



## OPERATIONS MANUAL

# *RGF* *TURBOZONE*®

MODELS 1000 and 7000

New Advanced Environmental Air Sterilization System



***RGF Environmental Group, Inc.***

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[www.rgf.com](http://www.rgf.com)

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## RGF TURBOZONE® OPERATIONAL INSTRUCTIONS

TO OPERATE YOUR *RGF Turbozone®* SAFELY AND EFFICIENTLY, WE ASK THAT YOU PLEASE TAKE TIME TO READ THE ATTACHED OPERATIONS MANUAL PRIOR TO USING THE EQUIPMENT. ALL INSTRUCTIONS AND PRECAUTIONS SHOULD BE ADHERED TO WHILE OPERATING THIS SYSTEM.

### Introduction:

Thank you and congratulations on your purchase of the *RGF Turbozone®* System. We are confident this system will provide you with years of fresh, clean and odor-free air!!!

### Unpacking/Inspection of Equipment

Please be sure to inspect the equipment upon receipt for any possible shipping damage. If equipment is found to be damaged, call RGF immediately at 800-842-7771 or 561-848-1826.

### System Familiarization:



**Model 1000**  
13.5 ppm - 1650 mg/hr  
45 cfm      110 VAC



**Model 7000**  
45.0 ppm - 10880 mg/hr  
65 cfm      110 VAC

**NOTE: DO NOT USE UNIT IF POWER CORD IS DAMAGED.  
PLUG MUST BE ACCESSIBLE AT ALL TIMES.**

The Turbozone 1000 utilizes a 4 amp and the Turbozone 7000 a 5 amp slow blow fuse

(All units are available in 220 VAC, 50/60 HZ - Price will vary from 110 VAC)

### Treatment Philosophy:

These units are intended to be used to treat **UNOCCUPIED AREAS ONLY** with high doses of ozone for sufficient sterilization and odor removal.

#### **A) Room or Area Treatment:**

Unit should be centrally located for adequate treatment. Room air volume should be turned over at least three times.

#### **FORMULA FOR CALCULATING AIR TREATMENT TIMES**

Calculate Area to Be Treated -

Square Ft. x Height of Room = Cubic Ft

Cubic Ft. ÷ CFM = Minutes

Minutes ÷ 60 x 3 = Hours needed to turn air in room over 3 times.

Example for Model 1000

10' L x 12' W x 8' H room = 960 cubic feet

960 cu. ft. ÷ 45 cfm = 21 minutes

21 x 3 ÷ 60 = 1 hour needed to turn air in room over 3 times.

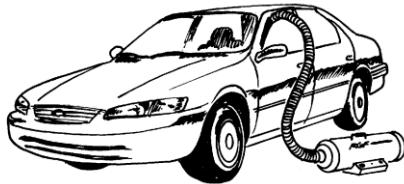
The amount of time necessary to sterilize an area with ozone depends upon the temperature, humidity level, and the amount of reactive substances (odors).

### B) Air Ventilation System Treatment:

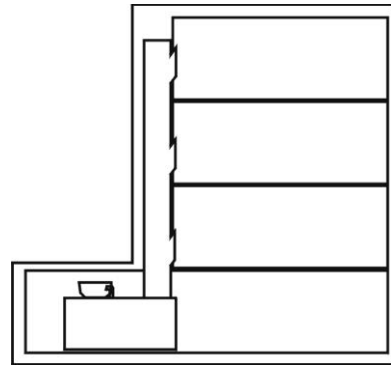
Unit should be placed by intake on ventilation system

