



ABSOLUTE OZONE®



ATLAS®/TITAN®/MAGNUM® OPERATOR'S MANUAL



ABSOLUTE OZONE®

OPERATOR'S MANUAL

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General Information

IMPORTANT SAFETY INSTRUCTIONS. PLEASE READ AND FOLLOW ALL INSTRUCTIONS.

Read this manual completely before operation of
ATLAS/TITAN MAGNUM Ozone Generator Equipment.

Warning - High Voltage is present inside the enclosure

USE EXTREME CAUTION

- Operate the ATLAS/TITAN/MAGNUM 30-200 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.



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Section 1

1A. Description

The ATLAS/TITAN/MAGNUM 30-200 are Ozone Generators that produce from 1 to 200 grams of ozone per hour respectively, with ozone concentration up to 22% by weight or as specified in attached test report.

The ATLAS/TITAN/MAGNUM 30-200 are designed to produce ozone for variety of applications.

1B. Specifications

Model	ATLAS®	TITAN®	MAGNUM®
Ozone Production (g/h)	30 g/h - 100g/h	30g/h - 100 g/h	160 g/h - 200 g/h
Nominal Working Pressure (psig)	20psig	20psig	40psig
Concentration (% by weight O ₃)	5%-22%	5%-12%	6-12%
Power Requirements	120 V ~ ±3%, 50/60 Hz, Single Phase, 5.0-9.0 A 220 V ~ ±3%, 50/60 Hz, Single Phase, 3.5-7.0 A Maximum Power Consumption: 350-650W	120 V ~ ±3%, 50/60 Hz, Single Phase, 5.0-9.0 A 220 V ~ ±3%, 50/60 Hz, Single Phase, 3.5-7.0 A Maximum Power Consumption: 350-650W	208/210/220/230 VAC ~ ±3%, 50/60 Hz, Three Phase, 8.0-10.0 A Maximum Power Consumption: 1600-1700 W



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Section 1

1C. Accessories

The ATLAS/TITAN/MAGNUM 30-200 could be used with several accessories and safety devices to assure long service life of the Generator.

1C.i 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.ii Required Equipment and Accessories

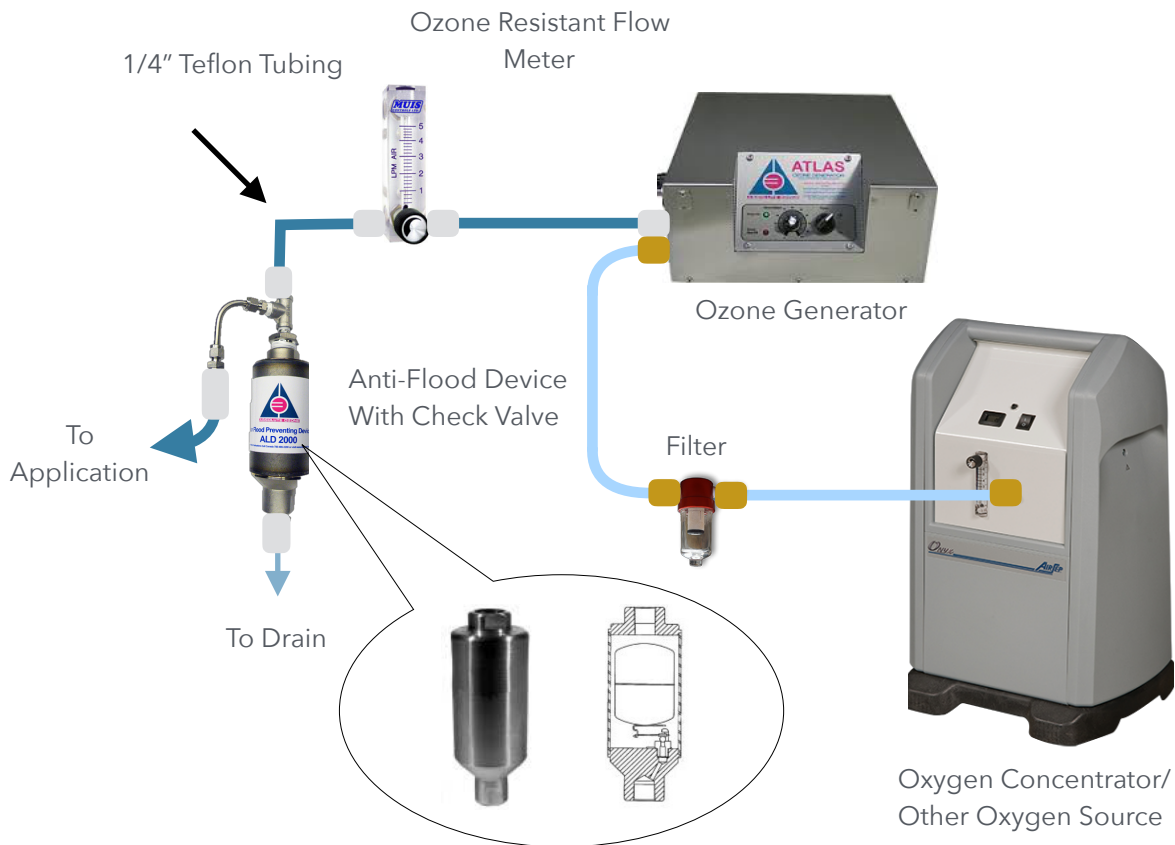
- Oxygen Concentrator: The oxygen concentrator uses a PSA (pressure swing adsorption) molecular sieve to remove dirt, moisture, nitrogen and other trace gases, producing oxygen at greater than 90% purity and less than -60°C dew-point. The air compressor pumps ambient air into the oxygen concentrator. 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.



