Ozone Solutions, Inc

Advanced Ozone Technology

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INSTALLATION MANUAL

OZV-20DG OZONE GENERATOR

Introduction: OZV-20DG ozone generator can not operate on dry air feed gas, it is designed and it can operate solely on oxygen sources that are capable of supply of 5 LPM (10 SCFH) of oxygen flow.

1. **INSTALLATION CONCERNS.**

A.1. Ozone is a very strong oxidant. Only ozone resistant materials may be used in contact with ozone gas.

A.2. Oxygen generators release moisture and nitrogen gas into the ozone room. In addition also tiny amounts of ozone are generated around the high voltage terminals. Both will accumulate over a time, exceeding the specified level of 85% R.H. or 0.08 ppm of ozone, and cause the equipment failure. Proper ventilation is essential. In many states proper ventilation is required by law. The rate of ventilation must be at least 3 m^3/min (120 CFM).

A.3. **The air for the ozone room must be free of dust, oil, acid and other volatile vapors.** All these elements would otherwise shorten the life of the high voltage circuits. Also the oxygen generator would be disabled very fast, namely from oil vapors. Oil vapors may be present where a backup power generator is in place.

A.4. **The equipment must be protected from splashing water, rain, sun, mist and Relative Humidity above 85%. For the best performance the temperature must not exceed 30°C.** Install a small A/C unit in-line with the air ventilation system to decrease R.H. and temperature below the above levels.

A.5. The ozone generator must be protected from vacuum airlock

B. INSTALLATION.

B.1. Install screws onto the wall, or onto a designer-frame and hook-up the ozone generator. Allow for easy access to the bottom back for connecting the tubes, to the right site for the cooling-air intake, and to the left side for the cooling air discharge.

B.2. Every ozone system must be equipped with vacuum-breaking Balance Barometer, installed between the ozone generator and vacuum-source MIC

injector. With Teflon-lined ¼" I.D. tubing connect the lower fitting at the BBL to the stainless steel valve at the injector. Secure all connections with s. s. clamps and keep the valve closed for now. With Teflon-lined ¼" I.D. tubing connect the top fitting at the BBL to the OZONE Kynar fitting at the bottom of the ozone generator-ask AZCO for details. Warranty is void if the device is not installed.

B.3. Some customers use special ozone-vacuum-pump that is capable of high level of vacuum. Install "T" with hand-valve into the ozone line between the ozone generator and vacuum pump, and install a vacuum-switch set at -2psi into the incoming oxygen line, to stop ozone generator in case the vacuum is deeper then -2psi. Use the hand-valve to feed extra air into the injector, till the vacuum switch activates the ozone generator. Connect the other side of that valve to the outside of the building. This is because in case the vacuum pump stops unexpectedly, ozone gas would be escaping trough the valve into the indoor spaces.

B.4. With PVC tube connect the oxygen source to the OXYGEN-IN connector at the ozone generator. Make sure that the oxygen source is equipped with a pressure reducer and set to between 2-5 psi (0.2-0.3 bar).

B.5. Plug the ozone generator into a designated controlled outlet. The outlet shall only be powered when all the application conditions are met.

B.6. Plug the oxygen generator into a designated and controlled outlet.

B.7. Fill water to the BBL Balance Barometer to fill about half of its full height.

B.8. The system must be set to work automatically. The controlled power outlets for the ozone generator and oxygen concentrator must have proper interlock to the hydraulic booster pump and other customer controls. Once the suction of ozone stops, also the ozone generator and oxygen generator must stop.

C. FIRST START UP.

C.1 Make sure the power switch is OFF.

C.2 Start the process booster pump that provides flow and pressure to the MIC ozone injector. The water level in the BBL suction side will rise almost to the top till bubbles start entering the tube from the lower open side. Using the stainless steel valve near the MIC injector set the flow on the flowmeter-scale at 5 LPM. Do not overfill the BBL.

C.3. Start the oxygen generator (such as AS12) and wait about 20 seconds for its flow to stabilize. If necessary adjust the valve on the oxygen generator at 5 LPM. Further fine-tune may be needed so that the water level on each side of BBL is equal, or almost equal. In the process the suction to the MIC injector may increase over 5 LPM by pushing air into the injector. Use again the valve near the MIC injector to correct the suction till that the water level is equal, or almost equal, on both sides of the BBL.

C.4. Once the level inside the BBL is balanced and the flowmeter reads 5 LPM, plug-in the ozone generator to the power outlet and start with the main switch. I high-pitch sound will tell the ozone-generating cell inside is active and producing ozone.

D. OPERATION.

The system must be set to work automatically. The controlled power outlets for the ozone generator and oxygen concentrator must have proper interlock to the hydraulic booster pump and other customer controls. Once the suction of ozone stops, also the ozone generator and oxygen generator must stop.

E. MAINTENANCE.

The Ozone Systems are designed to require minimal maintenance. THERE IS DANGEROUS HIGH VOLTAGE INSIDE! DO NOT OPEN THE UNITS; THERE ARE NO SERVICEABLE PARTS INSIDE. DO NOT REPLACE FUSES; they do not fail without good reason. Only trained and qualified personnel are permitted to repair the equipment. The following list of procedures should be performed:

DAILY:

E.1. The fans must be running and the airflow unobstructed. If FUSE 1 is lit, call for service.

E.2. **The moisture indicator in the oxygen line should remain BLUE all time**. If the color changes, the new color will indicate:

. **WHITE** - The dew point is above the allowable -40°C. If a **power failure** took place within last five hours, continue to operate as is. The crystals will turn blue again in the next five hours. If not, contact your nearest dealer.

. **BLACK** - The blue crystals are permanently damaged by an **exposure to ozone.** Check and restore the room ventilation, replace the indicator.

. **YELLOW** - The blue crystals are permanently damaged by an **exposure to oil vapors.** In this case also the oxygen generator is likely to be damaged and must be replaced.

. **PINK/RED** - The blue crystals are permanently damaged by an **exposure to acid vapors** in the air. The source of the problem must be identified and removed. Examples: A solid fuel burner near by, overcharged battery,

E.3. Check the flowmeter for proper airflow. A low flow may indicate a problem with the pump, injector, or integrity of the tubing.

E.4. Check the BBL to make sure its water level is equal or almost equal on both sides.

E.5. Check for signs of excessive dust around the cooling air intakes. Check the room filters and replace the inserts before dust may obstruct the flow.

E.6. Follow the instructions for the oxygen generator.

ANNUALLY:

Disconnect the ozone generators from power and check for excessive dust inside. Use a long hairbrush and vacuum cleaner to gently remove. Failures caused by dust are not covered under the warranty. Follow the instruction for the oxygen source.

LATER:

The cooling fans are rated for up to 100,000 hours of continues duty under ideal conditions. Excessive dust may decrease the life span considerably.

Troubleshooting:

- FUSE 1: The lamp indicates a need for service (Main Fuse is blown).
- FUSE 2: The lamp is lit with short interruptions after ~ 20 seconds, indicating a problem in the HV circuits. Ozone is not being produced.

The most likely reasons are:

. Water is inside the ozone electrodes
. Dirt or moisture is accumulated over a long period of operation around the HV circuits causing HV discharges.
. The pressure or vacuum inside the ozone-generating cell are extremely high. This may only be possible if the Balance Barometer BBL is not installed.
. The HV coil may have failed.

Except for the last item the digital fuse will recover once proper conditions for operation are established.

- FUSE 2: The lamp flashes,

. Voltage in the power line is greater than 132V

The digital controls will restore the operation once proper operating line-voltage is restored.

Please call us if you have any questions.

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