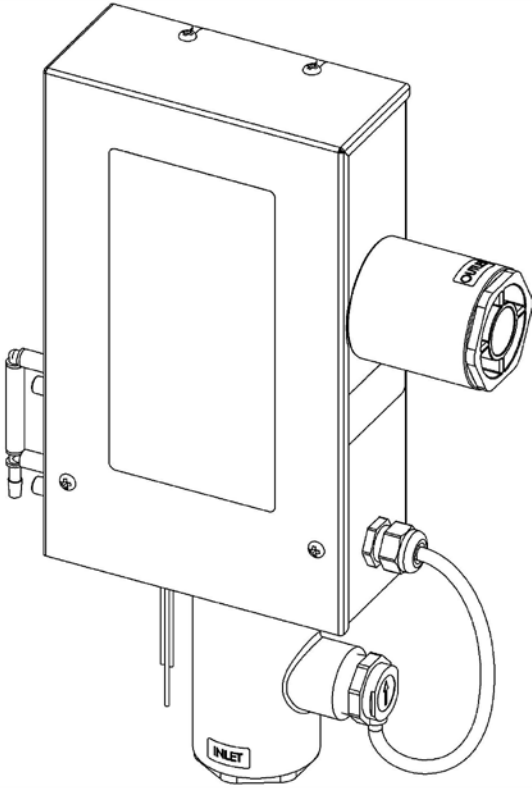




# DEL AOP-S INSTALLATION INSTRUCTIONS & PRODUCT MANUAL



Scan for  
Step-by-step  
instructions









OR VISIT [C-M-P.COM/TECH](http://C-M-P.COM/TECH)

**DEL AOP**  
C-M-P.COM/DEL  
4-2535-01 Rev.D

# IMPORTANT SAFETY INSTRUCTIONS

## READ AND FOLLOW ALL INSTRUCTIONS

- Read this manual completely before attempting installation. Failure to install in accordance with the installation instructions could void warranty and result in injury or death.
- All permanent electrical connections should be made by a qualified electrician.
- A pressure wire connector, labeled "bonding lugs", is provided on the outside of the unit to permit connection to a minimum No. 6 AWG (13.3 mm<sup>2</sup>) solid bonding conductor between this point and any metal equipment, metal enclosures of electrical equipment, metal water pipes, or conduit within 5 feet (1.5 meters) of the unit as needed to comply with local requirements.
- Install at least 5 feet (1.5 meters) from wall of pool. Install ozone generator no less than one (1) foot above maximum water level to prevent water from contacting electrical equipment. Install in accordance with the installation instructions.
- Follow all applicable electrical codes.
-  **DANGER** **ELECTRIC SHOCK HAZARD:** Be sure to turn power OFF and disconnect from power source before any service work is performed. Failure to do so could result in serious injury or death.
- The DEL AOP 50 must be installed in an outdoor location, or indoors in a forced air ventilated room, and installed so that the orientation is exactly as shown in **Figure 3**. Install to provide water drainage of generator to protect electrical components.
- Mount the DEL AOP so that it is inaccessible to anyone in the pool. Never attempt any servicing while unit is wet.
-  **WARNING** Short-term inhalation of high concentrations of ozone and long term inhalation of low concentrations of ozone can cause serious harmful physiological effects. DO NOT inhale ozone gas produced by this device.
-  **DANGER** For your safety, do not store or use gasoline, chemicals or other flammable liquids or vapors near this or any other appliance.
-  **NOTICE** To maintain cosmetic integrity, protect this unit from direct prolonged sunlight exposure.
-  **WARNING** To reduce the risk of injury, do not permit children to use this product, unless they are closely supervised at all times.
-  **WARNING** If unit is not operated according to instructions, high dosages of harmful substances may potentially be released.
- **ENVIRONMENTAL NOTICE** - Hg-Lamp CONTAINS MERCURY. Manage in accordance with disposal laws. See: [www.lamprecycle.org](http://www.lamprecycle.org).

**SAVE THESE INSTRUCTIONS!**

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## 1A. Description

The DEL AOP®-S described in this manual is designed to provide the benefits of ozonated and UV sterilized water in an environmentally safe and effective manner. The high quality, specially engineered components ensure efficient and reliable performance. As a result of proper use of the DEL AOP S, unpleasant effects of traditional chemical use are virtually eliminated. It is safe and harmless to your equipment when installed properly.

