AmeriWater
The Water Purification Specialists

INDUSTRIAL OZONE DISINFECTION SYSTEM

OPERATION & MAINTENANCE MANUAL

WARNING: NOT FOR USE IN THE DISINFECTION OF HEMODIALYSIS WATER DISTRIBUTION SYSTEMS OR OTHER DEVICES FOR HEMODIALYSIS APPLICATIONS!

Manufactured With Pride
In The USA

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AmeriWater • 3345 Stop 8 Rd. • Dayton, OH 45414

98-0109 Rev. B

Table of Contents

SECTION 1, GENERAL INFORMATION

IMPORTANT SAFETY INSTRUCTIONS:

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. **DANGER** – Risk of injury.
    a. Replace damaged line cord immediately
    b. Do not bury cord
    c. Connect to a grounded, grounding type receptacle only
3. **WARNING** – For indoor use only. This unit is not intended for outdoor use.

NOTE: **The operation manual should be stored near the system and used as a reference and troubleshooting guide.**

1.1 INDICATIONS FOR USE

The AmeriWater Ozone Disinfection System is intended for use in disinfection of water distribution systems. The disinfection process is completed during off-hours when the water distribution system is not being used to supply water to a point of use. The AmeriWater Ozone Disinfection System provides dissolved aqueous ozone concentrations of at least 0.5 ppm for disinfection of the water distribution system.

WARNING: **This device is not cleared for market by FDA for use on hemodialysis water distribution systems or other devices used in hemodialysis applications! The device is NOT intended for disinfection of medical devices and should not be used for disinfection of medical devices!**

1.2 WHAT IS OZONE?

Ozone is a form of naturally occurring oxygen possessing three atoms of oxygen per molecule instead of the normal two-atom oxygen molecule. Created by either lightning or ultraviolet radiation, ozone is commonly found in our atmosphere. The “ozone layer” protects us from the sun’s radiation. The “fresh air” smell after a thunderstorm is due to lightning generated ozone.

Ozone has a relatively short life span before it reverts back to oxygen. While active, ozone is 52% stronger and 3,125 times faster (in water) than chlorine as a disinfectant. Since it is much more effective than chlorine in destroying water-borne contaminants, ozone has become the preferred method of water treatment for over 4,000 large cities worldwide.

Ozone is recognized by the U.S. Environmental Protection Agency as a viable water treatment alternative to chlorine, and the FDA has added ozone to its list of disinfectants approved “Generally Recognized as Safe.” Ozone is the most powerful and rapid acting oxidizer disinfectant produced, and will oxidize all bacteria, endotoxin and biofilms it comes in contact with in medical piping and water systems.

1.3 THE TECHNOLOGY

The AmeriWater Ozone Disinfection System uses a high technology corona discharge process for producing ozone. This design provides the most efficient ozone production available in the small-scale ozone equipment market. Ozone is manufactured by drawing oxygen (O_2) into the ozone generator and exposing it to multiple high voltage electrical discharges. This causes a percentage of the oxygen molecules to dissociate and reassemble as ozone (O_3).

The ozone is drawn into the water by a venturi injector / mixer. This allows the ozone to be injected into the water under a vacuum condition, which is the safest and most efficient technology available. A pressure differential of at least 15 PSI (**P**ound per **S**quare **I**nch) must be maintained across the venturi injector. This pressure causes a vacuum that is measured on the vacuum gauge. The gauge should read between –3" and –8" Hg when the system is in normal operation.

1.4 THE SYSTEM

The AmeriWater Ozone Disinfection System is a complete unit with ozone generator, venturi injector mixer, gas off chamber with excess ozone gas destruct, feed water flow meter, oxygen flow meter and vacuum gauge that are mounted in a portable cabinet for disinfection of water distribution systems.

1.5 SPECIFICATIONS

Model	0077-0010
Dimensions	35" High X 15" Wide X 24" Deep
Weight	70 pounds
Electrical Requirements	115 VAC, 60Hz, 3 AMP
Power Consumption	275 Watts
Ozone Output	10 Grams/Hour (Oxygen)

Indicators: RPC **K100-0111** Ozone Test Strips, 0.05 - >0.5 ppm **(Not provided)**
HACH 25180-50, Accuvac Ozone, High Range Test Kit. **(Not provided)**
Water Feed Flow Meter - GPM (Gallons Per Minute)
Oxygen Flow Meter SCFH (Standard Cubic Feet/Hour) with flow control valve
Injector Vacuum Gauge (inches of mercury)

Safety: Ozone Safety Vacuum Switch prevents the ozone generator from operating without the proper ozone draw (vacuum).
Ozone Overload Switch shuts the ozone generator off when the system begins to overheat.
Door switch kills power to the system when door is not in place.
Ozone gas-off destruct device eliminates excess ozone gas.

1.6 HEALTH AND SAFETY

Ozone is a toxic gas above certain high concentrations, and an irritant at lower concentrations. The Occupational Safety and Health Administration (OSHA) regulations state that an individual must not be exposed to a concentration of ozone gas higher than:

1) 0.10 PPM (**P**arts **P**er **M**illion) by volume over an 8-hour period.

2) 0.20 PPM by volume over a 10-minute period.

*See ambient air ozone monitor information in Section 7.

The AMERIWATER OZONE DISINFECTION SYSTEM uses a gas off tank to contain any ozone gas not dissolved in the water and an ozone gas destruct device to limit the ozone exposure in the area of use. Ozone has a very short half-life and will decompose to oxygen in less than 5 hours. The human nose can detect the ozone odor at .02 PPM, which is 5 times lower than the OSHA safe level.

Call 1-800-535-5585 for the ozone MSDS sheet.

WARNING: Oxygen is a fire hazard. It is a highly active oxidizer as it vigorously accelerates the burning of combustible materials. Do not use oil, grease, cotton fibers or any other combustible material on or near the Ozone or Oxygen Generator. Smoking, heat or any open flame should be kept at a distance of not less than 5 feet from any part of the system. It is STRONGLY recommended that only individuals experienced in the safe handling of Oxygen be allowed to operate this equipment.

WARNING: Connect power cord only to a properly grounded wall outlet.

WARNING: High voltage is present in Ozone Generators. Only qualified electricians should work on this equipment.

1.7 OZONE COMPATIBLE MATERIALS

Ozone is one of the strongest oxidizing agents currently available for water treatment, so great care should be taken to ensure that all piping, valves, gaskets, and other materials used in the water treatment system that will come in contact with ozone are resistant to the concentrations of ozone present during disinfection. Just about all the materials except filter cartridges and membranes used in the typical water system are acceptable.

Below is a list of materials that are compatible for ozone concentrations up to 6 PPM in water.