TYPICAL INDUSTRIAL ODOR CONTROL DOSAGES				
INDUSTRY	ODOR	APPLICATION	DOSE	RETENTION TIME
* Smoke Fire Damage	Smoke	Direct Contact	0.5 ppm to 1.5 ppm	N/A
* Sewer Lift Station	Hydrogen Sulfide	Exhaust Gas Contact	1.0 ppm to 2.0 ppm	N/A
* Food Processing	Fermentation Odors	Building Exhaust	1.0 ppm to 2.0 ppm	60 seconds
* Cooking (Residential & Commercial)	Cooking Odors (food)	Kitchen Exhaust, Pan System	1.0 ppm to 2 ppm	N/A
* Rubber Plant	Processing Odors	Exit of a Cyclone Collector	2.0 ppm to 4.0 ppm	N/A
* Fishery	Wet Scrubber Exhaust	40 ft. from top of Discharge Stack	5.0 ppm to 10.0 ppm	N/A
* Pulp Mill	Hydrogen Sulfide/Sulfur Dioxide	Recovery Furnace Exhaust	60.0 ppm to 80.0 ppm	N/A
* Compost/Waste Management	Ammonia and Sulfur Compounds	Exhaust Gas Contact Chamber	2.0 ppm to 5.0 ppm,	45 second hold up time
* Marine	Bilge, Diesel Fumes	Direct Bilge	0.5 ppm to 1.5 ppm	N/A
* Rendering	Organic and Chemical	Engine Room Contact	94.0 ppm	5 seconds
* Organic	Ammonia and Sulfur	Building Exhaust	5.0 ppm	30 seconds

### C) Other Application Diagrams



Cars



Garbage Shoots

#### Operating Procedure:

#### **NOTE: ALWAYS WEAR PROPER SAFETY EQUIPMENT**

1. In the area to be treated, determine a suitable, centrally located, dry location to place the unit and plug in.
2. Turn off smoke/fire alarm systems in building or residence if system is known to be sensitive to ozone gas.
3. Clean or vacuum the air intake screens on ventilation systems in areas with high concentrations of smoke or airborne dust when treating air conditioning duct system.
4. Turn the air conditioning fan to "On" (if applicable) for continuous cool airflow throughout building, unit or house.
5. Make sure the area being treated is sealed shut to re-circulate the ozone and eliminate the ozone from escaping.
6. **Vacate the area** of all persons, animals, and rubber products or rubber plants (see "Precautions").
7. Place "**DO NOT ENTER**" caution signs on all entrances/exits to treated area.
8. Place respiratory breathing mask on.
9. Turn "On" the unit by setting the clock timer for the predetermined time treatment period.
10. Exit area immediately.



**Post Treatment Procedures:**

1. When time period is expired, you should re-enter only with breathing mask in place to vent out the area. If feasible, open windows and doors to vent area (See page "All About Ozone" #18).
2. Re-test the area after the pre-calculated venting time period to check whether the ozone level is safe to breathe without breathing apparatus.

**Electrical Considerations**

The *RGF TURBOZONE*® units are designed to use a normal household current of 110 or 220 volts. In accordance with the specifications of the National Electrical Code and for safety measures, a three-prong grounding plug is standard to the equipment. This three-prong plug mates with a standard three-prong ground wall receptacle. Do not under any circumstance cut, remove, or replace the third prong from the electrical cord. If in the event a three-prong receptacle cannot be located in the area to be treated, a temporary connection may be made (where local codes permit) utilizing P&S #1919 Adapter or equivalent. The adapter provides a means for plugging in the three-prong cord into a two-prong receptacle. When used around dampness or water, use a GFI outlet.

**SAFETY OPTIONS AVAILABLE**

The following is a list of additional safety equipment and monitoring devices available for purchase to use with your *RGF TURBOZONE*®. Please call for updated pricing. To purchase this equipment, you may call or fax your order to:

<b>PART NO.</b>	<b>MONITORING AND SAFETY EQUIPMENT</b>
SE-100T	BELLOWS PUMP KIT
SE-200T	BELLOWS PUMP KIT OZONE DETECTION TUBES - 0.5 - 7.0 ppm (Pk. 10)
SE-300T	BELLOWS PUMP KIT OZONE DETECTION TUBES - 10.0 - 300.0 ppm (Pk. 10)
SE-600T	ELECTRONIC OZONE DETECTOR A-20ZX
SE-601T	SPARE SENSOR FOR SE-600T
SE-700T	COMPLETE FACE MASK ASSEMBLY
SE-400T	REPLACEMENT FILTER ELEMENTS FOR SE-700T (Pk. 2)
PT-009T	PETRI DISH TEST KIT (Pk. 12)
LT-700T	OZONE CAUTION SIGNS (12)
*For export shipments, a 5% surcharge will be added to above prices to cover cost of packaging, handling and processing.	