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Section 1



- 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.

For more information about this product visit our website at, <http://www.absoluteozone.com>



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Installation

2A. Location

The ATLAS/TITAN/MAGNUM 30-200 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!**

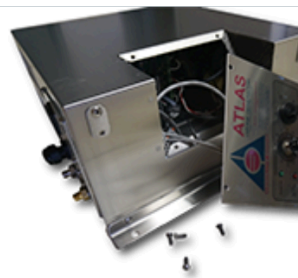
Unit could be installed indoors & outdoors if protected from weather element. Ambient working temperature from -10°C to $+30^{\circ}\text{C}$.

Reversible Universal Control Panel

We had to strive for efficiency in every detail, right down to how it connects and mounts. So we contributed to a new reversible universal control panel. Designed to efficiently accommodate installing the ATLAS in an upright or downright position



Control Panel In Upright Position



Remove 4 screws and reverse the control panel in the downright position



Tighten Screws



Now the ATLAS/Magnum can be installed in this position

Stackable Without a Rack

Every Absolute Ozone® ozone generator comes equipped with attachment tabs that can be reversed to provide you with the liberty to install the ATLAS one on top of another in a rack mount formation but without requiring a rack.



Reversible tabs in original position



Loosen screws and swing the tab into the upright position



Tighten Screws



Now the ATLAS/Magnum can be installed in this position

For more information about this product visit our website at, <http://www.absoluteozone.com>



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Section 2

2B. Electrical

Main Power Supply Circuit: The ATLAS/TITAN/MAGNUM 30-200 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)



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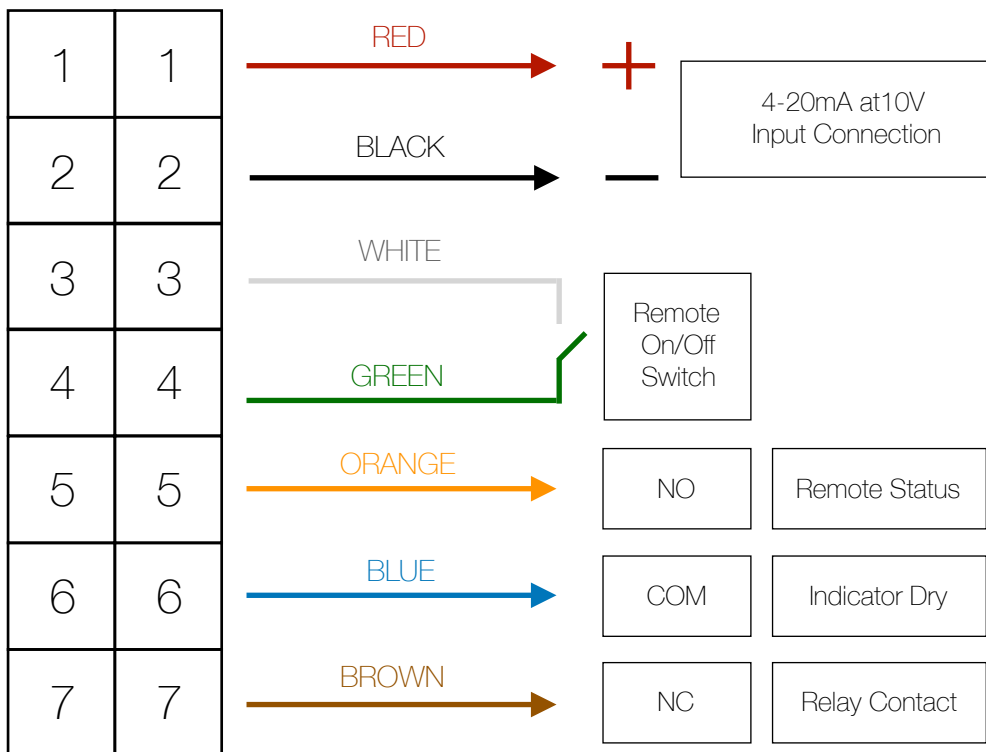
Section 2

2E. 4-20mA On/Off Power Remote Control

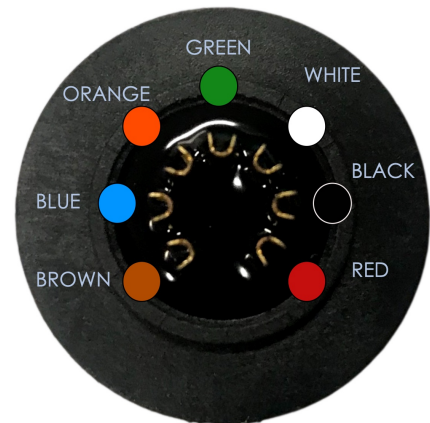
Description and Schematic of remote control features:

- Remote control of ozone production level by 4-20mA at 10 V 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.

Standard Remote Control Schematic



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



**Status
Indicator Relay
1A,
120-240VAC/
24VDC**

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

For more information about this product visit our
website at, <http://www.absoluteozone.com>



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Control Panel

3A. LCD Control Panel Overview

Here is a general description of the controller and features it offers:

All Atlas Absolute Ozone® come with 4-20mA remote power control as a standard feature that allows to select power going to the ozone cell that is later automatically monitored and maintained by a control system, regardless of minor voltage or pressure deviations. It is standard for all Atlas & Magnum ozone generators.

