

# ABSOLUTE OZONE



OZONE GENERATOR  
Models ATLAS/TITAN/MAGNUM 25-200

## OPERATOR'S MANUAL

Absolute Ozone  
10712 - 181 Street, Edmonton, Alberta, T5S 1K8, Canada  
780-486-3761

# **TABLE OF CONTENTS**

<b>SECTION 1 – General Information .....</b>	<b>2</b>
1A. Description .....	3
1B. Specifications (Ozone Output) .....	3
1C. Layout & Accessories .....	3
1C.1 Ozone Generation.....	3
1C.2 Required Accessories .....	4
<b>SECTION 2 - Installation.....</b>	<b>5</b>
2A. Location .....	5
2B. Electrical .....	6
2C. Plumbing.....	6
2D. Remote Control.....	6
<b>SECTION 3 - Operation .....</b>	<b>9</b>
3A. Control Panel Overview .....	9
3B. System Startup .....	10
3C. System Shutdown .....	10
3D. Standard Operating Procedures.....	10
<b>SECTION 4 – Maintenance and Service .....</b>	<b>11</b>
4A. Preventative Maintenance.....	11
4B. Troubleshooting .....	11
<b>SECTION 5 – Replacement Parts.....</b>	<b>13</b>
<b>SECTION 6 – Ozone Overview and Safety Procedures.....</b>	<b>13</b>
6A. Ozone Use and Technology Overview .....	13
6A.1 Relative Strength of Ozone .....	13
6A.2 Micro-Flocculation and Oxidation .....	13
<b>6B. General Safety Information.....</b>	<b>13</b>
6B.1 Ozone Properties .....	13
6B.2 Ozone Uses .....	14
<b>6C. Hazards.....</b>	<b>14</b>
6C.1 Health Hazards – Detection Levels.....	14
6C.2 Health Hazards – Effects on Humans.....	14
6C.3 Electrical Hazards .....	15
6C.4 Fire Hazards .....	15
6C.5 Chemical Action .....	15
<b>6D. Precautions for Safe Handling and Use .....</b>	<b>15</b>
6D.1 Ozone Monitors.....	16

6D.2 Ventilation .....	15
6D.3 Emergency Procedure.....	16
6D.4 Respiratory Protection .....	16
6D.5 Education and Training .....	16
<b>6E. System Operation and Maintenance.....</b>	<b>17</b>
6E.1 Safety Precautions and Equipment .....	17
6E.2 Maintenance Requirements.....	17
<b>6F. Monitoring .....</b>	<b>17</b>
6F.1 Location of Monitors .....	17
6F.2 Monitoring Equipment.....	17
<b>6G. First Aid Procedures .....</b>	<b>17</b>
6G.1 General Information.....	17
6G.2 Inhalation.....	16
6G.3 Eye Contact .....	18
6G.4 Precautions.....	17
6G.5 Emergency Information Form .....	18
<b>Absolute Ozone Five Years Limited Warranty .....</b>	<b>19</b>
7 Ozone Generator Dimensions and Mounting Dimensions.....	20
8 Typical Ozone Injection System Diagram .....	21

## SECTION 1 – General Information

### **IMPORTANT SAFETY INSTRUCTIONS. PLEASE READ AND FOLLOW ALL INSTRUCTIONS.**

- Read this manual completely before operation of ATLAS/TITAN/MAGNUM 25-200 Ozone Generator Equipment. **Warning** - High Voltage is present inside the enclosure

### **USE EXTREME CAUTION**

- Operate the ATLAS/TITAN/MAGNUM 25-200 with safe access to electrical power.
- Connect to a GFCI type receptacle.
- Follow all applicable electrical codes.
- Do not bury cord.

**WARNING:** To reduce the risk of electrical shock, replace damaged cord immediately.

**ELECTRICAL SHOCK HAZARD:** Turn OFF all power switches and disconnect power cord from power source receptacle before performing any service work. Failure to do so could result in serious injury or death.

## 1A. Description

The ATLAS/TITAN/MAGNUM 25-200 are Ozone Generators that produce from 1 to 160 grams of ozone per hour respectively, with ozone concentration up to 14% by weight or as specified in attached test report.

The ATLAS/TITAN/MAGNUM 25-200 are designed to produce ozone for variety of applications such as:

- Water Disinfection for Bottled Water Plants, Medical & Pharmaceutical Facilities, Swimming Pools, etc.
- Industrial Processes, Chemical Production and Laboratories, Electronic Production, Mining
- Aquatic Life Support Systems for Marine Mammals, Fish Hatcheries, Large Aquariums...
- Food Processing, Food Processing Facilities Disinfection, Food Preservation
- Soil Remediation, Ground Water Remediation
- Wineries Facilities Disinfection, Barrel Disinfection
- Cooling Towers Water Treatment, Technological Processes Water Treatment
- Potable Water Disinfection for Small Communities
- Waste Water Treatment for Industrial Plants, Technological Production Processes, Commercial Facilities Waste Water Treatment, Dangerous Chemical and Bacteria Treatment, etc.

## 1B. Specifications :

- Ozone Output as specified in supplied performance chart, g/h.
- Gas Flow Rate (min): 0.05 SLPM
- Gas Flow Rate (max): as specified in supplied performance chart, SLPM
- % By Weight O<sub>3</sub>: 5 – 12% (6 – 14% for ATLAS/ TITAN 25-100C/ MAGNUM 200C)
- Working Pressure: 20-120 PSIG according to supplied performance chart.
- Feed Gas – Oxygen 90%-95% concentration for best performance. When bottle oxygen or LOX is used, Nitrogen 0.5%-5% has to be added to the feed gas for best performance.
- Power Requirements:
  - Domestic: ATLAS/TITAN/MAGNUM 25-200– 115 V AC, 60 Hz, 5.0-18.0 A (25 Amp Service)
  - International: ATLAS/TITAN/MAGNUM 25-200E – 220/240 V AC, 50/60 Hz, 2.5-9.5 A (15 Amp Service)

