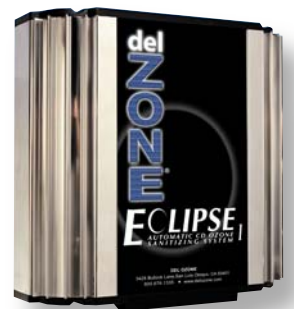


del
**NOZ
NE**®



ECLIPSE™ 1, 2, & 4

Corona Discharge Ozone Generators INSTALLATION & OPERATION MANUAL

Table of Contents

SECTION 1

General Information

1A Description 1
 1B Specifications 1
 1C Warranty Summary 1

SECTION 2

Installation

2A Location 1
 2B Mounting 1
 2C Electrical 1
 2D Plumbing 2

SECTION 3

Operation

3A General 2
 3B Initial System Start-Up 2
 3C Normal Operation 2
 3D System Shut-Down 3
 3E Water Chemistry 3

SECTION 4

Maintenance & Service

4A System Electro-Mechanical Overview 3
 4B System Maintenance 3
 4C Generator Servicing 3
 4D Trouble Shooting 4

SECTION 5

Replacement Parts and Ordering Information

5A Ordering Information 5
 5B Standard Replacement Parts List 5

Warranty 5



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.
- For cord and plug-connected units, connect to a grounded, grounding type receptacle only. If the DELZONE® Eclipse electrical connection is to be attached to the pool controls, be sure the pool controls are protected by a Ground Fault Circuit Interrupter (G.F.C.I.). If the DELZONE® Eclipse is connected to an independent electrical supply, then a G.F.C.I. must be installed between the DELZONE® Eclipse and the electrical supply.
- Do not bury cord.
- Warning - To reduce the risk of electrical shock, replace damaged cord immediately.
- A pressure wire connector is provided on the outside of the unit to permit connection to a minimum No. 8 AWG (8.4 mm²) solid bonding conductor between this point and any metal equipment, metal enclosures of electrical equipment, metal water pipes, or conduit within five (5) feet (1.5m) of the unit as needed to comply with local requirements.
- Install at least 5 feet (1.5 meters) from wall of pool water using nonmetallic tubing. 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.
- 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 DELZONE® Eclipse 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. Install to provide water drainage of generator to protect electrical components.
- Mount the DELZONE® Eclipse so that it is inaccessible to anyone in the pool. Never attempt any servicing while unit is wet.
- Plastic ozone supply tubing is supplied with the Eclipse. Never replace this tubing with metal tubing.
- 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.
- For your safety, do not store or use gasoline, chemicals or other flammable liquids or vapors near this or any other appliance.

SAVE THESE INSTRUCTIONS!

SECTION 1 General Information

1A Description

The DELZONE® Eclipse Corona Discharge (CD) series ozone generators described in this manual are designed to provide the benefits of ozonated water in an environmentally safe and effective manner. The high quality, specially engineered components ensure efficient ozone output and reliable performance.

As a result of proper use of the DELZONE® Eclipse CD ozone generators, unpleasant effects of traditional chemical use are virtually eliminated. The DELZONE® EclipseCD ozone generators are safe and harmless to your equipment when installed properly.

1B Specifications

Ozone Output:

Ozone output ($\pm 10\%$): Eclipse-1 (EC-1)0.25 g/hr
 Eclipse-2 (EC-2)0.5 g/hr
 Eclipse-4 (EC-4)1.0 g/hr

Flow rate: 15 scfh

Power Requirements:

Domestic:

EC-1 120V, 60 Hz, 1Ø, 0.06 Amp
 240V, 60 Hz, 1Ø, 0.03 Amp
 EC-2 120V, 60 Hz, 1Ø, 0.12 Amp
 240V, 60 Hz, 1Ø, 0.06 Amp
 EC-4 120V, 60 Hz, 1Ø, 0.24 Amp
 240V, 60 Hz, 1Ø, 0.12 Amp

International:

CE EC-1 240V, 50 Hz, 1Ø, 0.03 Amp
 EC-2 240V, 50 Hz, 1Ø, 0.06 Amp
 EC-4 240V, 50 Hz, 1Ø, 0.12 Amp

Shipping Weight:

EC-1: Approx. 3.5 pounds / 1.6 kg
 EC-2: Approx. 5.5 pounds / 2.5 kg
 EC-4: Approx. 10.5 pounds / 4.8 kg

Location Requirements:

Mounting: Wall mount in a clean, protected area.
 Ambient Temp: 30°F - 120°F (0°C - 50°C)

1C Warranty Summary

Limited Warranty:

1 year warranty on entire generator. See Warranty section (page 5) for limitations and details on obtaining warranty service.

