



# Installation, Operation and Maintenance Guide

## 500 Series

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#### **OUR MISSION**

To improve health and wellness by actively restoring indoor air to its pure, natural state where no pollution or contaminants exist, while reducing energy use and emissions in the process.

#### **IMPORTANT**

Save this Document for future Reference & Warranty Information

[AtmosAirAsia.com](http://AtmosAirAsia.com)

## **!IMPORTANT!**

READ THIS BEFORE STARTING INSTALLATION.  
DO NOT THROW AWAY THIS GUIDE.

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For safe installation you **MUST**:

- Always disconnect power to the unit before handling any of the components.
  - Secondary voltage to the ionization tube can be as high as 3000 volts AC. DO NOT connect to the power before the installation is complete and personnel are aware of the imminent operation.
  - Carefully read this instruction booklet before beginning the installation.
  - Follow each installation or repair step exactly as shown and explained in this guide.
  - Observe all local, state, national and international electrical codes.
  - Pay close attention to all warnings and caution notices given in this guide.
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**How to Contact us:** If you need help, please contact an AtmosAir Representative for technical assistance @ [BreathingisBelieving@AtmosAir.com](mailto:BreathingisBelieving@AtmosAir.com)

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## 01 PRODUCT OVERVIEW

The AtmosAir 500 series, models 500E, 500F and 508F, ionization generators are industrial quality units intended for installation in air conditioning systems or in custom-designed air distribution systems in commercial and industrial facilities. AtmosAir equipment is effective in reducing odors and harmful pollutants through the introduction of positive and negative ions into the air stream to be treated. The number and size of the ionization tubes used is dependent upon the airflow, size of the space, and severity of the pollution and odors. The AtmosAir 500 series equipment is designed for minimal maintenance efforts. The 500 series has two components that require inspection and maintenance:

1. AtmosAir 500 series ionization generator
2. Ionization tubes

Because there are no moving parts, little maintenance is required and the systems have very low failure rates and minimal maintenance requirements. For more information, read the AtmosAir 500 series submittal document.

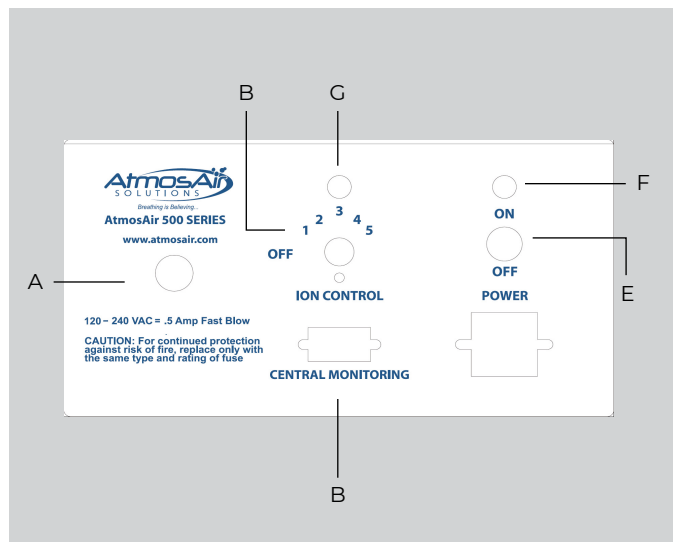
**Pressure Drop Chart**

Unit Size	Flowrate (CMH)	Drag – Inches WC (Pascals)
500 EC	13,600	0.0080 (2.00)
500 FC	17,000	0.0102 (2.55)
508 FC	25,500	0.0297 (7.40)

Pressure Drop @ 20°C, Density of Air = 1.225 kg/m<sup>3</sup> & 120V @ 50/60hz

## Control Panel Diagram

AtmosAir 500 Series Control Panel Layout:



- A. Fuse
- B. 5-step power adjustment switch
- C. Monitoring DB-9 output connection
- D. Power socket / Quick Disconnect
- E. Power switch
- F. Green system power light
- G. Red ionization power light

### Overall Dimensions:

L x H x W  
704.85 x 254 x 273.05 (mm)