## 1C. Accessories

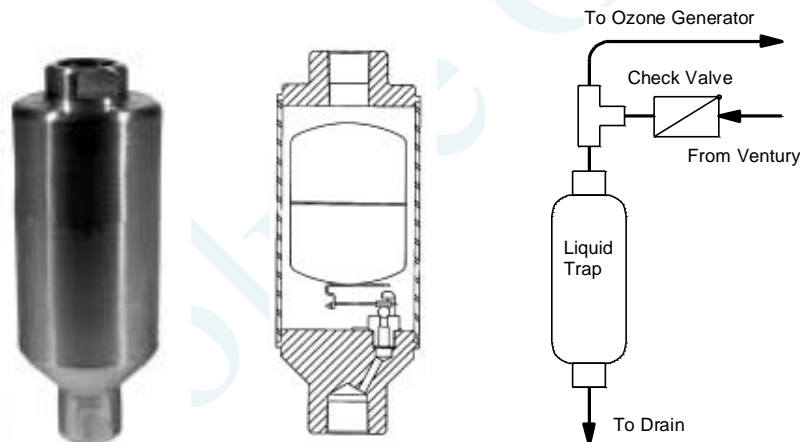
The ATLAS/TITAN/MAGNUM 25-200 could be used with several accessories and safety devices to assure long service life of the Generator.

### 1C.1 Ozone Generation

- Air Compressor: air compressor pumps ambient air into the oxygen concentrator
- Oxygen Concentrator separates oxygen from Nitrogen and supplies it to ozone generating cell.
- Ozone Generating Cell design is based on proprietary Microfluidic Platform Technology, constructed from ozone resistant materials and offers extremely high performance and reliability. Ozone Cell is designed to be absolutely maintenance and service free. Anticipated service life 15-20 years.

## 1C.2 Required Equipment & Accessories

- **Oxygen Concentrator:** The oxygen concentrator uses a PSA (pressure swing adsorption) molecular sieve to remove dirt, moisture, nitrogen and other trace gases, producing oxygen at greater than 90% purity and less than  $-60^{\circ}\text{C}$  dew-point. The air compressor pumps ambient air into the oxygen concentrator. Concentrated oxygen feed-gas enables ozone concentration up to 14% by weight. In our experience, Oxygen Concentrators made by AirSep work well with all Absolute Ozone generators.
- To protect Absolute Ozone Generator from sieve particles in case of oxygen concentrator failure we recommend installing Oxygen Filter Upstream from the generator.
- **Ozone Flow Control Valve:** Downstream from ozone generator to maintain working pressure across ozone cell as specified 20-120 PSIG for the unit.
- **Automatic Ozone Compatible ALD2000 Water Drain system** to prevent Ozone Generator flooding.  
Please note – **Non return valves (check valves) do not provide 100% protection to ozone generator!**  
We do not recommend installing ozone generator, without this device.



- **Ozone Injector for Water Treatment Applications:** Inlet water flows through the pump and through the ozone injector, creating vacuum that pulls ozone gas from the ozone generation module and injects the ozone into the water flow. The injector should be sized to dissolve a minimum of 90% of the ozone gas into the water flow continuously.
- **Ozone Degas Chamber:** Ozone-enriched water from the ozone injector flows into the degas chamber where the counter-current design forces any undissolved ozone gas through the float valve-protected top vent to the Ozone Destructor.
- **Ozone Destructor:** Undissolved ozone gas passes through the heated catalytic ozone destructor that is made of non-consumable manganese dioxide (heat protected from moisture fouling). The manganese dioxide and heat offer redundant ozone destruct capabilities.

## SECTION 2 - Installation

### 2A. Location

The ATLAS/TITAN/MAGNUM 25-200 Ozone Generators are designed to be installed on the wall, on the rack or stack up system in convenient location mobile cart or skied. Allow for access to protected electrical power and required gas connections and cooling air to the Ozone Generator. **Do not obstruct cooling air vents of the Generator!**

Unit could be installed indoors & outdoors if protected from weather element. Ambient working temperature from  $-10^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$ .



### TITAN 25-100

Standard 19" x 7"h Rack Mount Enclosure offers retrofit replacement for most popular rackmount ozone generators on the market providing superior performance and reliability.

## 2B. Electrical

**Main Power Supply Circuit:** The ATLAS/TITAN/MAGNUM 25-200 are supplied with 3-5 feet power cord. Connect the power cord to a standard grounded 15 Amp (10 Amp International) power source, according to a local electrical code only.

## 2C. Plumbing

When injecting Ozone in to water all measures should be taking to protect the Generator Cell from water exposure, which may cause internal cell damage. A small tank with/or an automatic water drain system is recommended.

## 2D. Gas Connections

The Ozone Generator should be connected by tubing made from material appropriate for ozone and oxygen applications. Connect the Ozone Generator according to indications on input and output bulkheads. All efforts should be made to protect the generator from exposure to excessive pressure fluctuations, which may lead to the damage of electronic circuitry and Ozone Cell. For applications where pressure fluctuations are possible we strongly recommend installation of a buffer tank with an appropriate hi-low pressure switch. It is **VERY IMPORTANT** to protect the Generator from any possible contamination from the Oxygen Concentrator or from water injection device, by installing oxygen monitor and filter upstream from the Generator and automatic water drain device in combination with check valve. Concentration of feed oxygen should not be below 90%.

