



Each issue of *Pool & Spa Marketing* offers the following question and answer column on pool and spa maintenance and troubleshooting. Questions come from our readers and answers are provided by experts in their field. Information for this edition of 'Question The Expert' on the installation, operation, and maintenance of ozone generators for residential swimming pools was provided by Debora Kon, R&D manager at UltraPure Water Quality Inc., a manufacturer of ozone generator for residential pools and spas based in Burlington, Ontario. She holds a B.Sc. (Hons.) degree, with a major in chemistry from the University of Guelph, in Guelph, Ontario. She can be reached by calling 1-877-281-7603, by email at deborah@waterquality.net or by visiting www.waterquality.net.

Q. How is an ozone generator installed?

A. Our ozone generators are installed on the suction side of the pump. This is necessary because a certain amount of air needs to be drawn through the ozone generator in order for ozone to be made. Installation on the return side is not recommended as there is not enough contact time between the ozone and water. A compression fitting is installed on the suction side of the pump. When the pump is running, ozone and air are drawn into the pump. The ozone-air mix goes through the pump impeller and the ozone enters the water and the filter.

Q. How is the ozone generator electrically installed?

A. A qualified electrician should be performing the electrical hook-up. Basically, the ozone generator will be hooked up into the pump power supply. When the pump is on, the ozone generator is also on.

Q. How long should the ozone generator be on?

A. If you have a single speed pump, the ozone generator should be on for 6-12 hours per day. If you are using a 2-speed pump, the ozone generator should be on high speed for 2-4 hours per day.

Q. Will the operation of the ozone generator cause the filter to fill up with air?

A. No. In most cases, if the air draw is set in the recommended range, the filter will not fill up with air. Most new filters have an internal air bleed line that will release any excess air. If the filter does keep filling up with air, an external safety air bleed kit can be installed. This kit takes the air from the top of the filter and sends it downstream past all equipment. The external air bleed kit may be necessary if the filter is old and does not have an internal air bleed, if there is a solar system on the pool, if there is a pressure side cleaner, or if there is a booster pump.

Q. What pump sizes are recommended with ozone generators?

A. The volume of the swimming pool will determine the pump size. For a pool up to 15,000 USG, the minimum pump size should be 1.0 HP. For a pool up to 25,000 USG, the minimum pump size should be 1.5 HP. For a pool up to 50,000 USG, the minimum pump size should be 2.0 HP.

Q. What is the required air draw for the ozone generator?

A. For our ozone generators, the recommended air draw is 4-8 CFH (cubic feet per hour). If the air draw is much below 4 CFH, not enough ozone will get into the water. If the air draw is too high, the pump can lose prime and there may be a build of air in the filter.

Q. How do I know if the ozone generator is working and if the ozone is getting into the pool?

- A. In order to check whether the ozone generator is working and if ozone is entering the water, the following should be checked:
- Check if the sight glass on the generator is lit. If the blue light is on, the unit is working.
 - Check the air gauge. If the float is in the recommended range, then ozone is getting into the pump.
 - Check the returns. Bubbles in the pool indicate that ozone is getting into the water.
 - Measure the chlorine level. If combined chlorines (total chlorine – free available chlorine) is less than 0.5 ppm, ozone is doing its work in the water.

Q. What specific maintenance of the ozone generator is required?

A. Once the ozone generator is installed and running, there is not specific maintenance required. The pool owner should be checking that the ozone generator is working and that ozone is getting into the pool. This can be accomplished by following the steps outlined directly above.

Q. What is the lifespan of an ozone generator?

A. This depends on the running time of the ozone generator. In general, the UV lamps should be changed after 18,000 hours of operation.

Q. What is the difference between UV and CD ozone generators?

A. UV ozone generators contain special ozone producing UV lamps. Ozone is produced by passing ambient air over these lamps. This method does not require any air-preparation systems since ambient air can be used. UV systems are suitable for use in residential swimming pools. They produce enough

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ozone to be effective and tend to cost less than CD systems because they don't require special air preparation systems. In CD ozone generators, ozone is produced with a high voltage electrical discharge. These generators do not use UV lamps. The electrical discharge is generated between two electrodes and ozone is produced as this discharge reacts with the prepared feed gas. If ambient air is used, the electrical discharge will cause the formation of nitric acid, which can damage the ozone generator and restrict the flow of ozone. To avoid problems associated with the production of nitric acid, the feed gas must be dried to remove all moisture from it. Alternatively, oxygen concentrators can also be used. A good CD system consists of the ozone generator and an air-preparation system.

Q. Can ozone escape into the surrounding air and is it harmful if it does escape?

A. It is very unlikely that ozone will escape into the surrounding air since the ozone generator is sealed. Ozone has a very short half-life and is very reactive. If some ozone was to be found near the pool, it would not last too long since it is so reactive. It will quickly react with the pollutants in the air. The bathers would not be exposed to any significant amounts of ozone.

Q. Are the ozone-producing UV lamps harmful in any way?

A. The UV lamps are enclosed within the ozone generator. Under normal operation of the ozone generator, the lamps should not break. There is no need for the pool owner to open up the ozone generator and look at the lamps. In order to see whether the unit is working, the pool owner can see the blue light through the sight glass located at the front of

the unit. UV light is harmful to eyes and exposed skin. When servicing the ozone generator, the electrical supply should be turned off before opening the ozone generator.

Q. Will I have to circulate my pool longer?

A. No. The filtration cycle for a residential pool should be from dawn to dusk no matter what purification system is used.

Q. Do I have to shock my swimming pool water?

A. With normal swimming pool usage, there is no need to shock the pool water. Ozone is a continuous non-chlorine shock and the strongest oxidizer available. When the circulation system is running, the pool water is being continuously and automatically shocked. The pool water may need to be shocked after heavy usage, or after a storm or heavy rainfall.

Q. Should I still be using chlorine in my pool?

A. Yes. Ozone is an oxidizer. This means that ozone will remove or alter non-living bather wastes – bod oils, perspiration, urine, and suntan lotion. A small amount of chlorine is still needed to provide continual protection against bacteria, viruses, and algae. In combination with ozone, we recommend 1.0 – 2.0 ppm of free available chlorine in the water at all times.

Q. Do I have to test for ozone?

A. There isn't a specific test for ozone available since ozone is so reactive. Instead, the level of chlorine should be tested. If the level of combined chlorine is 0.5 ppm or less, ozone is doing its work in the water. A water test kit is readily available through your dealer or service company.

Please contact us for additional articles and write ups on Ozone Water Chemistry; Salt Chlorine Generators, Menu Management for Water Sanitation, Ultra Violet (UV) Versus Corona Discharge (CD) Ozone Generators and Ozone in Spa Applications.

Contact us or Visit Our Web Site

Telephone: 905 335-4085
Fax: 905 335-1483
Customer Service: 877 281-7603
Web Site: www.waterquality.net
Email: help@waterquality.net

Mailing Information

UltraPure™ Water Quality Inc.
1175 Appleby Line, Unit B2
Burlington, Ontario, Canada
L7L 5H9