<b>PART NO.</b>	<b>REPLACEMENT CELLS</b>
PHIC-14HOA	Models 1000 Replacement PHI Cell
PHIC-36HOA	Models 7000 Replacement PHI Cell



## RGF TURBOZONE® TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	SOLUTION
1. Machine Not Operating	a. Plug not in receptacle b. "House" power fuse or circuit breaker tripped	a. Re-insert plug b. Replace "house" power fuse or reset "house" circuit breaker
2. "Blown" Fuse		Replace fuse. If new fuse fails, contact factory.
3. Low Or No Ozone Output	a. Loose cord connection b. No air movement (fan motor not running) c. Air blowing but no ozone d. Broken UV bulb e. Blocked air passage f. Broken on/off switch	a. Ensure plug is fully inserted. b. Contact factory c. Contact factory d. Contact factory e. Remove any obstruction. f. Contact factory

## RGF TURBOZONE® PRECAUTIONS

**OZONE IS CONSIDERED A TOXIC AND HAZARDOUS SUBSTANCE BY THE FEDERAL GOVERNMENT, SPECIFICALLY OSHA (OCCUPATIONAL SAFETY AND HEALTH ACT) (29 USC 655, 657). IT IS A POWERFUL OXIDIZER, WHICH DESTROYS ORGANIC SUBSTANCES. ALL SAFETY PRECAUTIONS HEREIN MUST BE ADHERED TO AND COMMON SENSE MUST BE USED. DO NOT ATTEMPT TO OPERATE THE RGF TURBOZONE® SYSTEM WITHOUT FIRST READING AND UNDERSTANDING ALL INFORMATION AS PROVIDED BY THE MANUFACTURER HEREIN.**

1. Due to the variety of operational conditions and applications for these systems, the user through his/her own analysis and testing is solely responsible for making the final selection of the type of system and assuming that all performance, safety, and precautions requirements of the applications are met.
2. **Vacate the area of persons, animals, and rubber plants before starting the system.** The amount of ozone that is produced by RGF TURBOZONE® is much higher than the maximum permissible OSHA standard for ozone concentration in an inhabited, enclosed area (.1 ppm). Therefore, no person or animal should remain in or enter the treated area until the area is vented properly for the recommended time period, and the level of ozone has depleted down to the acceptable level (.1 ppm). **\*Do not breathe or inhale the ozone gas.**
3. A **Caution Do Not Enter** sign should be placed on all entrances/exits to the treated area at all times during and after the treatment until such time as the ozone level is .1 ppm, safe for re-entry.
4. **Do not breathe the ozone.** The applicator should wear appropriate respiratory (breathing) mask when entering a treated area afterwards. If it is absolutely necessary to re-enter the treated area, you should wear the respiratory breathing mask and turn off the system.
5. **Vent area before re-entering.** The area may smell of ozone when you re-enter (ozone smells like that of air immediately after a thunderstorm), if the ozone level measures more than the .1 ppm concentration, the area should be vented longer until the level is reduced.
6. **Do not disassemble** the RGF TURBOZONE® unit to service or look directly inside at the ultraviolet light while it is operating.
7. Do not use in an overheated (over 120° F.) or explosive atmosphere.

Manufacturer shall not be held liable for consequences of any actions by the purchaser and/or applicator while using or applying RGF TURBOZONE®.

**Some physical symptoms of prolonged or excessive ozone exposure may result in: burning, watery or irritated eyes, nose, and throat, nausea, headache, difficulty breathing, dry cough, irritation to nasal passages, throat, bronchial and pulmonary membranes. Should this occur see a Physician immediately. Persons suffering from chronic breathing problems are known to be sensitive to ozone.**

**RGF TURBOZONE®  
LIMITED WARRANTY**

This warranty supersedes and replaces any warranty statements orally made by the Sales Person, Distributor or Dealer or contained in the written instructions or other brochures or informational documents in relation to this product.