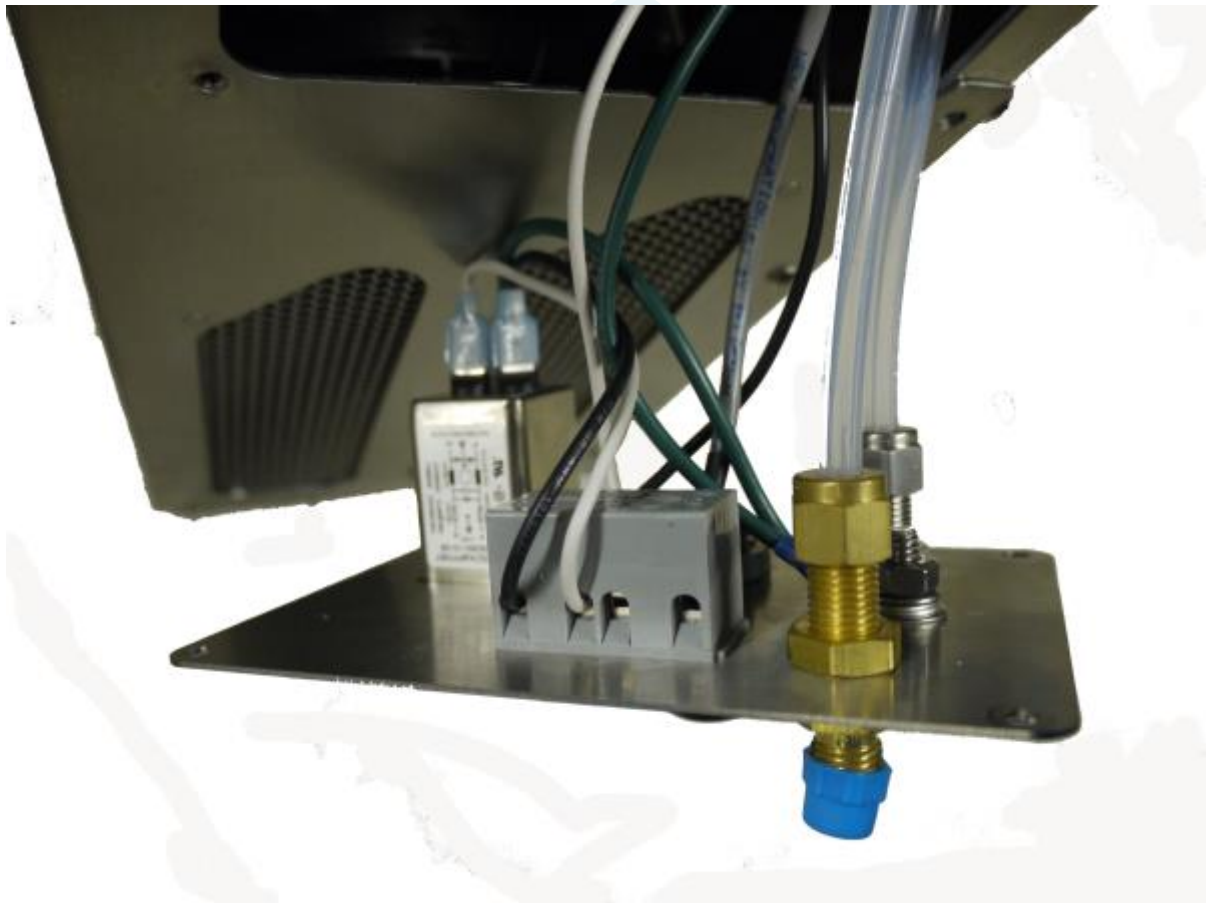
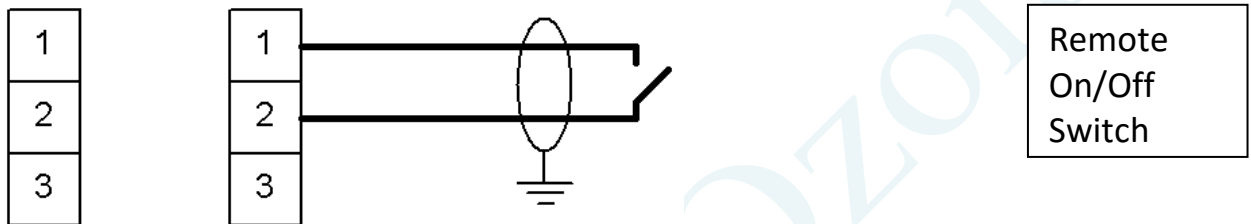


## 2E. Remote Control

All Absolute Ozone Generators are equipped with standard "On/Off" remote control terminals to enabling operator, ambient ozone monitor or PLC to remotely switch the Ozone Generator On or Off.

This contacts have to be connected to dry contact only (not connected to the ground on any kind or to any voltage source AC or DC)

### Standard Remote Control Schematic



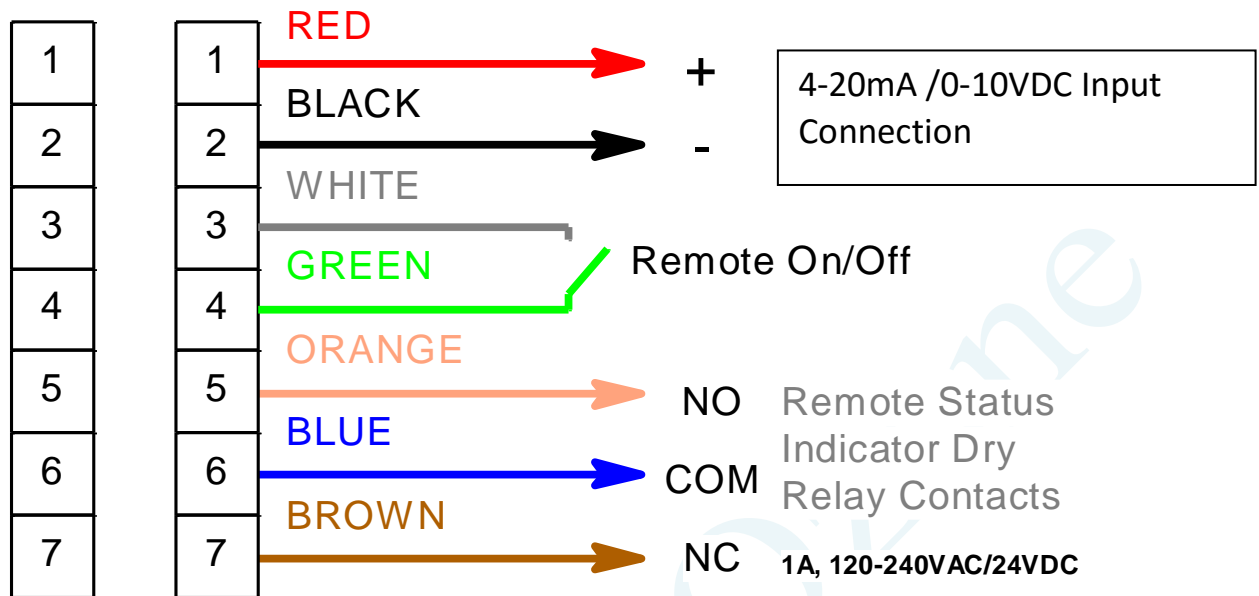


### Full (Optional) 4-20mA Remote Control Description and Schematic

Full remote control features:

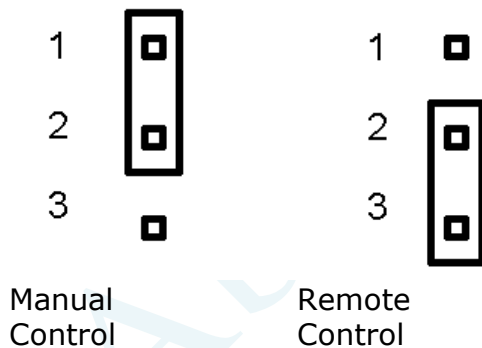
- Remote control of ozone production level by 4-20mA or 0-10 VDC signal, no special switching for both of these signals required
- Remote On/Off. Remote Switch must be normally open for the generator to be "On" and closed to stop the Ozone production.
- That switch has to be connected to dry contacts only (not connected to the ground on any kind or to any voltage source AC or DC)
- Remote Ozone Generator status indicator.
  - a. During Normal Ozone generator operation pin 5 –normally open, pin 6 – common, pin 7 – normally closed.
  - b. If Remote Control Switch is off or safety shutoff is activated the circuit will be closed between pins 5 & 6.

## Full Remote Control Connection Schematic



Use Shielded Cable Only!  
Ground Shield Only on  
One Side!

To switch from manual control operation to remote control please switch jumper in the middle PCB from pins 1-2 to 2-3



Remote Control Cables of required length are available as a special order option

## SECTION 3 - Operation

### 3A. Control Panel Overview

1. Green LED – Power "On"
2. Red LED - Safety Shutoff/Remote Control Off
3. Power On/Off Switch
4. Ozone Production Adjustment Dial

### 3B. System Startup

5. Make sure the Ozone Generator enclosure is securely attached to an appropriate frame or wall Ozone Generators Stack.
6. Make sure all connections to the generator, power and gas are made according to local codes and regulations.
7. Purge the generator with 90% or higher concentration oxygen and assure free flow of oxygen through the system and removal of contaminants. Conduct system leak test applying working pressure +/-10% using oxygen only. Adjust gas pressure across the cell according to specifications using downstream Control Valve and pressure gage (supplied by the installer).
8. Turn the potentiometer on the front panel fully counterclockwise.
9. Plug the system into a specified receptacle.
10. Flip the Power Switch in to "ON" position.
11. Turn the Ozone Production Potentiometer clockwise slowly, to reach optimum power setting according to supplied "Ozone Generator Performance Test" chart. Now the generator is in optimum production mode, and ozone should be flowing through the system.

### 3C. System Shutdown

1. Turn the potentiometer fully counterclockwise.
2. Turn the Ozone Production switch in to "OFF" position. (No ozone is produced at this time.)
3. Unplug the system from the power source if required.
4. Close the Control Valve off (optional, supplied by installer) to protect unit from accidental flooding.
5. Turn the oxygen source off.

### 3D. Standard Operating Procedures

**NOTE:** To assure a long trouble-free service life of the ATLAS/TITAN/MAGNUM 25-200 Ozone Generators, provide following operating conditions:

- Make sure that the oxygen concentrator is maintained properly and is producing oxygen at greater than 90% purity and less than -60°C dew point. Check sieve conditions and replace it as often as recommended by manufacturer
- Install oxygen filter and oxygen dryer between oxygen concentrator and the Ozone Generator, check condition and replace a cartridge as to protect Ozone Generator from sieve particles in case of oxygen generator failure and moisture.

- Make sure to maintain working pressure across ozone cell as specified for the generator protection and most efficient ozone production.
- When injecting ozone in to water make sure to protect the generator from flooding by installing device capable of preventing water backup. Check valves usually start leaking after few days of operation in ozone and cause serious damage to the ozone cell. We recommend using devices, which could automatically drain water out of ozone line and stop it from entering the ozone cell.
- Protect internal components of the Ozone Generator from water, snow, excessive dust and humidity, vibration, mechanical shock; make sure that there is a sufficient amount of clean air available for the unit cooling air and inlet and outlet are not obstructed by other equipment or elements.
- Check that electrical power fluctuations are within +/- 10% of the specified AC Voltage and install power-conditioning devices if necessary.

## SECTION 4 – Maintenance and Service

### 4A. Preventative Maintenance

Generally the ATLAS/TITAN/MAGNUM 25-200 are maintenance-free although it is useful to check the Ozone Generator for proper operation:

- a. Make sure green indicator light is lit during operation.
- b. Red light or Amber light for Magnum is off
- c. Make sure that all air vents are clear of any obstruction.

#### On a monthly basis:

1. Make sure that all system equipment (oxygen concentrator, air compressor, etc.) is maintained according to the manufacturer recommendations.
2. Remove and replace or clean filter cartridges and other devices if installed and required.
3. Perform general cleaning of cabinet exterior after disconnecting the equipment from electrical source.
4. Using clean/dry compressed air, blow out the interior of cabinet, taking special care around electronic components and wiring.

### 4B. Troubleshooting

Knowledge of electrical applications is required for troubleshooting. Contact a certified electrician if you are unsure of your ability to service the equipment. If

any problem persists, please call 780-486-3761. We will have one of our system engineers discuss your situation with you over the phone.

**Symptom:** Green, Red or Amber indicator lights "OFF", POWER Switch is in the "ON" position and the cooling fan is not running.