Piping:
304L Stainless Steel
316L Stainless Steel
PTFE (Teflon)
ETFE (Teflon)
ECTFE (Halar)
PVDF (Kynar)
CPVC Schedule 80
PVC Schedule 80
HDPE (Polyethylene)
PP (Polypropylene)

Gaskets & Seals:
Kel-F 2800
Kal-Rez
Chem-Rez
Gortex
Teflon tape
Hypalon
Viton
Silicon
EPDM

NOTE: **Natural rubber and many plastic and synthetic rubbers cannot be used as gaskets, seals, or o-rings in combination with ozone. Exposure to ozone will cause these components to become brittle and crack.**

SECTION 2, COMPONENTS AND FLOW SCHEMATICS

2.1 OZONE DISINFECTION SYSTEM COMPONENT IDENTIFICATION

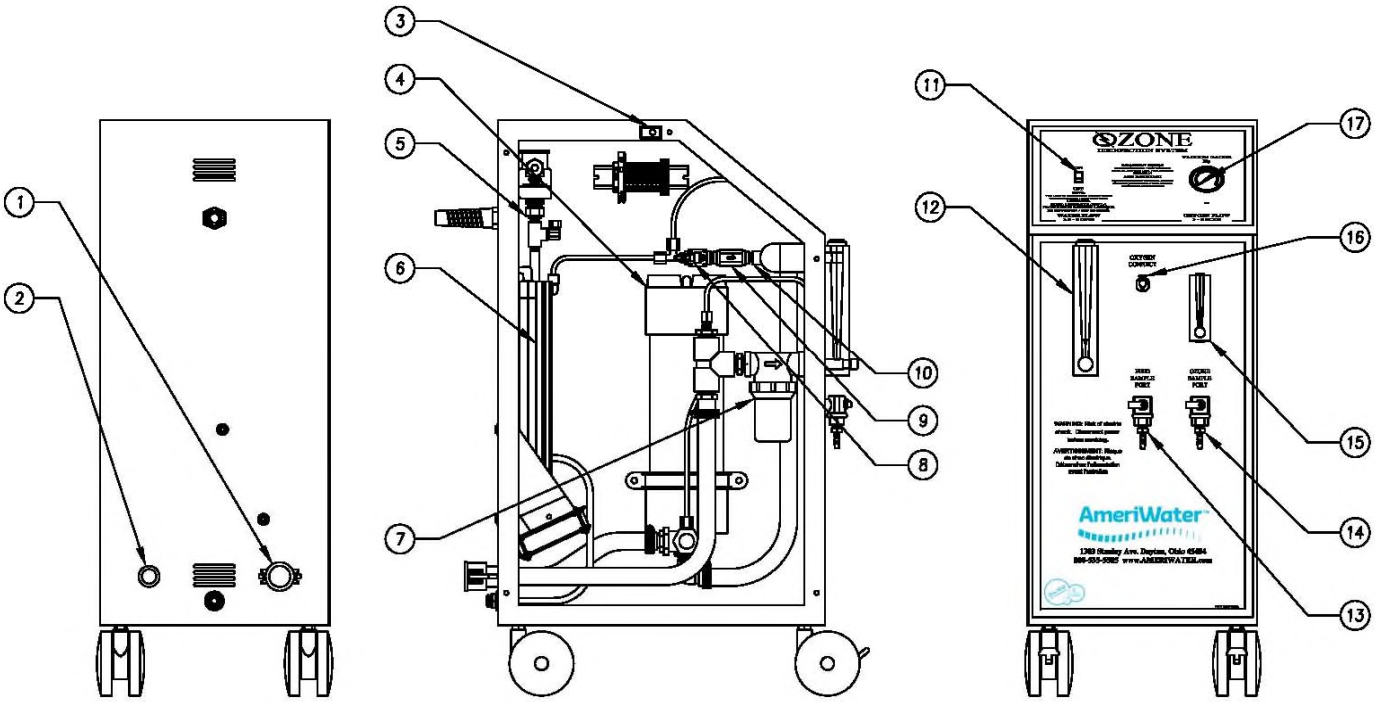


FIGURE 1

IDENTIFICATION OF COMPONENTS (FIGURE 1)

1. **Inlet Hose Connection** – (Female connector) Carries water to be disinfected to the ozone machine.

2. **Outlet Hose Connection** – (Male connector) Carries ozone rich water to the loop or tank to be disinfected.

3. **Door Switch** – Shuts off power to the unit when the cabinet door is removed.

4. **Gas Off Chamber** – Ozone rich water enters the gas off chamber to remove any excess, un-dissolved ozone before being directed into the water system.

5. **Ozone Gas Destruct Chamber** – Converts ozone gas back to oxygen.

6. **Ozone Generator –** Produces ozone by passing oxygen through a corona discharge.

7. **Strainer –** 40 mesh screen ensures small particles do not block injector.

8. **Injector Vacuum Switch –** Turns off the ozone generator when there is not enough flow of water to create an adequate vacuum.

9. **Check Valve –** Controls the direction of flow of ozone into the water stream.

10. **Injector** – Injects ozone gas into the water flow.

11. **Ozone Generator ON / OFF Switch –** Turns power to ozone generator ON and OFF and will illuminate when the ozone generator is producing ozone.

12. **Water Flow Meter and Valve** – Measures the flow rate in gallons per minute (GPM) of the water.

13. **Feed Sample Port** – Test port used to sample the water feeding the device.

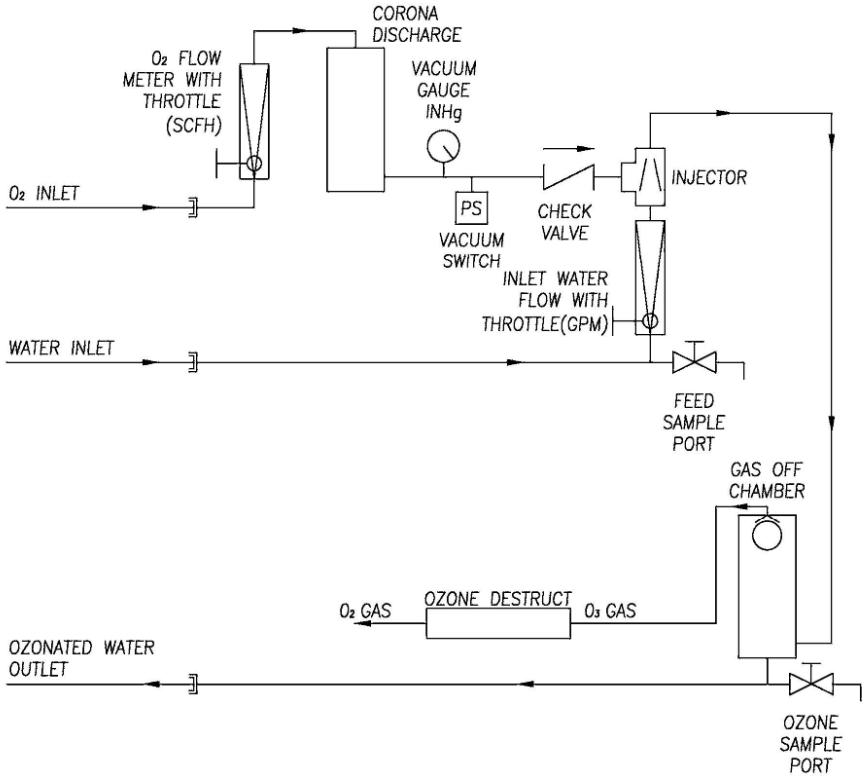
14. **Ozone Sample Port** – Test port used to sample product water rich in ozone.