## 02 INSTALLATION

The AtmosAir 500 series equipment can be mounted on the side of a duct or air handler wall, using the integral mounting flange and a weather-strip gasket; or inside an air handler using a custom mounting rack. In an air handler, the units operate best when located after the filters. Ideally, the tubes lie parallel to the direction of airflow with the end of the tubes pointing upstream. When installed on a side of a duct or air handler wall, the outer box and faceplate should not be exposed to direct sunlight or moisture. If installing outside, a weatherproof enclosure with an access panel for servicing should be installed over the AtmosAir Ion Generator (Can be provided by AtmosAir). The 500 series is available in either 120VAC, 50/60 Hz or 240VAC, 50/60 Hz. AtmosAir will deliver units appropriate for your market, however please verify on the unit label that the voltage on the unit matches the voltage you are connecting to. If using the integral remote monitoring panel, the connection is made using a supplied 9-pin(DB-9) connector. The tubes and electrode contacts should not come into contact with any conductive surface. A minimum 101.6 mm clearance around the tubes is recommended.

### PROCEDURE FOR 500 SERIES QUICK CHANGE PLATE (QCP)

(PLEASE READ ENTIRE PROCEDURE BEFORE COMMENCING)

Notes; Utilize the Quick Change Plate in thin ducts, fiberboard ducts or where relatively frequent dismounts may occur. The Quick Change Plate may be used to compress sagging fiberglass insulation and prevent damage due to airflow.

It is not necessary to use the Quick Change Plate in all instances, however we highly recommend using it as over time maintenance with self-tapping screws may lead to stripping of the holes. The Quick Change Plate also functions as the template for cut-out of duct.

Provide enough electronic clearances for the tubes, no metal tube parts or brackets may contact any part of the duct. 4cm of clearance is recommended.

1. Using the inner perimeter of the Quick Change Plate (QCP), place on appropriate area of duct. Measure clearances and distances for tubes and electrical cord.
2. Trace the inner perimeter, skip the 'T' clamp features.
3. Mark the location of the holes on the duct.
4. Drill out the marked holes with a 5mm or 6mm drill.
5. Using appropriate tools cut out the traced area in the duct. INSIDE PERIMETER!
6. NOTE; The QCP is sized so it will slip into the duct at an angle.
7. Screw in the screws (provided) from the BACK of the QCP after procedure # 9. Tighten screws securely.
8. ANGLE the QCP in through the cut hole and bring the screws back through the drilled holes.
9. Using the 'T' Clamp features in the QCP, bend the T clamps BACK out through the cut hole and bend them FLUSH to the duct.

## PROCEDURE FOR 500 SERIES QUICK CHANGE PLATE (QCP)

**10.** Flatten the T clamps first with your thumb and then flush with pliers. This feature is so the QCP will not fall back through the hole.

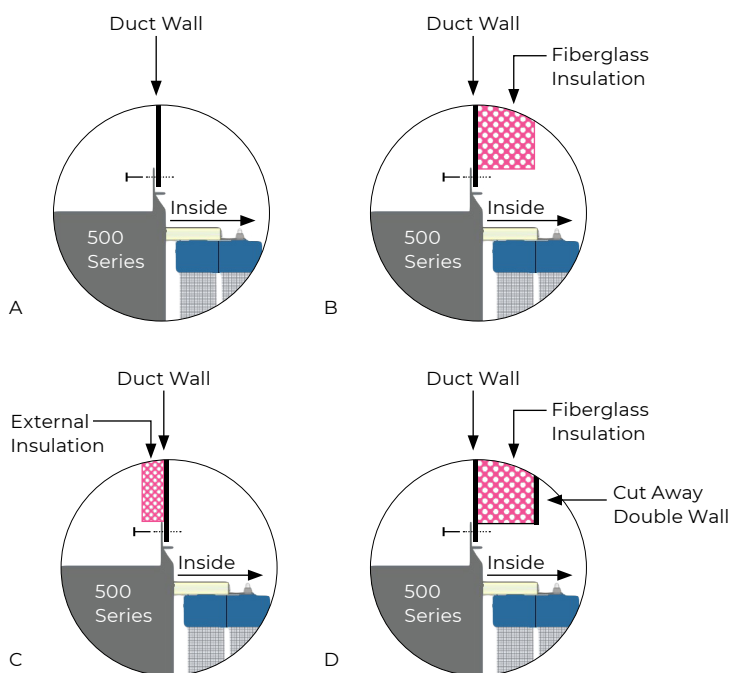
**11.** Insert the 500 series so that the screws align with the holes in the 500 series. NOTE; it is recommended to clear the black gasket material from the 500 series holes ahead of time by putting screws into and then pulling them out of the holes on the unit. This will ensure that the 500 series can easily be placed on the mounting bracket screws.

