



Installation, Operation and Maintenance Guide

Matterhorn 1000/1002



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-23-10-005

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To the Holder of this Document

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WARNING

Failure to follow this warning could result in personal injury or death.

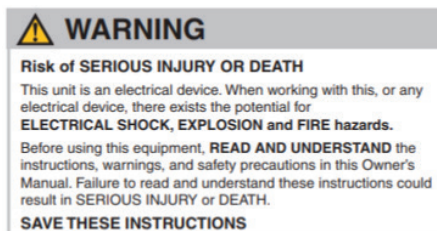
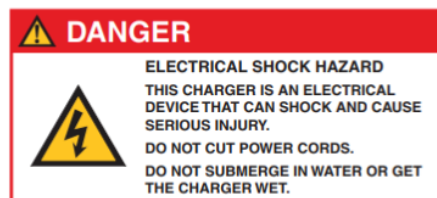
For installation you **MUST**:

- Always disconnect all electrical power to the unit before handling any of the components, to the air handler before removing access panels, or to perform any maintenance activities.
- Do NOT connect to the power before the installation is complete and personnel are aware of the imminent operation – secondary voltage to the ionization tube can be as high as 3,000 VAC.
- Installation of AtmosAir equipment is not to be performed in areas with extreme conditions such as extreme heat or cold, or where water or condensing moisture can impact the system.
- 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.

1. Before installing or servicing system, always turn off main power to system.

Note: There may be more than one disconnect switch.

2. AtmosAir equipment must be installed with a proper ground. The electrical cable enclosed with your AtmosAir unit must be used as it has a special plug which provides a ground circuit for the equipment.
3. Always replace fuse with the same rating and type of fuse.
4. Failure to follow this caution may result in personal injury or product and/or property damage.
5. Although special care has been taken to minimize sharp edges in the construction of your unit, be extremely careful when handling parts or reaching into the unit.
6. Do NOT block or obstruct the air flow over or around the ionizing tubes.
7. Do NOT touch ionizing tubes when power is on.
8. Tube cleaning should be performed only when the power is disconnected.
9. The tubes require minimal cleaning with routine operation and maintenance.
Longer operating cycles and reduced ionizing efficiency may indicate the need for cleaning or replacing tubes by your AtmosAir dealer or qualified installer.



Commissioning Statement

Do not commission new airhandlers after installation. All duct cleaning must be performed **before** the unit is installed.

Disclaimer: The air purification technologies provided by Clean Air Group are intended to improve indoor air quality. They are not intended as a replacement for reasonable precautions aimed at preventing the transmission of contaminants, airborne or otherwise. All persons having access to the serviced premises should comply with applicable public health laws and guidelines issued by federal, state and local governments and health authorities such as the Centers for Disease Control and Prevention (CDC). Clean Air Group does not maintain that its products will protect people from all modes of transmission of bacteria, viruses or other contaminants, and excludes liability for loss or damage arising from any such claims or the consequences arising out of the application, use or misuse of its products.

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01 PRODUCT OVERVIEW

The AtmosAir Matterhorn 1000 series, models Matterhorn 1000 and 1002 ionization generators are commercial and 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 air stream to be treated. The number and size of the ionization tubes used is dependent on the airflow, size of the space, and severity of the pollution and odors. The Matterhorn 1000/1002 is a 120 or 240 VAC unit equipped with one (1) specified tube. The Matterhorn 1002 is equipped with two (2) specified tubes. The AtmosAir Matterhorn 1000/1002 series equipment is designed for minimal maintenance efforts. The 1000/1002 series has two components that require inspection and maintenance:

1. AtmosAir Matterhorn 1000 series base unit components
2. Ionization tubes

Because there are no moving parts, little maintenance is required, and the systems have very low failure rates. For more information, read the AtmosAir Matterhorn 1000/1002 series submittal documents.