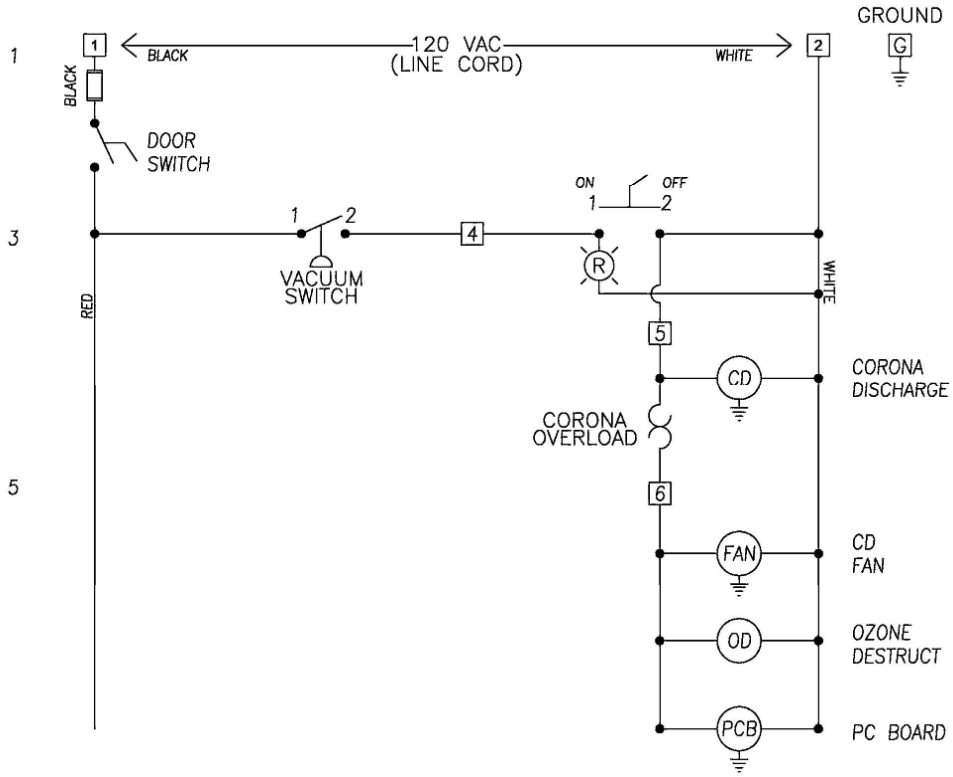
15. **Oxygen Flow Meter and Valve** – Controls and measures the flow rate in standard cubic feet per hour (SCFH) of oxygen to the ozone generator.

16. **Oxygen Connection** – Quick connect fitting for connecting oxygen supply to the system.

17. **Vacuum Gauge –** Displays the vacuum draw at the injector vacuum switch.

2.2 FLOW DIAGRAM AND ELECTRICAL DIAGRAM





SECTION 3, INSTALLATION & OPERATION

3.1 GENERAL OVERVIEW

WARNING: Do not turn the ozone generator on until the water flow has been established.

The flow path in the AmeriWater Ozone Disinfection System is illustrated in Section 2.2. The water to be disinfected is pumped into the AmeriWater Ozone Disinfection System by the water distribution pump(s). The water flows through the feed flow meter and into the venturi injector, which draws the oxygen from the oxygen valve through the flow meter into the generator creating ozone. The ozone is then mixed in the water flow. The ozone rich water enters the gas off tank to remove any excess, un-dissolved ozone gas and then is directed into the water system to be disinfected. The ozone gas collected in the gas off tank is vented automatically to the ozone gas destruct chamber and destroyed.

The driving force of the AmeriWater Ozone Disinfection System is the distribution pump(s) on the water loop. A valve arrangement has to be installed after the water distribution system distribution pump(s) to divert the flow into the AmeriWater Ozone Disinfection System and back to the storage tank.

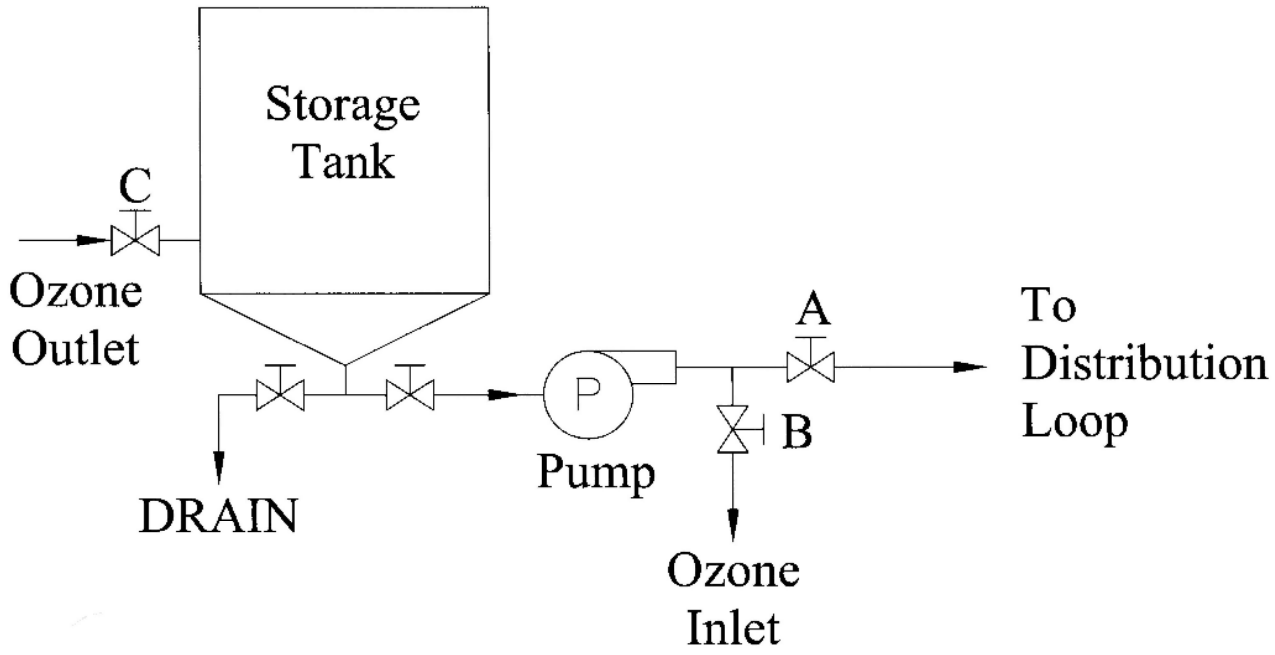


Figure 4a

In the illustration Figure 4a, Valve A is throttled and Valves B and C are open. (Note: Valve A is only closed enough to divert the loop water through the ozone system.) Once the flow through the AmeriWater Ozone Disinfection System is established, the “Feed Flowmeter” on

the unit should read from 3.5 to 5GPM. The amount of pressure supplied by the pump causes this variation in flow. If the “Feed Flow” is below 3 GPM the venturi injector may not draw the oxygen through the generator properly, throttle valve A until the flow is above 3 GPM. It is also necessary to have a differential pressure across the venturi injector to create a vacuum. The vacuum gauge should read between -3 and -8 in of Hg.