**12.** Install wing nuts and snug down until gasket is half compressed.

## Mechanical Installation

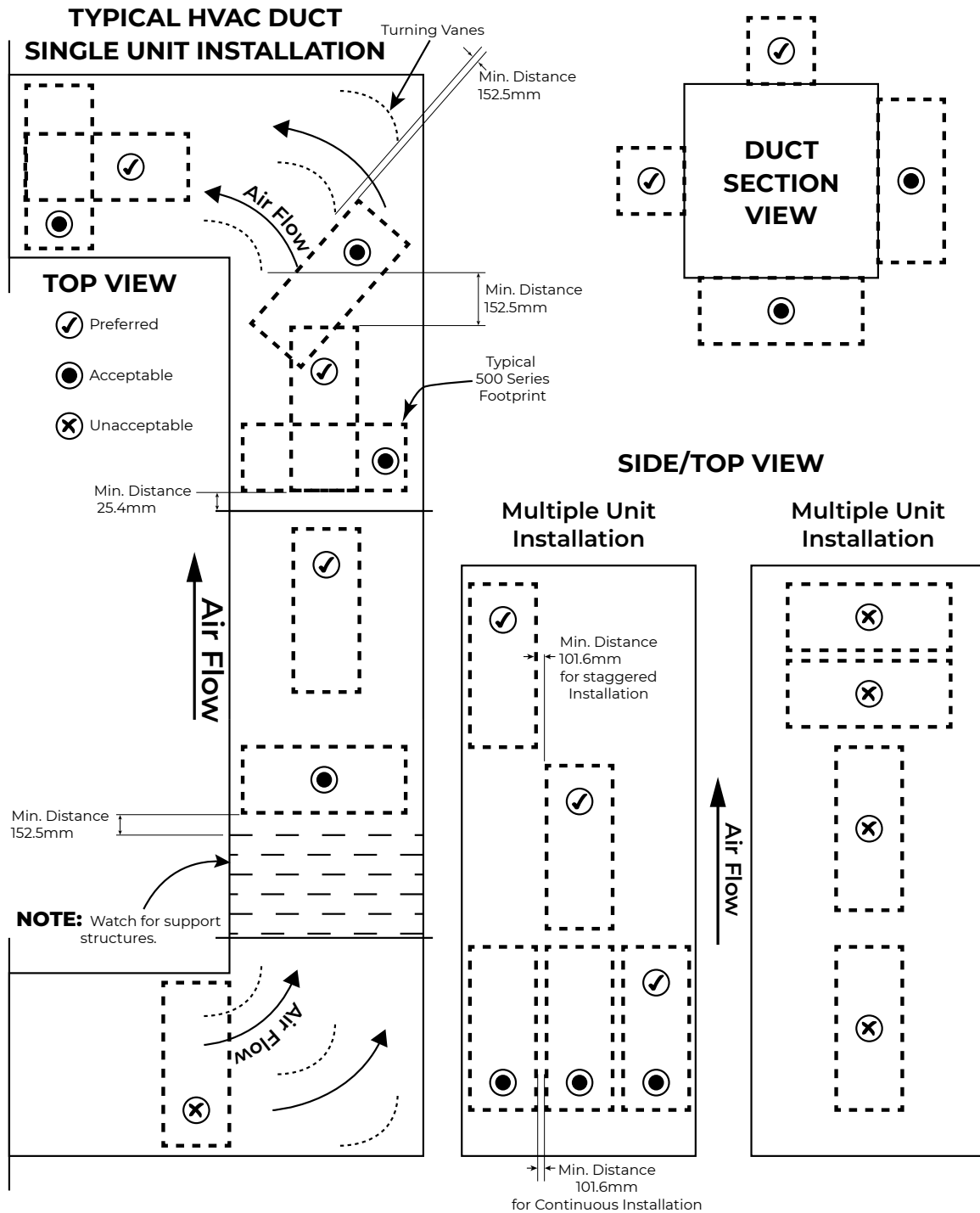
- Carefully remove the equipment from its shipping container. Inspect the box, components, and tubes for damage. Verify that the unit's voltage rating is the same as the available voltage, either 120VAC, 50/60 Hz or 240VAC, 50/60 Hz.
- Install the ionization tubes using the supplied friction nuts and clamp screws. Gently tighten the tube grounding clamps to ensure solid contact with the tube's outer mesh. Do not over-tighten either connection! In most cases, units come with tubes pre-installed.
- Orientation:** Install the unit with tubes parallel to the airflow and the nosecones normal to the airflow, whenever possible; otherwise, perpendicular orientation is acceptable. If multiple units are installed in the same duct, stagger the units, if possible, in the airflow so they are not in the same airflow path.
- For in-duct installation: Verify the flange gasket is in place and in good shape to ensure the unit seals properly. Make a cut-out in the duct sized per the illustration and table on the following page. Use the unit as a template for the mounting screw locations. Affix the unit securely in the duct using self-tapping screws. **Do not over-tighten, this may strip the screw-hole.** The unit is self-sealing to the duct so no further sealing is needed.
- For in-plenum/AHU installation: Mounting varies with rack-style. Follow mounting instructions provided with rack. Typically, racks require 101.6 mm of clearance from walls.
- Units should be installed to allow easy access for maintenance. Install units so that the power switch and 5-step power adjustment knob are accessible. When oriented vertically, control panel should be upwards.

