

INSTALLATION, OPERATING & MAINTENANCE

INSTRUCTIONS FOR MODEL

AM5400

*Model Specifications:  
AM5400 - 4gm/hr output*

***For settings see appendix A***

## INTRODUCTION

This Ozone Generator is designed to allow flexibility in the control and output of Ozone to suit the application. There are many applications for which the Ozone may be used e.g. the destruction of malodours in air, the destruction of bacteria and chemicals in water, air and on surfaces. This manual does not specify applications in which these units may be used, nor does Aircare Systems Ltd. or Ozone Industries Ltd. take any responsibility for any associated equipment used with these units and not supplied by Aircare Systems Ltd. or Ozone Industries Ltd. This manual covers the 'open cell' range of generators capable of producing up to 4 grams per hour (g/hr) of Ozone.

**NOTE: The ozone generator contains brittle Glass electrodes and must not be knocked, dropped or subjected to vibration.**

### 1.0 HEALTH AND SAFETY

Ozone is an irritant and a powerful oxidising agent. Like most products Ozone is only dangerous if used irresponsibly, therefore it is important to follow the guidelines detailed in this manual. Due to the high levels of Ozone produced by the unit it is strongly recommended that no person or animal be in the room when the unit is running.

The UK Health and Safety Executive (HSE) issue two documents controlling the use of Ozone.

EH38 'Ozone: health hazards and precautionary measures'

EH40 'Occupational Exposure Limits'

In addition a material Safety Data Sheet, required for COSHH compliance, has been included (Appendix 1)

As Ozone cannot be stored, transportation legislation (CHIP) does not apply.

### 3.0 UNIT DESCRIPTION

The AM5400 series of generator is designed to convert Oxygen found in the normal air into Ozone. It does this using the Corona Discharge (CD) principle, where air is blown over a glass tube with an electrode, known as an open cell. Each cell has its own power supply, which delivers high voltage, high frequency electricity to the cell. Each cell is capable of producing up to 4g/hr of Ozone.

See section 9.0 for more detailed specifications of the units.

### 4.0 INSTALLATION

These Ozone generators are primarily designed as a portable unit which is supplied with a 13A plug, fitted with a 5 Amp fuse and only requires a 13 Amp 230V 50Hz switched power supply. All electrical connections should comply with current **IEE wiring regulations (BS 7671: 1992 or equivalent)**.

There are a few guidelines to positioning the unit in order to maximise its effectiveness:

- On a horizontal, vibration free surface.
- Centrally in the area to be treated and if possible at approximately table height.
- The airflow around the unit should not be restricted, a minimum clearance of 800mm around the unit is recommended.
- There should be no risk of the unit being splashed with water, or other liquids.
- The temperature should be between 0°C to +30°C.
- The relative humidity should not exceed 75% at 20°C, non-condensing.
- The environment should contain no combustible gases or aggressive/corrosive chemicals such as bleach, bromine or similar.

Additional fixings are available separately, to allow connection to a 4" ducting set-up and Heating, Ventilation and Air Conditioning (HVAC) ducting. Instructions on how to fit these are supplied with the parts.

## **5.0 OPERATION**

### **5.1 Output Setting.**

The output setting of the unit will depend upon the volume of the room to be treated and the level of Ozone required. The Ozone level achieved in a room will depend on the room size, temperature, humidity, the number of air changes, the length of time the Ozone generator is run and the output setting. Any ventilation installed may reduce the effectiveness of your ozone generator.