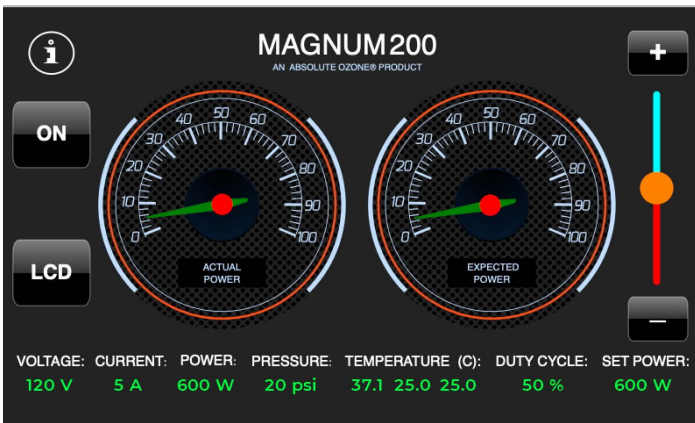
On top of it new generation controller protects the generator from damage caused by:

- connecting to incorrect power source,
- incorrect wiring or voltage applied to the remote control terminals,
- incorrect operating pressure,
- ozone cell contamination by water or similar,
- overheating or failure of the cooling system, etc.

In addition all Atlas ozone generators have:

- Status indicator that has No/Nc contacts that will change the status every time the generator is not producing any ozone regardless of the reason.
- On/Off contacts that are "NO" normally open. If the contacts are closed by external dry contact relay, the generator will move in to a standby mode. Once the contacts are open, the generator will start producing ozone again.

Photos of typical LCD 5" control touch screen:



The LCD screen shows the following parameters:

- Selected or Expected power setting %, so you will be able to see on the screen power selected by the remote control or slider.
- Actual power % & Watt going to an ozone cell.
- The cell voltage V
- Current Amp going to the ozone cell,
- Gas pressure inside the ozone cell
- Temperature inside the ozone cell.
- The LCD screen will allow by touch to switch the generator on and off and to adjust desire power by moving slider on the screen with your finger.

For more information about this product visit our website at, <http://www.absoluteozone.com>

- In a case when incorrect operating parameters are applied to an ozone generator the unit is switched off by the control system and LCD screen will indicate which of parameters caused the generator shutdown.
- In a safety shutdown mode the generator will be constantly monitoring operating parameters and the moment they are corrected the generator will restart automatically, without any assistance.
- I.e. if there is a power spike or if there is a pressure drop caused by temporary power failure and interruption of oxygen supply, the moment the pressure is normal again or voltage supplied is within the operating range, the generator will restart and will produce ozone again.

3B. System Startup

1. Make sure the Ozone Generator enclosure is securely attached to an appropriate frame or wall Ozone Generators Stack.
2. Make sure all connections to the generator, power and gas are made according to local codes and regulations.
3. 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 (on flow meter) and pressure gage (supplied by the installer).
4. Plug the system into a specified receptacle.
5. Flip the Power Switch in to "ON" position.
6. Slide red dot on the power control slider upwards to adjust to desired power from 0-100% 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. Slide red dot on the power control slider downwards to adjust power from to 0%. (No ozone is produced at this time.)
2. Switch the power switch (located on the side panel) to OFF position.
3. Unplug the system from the power source if required.
4. Close down the downstream Control Valve (located on the flow meter -supplied by installer) to protect unit from accidental flooding.
5. Turn the oxygen source off.



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3D. Standard Operating Procedures

NOTE: To assure a long trouble-free service life of the ATLAS/TITAN/MAGNUM 30-200 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 ALD 2000 Flood Prevention device (can be supplied) 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, dirt, humidity, vibration, and/or 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.



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Maintenance and Service

4A. Preventative Maintenance

Generally the ATLAS/TITAN/MAGNUM 30-200 are maintenance-free although it is useful to check the Ozone Generator for proper operation:

- a. Verify on the LCD display panel that parameters indicated are consistent with your

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.



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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.

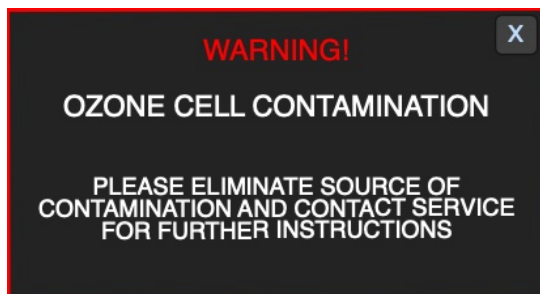
Symptom (Warning Message): INCORRECT REMOTE CONTROL VOLTAGE

PLEASE MAKE SURE THE VOLTAGE YOU HAVE SUPPLIED TO THE REMOTE CONTROL (4-20MA SIGNAL) IS NOT HIGHER THAN 10V.



Symptom (Warning Message): OZONE CELL CONTAMINATION

THE OZONE SENSOR DETECTED OZONE CELL CONTAMINATION BY WATER OR POSSIBLY SOME OTHER CONDUCTIVE LIQUIDS. PLEASE SWITCH THE OZONE GENERATOR OFF, LOCATE AND ELIMINATE THE SOURCE OF THE CONTAMINATION. WHILE HAVING POWER OFF. RUN OXYGEN THROUGH THE OZONE CELL FOR SEVERAL DAYS TO DRY THE LIQUID AND/OR OTHER CONTAMINANTS OUT AND THEN TRY TO RESTART THE OZONE GENERATOR. IF THE PROBLEM PERSISTS PLEASE CONTACT ABSOLUTE OZONE TECHNICAL SUPPORT.





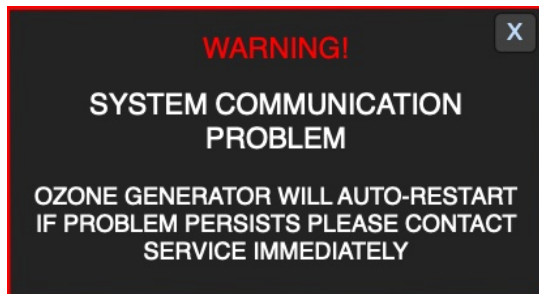
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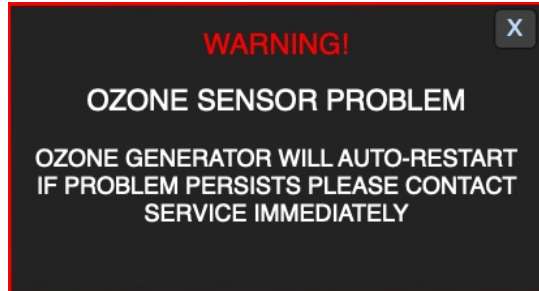
Symptom (Warning Message): SYSTEM COMMUNICATION PROBLEM

IF AFTER SEVERAL ATTEMPTS DOES NOT RESTART, PLEASE CONTACT US TECHNICAL SUPPORT



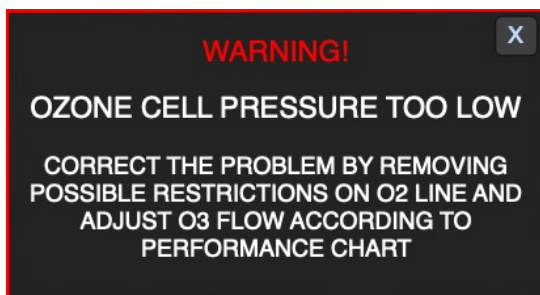
Symptom (Warning Message): OZONE SENSOR PROBLEM

AFTER SEVERAL ATTEMPTS DOES NOT RESTART, PLEASE CONTACT US TECHNICAL SUPPORT



Symptom (Warning Message): OZONE CELL PRESSURE TOO LOW

PLEASE MAKE SURE THERE ARE NO RESTRICTIONS ON THE OXYGEN LINE COMING TO THE OZONE GENERATOR AND THAT THE FLOW IS ONLY ADJUSTED ON THE OZONE LINE AFTER THE OZONE GENERATOR TO MAINTAIN CORRECT WORKING PRESSURE, IF THE PRESSURE IS TOO LOW DUE TO INCORRECTLY SET PRESSURE REGULATOR OR FAILURE OF OXYGEN GENERATORS, PLEASE RECTIFY THE PROBLEM AND THE OZONE GENERATOR WILL CONTINUE OPERATION.





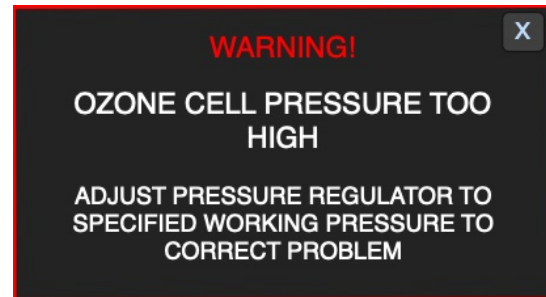
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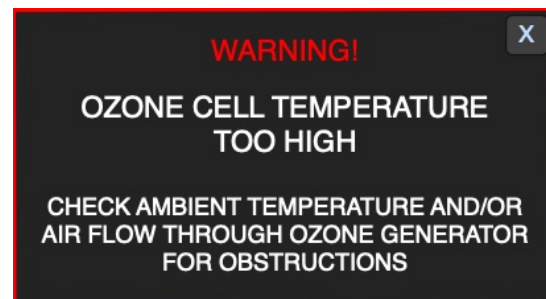
Symptom (Warning Message): OZONE CELL PRESSURE TOO HIGH

PLEASE ADJUST OXYGEN PRESSURE REGULATOR TO SPECIFIED PRESSURE AND THAT WILL RECTIFY THIS PROBLEM AND WARNING MESSAGE.



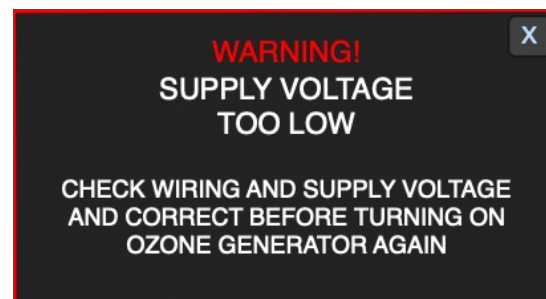
Symptom (Warning Message): OZONE CELL TEMPERATURE TOO HIGH

MAKE SURE THAT THE AMBIENT TEMPERATURE IN THE INSTALLATION ROOM IS BELOW 25 C, CHECK THAT THERE IS GOOD UNRESTRICTED COOLING AIRFLOW THROUGH THE OZONE GENERATOR (NOT OBSTRUCTED ON EITHER SIDE OF COOLING GRILLS). PLEASE MAKE SURE THAT THE COOLING FAN IS WORKING PROPERLY. IN CASE OF THE COOLING FAN FAILURE, PLEASE CONTACT TECHNICAL SUPPORT FOR FURTHER INSTRUCTIONS



Symptom (Warning Message): SUPPLY VOLTAGE TOO HIGH OR TOO LOW

PLEASE MAKE SURE THAT THE VOLTAGE SUPPLIED TO THE OZONE GENERATOR AS SPECIFIED +/- 5% IN ORDER TO CORRECT THE PROBLEM. IF VOLTAGE SUPPLIED IS AS SPECIFIED AND THE PROBLEM PERSISTS, PLEASE CONTACT OUR SERVICE DEPARTMENT





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Safety Procedures and Ozone Overview

5A. Ozone Use and Technology Overview

5A.i Relative Strength of Ozone

The following compares the strengths of several common oxidizing reagents (EOP vs. Cl₂)

- 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)

5A.ii 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.