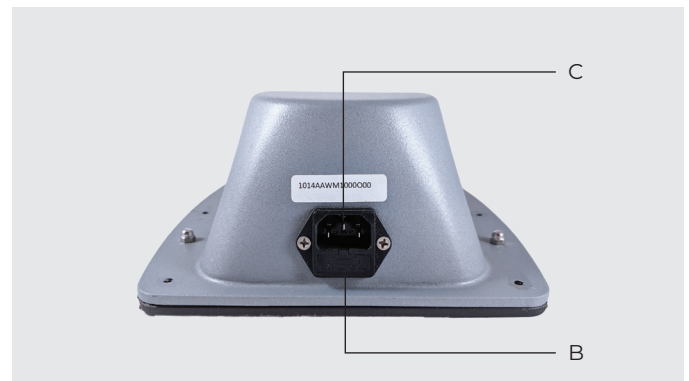
Pressure Drop Chart

	Tube Size	Tube Number	Flowrate (CFM)	mm / inch of WG	Pascals (Pa)	Steady State (mA)
M-1000	C	1	1,000	0.0102mm 0.0004"	0.01	34
	D	1	1,500	0.10156mm 0.0040"	1.00	35
	E	1	2,000	0.10156mm 0.0040"	1.00	35
	F	1	2,500	0.3048mm 0.0120"	2.99	37
M-1002	C	2	2,000	0.2032mm 0.0080"	2.00	34
	D	2	3,000	0.6121mm 0.0241"	6.00	35
	E	2	4,000	1.2243mm 0.0482"	12.00	35
	F	2	5,000	1.7348mm 0.0683"	17.00	37

Pressure Drop calculated at airflow velocity of 1500 f/m (7.62 m/s)

Control Panel Diagram

AtmosAir 1000/1002 Series Control Panel Layout:



- A. Power Transformer - Inside**
- B. Fuse Drawer (+1 Spare Fuse)**
- C. Power Cord Socket**
- D. 5-Step Ion Level Adjustment Knob**
- E. System Power Light**

Overall Mounting Plate Dimensions:

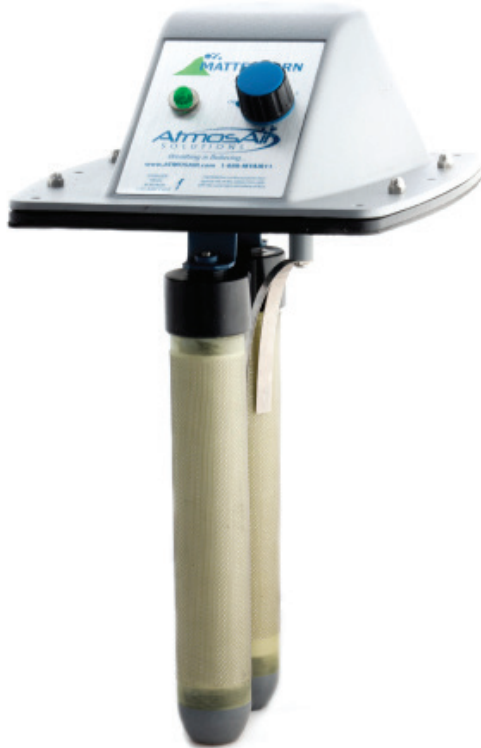
Height and Width: 222.25mm (8 ¾") x 215.90mm (8 ½")

02 INSTALLATION

The Matterhorn 1000/1002 series equipment can be mounted in-duct, using the faceplate mounting flange and its weather-strip gasket, or inside a plenum using a semi-custom mounting bracket. 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. Use the Duct Cut-Out and Quick-Change Plate Procedure for ideal placement of the Matterhorn 1000/1002 models.

When mounted on the side of a duct or air handler wall, the enclosure should not be exposed to moisture. If installing on outdoor exposed ductwork, a weatherproof enclosure with an access panel for servicing should be installed over the AtmosAir equipment. Contact AtmosAir Sales for A.W.E. specifications.

The AtmosAir Matterhorn 1000/1002 series operates on 120 VAC, 50/60 Hz. The tube and electrode contacts should not come into contact with any conductive surface. A minimum 50.8mm (2") clearance around the tube is recommended.