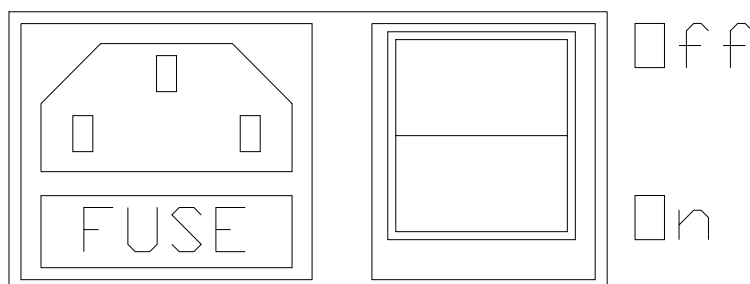
The output can be set as follows:

- a) 100% output, with the countdown timer.
- b) 100% output permanently (without countdown timer).
- c) 75% output, using mechanical segment timer with three segments set to switch ON per hour. (one segment equals 15 minutes).
- d) 50% output, using mechanical segment timer with two segments set to switch ON per hour.
- e) 25% output, using mechanical segment timer with two segments set to switch ON per hour.

These instructions describe how to operate the unit with the various options. The following information is common to all control options:

- Ensure doors and windows of the room to be treated are closed and place warning notices stating “CAUTION THIS ROOM IS BEING OZONISED DO NOT ENTER BETWEEN XX O’CLOCK AND XX O’CLOCK” at the entrances.
  - If you need to enter an Ozonised room with a high Ozone concentration, use a mask. A suitable Ozone mask is **3M Respirator type 9925**.
- NOTE: the time spent in the room must be kept to a minimum.**
- The Ozone will change back to Oxygen within 3 hours when the recommended settings are used. After this time it is safe to enter the room without a mask. This decay period must be allowed for when calculating the time it is safe to return to the room.
  - If the desired result is not achieved completely in the first instance, the process can be repeated as many times as is required until the desired results are achieved.

### 5.2.2 ON/OFF Control Panel.



- Connect the unit to the electrical supply and start treatment. The red mains switch on the control panel will illuminate to indicate that the unit is running.
- It is recommended that this panel is used in conjunction with an external power switch or plug in timer to turn the unit off remotely. If this is not possible use a protective mask to enter the room and switch off the unit.

### 5.2.3 Mechanical Segment Daily Timer (Mains socket plug in type).

The timer is for indoor use only.

Unplug the timer before setting times.

The operation of the timer set out below will turn the unit ‘on’ and ‘off’ up to 48 times per day. Each increment, that may be set, is for 15 minutes.

- a) Setting switch OFF times:  
With your finger, pen or small screwdriver, pull up segments corresponding to the required OFF period.  
Check that you cannot see 'red' against the rim of dial.  
Note: each segment represents 15 minutes; 4 segments equal 1 hour.
- b) Setting switch ON times:  
With your finger, pen or small screwdriver, push down all segments corresponding to the required ON period. Check that you can see 'red' against the rim of dial.
- c) Setting current time:  
Turn the dial clockwise (as per indicating arrows) until the current time of day is set against the arrowhead (24 hour clock). Check that segments have not been accidentally pushed when rotating the dial.
- d) Connecting the generator:  
Plug the generator into the socket of the timer and insert the timer into a socket outlet. Ensure the outlet socket is switched on.
- e) Timed switching:  
Ensure the red slide switch on the side of the timer is set to the centre (AUTO) position, with the clock face symbol.
- f) Manual override:  
To switch the plugged in generator permanently on, set the red slide switch on the side of the timer to the '1' ON position.  
To switch the plugged in generator permanently off, set the red slide switch on the side of the timer to the '0' ON position.

#### Usage –Important

The timer is rated at 13 Amps (resistive load) and 4 Amps (inductive load).

If you have any queries regarding the operation of the various control panels please contact your supplier.

## **6.0 MAINTENANCE AND SERVICING.**

The exterior of the unit requires an occasional wipe with a damp cloth to maintain its appearance, do not use abrasives.

Servicing of the unit must be carried out by a competent person who has read and understood the instructions.

The service frequency will vary depending upon the output setting and the environments in which the unit has been used.

A guide to maintenance and service of the unit is:

### **6.1 Weekly:** Check the operation of the fan.

- Switch on the power supply to the unit.
- Check that the fan is rotating freely. If the fan is faulty please refer to the Annual service section for details on how to replace it.