1. Check if the power coming to the generator.
2. Check the Power fuse located on exterior of the Ozone Generator and if the fuse is "OK" check power cord for breaks in insulation or loose connections or contact the Service Department
3. If the fuse is not "OK" please contact Service Department

**Symptom:** Green indicator light is "ON", Red or Amber indicator light are "ON", Internal Safety Shutoff;

1. Please check the following;
  - a. Presence of moisture inside the tubing and the generator. If moisture is present, dry it out by running oxygen through the generator without power (that could take from a few hours to several days). Do not power the generator unless absolutely sure that it is dry. Running the generator with moisture inside will cause serious damage to the internal components and costly repair.
  - b. Red or Amber light can be "ON" also in case of Remote "Off" condition
  - c. Oxygen pressure and adjust the pressure according to the specifications.
2. If the above conditions are not present, please turn the Ozone Production Potentiometer on the Control Panel  $\frac{1}{2}$  of a turn down and switch the Power Switch "ON" again. If the Red indicator light is still "ON" – Please contact our Service Department

If the above conditions are no longer present, please turn the power to "OFF" position, turn the potentiometer to 0 position, wait 10 seconds and turn the power switch "ON". Adjust the potentiometer according to the instructions. Should the problem persist, please contact our service department.

## SECTION 5 – Replacement Parts

**ATLAS/TITAN/MAGNUM 25-200 Ozone Generators are repaired at Absolute Ozone facilities only.** On a rare occasion (must be authorized by Absolute Ozone technicians only), if any of the parts have to be replaced in the field Absolute Ozone will provide those parts to the customer. Please contact our service department.

## SECTION 6 – Ozone Overview and Safety Procedures

### 6A. Ozone Use and Technology Overview

#### 6A.1 Relative Strength of Ozone

The following compares the strengths of several common oxidizing reagents (EOP vs.  $\text{Cl}_2$ )

- Elemental Fluorine (2.25)
- Hydroxyl Radical (2.05)
- Ozone (1.52)
- Hydrogen Peroxide (1.30)
- Hypochlorite (1.10)
- Chlorine (1.00)
- Chlorine Dioxide (0.93)
- Bromine (0.57)

#### 6A.2 Micro-Flocculation and Oxidation

Ozone oxidizes the following metals (known as micro-flocculation), enabling their removal via filtration:

- Iron
- Copper
- Manganese
- Zinc
- Arsenic

Ozone neutralizes "nuisance" compounds - most commonly, hydrogen sulfide.

### 6B. General Safety Information

#### 6B.1 Ozone Properties

- Colorless to blue gas (greater than  $-169^\circ\text{F}$ )
- Characteristic odor often associated with electrical sparks or lightning in concentrations of less than 0.02 ppm

- Highly chemically reactive
- Non-flammable, non-carcinogenic
- Hazardous polymerization can occur in some rear materials
- Spontaneously decomposes to oxygen gas

### **6B.2 Ozone Uses**

- Air and water disinfection
- Surface sanitation
- Water treatment plants
- Bottled water, irrigation, community water supplies, swimming pools/spas, etc.
- Aquariums/life support
- Agricultural wash water
- Wastewater treatment
- Mold and bacteria control in cold storage

## **6C. Hazards**

### **6C.1 Health Hazards – Detection Levels**

Gaseous ozone can be detected in air by its distinctive odor at concentrations of about 0.02 ppm. Although each nose varies, olfactory fatigue occurs quickly. Initial small exposure may reduce cell sensitivity and/or increase mucous thickness producing a resistance to low gaseous ozone levels.

#### **DO NOT RELY ON ODOR AS A WARNING OF HIGH OZONE**

**CONCENTRATIONS.** The Permissible Exposure Level (PEL) or time-weighted concentration for gaseous ozone to which workers may be exposed is 0.1 ppm averaged over 8 hours, 5 days a week (OSHA). The short-term exposure limit is 0.3 ppm averaged over 15 minutes. The concentration of 5.0 ppm ozone in air is generally accepted as Immediately Dangerous to Life or Health (IDLH).

### **6C.2 Health Hazards – Effects on Humans**

Gaseous ozone acts as a primary irritant, affecting mainly the eyes, upper respiratory tract and the lungs. Inhalation produces various degrees of respiratory effects from irritation to pulmonary edema (fluid in lungs). Short exposure to 1-2 ppm concentrations causes headache as well as irritation to the respiratory system but symptoms subside when exposure ends. High concentrations of ozone produce severe irritation to the eyes and respiratory system. Exposure above the ACGIH/OSHA limits may produce nausea, chest pain, coughing, fatigue, reduced visual acuity and pulmonary edema. Symptoms of edema from excessive exposure can be delayed one or more hours. There is no threshold limit and so no exposure (regardless of how small) is theoretically without effect from ozone's strong oxidative ability.



TOXIC EFFECTS OF GASEOUS OZONE	
OZONE	
CONCENTRATION (PPM)	EFFECT
0.01 - 0.10 .....	Range of odor threshold
0.1 .....	Permissible concentration (8 hour work day)*
0.3 .....	Permitted short-term exposure (15 min.)*
0.01 - 1.0 .....	Headaches, irritation to respiratory tract, severe irritation to eyes
1.0 - 10.0 .....	Nausea, chest pain, coughing, fatigue, reduced visual acuity, pulmonary edema
5.0 .....	Immediately Dangerous to Life or Health (I.D.L.H.)*
>20.0 .....	Can be fatal after 1 hour
>50.0 .....	Can be fatal after 1/2 hour
<i>*Regulatory Levels</i>	

### 6C.3 Electrical Hazards

Turn OFF all power switches and disconnect power cord from power source receptacle before performing service work. Failure to do so could result in serious injury or death. Operate the ATLAS/TITAN/MAGNUM 25-200 with safe access to electrical power. Connect the ATLAS/TITAN/MAGNUM 25-200 to a G.F.C.I. type receptacle or as required by local electrical code & regulations. Do not bury the electrical cord. To reduce risk of electrical shock, replace damaged cord immediately.

### 6C.4 Fire Hazards

Ozone is nonflammable. Decomposition of ozone into oxygen gas ( $O_2$ ) can increase strength of fire. Ozone is unstable at room temperature and spontaneously decomposes to oxygen gas. Avoid ignition sources such as heat, sparks, and open flame. Keep away from strong combustible materials such as grease, oils, and fats.

