



Breathing is Believing.SM

Installation, Operations and Maintenance Guide

AtmosAir 500 Series

MCC Tubes



Table of Contents

1. Product Overview	3
1.1 Product Diagram	3
2. Installation	4
2.1 Mechanical Installation	4
2.2 Electrical Installation	5
3. Operation	6
4. Maintenance Requirements	6
5. Troubleshooting	7
Appendix A: Tube Installation Instructions	9



AtmosAir Model 500FCs rack-mounted systems in an AHU.

Install AtmosAir 500 series products in air handlers, or wall-mounted in ducts.

AtmosAir Models 500EC & 500FC purify the air and remove odors using cold plasma ionization technology.



Product Overview

The AtmosAir 500 series, models 500EC and 500FC, 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. Custom designs include supply air distribution and exhaust treatment systems. 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 dependant 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.

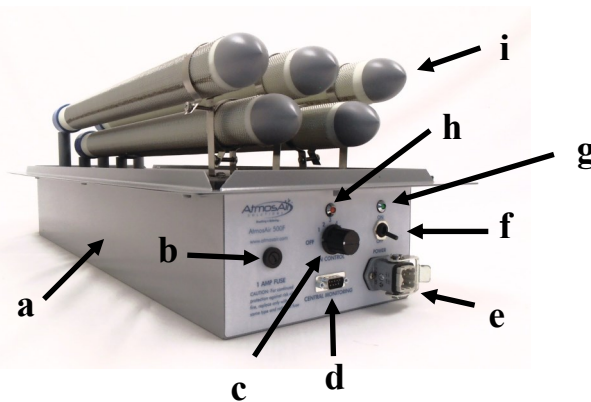
Typical installations for office buildings, schools, and hospitals operate one 500EC unit per 13,592 CMH and one 500FC unit per 16,990 CMH as a design matrix.

Product Diagram

AtmosAir 500 Series:

- a. Circuit box
- b. Fuse
- c. 5-step power adjustment switch
- d. Monitoring DB-9 output connection
- e. Power socket
- f. Power switch
- g. Green system power light
- h. Red ionization power light
- i. Ionization tubes

AtmosAir 500 series system equipment labeled.



Overall Dimensions:

Height and width: 209.54mm x 273.05mm ; Length: 539.75mm (500EC), 692.15mm (500FC).

Installation

AtmosAir series equipment can be mounted in the side of a duct or air handler wall, using the 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 MCC end of the tubes pointing upstream.

When installed in the 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 box.

The AtmosAir 500 series operates on 115 VAC, 50/60 Hz (220 VAC, 50/60 Hz is available on request); if using the optional remote monitoring / control 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 four inch (101.6mm) clearance around the tubes is recommended. The box and all other exposed metal parts are grounded.

Mechanical Installation

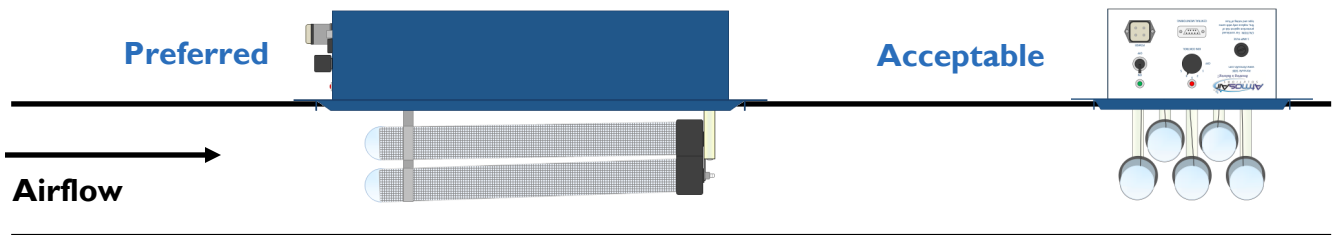
1. Carefully remove the equipment from its shipping container. Inspect the box, components, and tubes for damage. Verify that the unit's voltage rating is the same as the available voltage, normally 115 or 220 VAC.
2. Install the ionization tubes using the supplied friction nuts and clamp screws. Tighten the tube grounding clamps to ensure solid contact with the tube's outer mesh. **Do not over-tighten either connection!** See tube installation instructions, in Appendix A, for further details.
3. **Orientation:** Install the unit with tubes parallel to the airflow and the MCC end of the tubes on the upstream side, whenever possible; otherwise, perpendicular orientation is acceptable. If multiple units are installed in the same duct, stagger the units in the airflow so they are not in the same airflow path. See illustrations on following page.
4. **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-

Mechanical Installation, continued

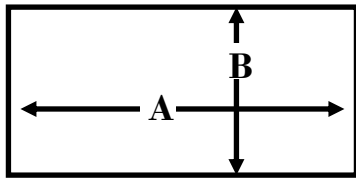
hole. The unit is self-sealing to the duct so no further sealing is needed.

5. **For in-plenum/AHU installation:** Mounting varies with rack-style. Follow mounting instructions provided with rack. Typically, racks require 101.6mm of clearance from walls.
6. 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.

Duct Installation Orientation Options:



Duct cut-out dimensions:



Model	Dimensions, Inches	
	'A'	'B'
500E	495.30 mm	228.6mm
500F	660.4mm	228.6mm

!!!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.