### Types of Insulated duct walls



- Single wall, no insulation
- Single wall, internal insulation
- Single wall, external insulation
- Double wall, internal insulation.

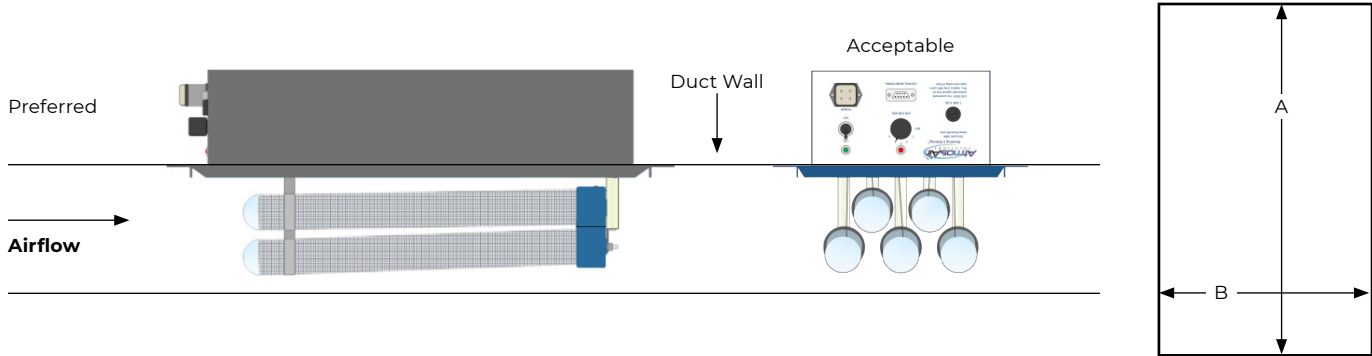
## Mechanical Installation — Mounting



Continue on Next page

## Mechanical Installation — Mounting

### Installation Orientation



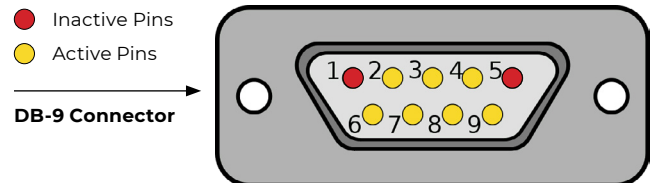
Cut-Out Dimensions (in)		
Model	A	B
500 EC	495.3 mm	228.6 mm
500 FC	660.4 mm	228.6 mm
508 FC	660.4 mm	228.6 mm

## Electrical Installation

AtmosAir 500 series systems require an average of 50 watts per unit. An internal 500mA, slow-blow 5mm x 20mm fuse protects the unit.

1. Follow proper electrical procedures, guidelines, and codes for providing power supplies to the systems. Including requirements for conduit, sufficient ampacity, phase balancing, etc. Electrical installation should be performed by a qualified electrician.
2. Field-install a junction box within 244 cm of the unit(s). Each 500 series unit is typically shipped with a 3.05-meter power lead in a flexible metallic conduit with a quick-connect power plug on one end and bare wires on the other.