### 6C.5 Chemical Action

Ozone is chemically incompatible with all oxidizable materials, both organic and inorganic.

## 6D. Precautions for Safe Handling and Use

### **6D.1 Ozone Monitors**

Ambient ozone monitoring equipment should be installed in the areas where ozone is being generated or applied. (See Monitoring section 6F.) Self-adhesive ozone monitor badges, such as the Chromair® System by K&M Environmental (Virginia Beach, VA, [www.kandmenvironmental.com](http://www.kandmenvironmental.com)), may be used for personal or area monitoring for exposure times ranging from 5 minutes to 10 hours.

### **6D.2 Ventilation**

It is mandatory that general and local exhaust ventilation be provided to dilute and disperse small amounts of ozone into the outside atmosphere. Federal, state, and local regulations must be followed.

### **6D.3 Emergency Procedure**

Due to the short life of ozone, evacuation and ventilation is all that is generally required in the event of a high ambient ozone alarm. All ozone generating and delivery equipment should be shut down (manually or automatically by alarm) and a high-speed fan activated to dilute and disperse ozone in to the atmosphere. Personnel should leave the affected area until levels are returned to below 0.1ppm.

### **6D.4 Respiratory Protection**

A disposable respirator (3M #N95 8214/8514 - Minneapolis, MN, [www.3m.com](http://www.3m.com)) is recommended for relief against ozone levels up to 10 times the OSHA PEL or applicable government occupational exposure limits, whichever is lower.

### **6D.5 Education and Training**

The education and training of workers is the responsibility of the employer. An effective training program must be practical, based on written work procedures and be specific to both the job-site and the tasks to be performed. Training shall also include the responsibilities and responses of workers in an emergency. The employer shall ensure through the education and training program that all workers are able to work without risk to themselves or others around them.

All workers must clearly understand their responsibilities with regard to not only specific work procedures, but also the need to report all hazards, accidents or incidents and injuries. Management and employees shall review all routine work and emergency procedures jointly at least once annually.

## **6E. System Operation and Maintenance**

### **6E.1 Safety Precautions and Equipment**

Repair and maintenance of the ozone system shall be done under the direction of qualified personnel. Qualification shall consist of instruction and training by the equipment supplier in the safeguards and procedures necessary for safe performance of the work. A certificate of completion of such training shall be provided. Repair of Ozone Generator could be performed only at Absolute Ozone facilities unless authorized and instructed otherwise by Absolute Ozone personal.

All equipment in an ozone plant (ozone generator, piping, pumps, tanks...) coming in contact with gases containing ozone must be maintained free of oil and grease.

Monitoring equipment and alarm system shall be tested and serviced according to the manufacturer's instructions. The planned maintenance of all safety equipment is essential to worker safety.

### **6E.2 Maintenance Requirements**

It is the joint responsibility of the manufacturer, supplier and installer of the Ozone Generating and handling equipment to determine whether or not the system is working properly. The operation and maintenance manual provided with the equipment outlines the operating procedures and maintenance requirements.

## **6F. Monitoring**

### **6F.1 Location of Monitors**

Ambient ozone detection monitors shall be located to monitor ozone room air and production/plant room air for indoor applications.

### **6F.2 Monitoring Equipment**

Proper Ozone Monitoring equipment should be use to protect personnel from dangerous levels of ozone exposure. Absolute Ozone could provide suitable ozone monitoring at customer request.

## **6G. First Aid Procedures**

### **6G.1 General Information**

1. DO NOT PANIC. If exposure to gaseous ozone causes headaches or shortness of breath, immediately remove the worker to a fresh-air

environment.

2. Ensure there is no more danger to yourself or the worker.
3. Workers who have been exposed to low concentrations of ozone should be given oxygen to breathe while under the observation of trained personnel.
4. If exposure is severe, send for medical assistance immediately.
- 5.

## **6G.2 Inhalation**

1. Assess worker's breathing.
2. All unconscious workers must be placed in the drainage position (on their sides); so that fluids can drain from the airways once breathing has been restored.
3. Check pulse.
4. If breathing has ceased, start artificial respiration (rescue breathing is the most effective method) until breathing has been restored.
5. Send for medical assistance immediately.
6. If absent, begin cardiopulmonary resuscitation (CPR).

## **6G.3 Eye Contact**

1. Effective irrigation should start immediately. Eyes should be irrigated for 30 minutes by the clock with running tap water or preferably normal saline.
2. Effective irrigation must be continued while en-route to hospital.

## **6G.4 Precautions**

Workers with a previous cardiopulmonary (heart and lung) condition must consult their physician prior to working in an area in which they may be exposed to ozone. Significant alterations in cardiopulmonary functions have been documented when such workers have been exposed to low concentrations of ozone.

## **6G.5 Emergency Information Form**

An emergency information form (see below) should be filled out prior to operating the Ozone Generator.

## EMERGENCY INFORMATION

[illegible]

## **Absolute Ozone Five Years Limited Warranty**

The limited warranty set forth below applies to products manufactured by Absolute Ozone 10712 - 181 Street, Edmonton, AB., T5S 1K8, Canada, and sold by Absolute Ozone and 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.

Absolute Ozone warrants that Absolute Ozone will repair or replace, at Absolute Ozone's option, any part of such products proven to be defective in materials or workmanship within Five (5) years from date of original purchase. Parts are covered under the Five (5) year warranty when and only when required operating conditions and procedures as described in this manual are performed and provided. This Warranty specifically excludes any components not manufactured by Absolute Ozone that are external to the products covered, such as pumps, air compressors, monitors, tanks, or related components. Absolute Ozone will assist with warranty claims for such components purchased through Absolute Ozone; limited to the extent of the manufacturer's standard warranty. ANY REPAIR OR REPLACEMENT WILL BE WARRANTED ONLY FOR THE BALANCE OF THE ORIGINAL FIVE (5) YEAR WARRANTY PERIOD.