Once the water flow has been established, a vacuum will draw the oxygen into the ozone generator and ozone will be created. The ozone generator has a vacuum switch and will not operate without a minimum of -3” of vacuum from the venturi injector indicated on the vacuum gauge.

The gas off tank is in the flow path after the venturi injector. The water-ozone mix enters the bottom of the tank and exits at the bottom of the tank. The excess ozone will gas off and be vented to the destruct chamber to be converted to oxygen.

When ozone is injected into the water, Ameriwater recommends a reading of (0.5 ppm or mg/l) or greater for more than 30 minutes to thoroughly disinfect a system. Be aware that the water being disinfected may contain bacteria and endotoxin, and the piping may contain biofilm all of which consume the ozone. It is important to verify the ozone concentration at the end of the loop with RPC Ozone Test Strips or the Hach, Accuvac Ozone, High Range Test Kit before starting the 30-minute dwell time.

After the treatment with ozone, the disinfected water can be left in the water loop, storage tank. Due to the killing of the bacteria, endotoxin ***will*** be present. You must dump the tank, refill, flush the loop and dump the tank again prior to use to remove endotoxin (if your application requires the removal of endotoxin).

Helpful Hints

- Rapid intermittent stopping and starting of the ozone generator must be avoided to prevent damage to the generator.
- After stopping the ozone generator, do not restart for 1 minute.
- Input voltage to the ozone generator should never exceed 125 Volt AC 60 Hz. (The AmeriWater Ozone Disinfection System operates on 115 Volt AC 60Hz).
- Always use clean, dry, oxygen.
- Do not allow water to enter ozone generator. If a leak is detected inside the ozone disinfection system, turn off the system, unplug the power cord from the receptacle and repair the leak prior to restarting.
- When adjusting the oxygen flow to the Ozone Disinfection system higher flow creates lower vacuum and lower flow creates more vacuum.

3.2 TANK FITTING INSTALLATION INSTRUCTIONS

1. Any PVC tank bulkhead fitting can be used in a polyethylene tank. Verify that the gasket material is compatible for use with aqueous ozone (Viton is preferred).

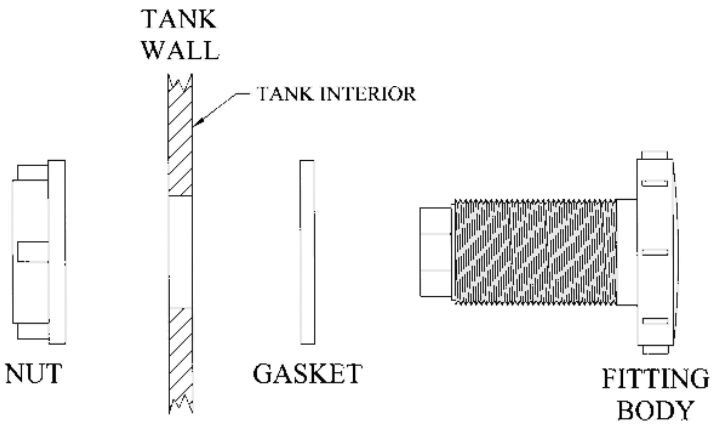
2. Instructions for installing PVC fittings in Fiberglass Reinforced Plastic (FRP) tanks.

3. Use a standard hole saw that fits any ¼" electric drill motor to cut the proper size hole in the fiberglass or metal tank.

4. For installing the Raven 1/2", 3/4", and 1" pipe thread fittings, a 2 1/8" hole saw must be used.

5. For installing the 1 1/4", 1 1/2", and 2" fittings, a 1/4" hole saw must be used.

6. The hole saw provides the perfectly round hole that is necessary for a proper seal.



FRP TANK FITTING INSTALLATION…

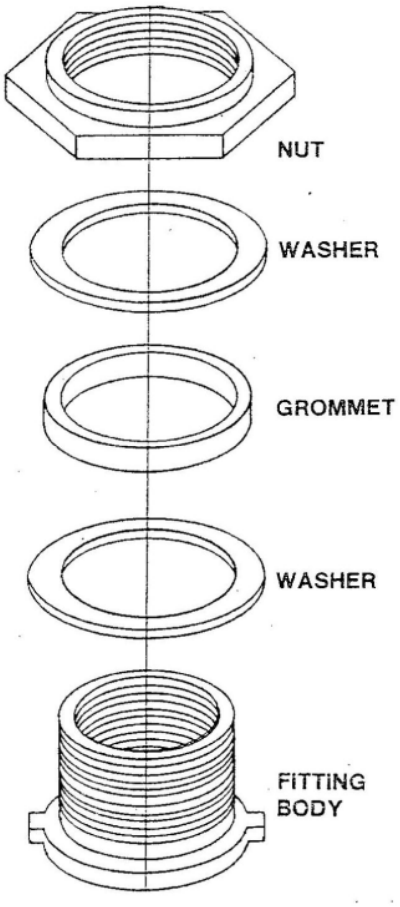
1. Place your finger through the fitting and install the body in the hole by placing one lug through the hole first. A slight tap with a hammer will slip the second lug through the hole.

2. Flex the back-up washer through the hole and over the fitting body.

3. Slip the grommet over the fitting body but do not slide it all the way down the body at this point.

4. While holding the fitting body with your finger, work the grommet down the fitting body until the grommet is in the hole in the tank wall. (The grommet will protrude slightly on both the inside and outside of the tank.)

5. Place the washer on the fitting, then install the nut and tighten until snug. Sealing is accomplished by the grommet expanding against the circumference of the hole you cut in the tank.



3.3 WATER TREATMENT SYSTEM DISINFECTION PROCEDURE

WARNING: **Verify that water usage at points of use has been terminated prior to disinfection with ozone.**