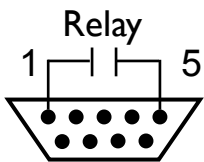
!!!WARNING!!!

Electrical Installation

AtmosAir 500 series systems require approximately 10 watts per tube, an average of 50 watts per unit. An internal 1-amp, fast-acting fuse protects the unit.

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.

1. Field-install a junction box within 2.43m of the unit(s). Each 500 series unit is typically shipped with a 3.04m power lead in a flexible metallic conduit with a quick-connect power plug on one end and bare wires on the other.



DB-9 Connector

2. The unit is equipped with a normally-closed relay that opens on ionization start-up and closes 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.

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.

!!!CAUTION!!!

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.

!!!CAUTION!!!

The system is intended to deliver ions into the treated area such that the ion levels should increase by 100 up to 1500 negative ions / cm³. The desired ion increase is dependant on many factors, including space, use, contaminant level, and distribution effectiveness. An authorized AtmosAir design consultant should recommend the desired ion increase and appropriate system layout.

Optimization and tuning can be provided by AtmosAir personnel.

Maintenance Requirements

The maintenance requirements on an AtmosAir system are mainly site-dependent; a dirtier environment requires more frequent maintenance. In general, quarterly or bi-annual maintenance is recommended along with an annual tube replacement.

The local AtmosAir dealer can provide you with an annual service contract.

Quarterly / Bi-annual Maintenance Requirements:

- 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.*

Maintenance Requirements, continued

- **Optional:** Check performance using a high voltage probe (minimum of 5000 V) 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.

- Inspect the unit box, plastic tube caps, and black 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.
- Inspect connections: tightness of all nuts and screws; remove excessive rust on the connections using sand paper or wire brush - it may be necessary to remove the tubes for this step.
- 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 MCC and mesh are completely dry before re-installing.*

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.

Instructions for the installation and removal of tubes are provided in Appendix A.

NEED HELP???

Contact an AtmosAir

representative at

any time for

technical guidance:

West Coast Office:

480-629-4784

East Coast Office:

203-335-3700

NEED HELP???

Troubleshooting

In the event that the system is not functioning, the first step is to check the power source and fuse:

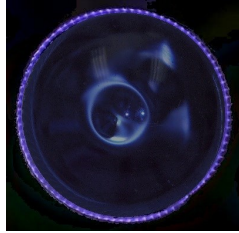
- Check the fuse. If it is blown, replace it with the appropriate sized slow-blow 1-amp fuse rated at 115 or 250 VAC and continue to the next step. The fuse may be 1¼" x ¼" or 5 x 20 mm in size.
- Check that the main power supply is sending the correct power to the unit.
- If the system is controlled by an air pressure switch, and/or a door switch, check that these are not preventing power from being sent to the system.

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

Troubleshooting, continued

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 still a problem with delivering power to the system. If all external sources of failure are eliminated, the system should be serviced by a qualified AtmosAir technician.

The next step is to determine the cause of the failure, or blown fuse.



End-on view of tube: the purple edge glow is the plasma generated between the MCC and the outer mesh electrode.

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.

1. Inspect the mounting plate for tracking evidence.
2. Inspect the MCC tubes for cracks, pitting, or other degeneration of the MCC material that causes the dielectric to fail and arcing to occur.
3. 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.
4. 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.

The visual cue may be small or may be a large spark or spark-trail, so be cautious when turning system on. Start on the lowest setting with personnel clear of the system, but observant.

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. 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 115 or 250 VAC.

If the fuse continuously blows, or if the voltages are lower than expected, then the system should be serviced by a qualified AtmosAir technician.

Otherwise, replace the damaged tube(s), clean and smooth any mounting plate or end cap carbon tracking, and return the system to service.

If there seems to be a gradual loss of effectiveness, check the tubes and clean them, if necessary. Overly dirty tubes not only provide additional stress on the transformer, they can block the ability to form plasmas and thus generate sufficient ions.



The Clean Air Group AtmosAir Solutions

418 Meadow Street, Suite 204

Fairfield, CT 06824

Phone: 203-335-3700

Fax: 203-335-1075

--

2115 E. Cedar Street, Suite 6

Tempe, AZ 85281

Phone: 480-629-4784

--

www.AtmosAir.com

Breathing is Believing...

AtmosAir Solutions'™ mission is to bring and restore every indoor environment the same clean and pure quality air that is typically found at higher mountain elevations.

AtmosAir's unique and proven air purification process significantly reduces mold, controls the spread of bacteria and airborne viruses, and reduces airborne particles that evade normal filtration solutions. AtmosAir equipment uses non-thermal plasma technologies to generate bi-polar ionization that attacks and breaks down odors and contaminants.

www.AtmosAir.com

More Solutions



The Matterhorn 1000 solution works well for smaller spaces such as residential housing and office spaces served by several smaller air handlers. This residential system can operate C tubes all the way up to F tubes, depending on the size of the

space.

Portable systems are an alternative solution for small spaces where use of the existing air handler is not possible or practical. For smaller applications the



AtmosAir 500 Series



lightweight Tower systems, the T400 and the wall-mountable T400WM (to the left), blend nicely into the space as easily as a stylish fan.

The P2000 or P2002 models distribute ions for a larger space, operating almost noiselessly as they clean the