**NOTE:** ANY WORK PERFORMED ON ABSOLUTE OZONE PRODUCTS WITHOUT PRIOR AUTHORIZATION FROM ABSOLUTE OZONE WILL AUTOMATICALLY VOID THIS WARRANTY. ANY ABSOLUTE OZONE PRODUCT MUST BE RETURNED TO ABSOLUTE OZONE PREPAID, FOR WARRANTY EVALUATION.

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, or improper operating procedures and conditions, misuse, abuse, negligence, accident, fire, flood, repair materials, and/or unauthorized accessories;
- (c) Any such products installed without regard to required local codes and accepted trade practices;
- (d) Damage caused by water passing through unit;
- (e) Damage caused by operating below or above specified working pressure;
- (f) ANY IMPLIED WARRANTY OF MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE, AND SUCH WARRANTIES ARE HEREBY DISCLAIMED; AND
- (g) ABSOLUTE 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:**

**THE OZONE CELL CONTAINS TAMPER PROOF DEVICE. ANY ATTEMPT TO OPEN THE CELL WILL NOT ONLY VOID THE WARRANTY, BUT WILL VOID A POSSIBILITY OF OBTAINING ANY SERVICE BY ABSOLUTE OZONE.**

Absolute Ozone  
10712 – 181 Street,  
Edmonton, Alberta,  
T5S 1K8, Canada

Customer Service: 780-486-3761  
Fax: 780-486-3763

Web: [www.absoluteozone.com](http://www.absoluteozone.com)  
Email: [info@absoluteozone.com](mailto:info@absoluteozone.com)

Please provide the following information:

1. Project, contact name, mailing address and telephone
2. Installer/Mechanical Contractor
3. Serial # and date of purchase
4. The date of failure
5. A description of the failure
6. **All shipping documents should clearly state "Warranty Repair" and indicated RMA number.** Absolute Ozone is not responsible for double taxes or duties resulted from improper shipping documentation.

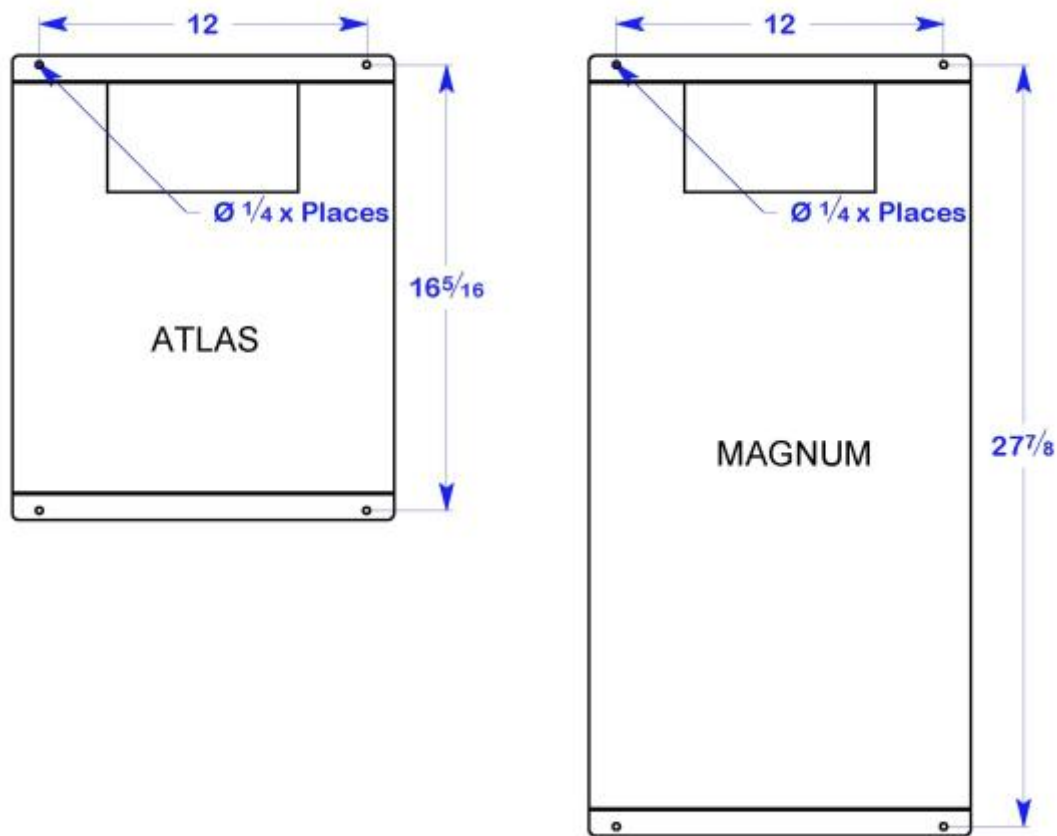




### **MAGNUM 160-200 Ozone Generator dimensions and mounting hole dimensions.**

Dimensions: 14" x 26.5" x 7"

Mounting holes dimensions: W12" x H27-7/8"