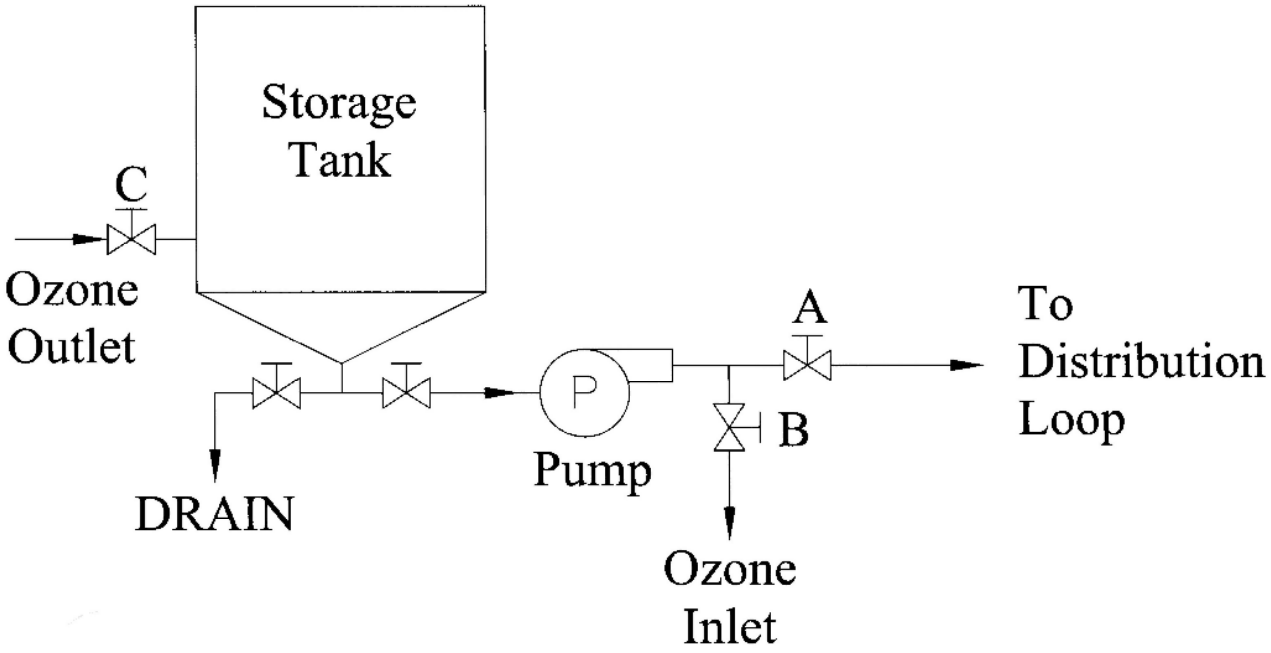
NOTE: **When the red on/off switch light is lit, the ozone generator is producing ozone.**

1. Remove any loop filter cartridges and store in plastic. (If a cross flow ultra-filter is used remove the membranes from the housings or bypass the ultra).

2. Disconnect DI exchange tanks (if applicable) and place a latex glove over the fittings on the tanks. Jumper the hoses together by connecting the male connectors to the female connectors or by using jumpers. Exposing DI tanks to ozone may cause damage to the tanks.

DISINFECTION OF THE RO WATER STORAGE TANK & DISTRIBUTION LOOP

3. Connect the ozone inlet hose to VALVE B, on the ozone bypass (as shown below). Connect the ozone outlet hose to VALVE C, on the storage tank. The quick connect fittings are gender-oriented to prevent incorrect connections.



4. Connect the oxygen supply to the oxygen connection on the front of the ozone disinfection system and adjust to between 2L and 4L.

5. Plug the power cord for the AmeriWater Ozone Disinfection System into a 115 V, properly grounded power outlet.

6. Open VALVE B on the loop and VALVE C on the storage tank. Throttle VALVE A on the loop (see above) to force water through the ozone system. Turn on the distribution pump. (If the water system has dual distribution pumps, use only one of the pumps at this time.) The feed flow should be between 3.5 and 5 GPM.

7. Turn on the oxygen flow meter valve (adjust to 2-5 SCFH). Verify that the vacuum gauge on the front of the cabinet is above –3" Hg (the operating range is –3" to –6" Hg). The ozone generator will not operate if the vacuum is less than –3" Hg. The vacuum is adjusted by providing more or less oxygen flow. Less oxygen flow produces more vacuum. More oxygen flow decreases the vacuum.

8. Turn the ozone generator power switch ON (power switch shown in Figure 1, page 5).

9. If the ON / OFF switch is illuminated, ozone is now being supplied to the system being disinfected. Monitor the FEED FLOWMETER and the VACUUM GAUGE to verify they are in range (Feed Flow = 3.5 - 5 GPM, Vacuum = -3" to –6" Hg).

10. Run the unit until the water from the sample port of the system has a reading of at least 0.5 ppm (or mg/l). Use RPC Ozone test strips or the Hach, Accuvac Ozone High Range Test Kit to obtain this reading.

11. Continue running the system for 30 minutes at a minimum of 0.5 ppm (mg/l) to build the ozone level in the storage tank.

12. Throttle VALVE A to allow ozonated water from the storage tank to the loop. (Note: on some systems, VALVE A may not need to be throttled at all.) Verify flow and pressure on the loop.

13. If the water system has dual distribution pumps, use the opposite pump at this time.

14. Continue running the ozone system until ozone is detected at the end of the loop at a level of at least 0.5 ppm (mg/l). **DO NOT USE THE FEED SAMPLE PORT TO VERIFY THIS**. This level must be maintained for 30 minutes to completely disinfect the system. If the water system has bacteria, endotoxin, or biofilm the ozone will be consumed, so it may require several minutes to achieve the 0.5 ppm (mg/l) level <u>at the end of the loop</u>.

15. All points of use must be opened and tested with RPC Ozone test strips or the Hach, Accuvac Ozone, High Range Test Kit to verify that ozone is present at a level of at least 0.5 ppm (mg/l).

16. Turn off distribution pump(s).

17. Turn off and disconnect the oxygen supply from the ozone disinfection system.

18. Turn the ozone generator power switch OFF and unplug the ozone disinfection system from the power outlet.

19. Turn off the distribution pump and close VALVE B and VALVE C, and FULLY open VALVE A. Let the system dwell for 15-30 minutes before turning the distribution pump back on.

20. Empty the storage tank drain in order to remove any endotoxin created by the destruction of the bacteria.

21. Refill the tank with RO water and flush the distribution loop. Empty the tank and loop to drain.

22. Return the water distribution system to normal operation, reconnect the deionizers, and replace the loop filters. Residual ozone will not affect these components.

WARNING: **Prior to use, test the water at the end of the loop (when the storage tank is full) to verify that there is no residual ozone left in the system. If the residual ozone level is above 0.05 ppm (mg/l), dump the storage tank to drain and refill the tank. Test the water again at the end of loop and repeat until the residual ozone level is no longer detected.**

SECTION 4, MAINTENANCE/TROUBLESHOOTING GUIDE

4.1 MAINTENANCE

Keep the ozone generator clean. The ozone generator does not need regular service if clean feed oxygen is used.

4.2 GENERATOR TROUBLESHOOTING GUIDE

Problem / Symptom	Possible Cause	Solution
Unit does not turn on	**No power to unit**	**Check breakers**
	Switch not turned on	**Check switch**
	Blown fuse	**Replace fuse**
	Cover / door interlock not active	**Check door interlock switch replace cover**
	Incorrect wiring connections	**Check wiring**
	Vacuum switch not closed	**Check vacuum and vacuum switch**
Unit does not stay on	**Unit overheating**	**Check fan**
	Insufficient vacuum (should be –3 to –8 on vacuum gauge)	**Adjust injector vacuum, be sure check valves are properly installed**
	Defective check valve	**Inspect and replace if necessary**
Unit cycles on and off	**Overheating**	**Check fan**
	Defective power	**Check for constant power if not timer controlled**
	Insufficient oxygen supply	**Check oxygen supply**
	Insufficient water flow	**Check water flow meter**
Unit trips circuit breaker	**Incorrect wiring**	**Check wiring**
	Incorrect circuit breaker	**Check and, if necessary, replace with correct circuit breaker**
You receive an electric shock upon touching the unit	**Incorrect wiring**	**Check wiring**
	Unit not grounded	**Ground unit in accordance with local codes**
	Unit has been flooded	**Return unit for major service or completely disassemble and clean**

