



# Installation, Operation and Maintenance Guide

## FC-400FM

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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



AtmosAir.com  
CAG-04-19-001

## **!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.

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## 01 PRODUCT OVERVIEW

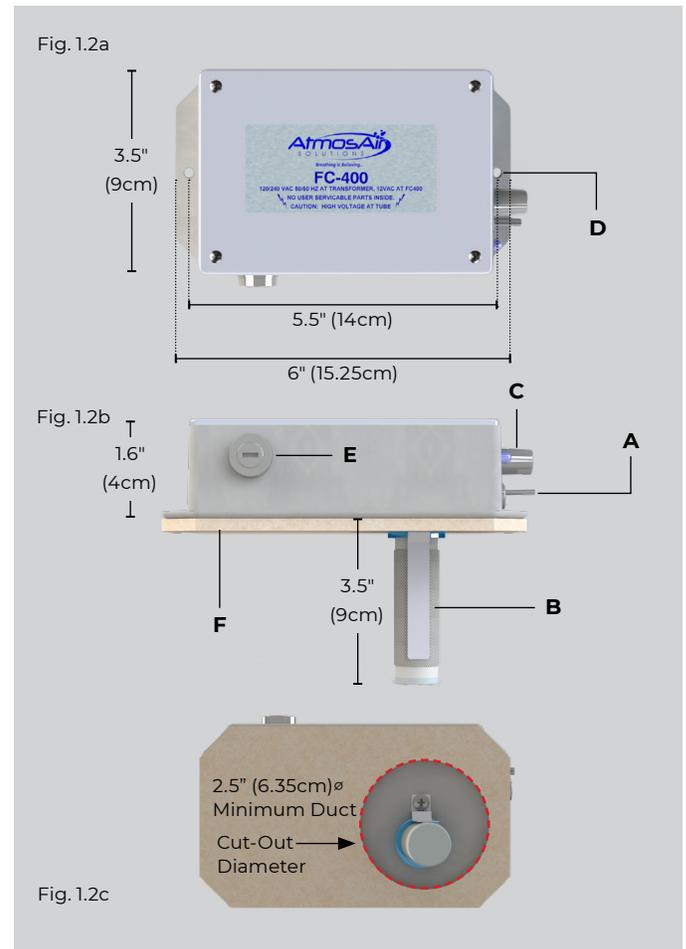
The AtmosAir FC-400FM series (Flush - Mount) ionization generators are small residential-sized units intended for installation in air conditioning systems or in custom-designed air distribution systems in small commercial spaces and typical residential houses. AtmosAir equipment is effective in reducing odors and harmful pollutants through the introduction of positive and negative ions into the airstream to be treated. The number and size of the ionization units used is dependent upon the airflow, size of the space, and severity of the pollution and odors. The AtmosAir FC-400 series equipment is designed for minimal maintenance. The FC-400 series has two components that require inspection and maintenance:

1. AtmosAir FC-400 series base unit components + Fuse
2. Ionization tube

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 FC-400 series submittal documents.

## FC-400 FM Diagram

AtmosAir FC-400 FM Layout



- A. Power Input
- B. Ionization Tube
- C. Blue LED Power Light
- D. Mounting Holes
- E. Fuse Holder
- F. Silicone Foam Gasket

### Overall Mounting Plate Dimensions:

6" (15.25cm) L x 3.5" (8.9cm) W x 1.6" (4cm) H

### Silicone Foam Gasket Seal:

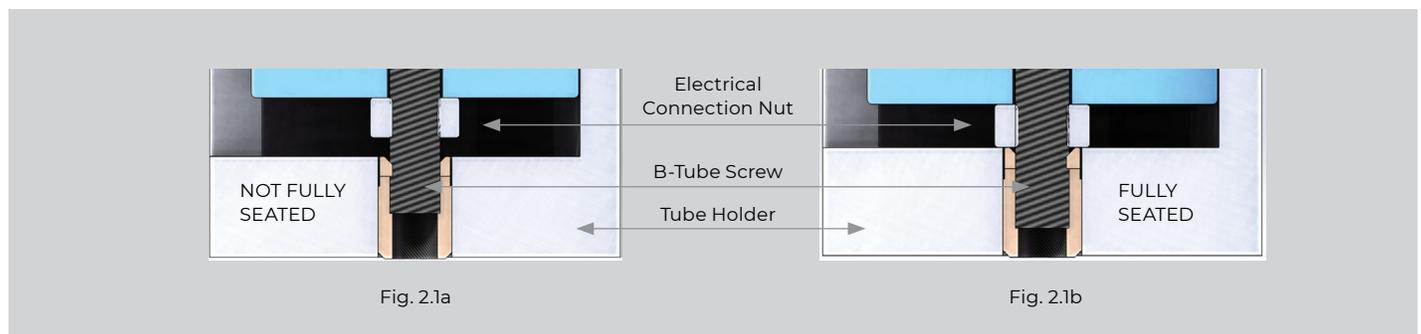
0.200" (0.5cm) Thickness

## 02 INSTALLATION

AtmosAir FC-400 series equipment can be mounted on a duct FC-400 FM using the faceplate mounting flange and its weather-strip gasket. The units operate best when located after all filters, coils, and fans. Various mounting arrangements are possible; however, the available options may be limited due to size and configuration restrictions. When mounted on the side of a duct, the enclosure should not be exposed to direct sunlight or moisture. If installing outside, a weatherproof NEMA-4 enclosure with an access panel for servicing should be installed over the AtmosAir equipment. The AtmosAir FC- 400 FM operates on 120 VAC, 50/60 Hz. The tube and electrode contacts should not come into contact with any conductive surface. A minimum 1.5" (3.8cm) clearance around the tube is recommended.

### Mechanical Installation

- Carefully remove the equipment from its shipping container. Inspect the main components, gasket, and tube for damage. Verify that the unit's voltage rating is the same as the available voltage, 120 VAC 50/60Hz.
- Install the ionization tube: Gently pull the conductor strap back to allow the tube to turn freely; screw the end screw of the tube into the tube-holder hand-tight. Ensure that the tube is **FULLY SEATED**.
- Once the tube is secure, return the conductor strap to its normal position and ensure solid, flat and continuous contact is made with the tube's outer mesh (See Fig. 5a below).
- Location and Orientation: Install the unit downstream of filters, coils, and fans with tubes perpendicular to airflow whenever possible. Contact AtmosAir Engineering for Installations outside this scope.
- For in-duct installation: Verify the flange gasket is in place and in good shape to ensure the unit seals properly. Make a 2.5" (6.35cm) Diameter hole in the duct that the FC-400FM tube will fit into (See Fig. 1.2c). Use template provided to locate the cut-out hole, then cut out with a 2.5" (6.35cm) Hole Saw and mark the locations of the mounting holes for the FC-400FM. Mark the drill holes for the self tapping screws to mount the FC-400 FM to the Duct Wall.
- 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.
- Units should be installed to allow easy access for maintenance. Install units so that the power adjustment knob, fuse and status light are easily accessible, variable and visible.



#### !!!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.

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## Electrical Installation

- AtmosAir FC400 series systems require approximately 4.0 watts. The FC-400 series can be wired directly to single-phase blower circuits.
- Follow proper electrical procedures, guidelines, and codes for providing power to the systems, including requirements for conduit, sufficient ampacity, phase balancing, etc. Electrical installation should be performed by a qualified electrician.
- Field-install a power plug outlet or junction box within 6 feet (1.8m) of the unit(s).
- Each FC-400 series unit is typically shipped with a 8-foot (2.4m) power cord with a field install pair of wire hot/ neutral connector on one end and a quick disconnect plug on the other end. FC-400FM has a polarized quick disconnect on the unit. Each unit is shipped with 2 wiring options per country-specific requirements:
  1. 2 conductor, field wire connection (No Ground)
  2. NEMA 5-15 2-prong plug adapter

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### Caution!