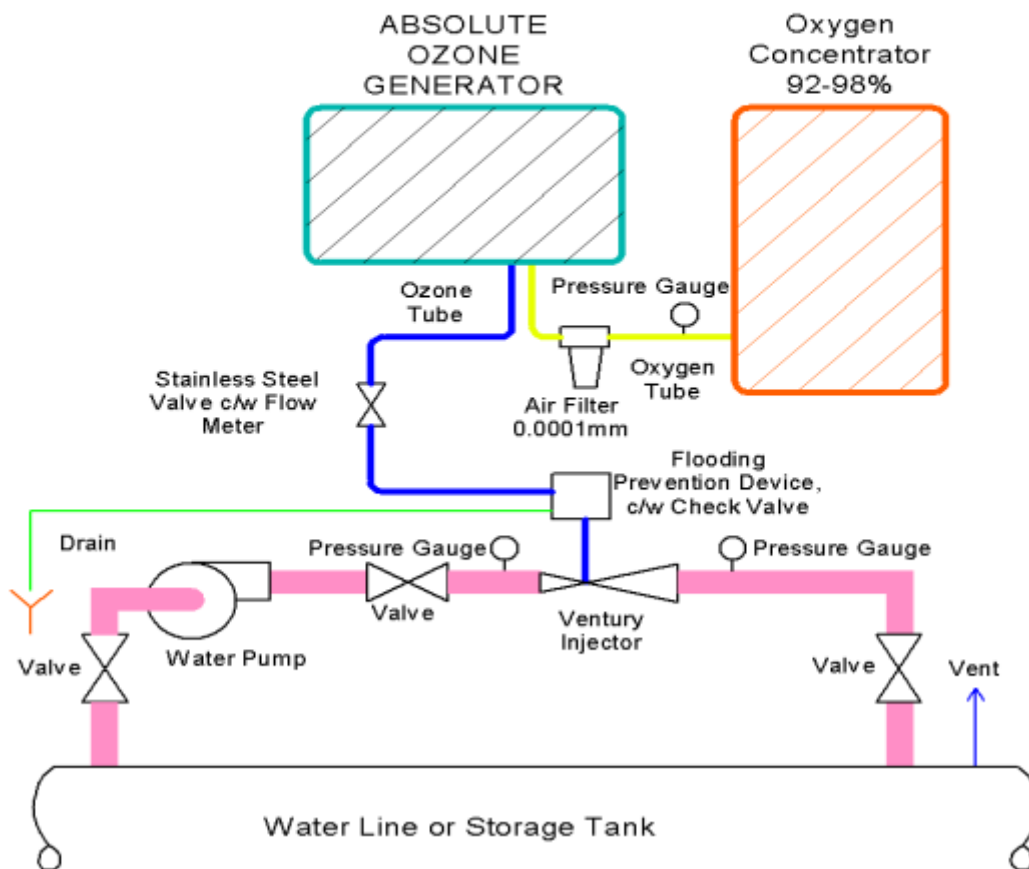
### **7 ATLAS 25-100 Ozone Generator dimensions and mounting hole dimensions.**

Dimensions: 14" x 15" x 7"

Mounting holes dimensions: W12" x H16-5/16"

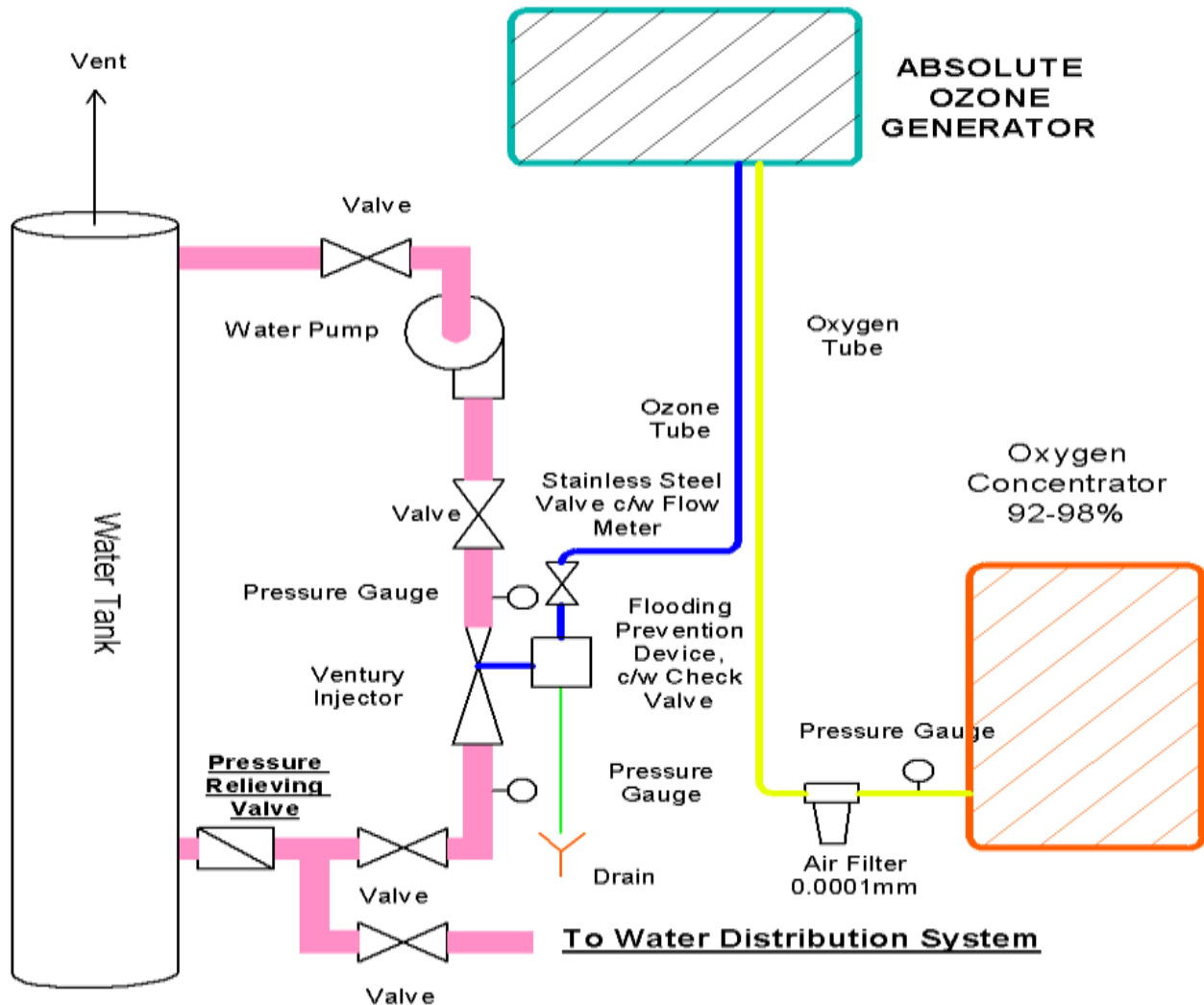
## 8. Typical Ozone Injection System Diagrams for Water Treatment

### Typical Ozone Injection System Diagram for Water Treatment with Continues Water Consumption



**Comment:** All System Components and Materials have to be Ozone Compatible.

## Typical Ozone Injection System Diagram for Water Treatment with Interrupted Water Consumption



**Comment:** All System Components and Materials have to be Ozone Compatible.

### 9. Notes: