

# MCD-U

## Spa Ozone Generator

*For Models MCD-50U & MCD-250U*

### Installation & Operations Manual



  
**DEL ozone™**  
advanced sanitation solutions

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## IMPORTANT SAFETY INSTRUCTIONS

When installing and using DEL Models MCD, basic safety precautions should always be followed: Be sure all the electrical power is shut OFF at the main circuit breaker before installing the MCD.

### READ AND FOLLOW ALL INSTRUCTIONS.

- All permanent electrical connections should be made by a qualified electrician.
- Follow all applicable electrical codes.
- Be sure all the electrical power is shut off at the main circuit breaker before installing the MCD.
- If the MCD electrical connections will be attached directly to the spa controls, be sure the spa controls are protected by a Ground Fault Circuit Interrupter (G.F.C.I.). If the MCD is connected to an independent electrical supply, then a G.F.C.I. must be installed between the MCD and the electrical supply.
- Do not bury cord.
- Warning – To reduce the risk of electric shock, replace a damaged cord immediately.
- The MCD must be mounted indoors or, under a cover, sheltered from natural elements (rain, sun, sprinklers).
- Mount the MCD so that it is inaccessible to anyone in the spa.
- Mount the MCD using the mounting tabs such that the MCD is vertical with the vents facing downward.
- Install a check valve in the tubing between the MCD and the vacuum source.\*\*
- Plastic ozone supply tubing is supplied with the MCD. Never replace this tubing with metal tubing.
- Do not operate the MCD unless sufficient air flow is being drawn through the unit.
- Warning – Short term inhalation of high concentrations of ozone and a long term inhalations of low concentrations of ozone can cause harmful physiological effects. Do not inhale ozone gas produced by this device.

### SAVE THESE INSTRUCTIONS!

\*\* A condensate may collect in dips or loops in the tubing. For best results install the MCD just above the vacuum source and use a short, straight piece of tubing to make the connection. If condensation appears in the tubing, DO NOT DRAIN IT, the moisture may be moderately corrosive. Disconnect the power to the MCD and allow the liquid to be drawn out or dried up before removing the tubing.

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## SECTION 1 Installation Instructions

### 1. How the DEL Spa Ozone Generator Works

DEL Ozone Generators produce ozone gas which is introduced to the spa water through suction created by the spa. Tubing is used to connect the Ozone Generator to an injector or a vacuum port provided by the spa manufacturer. The injector or port are vacuum sources used to pull the ozone gas out of the Ozone Generator and into the water. At no time should water come in contact with the Ozone Generator. To protect the Ozone Generator from water traveling backwards through the tubing connection, the unit must be mounted and plumbed as described in this manual.

### 2. Installation Parts

Common Installation Parts for MCD Spa Ozone Generators:

- One (1) Installation Manual (4-2308-01)
- One (1) check valve (7-1140-01)
- Five (5) feet of tubing (7-0075)
- Four (4) hose clamps (2-0078)
- Two (2) screws (2-0278) for mounting

### 3. Installation Tools and Materials

- a. Phillips Screwdriver
- b. Pliers
- c. Scissors

### 4. Unit Assembly

All models are pre-assembled and ready to install.

### 5. Mounting

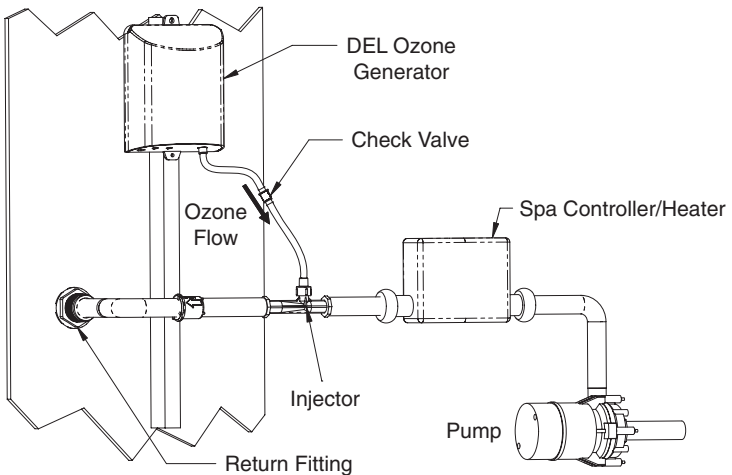
- a. Mount the Ozone Generator as high as possible within the spa's protected equipment area.
- b. Screws are provided for mounting but may not be appropriate for all surfaces. Substitute proper mounting hardware as required. Use the mounting features provided on the Ozone Generator.