Manufacturer warrants the *RGF TURBOZONE®* equipment to be free from defects in material and workmanship under the normal use and service when operated and maintained in strict accordance with manufacturer's instructions for a period of two (2) years from the date of receipt of equipment. **(For international orders twelve (12) months parts only. Shipping not included.)** This warranty is void if sealed *RGF TURBOZONE®* is tampered with or opened.

Manufacturer's obligation under this warranty is being limited to repairing or replacing any part found to its satisfaction to be so defective. This warranty does not cover parts damaged by decomposition from chemical action or wear caused by abrasive materials, nor does it cover damage resulting from misuse, abuse, or any other than its intended use, accident, neglect, or from improper operation, maintenance, installation, modification, or adjustments.

This warranty does not cover parts or equipment used with the *RGF TURBOZONE®* that are not made by Manufacturer, since these items are covered by warranties of the respective manufacturer. Manufacturer will process the claim and install the part.

If your equipment is malfunctioning within the warranty period, notify RGF either by telefax at (561) 848-9454 or call RGF directly at (800) 842-7771, or in Florida or Internationally (561) 848-1826, and request the Warranty Department. (It may be a simple solution - See Trouble Shooting Chart.)

The Warranty Department will determine if the unit should be returned for repairs and issue a return authorization number. If the unit is to be returned, it should be shipped freight prepaid to RGF. RGF will repair or replace the defective unit with a working replacement.

**RETURNED EQUIPMENT WITHOUT AN AUTHORIZATION NUMBER CANNOT BE ACCEPTED BY THE RECEIVING DEPARTMENT.**

**Manufacturer assumes no liability for any harm, which may occur as a result of the use of the equipment herein and shall not be liable for consequential or any other damages whether or not caused by manufacturer's negligence or resulting from any express or implied warranty or breach thereof. Consequential damages for the purpose of this warranty shall include, but not be limited to, loss of use, income or profit, or loss of or damages to property, or injury or death to persons or animals occasioned by or arising out of operation, use, the operation, installation, repair or replacement of the equipment or otherwise.**

While this warranty gives you specific legal rights, you may also have other rights, which vary from state to state (or province).

*RGF TURBOZONE®* is a Registered Trademark with the U.S. Department of Commerce, Patent and Trademark

**THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF**

To obtain warranty service and return authorization number, contact the factory at (561) 848-1826 / 800-842-7771, fax (561) 858-9454, or ship the part, postage prepaid, to:

RGF Environmental Group, Inc.  
Customer Service Department  
1101 West 13<sup>th</sup> Street Riviera Beach, Florida 33404 USA

Include a copy of your Bill of Sale, Invoice or Receipt of Purchase, with an explanation of the problem or defect.
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Hg- LAMP CONTAINS MERCURY Manage in accord with disposal laws See: <a href="http://www.lamprecycle.org">www.lamprecycle.org</a>
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# ALL ABOUT OZONE

## FREQUENTLY ASKED QUESTIONS WITH PRACTICAL ANSWERS

- 1. QUESTION:**  
What is ozone?

**ANSWER:**  
Ozone is a form of oxygen. It is a strong cleaning, purification, and oxidizing agent. It reacts with organics to oxidize unpleasant odors and kill germs. Ozone is O<sup>3</sup> or enriched oxygen containing 3 atoms instead of 2. Ozone weighs 50% more than oxygen.
- 2. QUESTION:**  
Why does ozone kill odors?

**ANSWER:**  
The third oxygen atom is loosely attached and easily separates from the ozone molecule to combine with other substances. Thereby oxidizing the odor causing substances.
- 3. QUESTION:**  
Just what do you mean by oxidation? Give an example.

**ANSWER:**  
Inside the body, food molecules combine with O<sub>2</sub> to form CO<sub>2</sub> and H<sub>2</sub>O and energy or heat. Oxidation means a substance undergoes a chemical change resulting in a different substance. Rust and fire are examples of oxidation.
- 4. QUESTION:**  
Is ozone dangerous?