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

## 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 to the appropriate quadrant. From low to high clockwise.
2. Plug the power cord into the plug receptacle on the FC-400 ionization system. (The FC-400 Series units are shipped with a quick disconnect spade terminals. The male and female terminals are specifically arranged so that the polarity can only be connected the correct way. Eliminating the risk of damaging the unit by accidentally reversing the polarity.
3. Turn the system on and set the ionization power knob to the appropriate setting Low, Med, High. The blue embedded LED light should light up to indicate that the system is on, ionization has been activated, and high voltage is being sent to the tube.
4. Settings are determined upon commissioning and installation with the Criteria below: The system is intended to deliver ions into the treated area such that the ion levels should increase by 350 up to 1500 negative ions / cm<sup>3</sup>. The desired ion increase is dependent on many factors, including space, use, contaminant level, humidity RH and distribution effectiveness. An authorized AtmosAir design consultant should recommend the desired ion increase and appropriate system layout.

## 04 MAINTENANCE RECOMMENDATIONS

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 annual tube replacement. Your 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 blue light on the unit. If the light is on, and you can hear the 'buzz' of the tube then the 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.
- **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 main power before performing any maintenance steps.
- 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.
- 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.
- 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.

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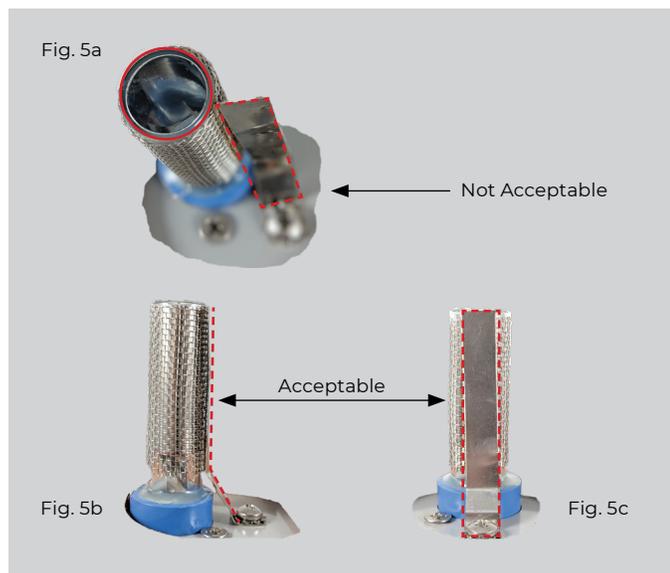
### **Annual Tube Replacements:**

The ionization tubes should be replaced once every 12 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 premature failure.

## 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 5mm 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 (~12VAC = White wire +).
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 to 'high' position, turning the knob all the way clockwise. Make sure all personnel are clear of the high voltage tube, then re-connect the power supply. Turn on the power to the unit and observe the blue light. If the light does not turn on, there is a 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.
5. Check that the spring tang is making **CLEAN, FLAT-TO-TUBE** contact with the tube as shown below:



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. Often, this occurs either because the tube isn't properly seated, or 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.

6. Inspect the enclosure and tube cap for tracking evidence.
7. Inspect the tube for cracks, pitting, or other degeneration of the dielectric material that causes the dielectric to fail and arcing to occur.
8. 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.
9. If the fuse blows, then the system should be serviced by a qualified AtmosAir Technician. You can contact repair services at [RMA@atmosair.com](mailto:RMA@atmosair.com) or by calling our east coast office (number below).
10. If the fuse continuously blows, 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.

## 06 MORE SOLUTIONS



Commercial solutions start with the 500 series, available in two sizes: the 500FC (Not pictured) and the 508FC (pictured above). Each 500 series uses 5 or 8 tubes and has a variable ionization output; additional systems can be used modularly to clean the air of small to large office buildings.



Portable systems, such as the Rainier R1 (above), are an alternative solution for small spaces where use of the existing air handler is not possible or practical. The Rainier R1 models distribute ions for a larger space, operating almost noiselessly as they clean the air.

### Explanation of Technology

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.