## 1B. Specifications

### Power Requirements:

110-240V, 50-60 Hz, 1Ø, 0.3 Amp

### Water Flow rate:

5-20 GPM

### Location Requirements:

Mounting: Wall or post mount in a clean, protected area.

Ambient Temp.: 30°F - 120°F (0°C - 50°C)

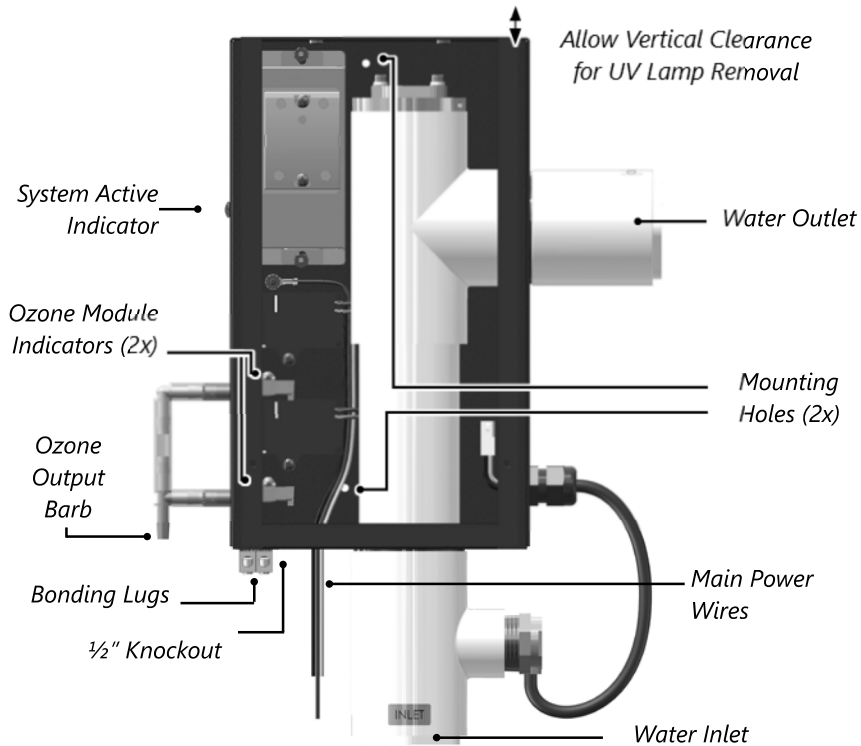
## 2A. Location

Mount in a clean, protected area out of direct sunlight. The unit must be installed in an outdoor location, or indoors in a forced air ventilated room, and installed so that the orientation is exactly as shown in Figure 1. Locate out of reach of sprinklers or drainage spouts. Mount in the orientation shown in **Figure 1**, using the two mounting holes provided inside the enclosure. Allow sufficient clearance in front for internal access, and above for service of the UV lamp and quartz tube (13 inches). The DEL AOP S should be installed at least one (1) foot above the maximum water level. See **Section 2C-3**. Check valve assembly, for plumbing instructions based on mounting location.

## SECTION 2 Installation

### 2B. Wall Mounting

1. Wall mount near pool equipment.
2. Refer to Figure 1 to mark the locations for the two mounting screws.
3. Install screws (or other hardware appropriate for mounting surface) through the two mounting holes built into the enclosure.



**Figure 1: Mounting** (cover removed)

### 2C.Plumbing

#### 2C-1. By-Pass Plumbing

Install by-pass plumbing to DEL AOP S as shown in **Figure**

**2.** Observe and follow the correct flow directions on all components.

The variable rate check valve will ensure adequate by-pass flow through the injector, which will create suction to pull in the ozone. It will also effectively limit the total by-pass flow to less than 20 GPM for optimal germicidal UV effectiveness.

The recommended configuration is a dedicated pool return from the DEL AOP S. If a dedicated pool return is not possible, a connection back to the main pool return may be used.