SECTION 2 Installation

2A Location

The DELZONE® Eclipse units are designed for wall mounting. **See Figure 1.** Mount generator in a clean, protected area, either indoors or outdoors (Preferrably out of direct Sunlight). Locate generator out of reach of sprinklers or drainage spouts. Allow sufficient access for maintenance and all tubing and electrical wires. Ozone generator should be installed at least (not less than) one foot above the maximum water level. **Note:** Injector manifold needs to be installed after all other equipment or possible failure may occur.

2B Wall Mounting

1. Refer to Figure 1 to mark the locations for the four mounting screws.
2. Install screws (or other hardware appropriate for mounting surface) through the four mounting holes built in to the top and bottom end caps on the Eclipse.

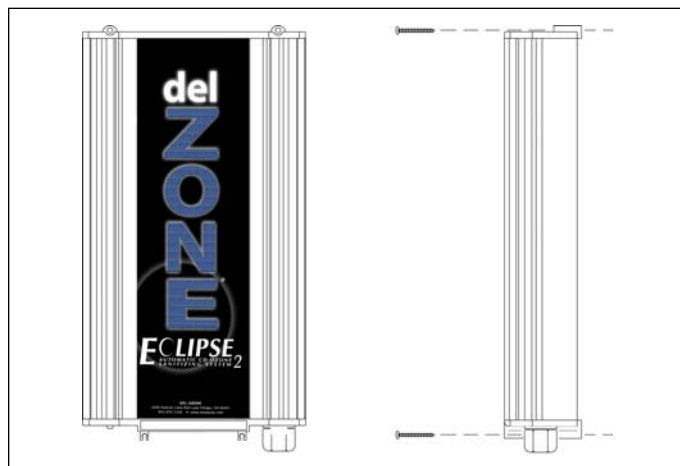


Figure 1 Wall Mount

2C Electrical

2C-1. Main Power: Connect the DELZONE® Eclipse to the pool timing clock so that the DELZONE® Eclipse operates simultaneously with the pool pump. The circuit must be protected by a ground-fault circuit interrupter (GFCI) installed in accordance to electrical code. Refer to the IMPORTANT SAFETY INSTRUCTIONS at the beginning of this manual for important wiring information.

NOTE: The standard DELZONE® Eclipse is equipped with a power cord that terminates with a NEMA plug. For units equipped with a conduit fitting, connect the Black wire to Line, the White wire to Neutral, and the Green wire to Ground.

2C-2. Grounding Lug: Using a 6-14AWG conductor, connect the Grounding lug on the right side of the DELZONE® Eclipse to an appropriate earth contact.

2D Plumbing

Ozone gas is introduced to the pool circulation line using a venturi injector. Suction developed by the venturi allows the DELZONE® Eclipse generator to operate safely under vacuum.

2D-1. Plumbing the Injector Manifold: The 2" DEL Adjustable Injector Manifold (Figure 2) must be installed in the pool's main return line after all other pool equipment (pump, filter, and heater).

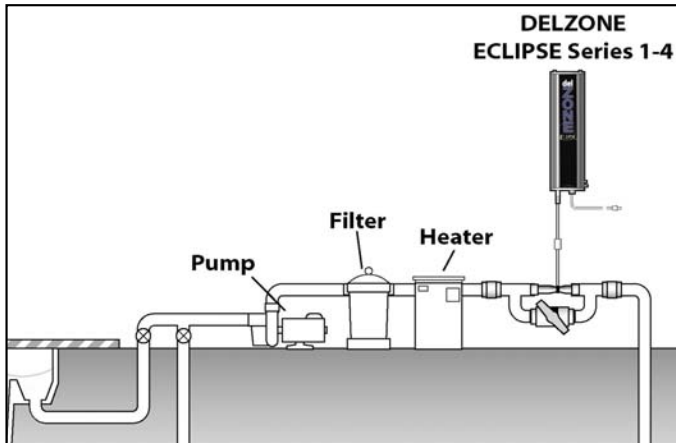


Figure 2 DEL Adjustable Injector Manifold Mounting Location

Locate an appropriate section of the return line, hold the injector manifold against the pipe and mark the length. Subtract 2-1/2" from the overall length. Mark this point, and cut out the section. Install the injector manifold with PVC cement. Be very careful to observe and follow the correct water flow direction (as indicated by the arrow on the injector manifold).