### 6. Plumbing – Vacuum System (refer to Figure 1)

- a. Most spas are factory equipped with an ozone injector, like the one shown in Fig. 1. Review your Spa's Installation Manual to identify the correct ozone connection location.

## 7. Plumbing – Ozone Generator (refer to Figure 1)

- a. Connect the PVC ozone tubing provided to the hose barb on the Ozone Generator.
- b. Slide hose clamps onto the tubing and run the tubing to the vacuum source.
  - i. If the Ozone Generator is mounted above the water line, tubing may be run directly to the vacuum source.
  - ii. If Ozone Generator is mounted below the water line, run tubing to a point above the water line and back down to the vacuum source. Secure tubing in this position.



**Figure 1: Typical Injection System**

- c. Cut the tubing near the vacuum source, slide hose clamps on each end and install the check valve in the tubing. Observe the flow arrow on the check valve and ensure that the flow direction is into the vacuum source.
- d. Secure all tubing connections with the hose clamps.

## 8. Electrical

- a. Test the GFCI breaker protecting the spa for proper operation.
- b. Disconnect power to the spa.
- c. Connect the Ozone Generator cord to the mating connector(s) on the spa control box as described in the Spa's Installation Manual.

- d. Where possible, route the power cord away from other electrical lines. Do not run the power cord parallel to any low voltage signal wires.
- e. Secure the power cord as required to prevent damage.

## 9. Operation

- a. With the spa filled to the proper level, run the spa controller through several cycles.
- b. Verify that the Ozone Generator turns on and off as required by the controller: Depending on your model, one or two LED lights should be visible through the cover and should illuminate when the ozone generator is turned on.
- c. Verify that gas is flowing into the injector (there should be no water in the tubing, and very small bubbles entering the spa through the return).
- d. Verify that water does not push past the check valve during any spa cycle.
- e. Check for and correct any leaks.

## 10. Installation Complete

- a. Once properly installed, the Ozone Generator requires no further user operation. It will operate automatically with the spa system.

## SECTION 2 Maintenance Instructions

The MCD is equipped with a replaceable ozone cell and power supply. For optimum performance, we recommend the ozone cell and power supply be replaced every five years. It is also recommended that the o-ring, hose barb insert, and be replaced at the same time. New replacement parts can be ordered from your local dealer.

Follow the steps below to replace the old ozone cell, power supply, o-ring, and hose barb insert. REFER TO FIGURE 2 ON PAGE 5.

### 1. Remove the MCD from your spa

- a. Shut off power to the MCD or to the spa, and disconnect the MCD power cord from the spa control pack.
- b. Disconnect the ozone tubing from the MCD ozone outlet hose barb.

- c. Remove the screw from the bottom mounting tab.
- d. Back the upper mounting tab screw out about two turns and lift the MCD up and off of the spa.

## **2. Remove the MCD Cover**

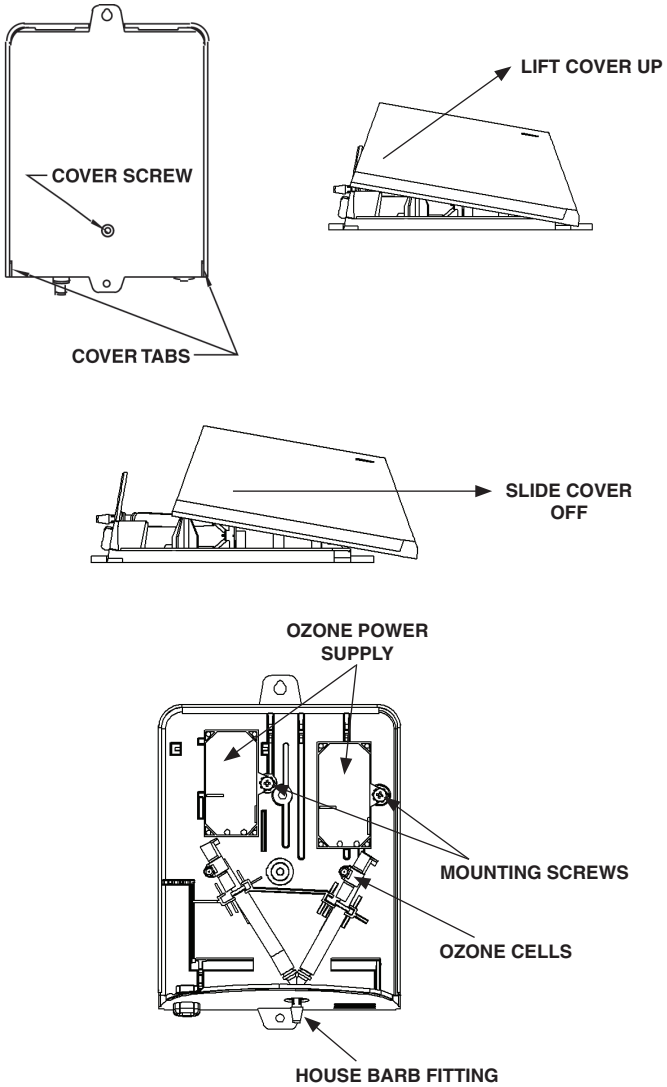
- a. Remove the cover screw on the back side of the base of the MCD.
- b. Using a flathead screwdriver or fingers, pry the two cover tabs outward to release the cover from the base.
- c. Lift the cover up.
- d. Slide cover forward and off.