**NOTE:** For pools equipped with a heater, the by-pass plumbing tee to the Injector should be installed BEFORE the heater. Any by-pass that connects back to the main pool return should occur AFTER all other equipment to avoid collection of gas in the system and possible failure of pool system components.

#### 2C-2. Pressure Test

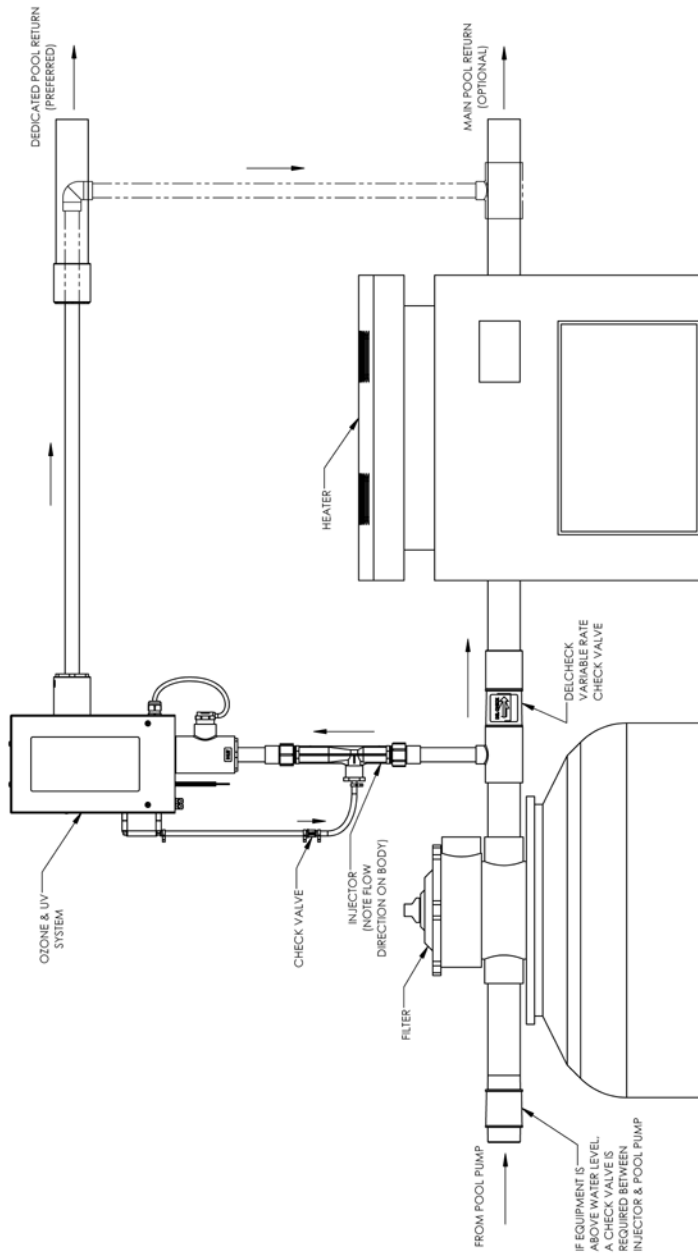
If a pressure test is required, it should be performed prior to installing the check valve assembly tubing connections. Cap the injector with the 3/4" pipe cap provided for the pressure test. Check inside the AOP S and all plumbing fittings for leaks. Repair any leaks before continuing installation.

#### 2C-3. Check Valve Assembly

1. Install tube adapter on the injector.
2. Connect the check valve assembly tubing that is closest to the check valve to the tube adapter on the injector.
3. Attach the other tubing end of the check valve assembly to the ozone outlet barb on the AOP S.

**NOTE:** If the DEL AOP S must be mounted below the water line, the check valve assembly tubing must be run to a point above the water line. This will prevent water from running back to the AOP S when the pool pump is not running, and provides protection in the event of a failed check valve.