Mechanical Installation

1. Carefully remove the equipment from its shipping container. Inspect the main components, gasket, and tube(s) for damage. Verify that the unit's voltage rating is the same as the available voltage, 120 VAC.
2. 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 utilizing the blue cap, **DO NOT TWIST THE TUBE OR MOVE THE EMITTER SCREEN. DO NOT OVER-TIGHTEN THE TUBE!** Once the tube is secure, return the conductor strap to its normal position and **ENSURE SOLID, FLAT CONTACT IS MADE WITH THE TUBE'S OUTER MESH.**
3. **Location and Orientation:** Install the unit downstream of filters, coils, and fans with the ionization tubes vertical whenever possible (When installing a dual F Tube setup, the tubes **MUST** be mounted vertically, and 'S' clips are recommended); If multiple units are installed in the same duct, stagger the units in the airflow so they are not in the same airflow path.
4. The standard Matterhorn 1000/1002 power cord is 3.05 meters (10') long. Be sure to consider receptacle location in your placement plan. The receptacle or junction box must be within 2.44 meters (8') of the M 1000/1002.
5. **For in-duct installation:** Verify the flange gasket is in place and not damaged to ensure the unit seals properly. When making a cut-out in the duct, ensure there is at least 25.4mm (1") clearance from the duct wall on all four sides before cutting the 139.7 mm (5½") high × 152.4mm (6") wide mounting cut-out. A galvanized steel template is included for ease of installation; use the inner lines to cut the cut-out hole, then trace the cut-out and mark the locations of the mounting holes for the Matterhorn 1000/1002 series. The semi-circular cutout in the template should be oriented upstream if possible.
6. Using the marked holes from the backer-plate template, affix the unit securely in the duct using self-tapping screws (if not using backer-plate). Do not over-tighten, this may strip the screw hole. The unit is self-sealing to the duct, so no further sealing is needed.

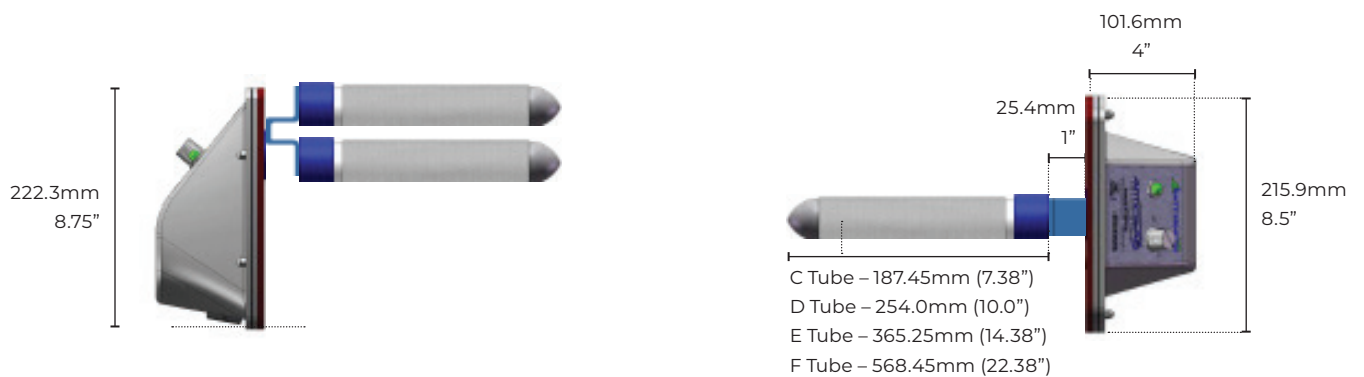
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- 7. For in-plenum/AHU installation:** Mounting varies with bracket-style. Follow mounting instructions provided with custom bracket. Typically, provide 50.8mm (2") of clearance from walls. Contact AtmosAir Sales for bracket options.
- 8.** Units should be installed to allow easy access for maintenance. Install units so that the 5-step power adjustment knob and status light are easily accessible and visible.
- 9.** In the case of the M1000, the second (forward-most) spring tang should be bent 90° upward, away from the rear tube and blue bracket.

Duct Cut-Out Dimensions



Overall Product Dimensions



Matterhorn 1002 Shown

Duct Cut-Out and Quick Change Plate Procedure

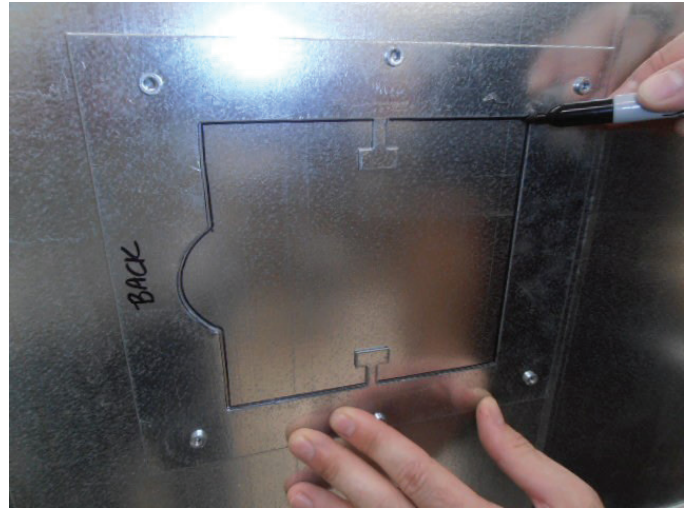
PLEASE READ ENTIRE PROCEDURE BEFORE STARTING:

Notes:

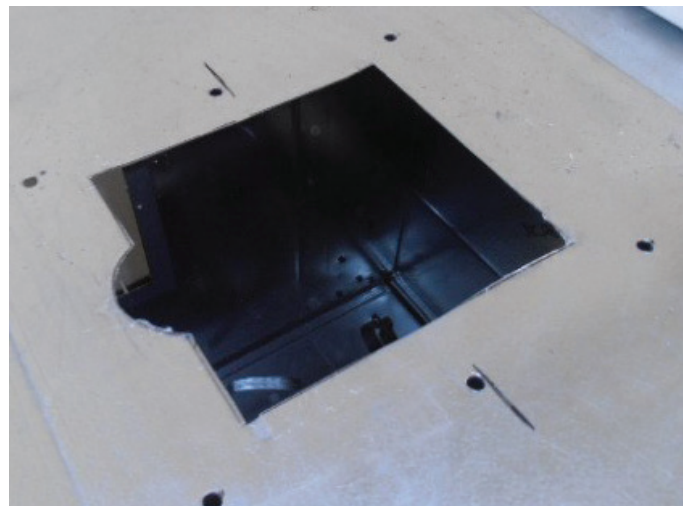
- Utilize the Quick-Change Plate (Q.C.P.) in thin ducts, fiberboard ducts or where relatively frequent dismounts may occur, however the Q.C.P. can be used in any duct mounting application.
- Additionally, the Q.C.P. may be used to compress loose fiberglass insulation and prevent damage due to airflow.
- It is not mandatory to use the Q.C.P. in all instances. #10 self-tapping screws are provided for other instances. Screw directly into duct. Use the Q.C.P. 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, 50.8mm (2") of clearance is recommended.

Procedure:

1. Always measure for clearances for the tubes and wires prior to any other steps. Then, place the Q.C.P. in the appropriate area.
2. Holding the Q.C.P. in place, use a marker to trace the INNER perimeter as shown in the image in the bottom-left. *Skip the "T" clamp features when tracing*.
3. Before removing the Q.C.P., also use the marker to mark the center point of the 6 PEM-NUT holes.
4. Using appropriate tools, cut out the traced area in the duct.
INSIDE PERIMETER.
5. Drill out the 6 marked holes with a 5 mm (3/16") or 6.5 mm (1/4") drill bit. **NOTE:** The Q.C.P. is sized so it will JUST slip into duct at an angle as shown in the image in the bottom-right.



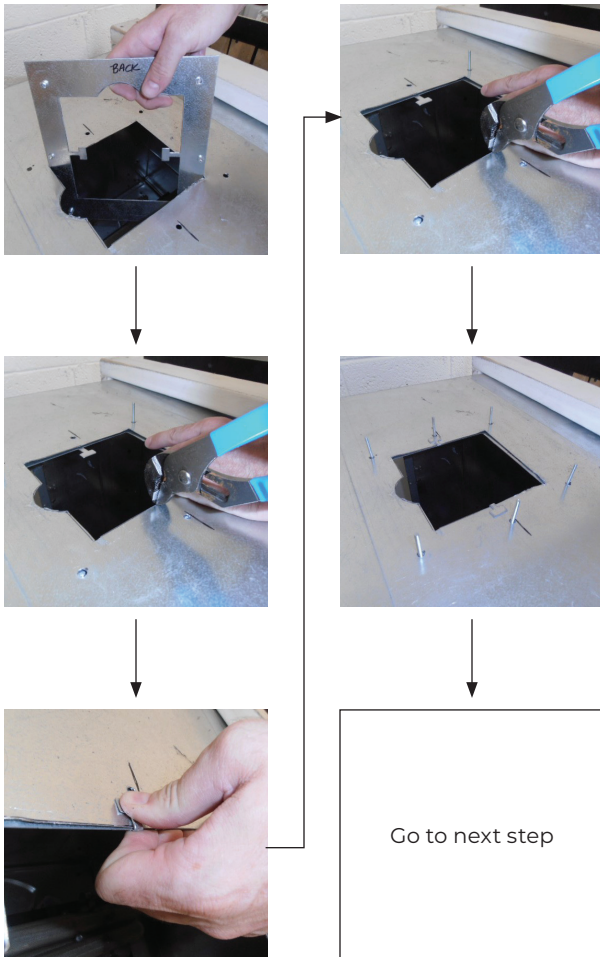
6. **DO NOT** Screw in the 8-32 x 38.1mm (1.5") long screws (provided) in from the **BACK** of the Q.C.P. until **AFTER** you have placed the Q.C.P. into the duct through the cut-out.
7. Align the Q.C.P. so that the PEM-NUTS are protruding into the duct, flat-side towards the duct wall. (This is so the Q.C.P. will sit flush to the inside of a duct.)



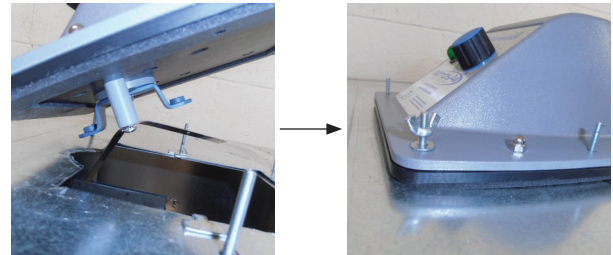
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8. Using the 'T' Clamp features in the Q.C.P, flatten the T clamps first with your thumb and then flush with the Plier. This feature is so the Q.C.P will not fall back through the hole. Then tighten screws securely.
9. Insert Tube(s) into the Matterhorn. Ensure that the Blue angled bracket is **UNDER** the Q.C.P.
10. Angle the Matterhorn into position with the **BLUE** tube

11. Align Screws through the holes in Matterhorn and place Matterhorn into position.
12. Install wing nuts and snug down until gasket is half compressed.



NOTE: TUBE INSTALLATION NOT SHOWN IN THESE PICTURES.



Dimensions on Next Page

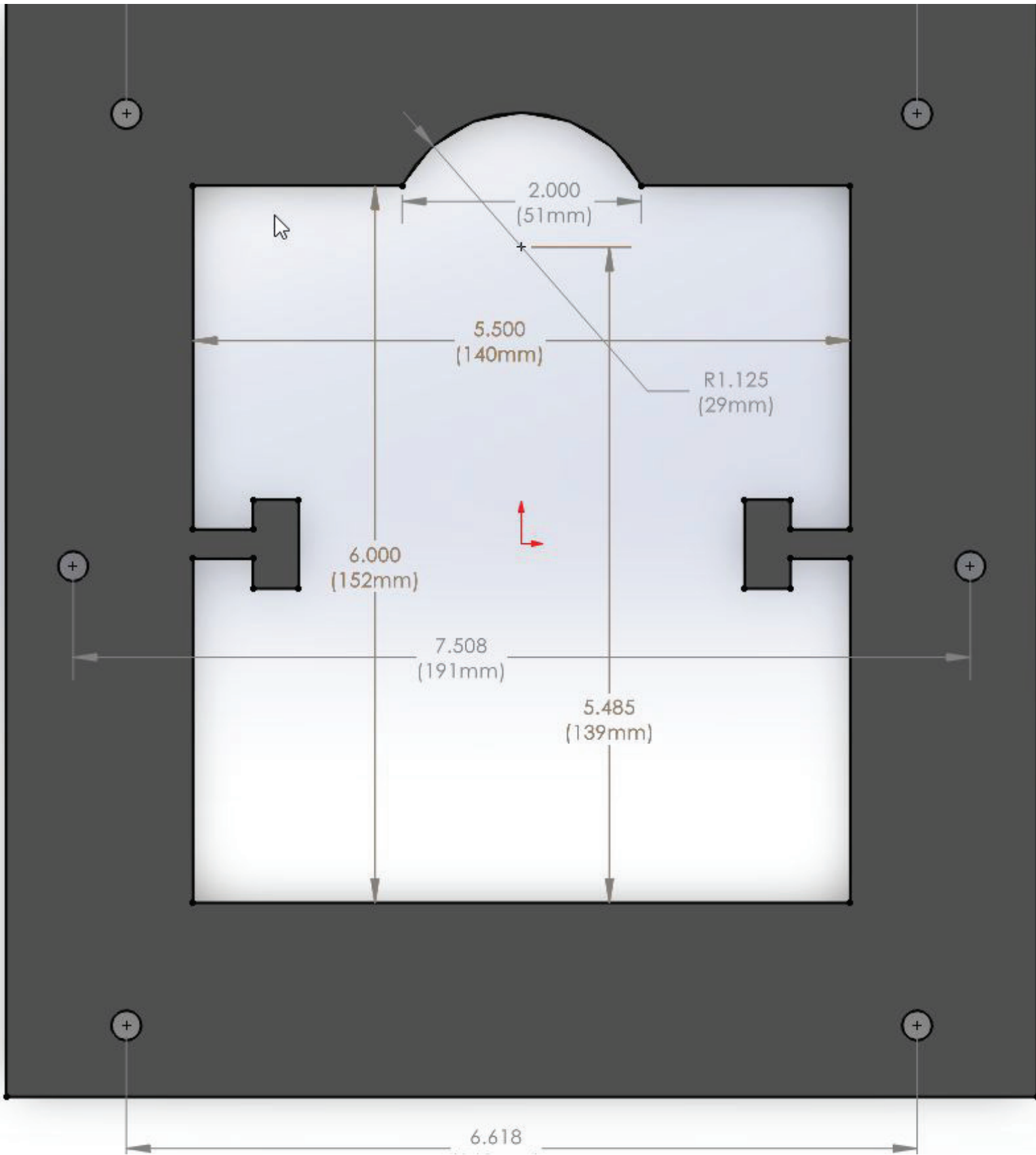
Electrical Installation