**ANSWER:**  
Ozone is a powerful oxidizer, which aggressively attacks organics. Our bodies are organic and ozone cannot differentiate between good organics and bad organics. Although there are no documented deaths due to ozone, it should be used with caution and common sense. Chlorine and fire are also oxidizers, but we have learned to work safely and control them. Ozone is no different.
- 5. QUESTION:**  
What are the EPA or OSHA regulations of ozone?

**ANSWER:**  
Regulatory agency limits ozone and exposure ranges in ppm.  
.005 - .01 Heavy forest country air  
.03 - .12 Inner cities  
.30 - 15 minutes - OSHA limit for internal air  
.10 for 8 hours - OSHA limit for internal air  
.05 - FDA limit for medical devices  
.003 - .015 Odor detecting range for humans  
.12 - EPA limit for city air  
1.0 - Human tolerance level
- 6. QUESTION:**  
Is ozone like radiation?

**ANSWER:**  
No, ozone emits no penetrating rays.
- 7. QUESTION:**  
What happens to ozone after it serves its purpose?

**ANSWER:**  
Ozone's additional oxygen atom when combined with other substances undergoes a chemical change and reverts back to ordinary oxygen.
- 8. QUESTION:**  
Is it ok to breathe ozone?

**ANSWER:**  
We all breathe some ozone that is produced naturally. However, we should limit our exposure to less than a continuous count of .04 ppm.
- 9. QUESTION:**  
How is ozone formed by nature?

**ANSWER:**  
Trees emit hydrocarbons, which are byproducts of photosynthesis together with sunlight they produce ozone. Also, the electric discharge of lightening will produce ozone. This is why the air always smells so fresh after a thunderstorm.
- 10. QUESTION:**  
I have heard of ozone being used in the home, office, and even hospitals while people are in the rooms!

**ANSWER:**  
Ozonating a room occupied with people is acceptable in low levels below .05 ppm.

**11. QUESTION:**

What are the first symptoms of excessive ozone exposure?

**ANSWER:**

Some physical symptoms of excessive ozone exposure may be burning, watery eyes, difficulty breathing, particularly during heavy exertion, and ozone may cause irritation to nasal passages.

**12. QUESTION:**

Will ozone damage my furniture or fabrics in my home, boat or car?

**ANSWER:**

In hundreds of applications, we have not had a problem, except items containing rubber. We maintain a test chamber in our laboratory where we continuously test household items.

**13. QUESTION:**

Can I leave my pets in my home (i.e., cats, dogs, birds) when using Turbozone®?

**ANSWER:**

No. Since average household pets are substantially smaller than people, naturally their tolerance level for ozone toxicity will be much lower.

**14. QUESTION:**

At what levels can a human smell ozone?

**ANSWER:**

Humans can begin to smell ozone at various levels depending upon their sensitivity, generally .003 to 0.15 ppm. Ozone becomes intolerable at 1.0 ppm, way before anything close to a toxic level could be reached.

**15. QUESTION:**

What substances does ozone kill?

**ANSWER:**

Ozone is known to eliminate the following substances: Airborne bacteria or yeast, smoke, smoke odors, spores, viruses, fungus, pollen, hydrocarbons, volatile organic compounds, ozone depleting substances, oxidizes heavy metals, garbage odors, fish odors, bathroom odors, pet smells (urine & feces), airborne mold and mildew, auto and truck pollutants (exhaust fumes), toxins, and airborne ketones from insulation, carpets and furniture.

**16. QUESTION:**

What ppm level should I reach to deodorize an area?

**ANSWER:**

1 ppm is what we find adequate, the amount of time depends on the amount of odor. More odors may require a longer treatment time.

**17. QUESTION:**

What is the optimum operating temperature for an area to be treated?

**ANSWER:**

70°F/ 21°C to 80°F/26.6°C.

**18. QUESTION:**

Should I leave on a fan or air conditioning?