2D-2. Water Check Valve: If the pool equipment is mounted above the water line, a 1/3# DELCheck™ check valve must be installed between the pump outlet and the injector assembly. This will prevent the pump from draining and losing its prime (When not in use).

2D-3. Ozone Gas Line - refer to Figures 3 & 4

1. The outlet on the injector assembly has a 1/4" hose port. Connect the 1/4" ID ozone supply tubing provided to the injector with a check valve between the two. Be sure that the flow direction arrow on the check valve is pointing towards the direction of the injector (away from the ozone generator).
2. Extend the ozone supply tubing so that it reaches the base of the DELZONE® Eclipse in its mounted location.
3. Cut off the excess tubing so that the line from the injector to the DELZONE® Eclipse is as straight and free from dips and loops as possible.
4. The base of the DELZONE® Eclipse has two hose connections. Connect the 1/4" end of the ozone supply tubing to the port marked "OZONE OUT" (see Bottom View - Figure 4).

NOTE: Plumbing the Ozone Line to the incorrect port will cause damage to the ozone generator.

2D-4. Flowmeter: Connect the flowmeter assembly provided to the "AIR IN" port on the base of the Eclipse. This flowmeter will indicate how to adjust the injector after start-up. See SECTION 3C.

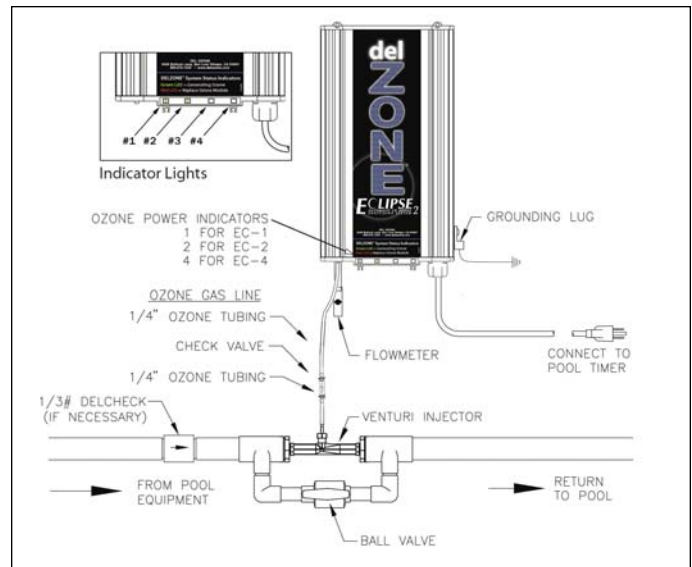


Figure 3 Installation Diagram

SECTION 3 Operation

3A General

To achieve optimal performance from the ozone system, the pool must be as clean as possible to start with.

1. Backwash or clean filters one day before starting the ozone generator.
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

Upon completing all of the generator system connections and cleaning the pool as outlined above, you are ready to begin start up procedures.

1. Check electrical connections.
2. Check for proper voltage.
3. Adjust the injector manifold ball valve to half open (45°) as shown in Figure 3.
4. Turn on pool circulation system.
5. Check for leaks.

3C Normal Operation

When the pool's circulation system starts, the green LED indicator(s) on the front of the DELZONE® Eclipse should illuminate. The EC-1, EC-2, and EC-4 should show 1, 2, and 4 green indicators, respectively.

The flowmeter ball should be bouncing **near** the line in the center of the flowmeter. If the ball is low, close the injector by turning the handle slightly clockwise. If the ball is high, open the injector by turning the handle slightly counterclockwise. Once the flow has been properly adjusted, the flowmeter should be removed.

If you experience complications see TROUBLE SHOOTING Section 4D, call 800-676-1335, ext. 248 for assistance, or visit our website at www.delozone.com for further technical assistance.

3D System Shut-Down

The following sequence of steps must be followed for servicing or for storage.

1. Disconnect the power to the ozone generator.
2. After the generator has been shut down, the pool water circulation pump may be turned off.
3. If the system is to be shut down for an extended period, disconnect the Ozone Gas Line from the ozone generator.