GENERATOR TROUBLESHOOTING GUIDE (CONTINUED)		
Water in unit or ozone delivery tubing	**Insufficient vacuum** **Defective check valve(s)** **Excessive backpressure on check valve(s)**	**Adjust injector vacuum** **Replace check valve(s)** **Backpressure not to exceed 40 PSI, if over 40 PSI consult AmeriWater**
Unit seems noisy	**Generator not securely bolted to cabinet** **Shipping damage** **Fan blocked** **Insufficient oxygen**	**Bolt it firmly into place** **Locate and repair** **Check and clear obstructions** **Check oxygen supply**
Flow meter will not adjust oxygen flow	**Oxygen not operating** **Defective check valve**	**Make sure oxygen supply system is set properly** **Check and replace**
Vacuum gauge reads on pressure side	**Insufficient vacuum** **Defective vacuum gauge** **Loose Kynar compression fittings** **Mesh strainer blocked**	**Adjust injector vacuum** **Replace vacuum gauge** **Tighten all Kynar fittings** **Remove bowl from strainer and remove obstructions**

4.3 BACKPRESSURE

Excessive backpressure on the system will cause the injector not to function properly. The inlet pressure must be at least 15 PSI greater than the outlet pressure in order for the injector to work properly. If the vacuum is not at least -3 Hg, verify that there are no restrictions on the outlet side of the system or in the loop or tank being disinfected.

SECTION 5, PRODUCT WARRANTY

AmeriWater warrants the Ozone Disinfection System to be free from defects in parts and workmanship for one year; provided that the system is not subject to abuse, misuse, alteration, neglect, freezing, accident or negligence; and provided further that the system is not damaged as the result of any unusual force of nature such as, but not limited to, flood, hurricane, tornado, or earthquake. This warranty covers all system components under normal use and operation. AmeriWater's obligation under this warranty is limited to the replacement of equipment and/or parts shown to be defective only. The warranty does not cover labor charges or travel expenses resulting from the service of equipment. The manufacturer is excused if failure to perform its warranty obligations is the result of strikes, government regulation, materials shortages, or other circumstances beyond its control.

To obtain warranty service, notice must be given to the manufacturer within 30 days of the discovery of the defect. Each system for which a warranty claim is asserted shall, at the request of AmeriWater, be returned freight prepaid with proof of purchase date to AmeriWater at the expense of the purchaser. Any replacement parts shall be warranted as stated above for the original one-year warranty.

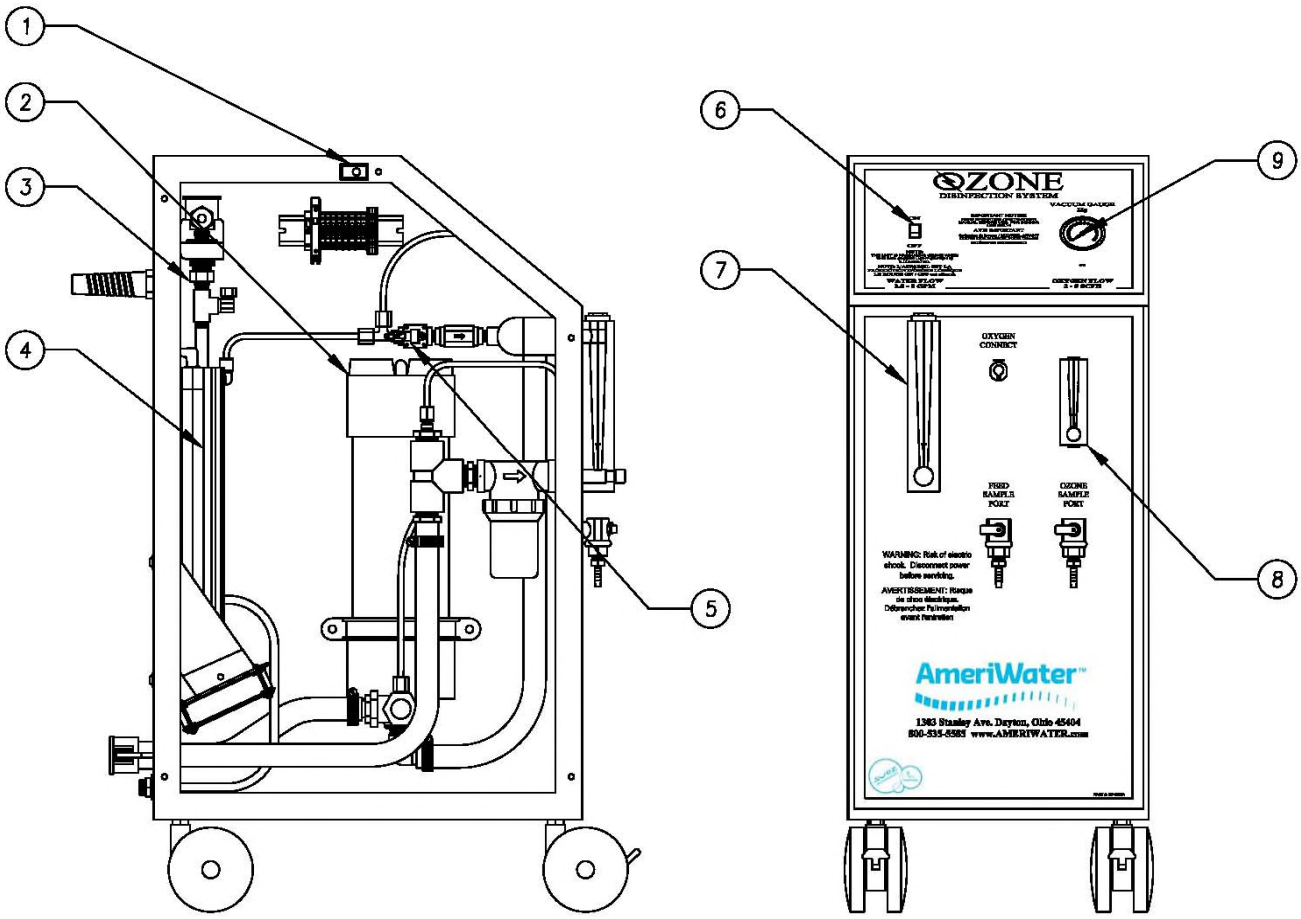
This warranty does not extend to any generator or part if a defect or malfunction occurs from misuse. Allowing water to enter the generator will cause damage not covered under AmeriWater's product Warranty. Feed gas must be clean, dry Air or Oxygen at –60º F dew point for maximum Ozone production. Provide proper voltage to the generator (100-125 VAC 60 Hz). Improper voltage causes damage not covered under the AmeriWater Product Warranty. Locate the generator in a well-ventilated area that is protected from the weather elements and remains between 40º F and 100º F to prevent damage not covered under the AmeriWater Product Warranty.