**ANSWER:**

Yes. Utilizing the air conditioner, ceiling fans, floor fans, blowers, etc., to ensure that the ozone is dispersed throughout the room greatly improves the Turbozone's® effectiveness. This air movement helps to ensure the ozone will come into contact with the odor. This same additional air movement in the room after the Turbozone® turns off will help the ozone to decompose more rapidly making the room occupiable sooner. In many cases, ventilating a room is not an option.



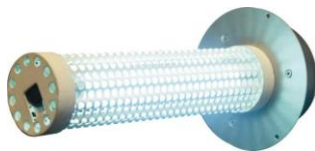
## Other RGF PHI Products



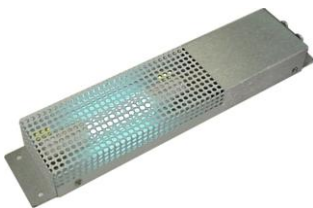
**The Guardian Air Plug In** Natural Air Purification System provides bacteria, mold, odor and VOCs (chemical odors) reduction. The advantage of the Guardian Air Plug In is its ability to be used in any room and be completely inconspicuous. The Guardian Air Plug In plugs directly into a wall outlet and can be used with or without its internal fan. Because it has its own outlets as part of the unit, you do not lose the wall outlet. The Guardian Air Plug In is an air treatment system not a filter.



**The RGF - IMSB** is designed for use on ice machine small compactors and holding tanks. The unit utilizes the PHI Cell to create hydroperoxides, super oxide ions, ozonide ions and hydroxides. This method is far safer and more effective than the traditional ozone generators. Targeted UV ozone generators do not produce nitric oxide gas or nitric acid and they have a very high efficiency rating. The additional oxidizers provide a broader range of applications and redundant oxidation gases.



**The Guardian Air** by RGF® is designed to eliminate sick building syndrome risks by reducing odors, air pollutants, VOCs (chemical odors), smoke, mold, bacteria and viruses\*. The HVAC-PHI Cells are easily mounted into air conditioning and heating systems air ducts where most sick building problems start. When the HVAC system is in operation the HVAC-PHI Cell creates an Advanced Oxidation Process consisting of: Hydro-peroxides, ozonide ions, super oxide ions and hydroxide ions. All are friendly oxidizers. By friendly oxidizers we mean oxidizers that revert back to oxygen and hydrogen after the oxidation of the pollutant.



**The Mini PHI Cell** by RGF® features the same technology as the Guardian Air but is designed to fit into smaller HVAC systems such as PTAKS – Fan coils and unit ventilators.

**WARRANTY REQUEST FORM  
(INCOMPLETE FORMS WILL NOT BE PROCESSED!)**

RETURN AUTHORIZATION NO. \_\_\_\_\_

**CUSTOMER:**

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIPCODE \_\_\_\_\_

CONTACT \_\_\_\_\_ PHONE \_\_\_\_\_ FAX \_\_\_\_\_

**DISTRIBUTOR:**

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIPCODE \_\_\_\_\_

CONTACT \_\_\_\_\_ PHONE \_\_\_\_\_ FAX \_\_\_\_\_

**UNIT:**

MODEL # \_\_\_\_\_

SERIAL # \_\_\_\_\_

INVOICE # \_\_\_\_\_

DATE OF PURCHASE \_\_\_\_\_

SERIAL # FOR EXCHANGE UNIT: \_\_\_\_\_

**ITEM(S) SUBMITTED FOR WARRANTY:**

1) \_\_\_\_\_

2) \_\_\_\_\_

**REASON(S) FOR RETURN:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**(FOR MANUFACTURER USE ONLY)**

DATE ITEM(S) RECEIVED: \_\_\_\_\_

RECEIVED BY: \_\_\_\_\_

REPLACEMENT UNIT OR PART SENT

COMMENTS: \_\_\_\_\_

**NOTE: THIS COMPLETED FORM MUST ACCOMPANY ALL RETURNED ITEMS.**

SHIP TO:

RGF Environmental Group, Inc.  
ATTN: CUSTOMER SERVICE DEPARTMENT  
1101 West 13<sup>th</sup> Street Riviera Beach, Florida 33404 USA  
Tel: (561) 848-1826 • (800) 842-7771 • Fax: (561) 848-1160