AtmosAir Matterhorn 1000/1002 series systems require approximately 6 watts per tube. An internal 1.25-amp, slow-blow fuse protects the unit.

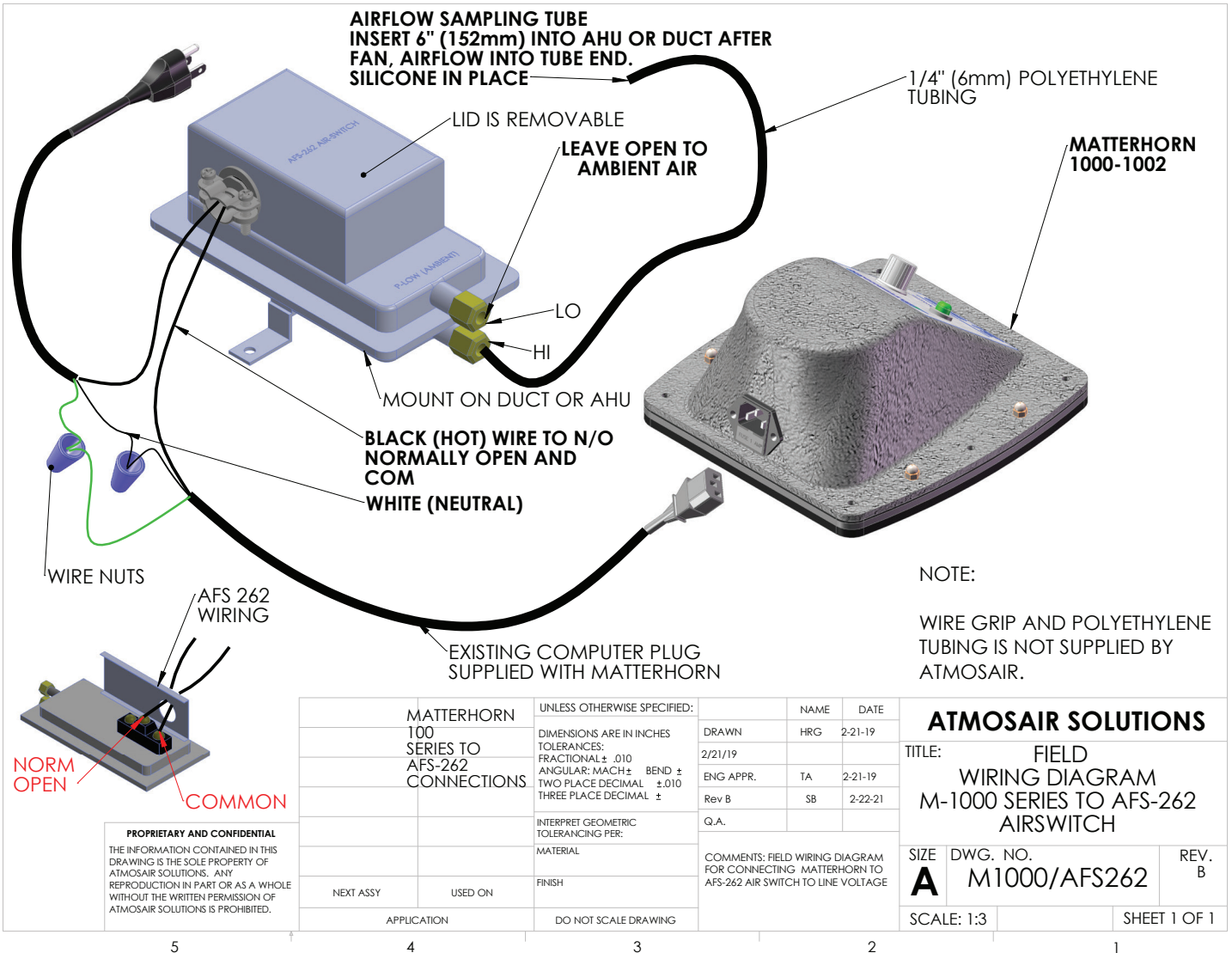
- Follow proper electrical procedures, guidelines, and codes for providing power to the systems, including requirements for conduit, sufficient ampacity, phase balancing, etc. Electrical installation should be performed by a qualified electrician.
- Field-install a power plug outlet or junction box within 8 feet (2.5 m) of the unit(s).
- Each Matterhorn 1000/1002 series unit is typically shipped with a 10-foot (3.05 m) power cord with a C-30 connector on one end and a 3-prong NEMA 5-15 plug on the other end. The plug can be cut off and wires stripped for junction box installations.

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 FIELD WIRING DIAGRAM



04 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 counterclockwise in the 'off' position.
2. Plug the power cord into the plug receptacle on the ionization system.
3. Turn the system on and set the ionization power knob to the appropriate setting (1-5, with 1 being low and 5 being high). The green embedded LED light left of the power knob should light up to indicate that the system is on, ionization has been activated, and high voltage is being sent to the tubes. The default setting for this device is #3.

The system is intended to deliver ions into the treated area such that the ion levels should be between 500 and 1500 negative ions/cm³. 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.

05 MAINTENANCE REQUIREMENTS

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.

The maintenance requirements on an AtmosAir system are mainly site-dependent; a heavily contaminated environment may require more frequent inspection and maintenance. A bi annual tube replacement is required. Your local AtmosAir dealer can provide you with a service contract.

Recommended Maintenance Procedures:

- Visually check the performance of the system by checking the green lights on the individual units. If the lights are on, then the unit should be 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 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 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 sandpaper 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. Install emitter mesh equidistant on the composite tube area.

Tube Replacements:

Bi-annual tube inspections are recommended, in addition to tube replacements once every two years 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.

06 TROUBLESHOOTING

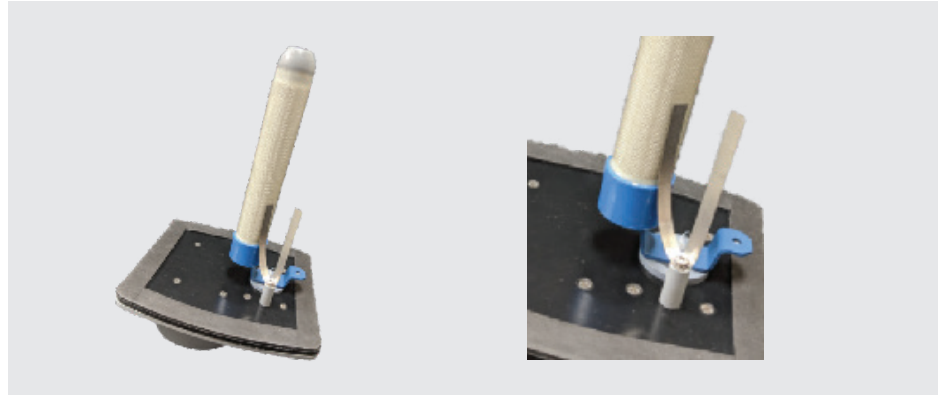
In the event that the system is not functioning, follow these steps **IN ORDER**:

1. Check the fuse. If it is blown, replace it with the appropriately sized slow-blow 1.25 A glass 5 mm × 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 to the 'off' position. Make sure all personnel are clear of the high voltage tubes, then re-connect the power supply. Rotate the Ion level dial to #1 and observe the green 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.
- 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. Inspect the tube for black dots indicating failed dielectric.
 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. The M1000/M1002 must be dismantled and carefully turned upside-down. Do not allow the unit to roll onto the ion level knob as this may damage it. If the tubes are functioning properly, they will buzz.
 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, 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. The technician must use a high voltage probe!
 10. If the fuse blows, then the system should be serviced by a qualified AtmosAir Technician. You can contact repair services at RMA@atmosair.com or by contacting us at 1-888-MY-AIR11.
 11. If the fuse continuously blows, or if the voltages are lower than expected, then the system should be serviced by a qualified AtmosAir technician.
 12. Otherwise, replace the damaged tube(s), clean and smooth any mounting plate or end cap carbon tracking, and return the system to service.

07 MECHANICAL INSTALLATION ILLUSTRATIONS



Above: Matterhorn 1002 Ionization unit. Here you see there are two Ionization Tubes installed, illustrating how the 'Spring Tangs' are flat against the tube.



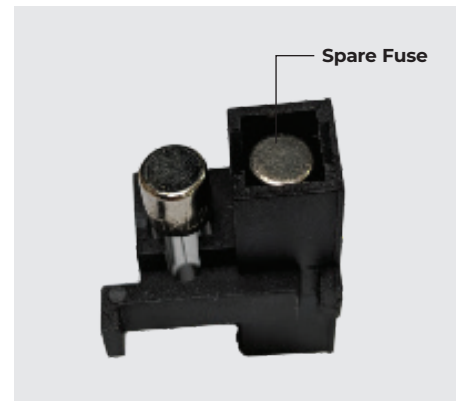
Above: Matterhorn 1000 Ionization unit. Here you will see there is one Ionization Tube installed towards the center of the device. **(This should always be installed with the tube closest to the center of the unit.)** The remaining unused 'Spring Tang' should be CAREFULLY bent by hand to a 90° angle. Please see the closer illustration above.



With the power plug removed, use a flathead screwdriver to pop the fuse drawer towards you.



Once popped loose, pull the drawer completely out towards you.



The 'operating' fuse is now exposed, along with the spare fuse (right).

08 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.

09 PRODUCT WARRANTY



CLEAN AIR GROUP, INC. – PRODUCT WARRANTY

Clean Air Group, Inc. d/b/a AtmosAir Solutions (“Clean Air Group”) warrants to the original purchaser of this product (“Customer”), that should it prove to be defective by reason of improper materials or workmanship, for **twenty-four (24) months** from the date of installation, or **twenty-seven (27) months** from the date of Clean Air Group’s original delivery of the product, whichever occurs first, Clean Air Group shall repair or replace the product without charge to the Customer. Proof of malfunction and return of the non-working product must be presented by the Customer if submitting a warranty claim. This warranty is invalid if the factory applied serial number has been altered or removed from the product. This warranty does not cover damage due to acts of God, misuse, abuse, negligence, or modification of or to any part of the product. This warranty does not cover damage due to improper installation, operation or maintenance, connection to improper voltage or electrical supply, or repair by anyone other than an authorized Clean Air Group service provider. To obtain warranty service the Customer must: (1) provide proof of purchase in the form of a Bill of Sale or receipted invoice, with evidence that the product is within the warranty period; (2) request a Return Merchandise Authorization (“RMA”) from Clean Air Group prior to shipping; and (3) ship the product with the RMA to Clean Air Group, freight prepaid, in either its original packaging or packaging affording an equal degree of protection. The product should be delivered to *AtmosAir, 2115 East Cedar Street, Suite 6, Tempe, AZ 85281*. All transportation charges and shipping expenses are the Customer’s responsibility. Clean Air Group will return the product by the same method it receives the product. A product returned for repair after the warranty period, or that shows damage outside of the warranty coverage described herein, shall be repaired for a reasonable charge as determined by Clean Air Group. The Customer will be advised of the cost of repair or replacement before Clean Air Group proceeds.

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Disclaimer:

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Manufacturer,

A handwritten signature in black ink, appearing to read "Anthony M. Abate".

Anthony M. Abate
Chief Technology Officer
Clean Air Group, Inc.