5B. General Safety Information

5B.i Ozone Properties

- Colorless to blue gas (greater than -169°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

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Section 5

5B.ii Ozone Uses

- Chemical Oxidation
- Organic Oxidation

5C. Hazards

5C.i 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).



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5C.ii 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 (15min.)*
0.01 - 0.1	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 30 minutes

*Regulatory Levels

For more information about this product visit our website at, <http://www.absoluteozone.com>



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5C.iii 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 30-200 with safe access to electrical power. Connect the ATLAS/TITAN/MAGNUM 30-200 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.

5C.iv Fire Hazards

Ozone is nonflammable. Decomposition of ozone into oxygen gas (O₂) 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.

5C.v Chemical Action

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

5D. Precautions for Safe Handling and Use

5D.i 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), may be used for personal or area monitoring for exposure times ranging from 5 minutes to 10 hours.

5D.ii 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.



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5D.iii 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.

5D.iv Respiratory Protection

A disposable respirator (3M #N95 8214/8514 - Minneapolis, MN, 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.

5D.v 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.



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5E. System Operation and Maintenance

5E.i 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 personnel.

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.

5E.ii 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.

5F. Monitoring

5F.i Location of Monitors

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



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5F.ii Monitoring Equipment

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

5G. First Aid Procedures

5G.i 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.

5G.ii 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).

5G.iii 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.



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5G.iv 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.

5G.v Emergency Information Form

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

EMERGENCY INFORMATION	
FILL IN ALL INFORMATION NOW. IF YOU DO NOT KNOW, FIND OUT BEFORE AN EMERGENCY OCCURS.	
Person responsible for control/evacuation:	
Phone #:	
Alternate:	
Phone#:	
Emergency response team:	
Phone #:	
Fire Department:	
Phone#:	
Doctor/First Aid:	
Phone #:	
Hospital:	
Phone#:	
Ozone Manufacturer:	
Phone #:	
Ozone Leak Location:	
Locations to notify in emergency situations:	
Name:	Phone:

For more information about this product visit our website at, <http://www.absoluteozone.com>



ABSOLUTE OZONE®

OPERATOR'S MANUAL

Warranty

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.

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.



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Warranty

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.

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.

TO OBTAIN WARRANTY SERVICE:

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.

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

Customer Service: 780-486-3761
Web: www.absoluteozone.com
Email: info@absoluteozone.com

For more information about this product visit our website at, <http://www.absoluteozone.com>



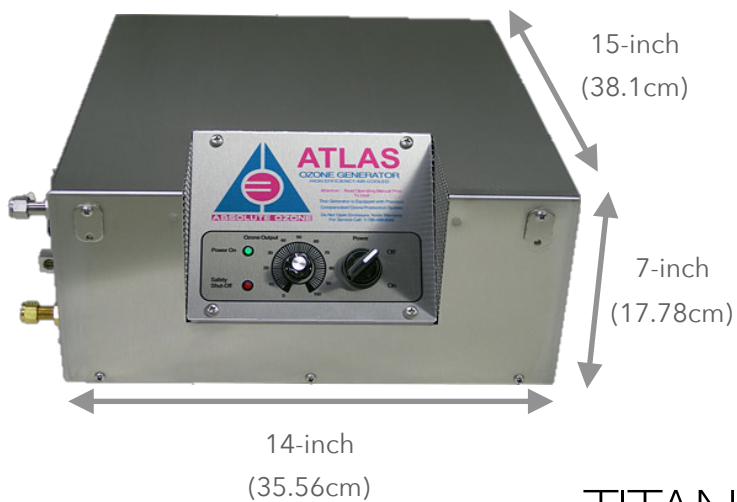
ABSOLUTE OZONE®

OPERATOR'S MANUAL

Dimensions

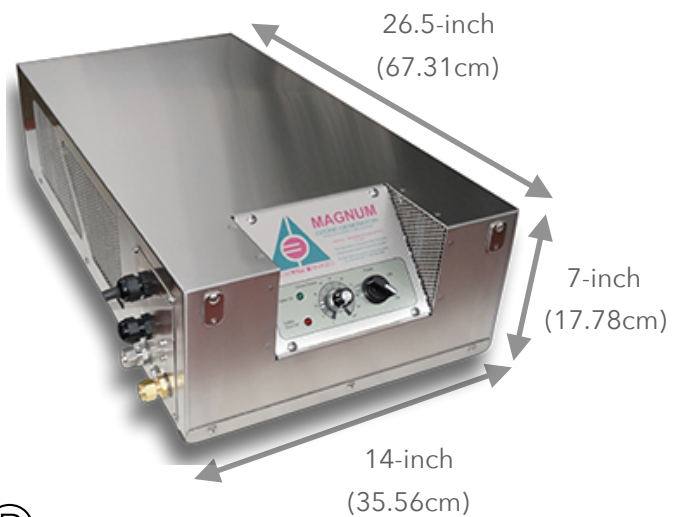
ATLAS®

Weight:
26lbs. - 32lbs.
(11.79 kg) - (14.52kg)