3E Water Chemistry

Regular chlorine or bromine testing should be performed as normal. Ozone will be eliminating the majority of contaminants. Therefore, only a small amount of chemicals will need to be added - just enough to maintain a minimum of residual level of 0.5 - 1.0 ppm chlorine or 1.0 - 2.0 ppm bromine. Ozone is pH neutral thus minimizing pH adjustments.

SECTION 4 Maintenance and Service

4A System Electro-Mechanical Overview

Refer to Figure 4.

4A-1. Indicator Lights (LEDs):

1. **Ozone Power:** The green indicator light(s) on the front of the DELZONE® Eclipse indicate(s) that the ozone power supplies are operating properly. The EC-1, EC-2, and EC-4 should show 1, 2, and 4 green "ozone power" indicator lights, respectively. **NOTE:** If any of the lights turns red, it means that the ozone generating module has failed. Contact DEL Ozone customer service at 805.541.1601 if your unit is still under warranty. If none of the indicator lights are on, it means that there is no power to the unit. Check the power connections and/or the fuse

4A-2. Internal Components: Ozone Module: Each ozone module consists of a power supply connected by two high voltage wires to an electrode.

4B System Maintenance

4B-1. The green "ozone power" indicator light(s) on the front of the DELZONE® Eclipse indicate that the ozone power supply is operating properly. When an indicator light turns red, replace the corresponding ozone module.

4B-2. Each ozone module should be replaced after 15,000 hours of operation*. Even if the green indicator light(s) are glowing, the ozone module may be producing little or no ozone after this period of time due to material degradation within the corona discharge ozone chamber.

*15,000 hours equals approximately 5 years if the pool system operates 8 hours/day 365 days of the year, or approximately 2 years if the pool system operates 24 hours/day 365 days of the year.

4B-3. Regularly check the flowmeter for proper flow and

inspect ozone supply tubing for cracks or wear. Replace ozone supply tubing as necessary.

4B-4. Replace "ozone check valve" (replacement part number 7-1140-01) every 15,000 hours, or sooner if needed.

WARNING: Do NOT touch the ends of the check valve when replacing. Trace amounts of nitric acid may be present on the check valve and could prove harmful if touched or ingested.

4B-5. While operating, check to see if bubbles are entering the pool (unless you have installed an MDV to remove bubbles).

4C Generator Servicing - Refer to Figure 4

4C-1. The DELZONE® Eclipse ozone generator must be removed from the wall before servicing. To remove the Eclipse:

1. Make sure the power is off by disconnecting the power cord from the pool timer circuit.
2. Disconnect the ozone supply tubing from the bottom end cap of the Eclipse.
3. Disconnect ground wire.
4. Remove the four wall mounting screws.

4C-2. Opening the Eclipse

The DELZONE® Eclipse enclosure consists of two aluminum plates that slide together. They are held in place by the plastic end caps. To open the enclosure:

1. Lay the DELZONE® Eclipse face up on a hard, flat surface.
2. Remove the Top End Cap completely by removing the four screws. Remove only the top two screws of the bottom end cap.
3. Remove the cover grounding screw located on the lower right side of the unit.
4. Carefully slide the two enclosure halves apart by gripping the Base End Cap firmly and pulling on the Enclosure Cover.

NOTE: If the two halves do not slide apart easily, turn the DELZONE® Eclipse over and use a screwdriver to pry the cover off as shown in Figure 4.

4C-3. Ozone Module Replacement

The EC-1, EC-2, and EC-4 have 1, 2, and 4 ozone modules, respectively. The green indicator lights on the front of the DELZONE® Eclipse correspond from left to right to ozone module number 1 through 4. For the EC-2 and EC-4, the ozone modules are numbered beginning with number 1 at the bottom.

To replace an ozone module:

1. Open the DELZONE® Eclipse as described in section 4C-2.
2. Disconnect the tubing at both the inlet and outlet of the ozone electrode.
3. Remove the two nuts that secure the ozone electrode to the support bracket.
4. Disconnect the plastic power connector between the power supply and wire harness.
5. Remove the two screws that secure the power supply to the metal base.
6. Install the new ozone module by reversing the above steps.

DELZONE® Eclipse 1, 2, & 4 Corona Discharge Ozone Generators

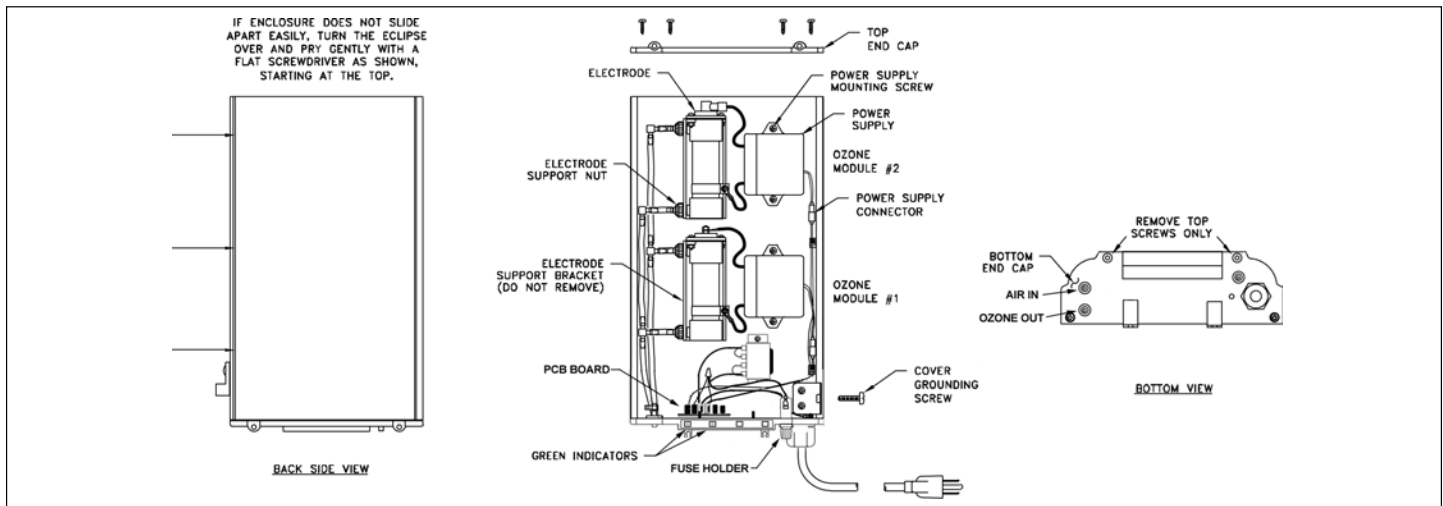


Figure 4 Component Locations (Eclipse-2 Shown). Additional transformers are used on 240V models, which are not shown in this diagram.

4D. Trouble Shooting

Knowledge of electrical applications is required for trouble shooting. Contact a certified electrician if you are unsure of your ability to service the equipment. Improper servicing will void generator warranty. If any condition persists, call DEL at 800-676-1335, ext. 248 for technical assistance or visit our website at www.delozone.com.

Symptom: "LED Indicator" not lit when pool system is on.

1. No power to the ozone generator from the power source:

- a. Check circuit breaker at the power distribution box.
- b. Check for loose connections or wiring breaks from the power distribution box to the generator.
- c. Fuse in the unit has blown and needs to be replaced.

2. G.F.C.I. has tripped.*

- a. Check power cord and reset G.F.C.I. (*If G.F.C.I. or breaker continues to trip after reset, call 1-800-676-1335, ext 248 for technical assistance).

Symptom: Flowmeter not indicating flow.

1. Injector not supplying adequate suction.

- a. Check pump and ensure water is flowing through injector.
- b. Check by-pass valve and adjust if necessary to obtain proper pressure differential in order to reestablish suction.
- c. Check that 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. Check 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 ozone tubing from the ozone generator and the check valve. With the pump running, test the end of the ozone tubing with your thumb, and feel for suction. Wash your hands immediately afterwards to remove any residual nitric acid that may be on the tubing. If there is sufficient suction without the check valve, replace the check valve with a new one.

Symptom: LED Indicator has turned red.

- a. This means that the power supply of that specific ozone module is no longer drawing power and needs to be replaced. Inside the Eclipse the modules are numbered from the bottom up. So on an Eclipse 4, the top ozone module is #4 and the bottom ozone module is #1. These correspond to the LED ozone indicators at the bottom of the Eclipse, numbered 1-4 from left to right. This should tell you which ozone module has failed. Refer to section 4C3 for instructions on how to replace the corresponding ozone module. If you are having difficulties, contact Del's service department at 1(800)676-1335 ext. 248.

Note: it is normal for the LED indicators to shine red for several seconds as the system powers up. As long as they turn back to green several seconds after startup. This is caused by the electronics charging up to create ozone.