## **3. Remove the old ozone cell, power supply and hose barb fitting**

- a. Remove power supply mounting screws.
- b. Disconnect power supply connector (red & black wires).
- c. Lift ozone cell up and out (grommet and hose barb fitting may remain attached to ozone cell).
- d. Remove and discard ozone cell power supply and Hose Barb fitting along with tubing.

## **4. Install the new ozone cell, power supply, hose barb insert, and grommet**

- a. Place new grommet into enclosure wall.
- b. Insert new hose barb insert making sure to align the hose barb correctly and insert it completely into its slotted hole.
- c. Install power supply and mounting screws. Route power supply wires through pegs.
- d. Connect ozone cell to power supply connector.
- e. Slide cover into position while lifting the base of the cover up.
- f. Lower cover over ozone cell and snap cover tabs into place.
- g. Replace cover screw.
- h. Reinstall the MCD into the spa, reconnect ozone supply tubing to hose barb and reconnect the power cord.



**Figure 2: MCD Component Locations**



## DELQUIK BASIC WATER CHEMISTRY CHART

PROBLEM	DESCRIPTION	CAUSE	REMEDY
Green Algae	<ol style="list-style-type: none"> <li>1. Green water</li> <li>2. Green spots on surface</li> <li>3. Slippery surface</li> </ol>	<ol style="list-style-type: none"> <li>1. Low ozone, bromine or chlorine levels</li> <li>2. Low algaecide levels</li> </ol>	<ol style="list-style-type: none"> <li>1. Superchlorinate</li> <li>2. Brush spa (removing algae)</li> <li>3. Vacuum spa (removing algae)</li> <li>4. Increase oxidizer residual</li> <li>5. Increase algaecide level</li> </ol>
Black Algae	<ol style="list-style-type: none"> <li>1. Black spots on spa surface</li> </ol>	<ol style="list-style-type: none"> <li>1. Low oxidizer levels</li> <li>2. Low algaecide levels</li> </ol>	<ol style="list-style-type: none"> <li>1. Superchlorinate</li> <li>2. Brush spa (removing algae)</li> <li>3. Increase ozone, chlorine or bromine residual</li> <li>4. Increase algaecide level</li> </ol>
Unpleasant Odor Burning Eyes	<ol style="list-style-type: none"> <li>1. Chlorine-like odor</li> <li>2. Burning sensation in eyes</li> </ol>	<ol style="list-style-type: none"> <li>1. Combined chlorine;</li> <li>2. pH out of balance</li> </ol>	<ol style="list-style-type: none"> <li>1. Balance pH to 7.2-7.6</li> <li>2. Superchlorinate</li> </ol>
Colored Water	<ol style="list-style-type: none"> <li>1. Water in newly filled spa turns black, blue or brown when first treated with ozone</li> </ol>	<ol style="list-style-type: none"> <li>1. Copper, iron, or manganese in water being oxidized by chlorine or ozone</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust pH to 7.2-7.6</li> <li>2. Run filter continuously and backwash as required</li> <li>3. Vacuum settled material</li> <li>4. Use sequestering agent for prevention</li> </ol>
Hard Water	<ol style="list-style-type: none"> <li>1. Cloudy water</li> <li>2. Scaling</li> </ol>	<ol style="list-style-type: none"> <li>1. Excessive hardness of makeup water or building up of dissolved minerals in the water caused by continued use of spa chemicals</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean filter</li> <li>2. Filter continuously</li> <li>3. Adjust pH to 7.2-7.6</li> <li>4. Use scale inhibitor</li> <li>5. Dilute with makeup water</li> </ol>

## APG CELL REPLACEMENT RECORD SHEET

Use the following form to record your ozone cell and power supply replacement information. For optimum performance, we recommend the ozone cell and power supply be replaced every five years. Fill out the following form each time you replace the ozone cell and power supply. This will help you remember to replace them every five years.

DATE REPLACED	COMMENTS

**SAVE THIS FORM!**





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