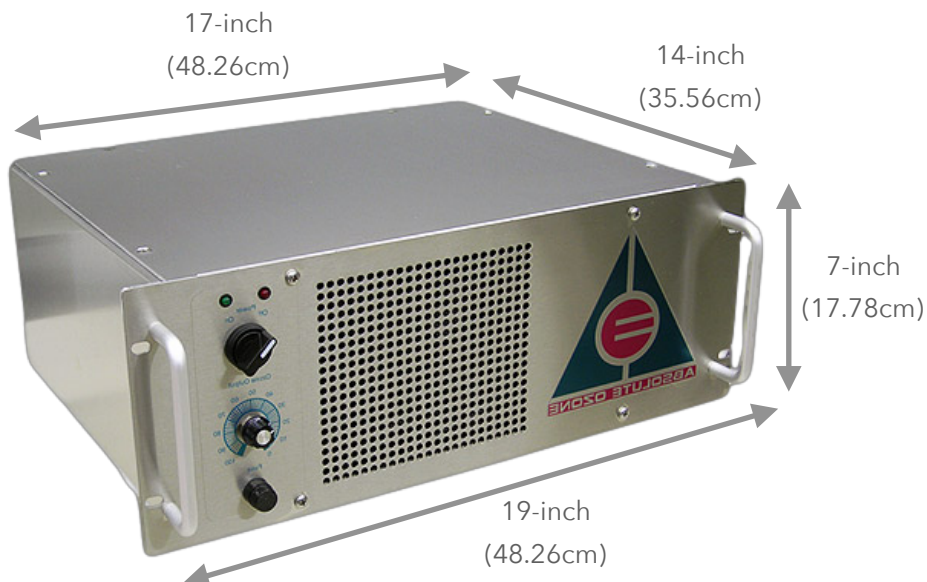
MAGNUM®

Weight:
53lbs.
(24.04kg)



TITAN®

Weight:
26lbs. - 32lbs.
(11.79 kg) - (14.52kg)



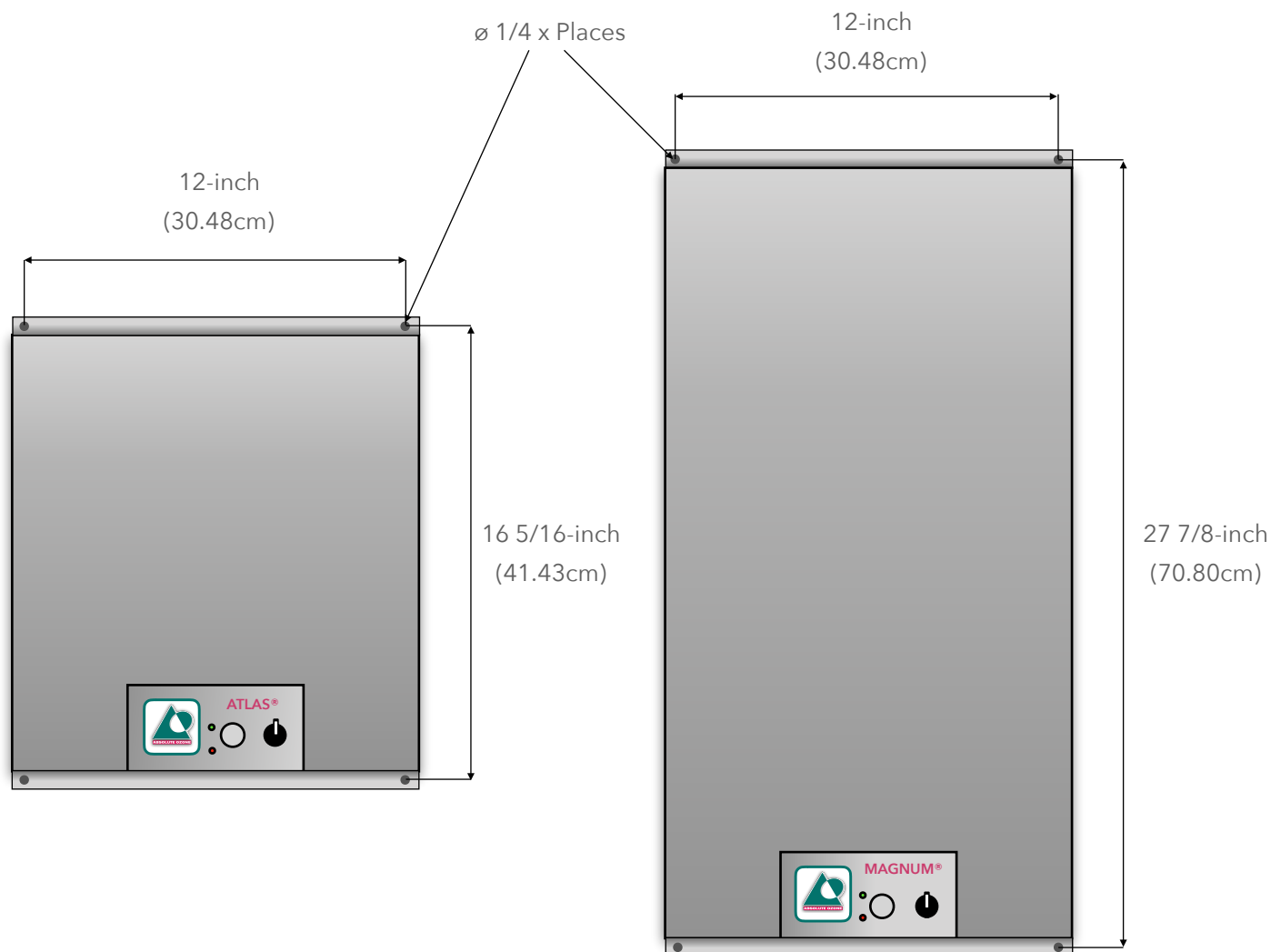
For more information about this product visit our website at, <http://www.absoluteozone.com>