# SECTION 2 Installation



**Figure 2: Typical Plumbing** (pool with heater)

## SECTION 2 Installation

### 2C-4. Flow Test

1. Temporarily disconnect tubing from inlet side of the check valve and attach included flow meter assembly (see **Figure 3**).
2. Hold the flow meter assembly so that the clear plastic chamber is vertical and pointed down.
3. Turn on the pool pump as this allows the injector to pull a vacuum. Under normal operation, the ball in the flow meter assembly will be floating between the min and max lines. At a minimum, the ball should indicate at least a small amount of air flow. If you experience complications, see **Section 4E. Troubleshooting**.
4. After the system flow has been verified, **remove the flow meter assembly** and reconnect the tubing to the inlet side of the check valve. Secure all tube connections on the check valve assembly with tube clamps.

### 2D. Main Power

Connect the DEL AOP S to the pool timing clock so that it operates simultaneously with the pool pump. The circuit must be protected by a Ground Fault Circuit Interrupter (G.F.C.I.) installed in accordance to electrical code.

The AOP S has three wires provided for electrical connection. Ensure that the AC power source is within the AOP S input power specifications and connect as shown on wiring decal: black wire to Line (or Line 1), white wire to neutral (or Line 2), and green wire to ground.

A knockout (1/2" trade size) is supplied for appropriate wiring conduit/fittings per local requirement.

A bonding lug is located on the bottom of the unit for connection to the pool bonding grid



**Figure 3: Flow Test**



### SECTION 3 Operation

#### 3A. General

To achieve optimal performance from the DEL AOP S, the pool must be as clean as possible to start with.

1. Backwash or clean filters one day before starting the AOP S.
2. Superchlorinate pool water using a chlorine based shock treatment.
3. Test pool chemistry and adjust pH between 7.4 and 7.6. Adjust total alkalinity between 80 and 120 ppm.
4. Run pool filtration continuously for 24 hours prior to starting ozone system.

#### 3B. Initial System Start-Up

1. With the AOP S cover off, turn on pool pump.
2. Check to ensure the AOP S system active indicator is on.
3. Check to ensure the AOP S ozone module indicators are on.
4. Verify that ozone is being pulled into the injector by checking for bubbles at the return. If an MDV is installed, check the MDV for bubbles.
5. Verify the above steps for all system conditions (multi-speed pump settings, etc.)

If you experience complications, see **Section 4E. Troubleshooting**. Call 1-800-733-9060 or visit [www.c-m-p.com](http://www.c-m-p.com) for further assistance.

#### 3C. System Shut-Down

If the system is to be shut-down for an extended period, disconnect the AOP S from the power source and disconnect the check valve assembly tubing from the ozone output barb of the AOP S. When winterizing, ensure that all water is drained from the AOP S.



**WARNING:** Before performing any maintenance, make sure the DEL AOP S is disconnected from the power source, the pool pump is off, and water pressure is relieved.

### 4A. System Electro-Mechanical Overview

#### 4A-1. DEL AOP S Components

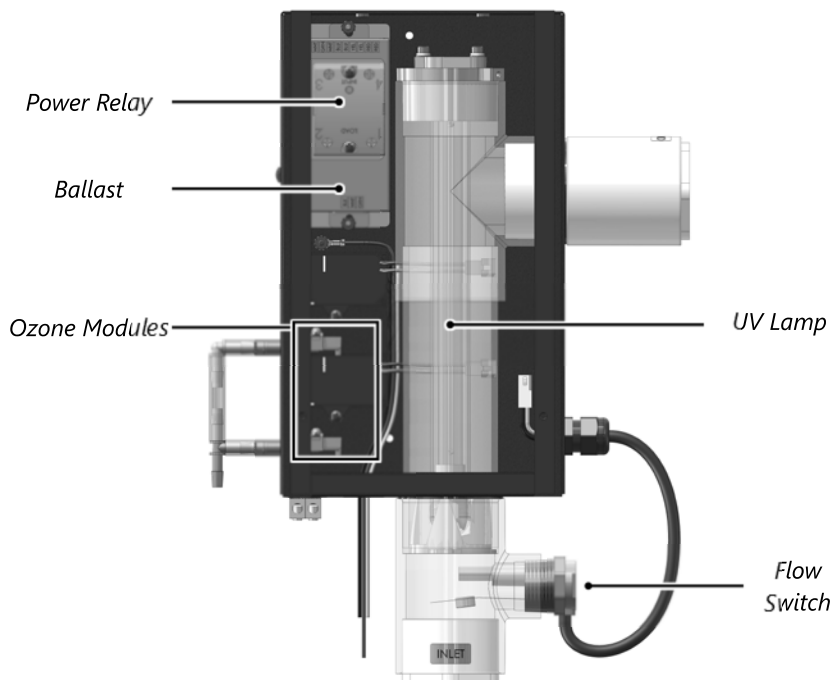
**Ozone Module:** Each ozone module consists of an ozone power supply connected by two high voltage wires to an ozone cell.

**UV Lamp:** This is housed in a quartz tube, which is sealed inside of the plumbing.

**Ballast:** Electronic ballast provides power to the UV lamp.

**Flow Switch:** Activates the power relay when adequate flow is established through the AOP S.

**Power Relay:** Turns on the ozone modules and ballast.



**Figure 4: Components**  
(plumbing transparent for clarity)

## 4B. System Maintenance

### 4B-1. Ordering Information

To locate a dealer nearest you, call 1-800-733-9060 or visit our website [www.c-m-p.com](http://www.c-m-p.com).

Be prepared to provide the following information:

- Name
- Address
- Model Number
- Date Purchased

### 4B-2. Standard Replacement Parts List

1. UV Lamp Replacement Assembly.....9-1100-01
2. Quartz Tube Replacement Kit.....9-1204-01
3. Sealing O-Ring.....7-1981-01
4. Check Valve Assembly\*.....9-0770-01
5. Ozone Module.....9-1056-01

\* Must be replaced every year.

**4B-3.** Regularly reinstall and check the flow meter assembly for proper flow. Always remove the flow meter assembly after confirming flow.

**4B-4.** Regularly inspect check valve assembly tubing for cracks or wear. Also, check to make sure that no water is present between the check valve and the AOP S. This indicates check valve failure. Replace the check valve assembly (replacement part number 9-0770-01) immediately.



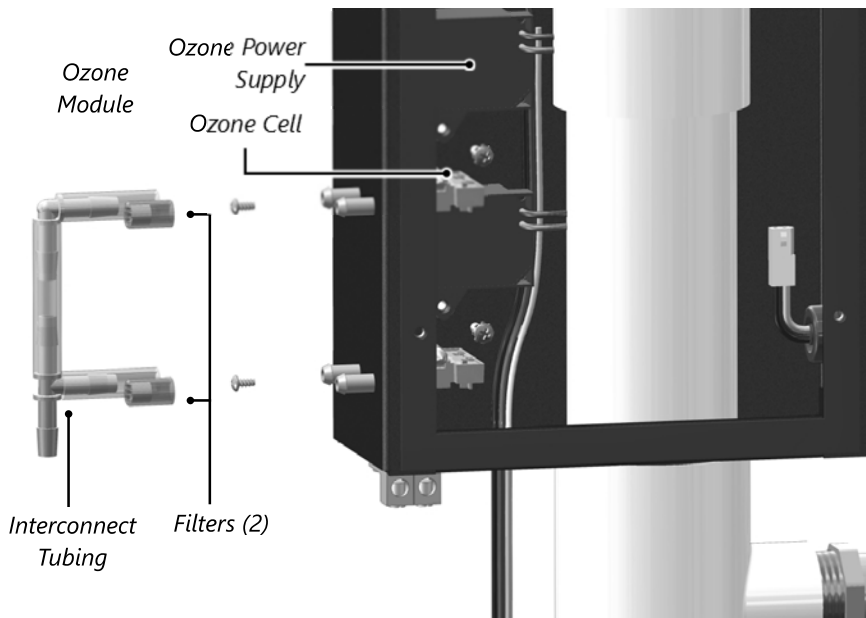
**WARNING:** Trace amounts of nitric acid may be present in the check valve assembly and could be mildly corrosive. Allow any moisture to be drawn out or dried up prior to servicing, if possible. Wear proper protective gear.

### 4C. Ozone Module Service

Replace ozone modules if the ozone module indicator will not light, or after 15,000 hours of operation (15,000 hours equals approximately 5 years for a pool system that operates 8 hours/day).

Disconnect power before servicing. Follow the instructions below to replace ozone modules and refer to Figure 5.

1. Remove the interconnect tubing and filters from the ozone cell connections on the outside of the AOP S.
2. Remove the screws securing the ozone cells to the side of the enclosure.
3. Disconnect the power connectors between the ozone power supplies and wire harness.
4. Remove the screws securing the ozone power supply to the standoff inside of the enclosure. Remove the ozone module.
5. Install the new ozone module by reversing these steps.



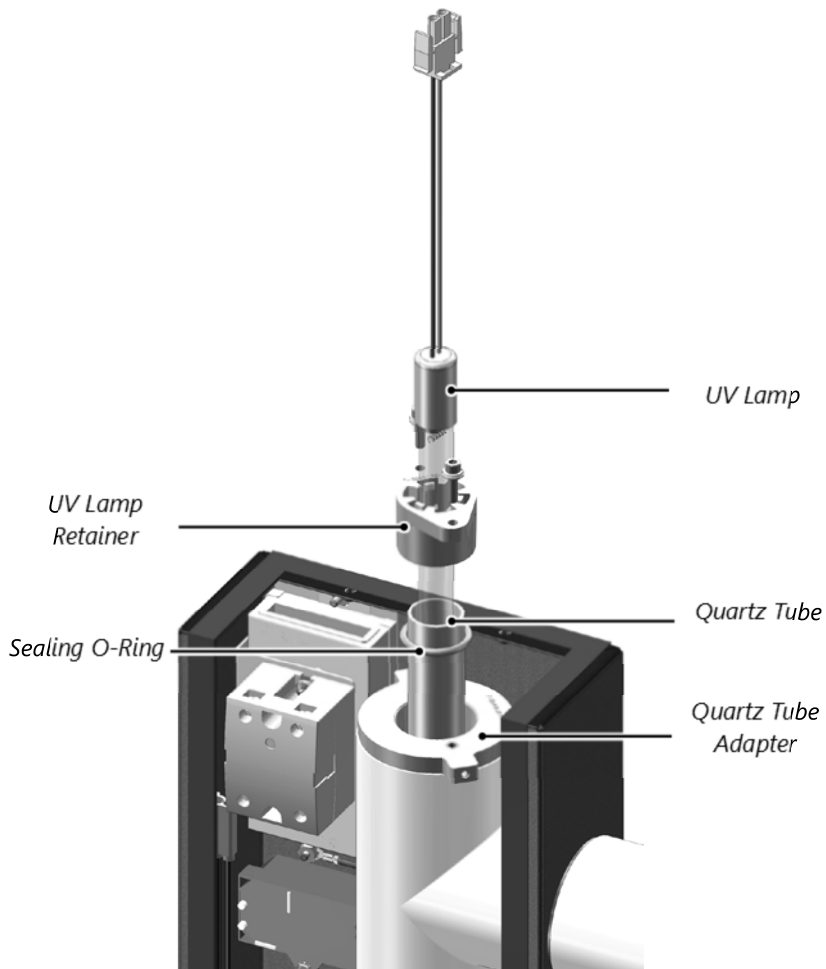
**Figure 5: Ozone Module Replacement**

### 4D. UV Lamp and Quartz Tube Service

#### 4D-1. UV Lamp Removal

For maximum UV sanitization effect, replace the UV lamp after 13,000 hours of operation.

Follow the instructions below for UV lamp replacement and refer to Figure 6.



**Figure 6: Lamp and Quartz Tube Removal**

## SECTION 4 Maintenance & Service

1. Make sure the unit is disconnected from power and the lamp has cooled before performing maintenance.
2. Disconnect the power connector between the UV lamp and wire harness.
3. Gently pull on the UV lamp wires until the top of the UV lamp is out of the UV lamp retainer. Grasp the white ceramic end of the UV lamp and pull until it is fully removed. If the UV lamp will be reused, avoid touching the UV lamp glass with your bare hands. Handle the UV lamp carefully and set aside. If discarding, dispose of properly (see Important Safety Instructions at the beginning of this manual).

### 4D-2. Installing the UV Lamp

1. Make sure to only handle the new UV lamp by the ceramic ends. Clean the UV lamp with a lint free cloth and rubbing alcohol before installation if needed.
2. Carefully push the UV lamp into the UV lamp retainer until the top of the UV lamp is past the tabs on the UV lamp retainer.
3. Reconnect the UV lamp power connector to the wire harness.

### 4D-3. Quartz Tube Removal and Cleaning



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

NOTE: Damage caused by a broken quartz tube is not covered under the DEL AOP S limited warranty.

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 AOP S at least once a year for inspection and cleaning.

1. Make sure the AOP S is drained of pool water and has cooled before performing maintenance on the quartz tube.
2. Remove the UV lamp as described in Section 4D-1. UV Lamp

## SECTION 4 Maintenance & Service

**Removal.** Remove the two screws and washers from the top of the UV lamp retainer, and pull the UV lamp retainer out of the quartz tube adapter.

**NOTE:** Any remaining water in the AOP S, or the plumbing system above the level of the AOP S, will drain when the UV lamp retainer is removed.

3. Grasp the inside of the quartz tube and pull it out of the housing. Make sure the sealing o-ring does not get lost during quartz tube removal.
4. Inspect the quartz tube for cracks and replace if cracks are found. Inspect the sealing o-ring for nicks or hardness and replace if necessary.
5. 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.



**CAUTION:** Follow the directions for safe use and handling of muriatic acid on the acid bottle label. Never add water to acid. Always add acid to water.

6. After cleaning the quartz tube, wash it off with water and wipe dry with a soft towel.
7. Make sure the inside of the quartz tube is dry before installing the UV lamp.

## SECTION 4 Maintenance & Service

### 4D-4. Quartz Tube Installation

1. Place the sealing o-ring on the quartz tube 3/4 inch from the open end.
2. Insert the quartz tube partially into the quartz tube adapter. Place the UV lamp retainer over the open end of the quartz tube and slowly push in until it is touching the quartz tube adapter.
3. Reinstall the two screws and washers and tighten until the UV lamp retainer is seated completely against the quartz tube adapter.
4. Turn on the pool pump and check the joint around the UV lamp retainer for leaks.
5. If it leaks, please contact Customer Support at 1-800-733-9060.
6. Once you have confirmed that there are no leaks, turn off the pool pump and install the UV lamp as described in Section 4D-2.

### 4E. Troubleshooting

Knowledge of electrical applications is required for troubleshooting. Contact a certified electrician if you are unsure of your ability to service the equipment. Improper servicing will void the warranty.

**Symptom:** "SYSTEM ACTIVE" indicator not lit when the pool system is on.

1. No power to the AOP S from the power source.
  - a. Check breaker at the power distribution box.
  - b. Check for loose connections or wiring breaks from the power distribution box to the AOP S.
  - c. The G.F.C.I. has been tripped. Reset the G.F.C.I.
2. Insufficient flow through the AOP S.
  - a. Check the pool pump and ensure water is flowing through the injector (5 GPM minimum).
  - b. Check to ensure that the pump skimmer and filter are clean.
  - c. Ensure that there is no debris clogged inside the injector.



## SECTION 4 Maintenance & Service

**Symptom:** No gas flow.

1. Injector not supplying adequate suction.
  - a. Check the pool pump and ensure water is flowing through the injector.
  - b. Check to ensure that the pump skimmer and filter are clean.
  - c. Check to ensure that the Injector is plumbed in the right direction.
  - d. Ensure that there is no debris clogged inside the injector.
2. Tubing is impaired.
  - a. Check for kinks or clogs.
  - b. Check for cracks or cuts.
  - c. Check connections.
  - d. Ensure that the check valve is installed with the arrow pointing towards the injector.
  - e. Be sure that the check valve has not become fouled with debris. Disconnect the check valve assembly from the tube adapter on the injector. With the pump running, test the end of the tube adapter with your thumb, and feel for suction. Wash your hands immediately afterwards to remove any residual nitric acid. If there is sufficient suction without the check valve assembly connected, replace the check valve assembly.

**Symptom:** Ozone tubing becomes yellow/brown and brittle.

1. The high concentration of ozone created by the corona discharge ozone generators, as well as environmental conditions like UV sunlight, will tend to deteriorate the supplied tubing. This is normal and acceptable, as long as the tubing doesn't become cracked and leak. Because of this, CMP recommends replacing the check valve assembly every year.





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