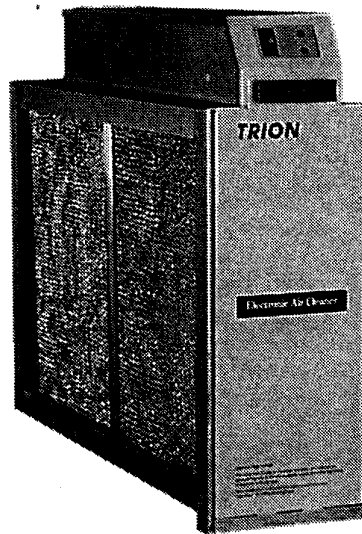


TRION[®]

IAQ 1400
IAQ 2000
IAQ 20x20
Trim TX

**Duct Mount
Electronic Air Cleaner**



Manual for:
Installation • Operation • Maintenance

CAUTION: Read installation instructions and rules carefully for safe operation.
Exercise the usual precautions when working with high voltage.

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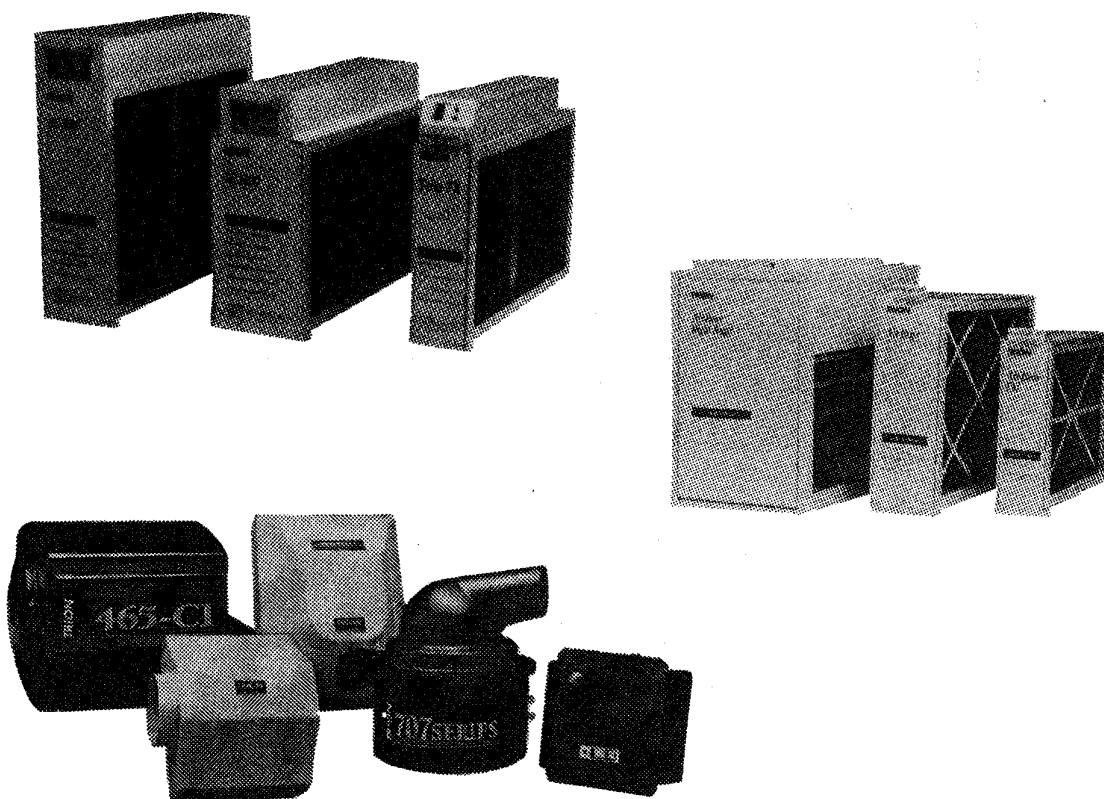
Dear Owner:

Congratulations on your choice of the Electronic Air Cleaner by Trion. Your family can now look forward to breathing cleaner air, year after year. We know, because we have been improving indoor air quality since 1947. Today, as then, we are committed to providing advanced products that improve the quality of the air you breathe.

The following information will familiarize you with the operation of your Electronic Air Cleaner and provide helpful tips on how to obtain maximum performance from your unit.