Symptom: Ozone tubing becomes yellow/brown and brittle.

- a. The high concentration of ozone created by the DELZONE Eclipse family of corona discharge ozone generators, as well as environmental conditions like UV sunlight will tend to deteriorate the supplied ozone tubing. This is normal and acceptable, as long as the tubing doesn't become cracked and leak. Because of this, DEL recommends replacing the ozone supply tubing and your check valve every year. More ozone tolerant tubing is available through DEL, however, it is still required that you change your check valve annually.

Symptom: Cant get ball to stay on centerline of flowmeter.

- a. The flowmeter provided is a general tool to setup flow to the ozone generator. Flow will vary depending on pressures across the injector, and therefore can be affected by things such as filter or strainer loading. The ozone generator's efficiency is optimized at near the centerline of the flow meter. However, the DELZONE Eclipse ozone generator will still perform quite well at flows above and below the recommended range. As long as the ball is moving, and not stuck on the bottom of the flowmeter, you should be fine.

SECTION 5 Replacement Parts and Order Information

5A. Ordering information:

To locate a dealer nearest you call DEL at **1-800-676-1335, ext 249** or visit **www.delozone.com**.

Be prepared with the following information:

- Name
- Address
- DEL Model #
- Date Purchased

5B. Standard replacement parts list:

1. Ozone Module 5-PA0213*
2. Ozone Check Valve, 1/4" x 1/4" 7-1140-01*
3. Tubing, 1/4" Ozone Line 7-0075*

** Items 2 and 3 should be checked & replaced concurrently, once a year.*

**DEL Ozone
LIMITED ONE YEAR WARRANTY**

The limited warranty set forth below applies to products manufactured by DEL Ozone - 3428 Bullock Lane, San Luis Obispo, California 93401, and sold by DEL Ozone or its authorized dealers. This limited warranty is given only to the first retail purchaser of such products and is not transferable to any subsequent owners or purchasers of such products.

DEL Ozone warrants that it or its authorized dealers will repair or replace, at its option, any part of such products proven to be defective in materials or workmanship within ONE (1) year from the date of retail purchase of such products. (All parts) ANY REPAIR OR REPLACEMENT WILL BE WARRANTED ONLY FOR THE BALANCE OF THE ORIGINAL WARRANTY PERIOD. NOTE: USE ONLY DEL Ozone AUTHORIZED REPLACEMENT PARTS. USE OF ANY OTHER PART(S) WILL AUTOMATICALLY VOID THIS WARRANTY.

THIS LIMITED WARRANTY DOES NOT INCLUDE ANY OF THE FOLLOWING: (a) any labor charges for troubleshooting, removal, or installation of such parts; (b) any repair or replacement of such parts necessitated by faulty installation, improper maintenance, improper operation, misuse, abuse, negligence, accident, fire, repair materials, and/or unauthorized accessories; (c) any such products installed without regard to required local codes and accepted trade practices; (d) ANY IMPLIED WARRANTY OF MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE, AND SUCH WARRANTIES ARE HEREBY DISCLAIMED; AND (e) DEL Ozone SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR LOSS OF USE OF SUCH PRODUCTS, LOST PROFITS, DIRECT DAMAGES, INDIRECT DAMAGES, CONSEQUENTIAL DAMAGES AND/OR INCIDENTAL DAMAGES.

TO OBTAIN WARRANTY SERVICE

Contact: DEL Ozone · 3428 Bullock Lane · San Luis Obispo, CA · 93401
Customer Service Number : (805) 541-1601

When filing a claim, you must provide:

1. your name, mailing address and telephone number
2. the selling dealer's name
3. proof of date of purchase
4. the date of failure
5. a description of the failure

After this information is provided, DEL Ozone will release a **RETURN GOODS AUTHORIZATION (RGA) NUMBER**. After receiving the RGA number the part in question must be returned to DEL Ozone, freight prepaid, with the RGA number clearly marked on the outside of the package. All preauthorized defective parts must be returned to DEL Ozone within thirty (30) days. Under no circumstances may any product be returned to DEL Ozone without prior authorization. You must call or write DEL Ozone prior to returning product or your returned goods shipment will be refused. Upon receipt of preauthorized returned goods, DEL Ozone will repair or replace, at DEL Ozone's option, the defective product(s) and return them freight (prepaid for products under warranty). Buyer's acceptance of the product and use thereof constitutes acceptance of these terms.