### **6.2 Three Monthly:** Check and clean the inside of the unit.

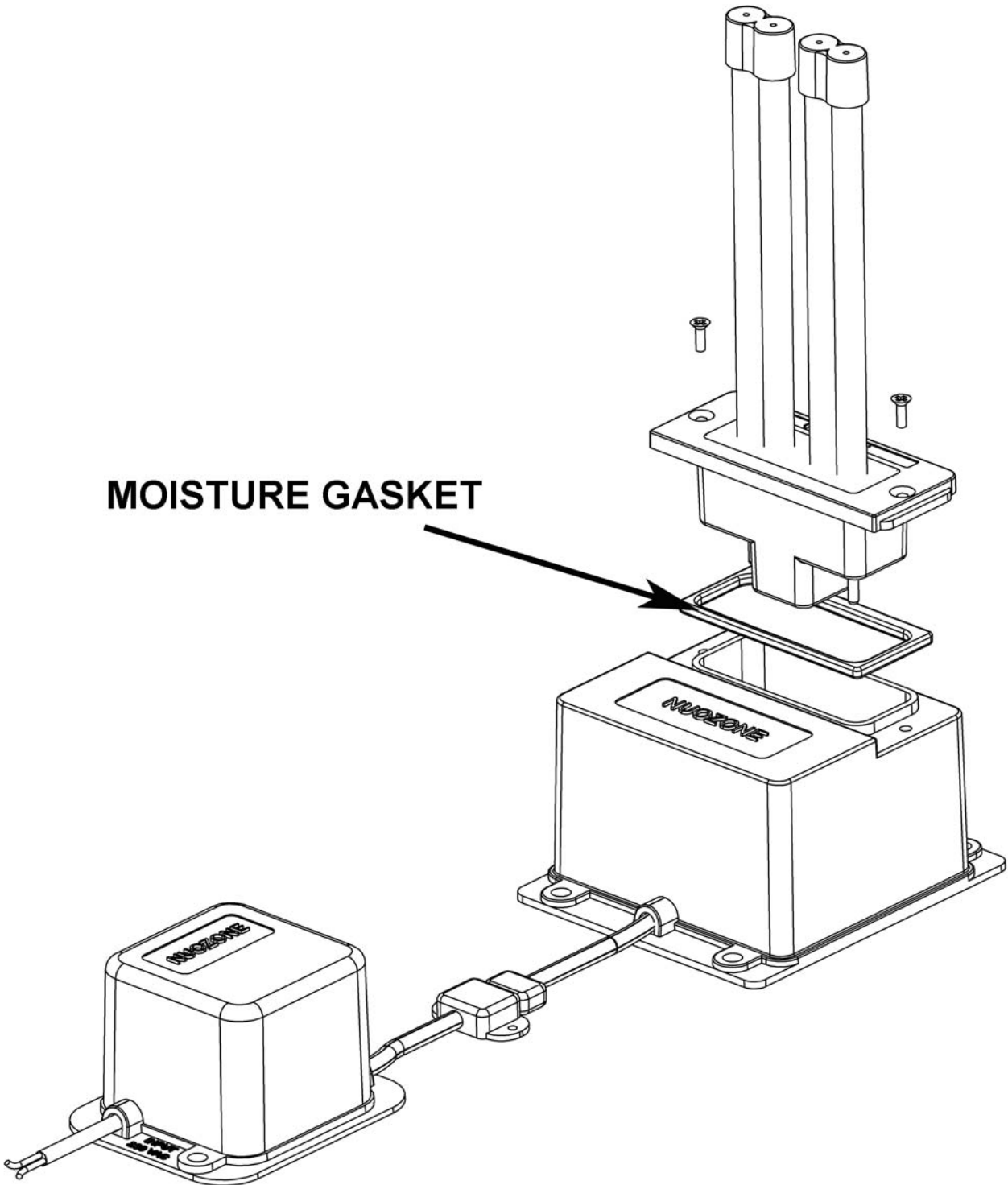
- Isolate the mains supply to the unit.
- Remove the lid of the unit by undoing (anti-clockwise) the 8 M4 Screws. NOTE: the lid has an earth lead attaching it to the base, take care when removing the lid not to stress the lead.
- Check the overall condition inside the unit and remove any debris.
- Check that all the electrical connections are in good condition.
- Clean the surface of the generator rods, highlighted in the diagram below, using a cleaning wipe\*, ensuring that the surfaces are free of all deposits, some of these deposits may be difficult to see.