ABSOLUTE OZONE®

OPERATOR'S MANUAL

Dimensions

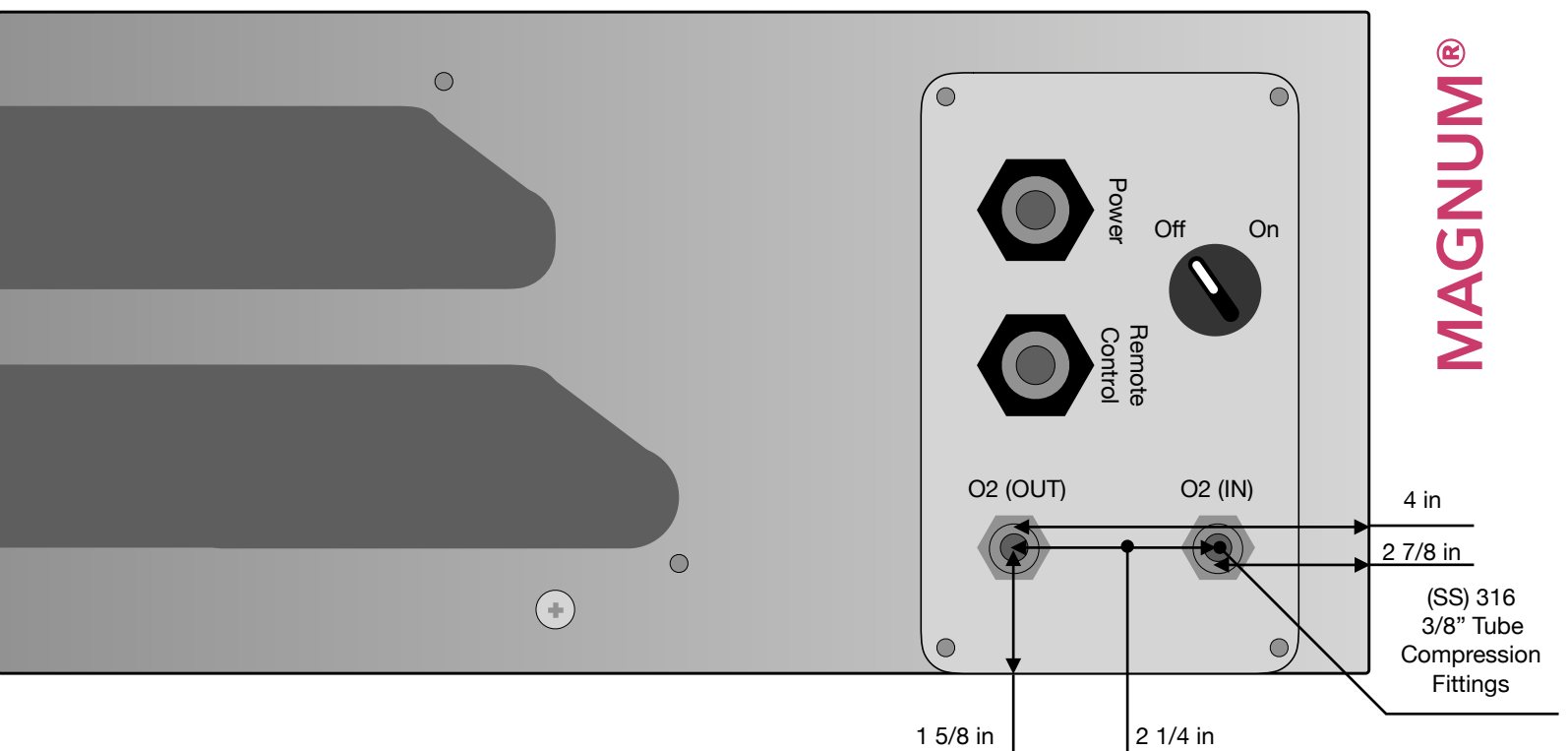
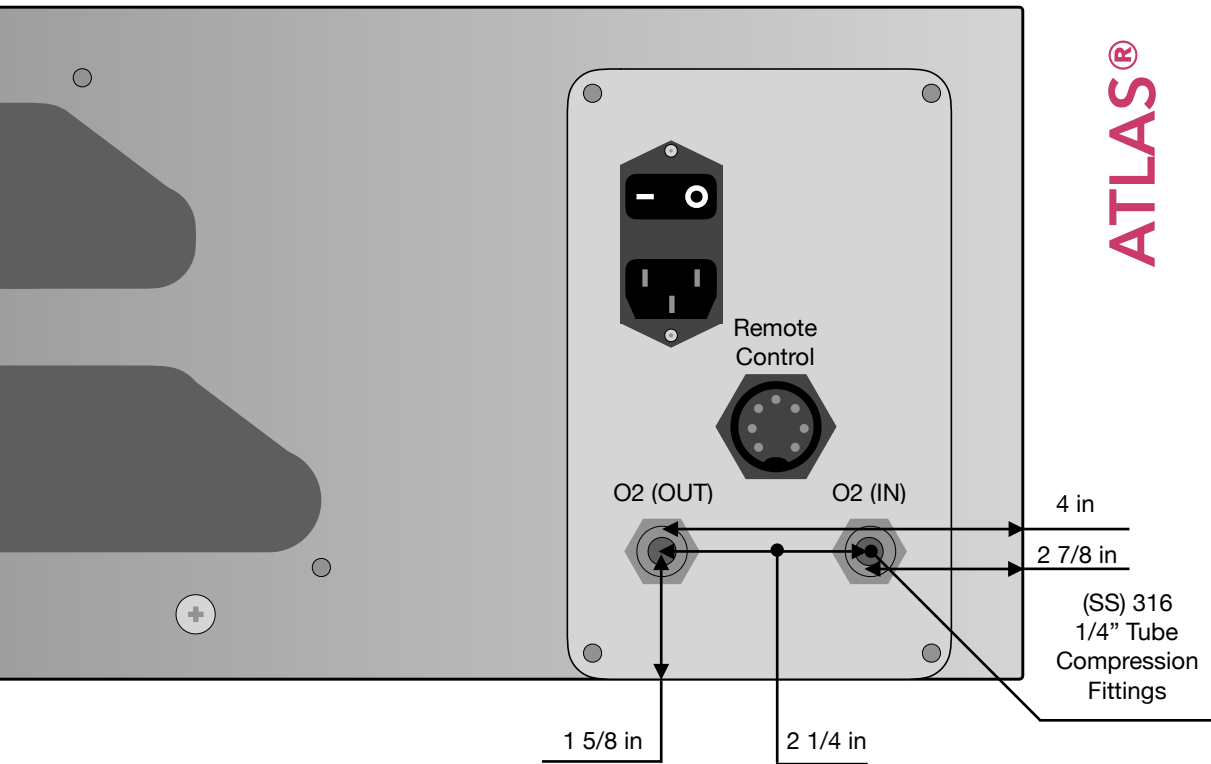


