
4. Once disconnected, the unit can be removed and drained of water.

4.8 Standard Replacement Parts List

Item	P/N
UV Lamp Kit Includes UV lamp	R1070400
Quartz Tube Kit Includes quartz tube, UV nut, washer, quartz tube sealing ring, and UV lamp cushion	R1070500
End Cap Kit Includes end cap, UV boot strain relief, screws, and UV reactor sealing ring	R1070600
Annual Ozone Service Kit Includes check valve, injector cap, air filter, ozone tubing, tubing clamps, and cover screws	R1070700

Section 5. Troubleshooting

DANGER

Risk of Personal Injury! Read "Section 1: Important Safety Instructions" of this manual before attempting troubleshooting.

DANGER ULTRAVIOLET RADIATION. The appliance must be disconnected from the supply before replacing the UV-C emitter.

WARNING

- Before performing any maintenance on the DEL AOP Spa 2, make sure the spa is turned off.
- Disconnect the appliance from the supply before carrying out maintenance.
- UV emitted from this lamp. Skin or eye injury could result. Avoid exposure of eyes and skin to unshielded lamp.
- NEVER look at the UV lamp when powered on.
- NEVER breathe in or ingest the nitric acid crystals for any reason. Crystals from nitric acid can accumulate in the air lines of the spa ozonator. Wear protective gear when working on the ozonator. Nitric acid will cause chemical burns on skin, if unprotected.
- NEVER blow into the spa ozonator or connected plumbing for any reason.
- NEVER inhale concentrated ozone gas produced by this device for any reason because it can cause serious harmful effects.
- NEVER place tubing connected to this device in your mouth for any reason.
- When providing maintenance to the DEL AOP Spa 2 that requires removing the cover, ensure that the Ozone Power Cord Seal is properly placed when the cover is reattached. See Figure 1.

ATTENTION

SAFETY: Product Safety Agency Ratings

The DEL AOP Spa 2 has been tested and designed for safety and is third party certified to the applicable UL, CSA, EN/IEC, and AS/NZS standards. If properly installed, ozone performs its oxidizing function and separates before off gassing.

Issue: The UV lamp isn't illuminated, but the power LED is on.

Solution: Replace the UV lamp following the steps in sections 5.1 and 5.2.

Issue: The water quality is poorer than usual.

Solution: This may or may not be related to the DEL AOP Spa 2's functionality.

1. Ensure the unit is on and within water flow parameters. This results in ozone gas flow through suction at the injector.

2. Check if the UV lamp is old or burned out. If so, replace the UV lamp following the steps in sections 5.1 and 5.2 using the UV Lamp Kit.
3. Check if the quartz tube is dirty. If so, clean by following the steps in section 5.3 or replace using the Quartz Tube Kit.
4. Ensure the LED light is on. If it's not, the ozone module is old or defective and the entire unit needs to be replaced.
5. If a known good UV lamp is not illuminated, the UV lamp ballast is old or defective. Replace the entire unit.