\* Please see the spares list for details of the cleaning wipe.

### **6.3 To replace a damaged/faulty generator rod assembly.**

- Remove the lid as described above to gain access to the rod assembly.
- Remove the screws at the top and bottom of the rod assembly.
- Using a cleaning wipe to support the rods, to prevent contaminating the quartz, gently extract the rod assembly from the master module.
- Replacement of the new assembly is the reverse of the removal taking care to position the moisture gasket correctly.

# GENERATOR GLASS TUBE ASSEMBLY



## 7.0 TROUBLESHOOTING

Fault	Possible Cause	Suggested Action
No power to unit	Power not switched on	Switch on power
	Fuse in plug blown	Replace fuse (1A) in the holder just beneath the mains cable entry
No Ozone smell	Generator rods not connected.	Check and correct
	Generator rods damaged	Replace damaged rods
	Generator rods dirty	Clean rods
	Airflow sensor jammed	Check for free action of airflow sensor vane in fan duct
No airflow through unit	Fan not connected	Check and correct
	Fan faulty	Replace fan
	Filter blocked (if fitted)	Clean or replace filter.

## 8.0 SPARE PARTS

Description	Model	Stock No:
Generator Rod Assembly	5400	N/A
Fan	5400	n/a
Cleaning Wipe	N/A	010-069-00

## 9.0 UNIT SPECIFICATIONS

MODEL	5400
Length	375mm
Width	310mm
Height	205mm
Weight	5.5Kg/6Kg
Electrical Supply	230Vac, 50-60Hz
Power Rating	5400 - 150W
Enclosure material	White Powder Coated Aluminium
Ozone Output	5400= 0-4g/hr $\pm$ 20%

# Appendix A

## SETTING GUIDE

- 1) Calculate the room volume (length x width x height)
- 2) Set the output of the machine to suit the room size and odour by altering the timer.
- 3) Each segment on the timer is equivalent to 15 minutes.  
For example, to run the generator for 30 minutes per hour for 2 hours: (a) push down two segments at the time setting you want the generator to start; (b) leave the next two segments "up"; c) push down the next two segments.
- 4) Do not enter the treated room until at least **three hours** after the ozone generator has stopped without the use of the respirator specified above.

### Example

A room measures 20m x 5m x 3m. So its volume is 300m<sup>3</sup>

From the chart, the unit can be set at any level to be effective at removing odours. The stronger the odour the higher the setting.

If the room to be treated is clear of people at 18.00hrs and access is not needed until 07:00hrs the following morning, the timer should be programmed to turn on at 19:00hrs, run for 9 hours and turn off at 04:00hrs the following morning.

This will allow 3 hours for the room to be safe to enter.

The warning signs on the entrances should state that the room should not be entered between 18:00hrs and 07:00hrs.

ROOM VOLUME	timer setting (mins per hour)		
	15	30	60
m <sup>3</sup>			
100	☺	X	X
150	☺	☺	X
200	☺	☺	☺
300	☺	☺	☺
400	☺	☺	☺
500	☺	☺	☺
600	☺	☺	☺
700	☺	☺	☺
800	☐	☺	☺
900	☐	☺	☺
1000	☐	☺	☺
1500	☐	☐	☺
2000	☐	☐	☺
<b>Note</b>			
:			
	15 minutes = 1 segment in 4		
	30 minutes = 2 timer segments in 4		
	60 minutes = 4 timer segments in 4		
X	NOT RECOMMENDED		
☺	RECOMMENDED		
☐	OZONE LEVEL TOO LOW TO BE EFFECTIVE		