3. The unit is equipped with a normally-open relay that closes on ionization start-up and opens on loss of power. This relay can initiate a local alarm or be tied into a building automation system. Connection is via a D-subminiature 9-pin connector, DB-9. Pins 1 and 5, starting from the top left, are the active pins. There is no electrical power across the terminals.



### !!!WARNING!!!

The secondary voltage to the ionization tubes can be as high as 3000 volts AC. Do NOT connect to power before the installation is complete and all personnel are aware of imminent operation. Always disconnect power to the unit before handling any of the components.



## Tube Installation Instructions

1. Ensure that all mains power is disconnected from the unit.
2. Carefully remove tubes from packing and check that the tube is free of damage or loose cap to tube connection.
3. Inspect the outer metal mesh and adjust, if possible, to maintain a 1.25cm distance from the end cap. It is ideal if the seams on both the inner and outer electrodes line up together.
4. It is easiest to install the tubes starting with the inner-most tube, then each side, starting with the lower tube then the outer tube.
5. Insert the tube end through the end clamp and align the end screw with the L-bracket, as shown below. The clamp may need to be opened completely by unscrewing the clamp screw.



6. Secure the tube on the unit at the end cap first, using the supplied friction nut, taking care not to over-tighten. **It is important to only hold the tube by the end cap when tightening;** otherwise the outer mesh may twist, reducing effectiveness.
7. Secure the tube by hand-tightening the screw for the clamp, taking extra care not to over-tighten. The connection only needs to be tight enough to make a secure connection. **It is important to only tighten the clamps enough to provide a secure tube and solid electrical connection.**



Once all tubes are installed and personnel clear, the power can be re-connected and the system turned on.

### !!!CAUTION!!!

#### Do NOT over-tighten:

- the end screw can be tightened using a power drill; however, care should be taken so as to not twist the L-bracket or crack the end cap. Only tighten so the tube is not loose.
- The tube clamps should only be hand-tightened using a screwdriver, and only to the point where the mesh and tube clamp have made a solid contact, and the tube is not loose.

### !!!CAUTION!!!

## Tube Removal Instructions

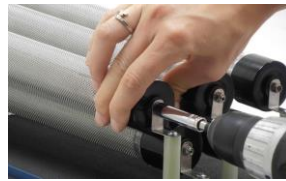
1. Ensure that all mains power is disconnected from the unit.



2. Loosen the screw in the end clamp around the tube. It is not always necessary to completely unclamp the tube; however, sometimes it is much easier to remove the tube by doing so.



3. Remove the nut from the end cap. It is important to hold the tube only by the end cap, not mesh, while unscrewing the nut.



4. Carefully remove the tube from the unit by first pulling the end cap screw out of the L-bracket, then by sliding the tube out of the loosened clamp.



!!!CAUTION!!!

Be careful when removing tubes. The wires from the mesh may have pulled away creating a potential puncture or scratch hazard.

!!!CAUTION!!!

## 03 OPERATION

Once the system is properly installed and all personnel are clear of the high voltage tubes, the system can be turned on:

1. Ensure the ionization power knob is turned all the way counter-clockwise in the 'off' position.
2. Flip the power switch up to the 'on' position. The green embedded LED light above the power switch should light up to indicate that the power is on and running to the system.
3. Set the ionization power knob to the appropriate setting (1-5, with 1 being low and 5 being high). The red embedded LED above the power knob should light up to indicate that ionization has been activated and high voltage is being sent to the tubes' electrodes.

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### !!!WARNING!!!

A non-functioning LED light may improperly indicate that the system is not functioning. Be sure to disconnect from the mains power before performing maintenance or troubleshooting the system.

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### Bi-Annual Tube Replacements:

The ionization tubes should be replaced once every 24 months, as the production efficiency slowly declines over time due to the stress caused by plasma and (lack of) cleanliness of the electrodes. Old or excessively dirty tubes can also put undue stress on the transformer causing pre-mature failure.

## 04 MAINTENANCE REQUIREMENTS

1. The maintenance requirements on an AtmosAir system are mainly site-dependent; a heavily contaminated environment may require more frequent inspection & maintenance. In general, quarterly or bi-annual maintenance is recommended along with an bi-annual tube replacement.
2. The local AtmosAir dealer can provide you with an annual service contract.