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ABSOLUTE OZONE®

Dimensions

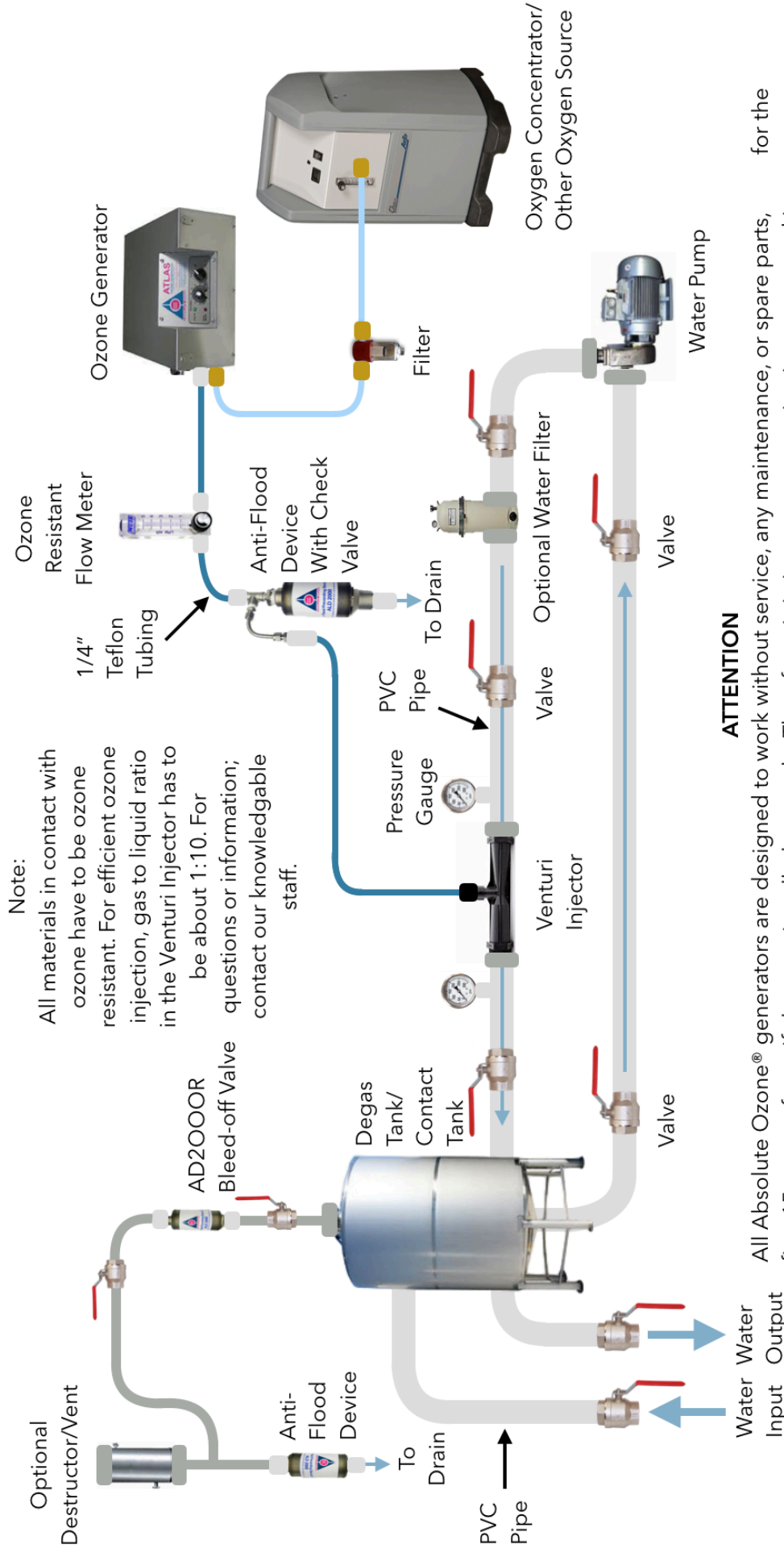




ABSOLUTE OZONE®

Conceptual Ozone Injection System

OPERATOR'S MANUAL



ATTENTION

All Absolute Ozone® generators are designed to work without service, any maintenance, or spare parts, for the first 15 years of use if they are installed correctly. Therefore, it is important to maintain correct working pressure across the ozone generator, good feed gas quality, and protect the generator from flooding or external contamination. For good ozone generator performance, it is important to place generator in a well ventilated, dust free environment, and maintain ambient temperature at 20-22°C.

For more information about this product visit our website at, <http://www.absoluteozone.com>



ABSOLUTE OZONE®

AquaCulture Ozone Injection Diagram