There are no warranties on the AmeriWater Ozone Disinfection System beyond those specifically described above. All implied warranties, including any implied warranty of merchantability or of fitness for a particular purpose are disclaimed to the extent they might extend beyond the above periods. The sole obligation of the manufacturer under these warranties is to replace or repair the component or part which proves to be defective within the specified time period, and the manufacturer is not liable for consequential or incidental damages. No dealer, agent, representative, or other person is authorized to extend or expand the warranties expressly described above.

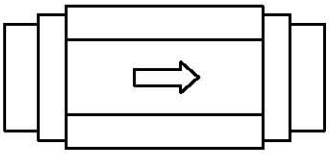
Some states do not allow limitations on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damage, so the limitations and exclusions in the warranty may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

SECTION 6, SPARE PARTS LIST

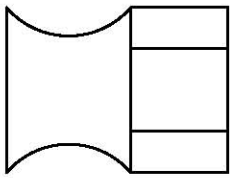
6.1 OZONE DISINFECTION SYSTEM COMPONENTS



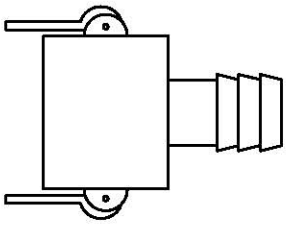
NUMBER	PART NUMBER	DESCRIPTION
1	65-0008	Door Switch
2	77-0007	Gas Off Assembly w/Float Valve
3	77-0006	Ozone Gas Destruct Chamber
4	77-0005	Corona Discharge Chamber w/Fan
5	65-0007	Vacuum Switch
6	65-0003	Switch, Toggle, ON / OFF, Illum.
7	41530611	Flow Meter 0-5 GPM W/Valve
8	41821990	Flow Meter w/Valve, 0-5 SCFH
9	43-0011	Gauge Vacuum, 0/30 INHG
NOT PICTURED		
-	77-0008	Fan for Corona Discharge Chamber
	77-0009	Power Supply Board for CD Unit
-	40531620	Injector, 0-6 GPM, ¾" MPT
	RPC # K100-0111	RPC Ozone Test Strips



041-0032 – CHECK VALVE



16-0009 – Q-CON 0.75 FPT X INS



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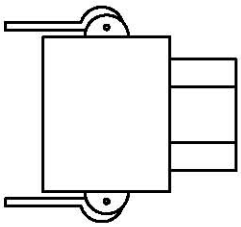
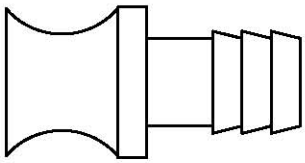
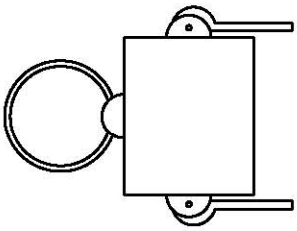


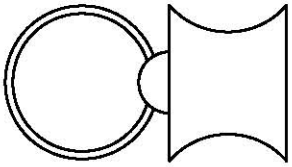
16-0012 – Q-CON 0.75 FPT X COUPLING



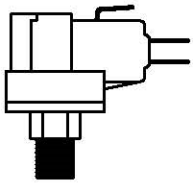
16-0013 – Q-CON 0.75 HB X INS



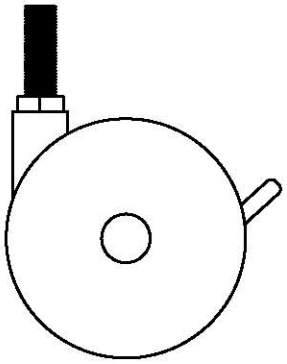
16-0015 – Q-CON CAP



16-0016 – Q-CON PLUG



65-0007 – VACUUM SWITCH



94-0013 – LOCKING CASTER
94-0014 – FREE ROLLING CASTER

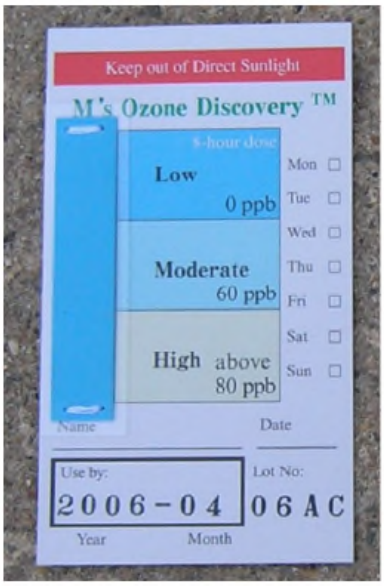
SECTION 7, OZONE AMBIENT AIR MONITORS

Introducing the *Ozone Discovery Badge*

Product ID: B1-D

Do you know your ozone levels?
This badge can tell you.

Badge before Ozone Exposure



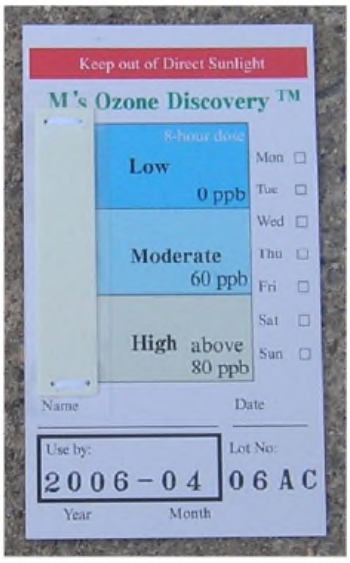
Introducing the first ozone badge with an accuracy of +/- 10%!

Features:

- Does not require Refrigeration
- Distinct color changes
- 1-year shelf life
- Very accurate

Color changes from Blue to Yellow if the ozone level exceeds OSHA limits of 100 PPB within 8-hrs.

Badge after 80 PPB Ozone Exposure



It doesn't get any easier than this!

Call us to learn more!

Ozone Solutions
789 7th St NW
Sioux Center, IA 51250
www.ozonebadges.com
sales@ozonemeters.com
Ph: 712-722-0337
Fax: 712-722-1787

The Ozone Discovery Badge is available from Ozone Solutions!

Inexpensive Ambient Ozone Sensor

Low Cost Ozone Monitor

EZ-1X Ozone Monitor for ambient ozone detection. 0.02-0.14 PPM range. LED Readout.

Features

- Constantly monitors your work environment
- No installation required. Easily understood by non-technical personnel
- Lowest cost
- AC Adapter Included

Product ID: EZ-**1X**
In Stock: **Yes**
Price: **$299**

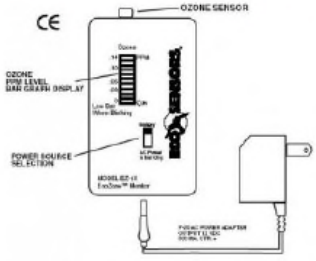
Specifications

Range	0.02-0.14 ppm
Bargraph Display	Normally green. Yellow at .05 ppm (caution). Red at .1 ppm (danger)
Response time	Within 10s of seconds of the ozone reaching the sensor
Measurement Principle	HMOS (heated metal oxide semiconductor) sensor
Size	85 × 35 × 60 mm (3.25 × 1.375 × 2.375 in)
Weight	154 grams (6 oz)
Power Requirements	12-24 VDC at 300 mA
Battery	Self-contained NiMH. Approximately 8 hour capacity. Recharged by AC adapter overnight

EZ-1X Specifications

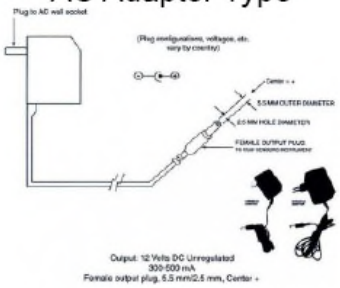
Printable information sheet on the EZ-1X. All specification & features are listed here.