### Quarterly / Bi-annual Maintenance Requirements:

1. Visually check the performance of the system by checking the red and green lights on the individual units. If both lights are on, and you can hear the 'buzz' of the tubes, then unit is functioning properly. If not, proceed to the troubleshooting section for repair. Maintain a physical distance between all personnel and the tubes while system is operating or turned on.
2. Optional: Check performance using a high voltage probe (minimum of 5000 V, Contact AtmosAir for additional minimum probe specifications) paired with a multimeter. Follow proper safety procedures for dealing with high voltages. If you are uncertain, do NOT perform any maintenance with the power on and, instead, proceed to the next step.

### Disconnect the system from the mains power before performing any maintenance steps.

1. Inspect the unit box, plastic tube caps, and tube-mounting plate. Remove particles from mounting plate, and thoroughly wipe clean any tracks or grooves that may have developed in the plate or caps.
2. Inspect connections: tightness of all nuts and screws; remove deposits on the connections using sand paper or wire brush - it may be necessary to remove the tubes for this step.
3. It may be beneficial to clean the tubes to improve performance. The tubes can be cleaned using an air compressor for a quick clean, or more thoroughly with cleaning solutions. Do not immerse the tubes in water. Ensure that the tubes and mesh are completely dry before re-installing.

## 05 TROUBLESHOOTING

In the event that the system is not functioning, follow these steps **IN ORDER**:

1. Check the fuse. If it is blown, replace it with the appropriate sized slow-blow 1A glass 5 mm x 20 mm fuse rated at 250 V and continue to the next step.
2. Check that the main power supply is sending the correct power to the unit.
3. If the system is controlled by an air pressure switch, and/or a door switch, check that these are not preventing power from being sent to the system.
4. If power is reaching the unit and it was necessary to replace the fuse, the next step is to determine whether there is a fault in the system or a tube. First, to check that the system's power is functioning, set the ionization power knob and the power switch both to the 'off' position. Make sure all personnel are clear of the high voltage tubes, then re-connect the power supply. Flip the power switch to 'on' and observe the green light. If the light does not turn on, there is power delivery problem. If all external sources of failure are eliminated, the system should be serviced by a qualified AtmosAir technician. Please see contact information at the bottom of this page.

The next step is to determine the cause of the failure, or blown fuse. Typically, failures are caused by arcing between the inner and outer electrodes, or between one electrode and ground. This often occurs because of damaged tubes or dirty and/or wet conditions that have allowed carbon tracking to temporarily connect two electrodes and/or a grounding point electrically.

5. Inspect the enclosure and tube cap for tracking evidence.
6. Inspect the tubes for cracks, pitting, or other degeneration of the dielectric material that causes the dielectric to fail and arcing to occur.

7. If physical inspection has not revealed the cause of failure, one may carefully observe the tubes as the ionization system is turned on to determine whether arcing is occurring at a particular tube. The fuse will usually blow, again, but for a short time, one may observe the cause of the power surge in the form of a visual or audio cue. Usually a failing tube can be determined in a darkened room by looking for a flash or arc from the failing tube. In some cases, the correctly operating tubes may be in the way of the failing tube's visual indication. **It is permissible and recommended to remove the top row of tubes temporarily to assist in the visual diagnosis. The device utilizes a bus-bar technology allowing the servicing technician to remove any amount of tubes needed to diagnose and/or temporarily run the device whilst waiting for replacement tubes.**
8. It may be necessary to remove all the tubes to ensure that the transformer is working properly in the absence of tubes. If the fuse still blows, then the system should be serviced by a qualified AtmosAir technician.
9. It is recommended to also check the voltage levels of the system when a fuse has blown and been replaced, in order to ensure that the transformer has not been irreparably damaged (See step 4 for more information on this process.) If the voltages are lower than expected, check that all the connections are secure and rust-free; also check that the input voltage is approximately 120 VAC or 240 VAC.
10. If the fuse continuously blows, or if the voltages are lower than expected, then the system should be serviced by a qualified AtmosAir technician.
11. Otherwise, replace the damaged tube(s), clean and smooth any mounting plate or end cap carbon tracking, and return the system to service.