EZ-1X Compnent Diagram



Included AC adapter (120V/60Hz only) easily plugs into the bottom of the ozone monitor.

AC Adapter Type



For overseas customers, the following Tech note show the type of plug required to connect to the AC Adapter.

SECTION 8, OZONE MSDS

AmeriWater
1303 STANLEY AVE
DAYTON, OH 45404
TEL (937) 461-8833, (800) 535-5585
FAX (937) 461-1988
www.AMERIWATER.com

MSDS

Material Safety Data Sheet
June 10, 2013

Section 01: Chemical Product Identification
Domestic Trade Name: Ozone Gas (O_3) Export Trade Name: Ozone Gas (O_3)

Section 02: Information on Hazardous Ingredients
Hazardous Components: Ozone (O_3)
CAS#: 10028-15-6 (100%) *OSHA PEL*: 0.1 ppm (0.2 mg/m^3)
ACGIH TLV: 0.1 ppm (c) (0.2 mg/m^3) Other Limits: 0.3 ppm STEL, 5 ppm IDLH

Section 03: Hazards Identification:
Overview: Use in locations with adequate ventilation. Exposure to ozone may cause headaches, coughing, dizziness, tightness in the chest, and irritation of the eyes, throat and mucous membranes.
Potential Health Effects: *Eyes*: Irritating to the eyes *Skin*: N/A *Ingestion*: N/A
Inhalation: Irritating to the respiratory system. May cause respiratory complications, pulmonary edema, and bronchial pneumonia.
Not listed as a carcinogen.
Medical Restrictions: Persons with asthma or emphysema may be further aggravated by exposure to ozone.

Section 04: First Aid Measures
First Aid For Ingestion: N/A.
First Aid Skin Contact: N/A.
First Aid Inhalation: Remove to fresh air and support breathing as needed.
First Aid Eye Contact: Immediately flush eyes with flooding water continuously for at least 15 minutes gently lifting upper and lower eyelids. Obtain medical attention if necessary.

Section 05: Fire Fighting Measures
Flashpoint: N/A
Flammable Limits: LEL (Lower Explosive Limits) N/A
Fire Fighting Media: Ozone is an oxidizer; use appropriate media for surrounding materials.
Special Fire Fighting Procedures: Stop flow of gas.
Fire/Explosion Hazards: Strong oxidizer capable of igniting combustibles. Contact with organic materials or incompatibles may cause explosion. Decomposition into oxygen will increase strength of fire.

Section 06: Accidental Release Measures
Spill/Leak Clean-Up Procedures: Provide adequate ventilation and allow to decompose into oxygen. Protect against inhalation.

Section 07: Handling and Storage
Precautionary Measures: Avoid inhalation, use in adequately ventilated areas.
Disposal Method: Ozone rapidly decomposes to form oxygen (O_2). Follow applicable Federal, state, and local regulations.
RCRA Class: Not Applicable.

Section 08: Exposure Control/Personal Protection

Ventilation: Use with adequate ventilation.
Respiratory Protection: Not required if OSHA PEL is not exceeded (0.1 ppm, 8 hours).
Eye Protection: None Required.
Skin Protection: None Required.
Personal Hygiene: Observe Ordinary Measures of Personal Hygiene.

Section 09: Physical and Chemical Properties

Boiling Point: -169.4 °F (-111.9 °C).
Melting/Freezing Point: Approximately –318.46 °F (-194.7°C) to –311.26°F (-190.7 °C).
Appearance: Colorless gas with pungent odor.
Density: Gas, 2.144 g/L at 32 °F (0 °C); liquid, 1.614 g/mL at –319 °F (-195.4 °C)
Odor: Pungent and detectable at 0.01 to 0.04 ppm, sharp disagreeable odor at 1 ppm.
Water Solubility: 49 cc/100 cc at 32 °F (0 °C).
Vapor Pressure: > 1 atm;1mm Hg at –292.7 °F (-180.4 °C).
Vapor Density: 1.6 (Air = 1)
Ionization Potential (eV): 12.52
Henry's Law Constant (H): 3.9 x10^3 atm-m^3/mole at 68 °F (20 °C)
Evaporation Rate: N/A
pH: N/A

Section 10: Stability and Reactivity

Stability: Unstable, readily decomposing to diatomic oxygen at room temperature.
Hazardous Polymerization: Cannot Occur.
Conditions to Avoid: Shock, exposure to heat or flame, contact with incompatible chemicals.
Reactivity: Reacts with any oxidizable organic or inorganic materials.
Hazardous Decomposition Products: Thermal oxidative decomposition of ozone will produce oxygen.

Section 11: Transport Information

DOT Transportation Data (49 CFR 172.101)

Shipping Name: Liquified gas, toxic, oxidizing, n.o.s. [Inhalation Hazard Zone A]

Shipping Symbols:	*Hazard Class*: 2.3	*ID No.*: UN3307
Packing Group:	*Label:* POISON GAS, OXIDIZER	
	Special Provisions (172.102): 1	
Packaging Authorizations:	*Exceptions*: None	
	Non-bulk Packaging: 173.192	
	Bulk Packaging: 173.245	
Quantity Limitations:	*Passenger Aircraft, or Railcar*: Forbidden	
	Cargo Aircraft Only: Forbidden	
Vessel Stowage Requirements:	*Vessel Stowage*: D	
	Other: 40	

⚠ WARNING

This product can expose you to chemicals such as vinyl chloride (used in the production of PVC) or Nickel (used in the production of stainless steel), that are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Dear Valued Customer,

California Proposition 65 (Prop 65) is the Safe Water and Toxic Enforcement Act of 1986. The State of California began enforcing amendments to California Prop 65 at the end of August 2018. Prop 65 requires manufacturers to provide a clear and reasonable warning to residents of California about chemicals used in products that they purchase that are included on the Prop 65 Chemical List. The chemicals included on the list are chemicals that are known to the State of California to cause cancer, birth defects, or other reproductive harm. One such chemical is Vinyl Chloride, a compound used to produce Polyvinyl Chloride (PVC). The AmeriWater system you have purchased may contain PVC or stainless steel parts.
While warnings are only required in the State of California, AmeriWater has initiated the use of Prop 65 labeling for all products to ensure compliance with California regulations. Please note that the above warning does not necessarily mean that the product that you have purchased is unsafe. Products that have been cleared for market by FDA have been determined to be safe and effective by the United States Food and Drug Administration. The warning is simply a requirement by the State of California. If you wish to obtain additional information, please visit: p65warnings.ca.gov. You may also contact your AmeriWater representative if you have any questions.

Thank you for your understanding and we look forward to continuing to serve you.