This manual provides information for installation, operation and service of the Electronic Air Cleaner. Before installation and use of the air cleaner, carefully read the instructions to assure safe operation, maximum benefits from the unit and to avoid needless service costs that can result from improper installation.

In addition, be sure to check out Trion's line of home humidification products to provide Personal Comfort for your entire family.

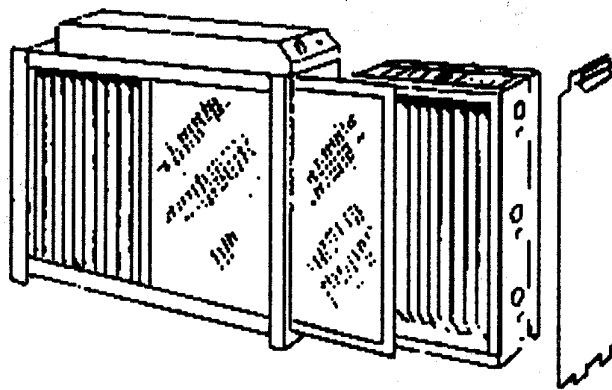


INTRODUCTION

This electronic air cleaner is technically known as a two-stage electro-static precipitator. The air cleaner is designed to remove airborne particulates, including dust, dirt, smoke, pollen, virus, spores, bacteria and mold, from indoor air.

Air movement through the unit is provided by the heating, air conditioning or ventilating system blower. As dirty air enters the air cleaner, the air passes through a metal mesh prefilter. The prefilter prevents lint, pet hair and other large particulates from entering the air cleaner. It is important that these filters be in place to prevent excessive dirt loading of the air cleaner collector cells. These filters extend the time between maintenance of the air cleaner collector cells. This allows the collector cells to provide clean air for a longer period between washings.

The prefiltered air then passes through a two-stage electronic air cleaner. In the first stage, all airborne particulate, even submicron size, are electrically charged (positive) as they pass through the ionizer. The ionizer field is set up by a corona discharge emanating from the fine, tightly strung wires suspended between two adjacent flat plates. In the second stage, the charged particulate passes through an intense electrical field established between alternately charged and grounded parallel plates. Here, the positively charged particulate is attracted to the negatively ground plates and removed from the air stream.



UNIT SPECIFICATIONS

This air cleaner is easy to install, operate and maintain. Its basic components are the:

Cabinet

Mounts to existing ductwork; houses the collecting cells and prefilters.

Ionizing-Collector Cells

Collect the dust, dirt and other particulate in the air. They contain the ionizing and collecting sections as described above. The cells must be installed with ionizing wires on the air intake side. A spring contact is located on the top of each cell and must be in position to make contact with the contact board assemblies on the bottom of the Power Supply.

Prefilters

Trap large particulates before it enters the collector cells.

High Frequency Power Supply Assembly

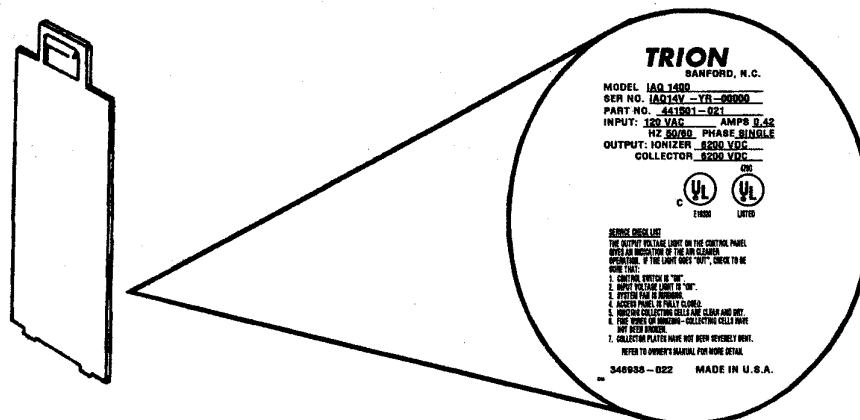
Contains the indicating light, solid state power supply, contact boards and electrical controls including ON/OFF switch and safety interlock switch. It also includes a wiring compartment located at the rear of the power supply assembly.

Air Flow Sensor (AFS)

Installed on certain models, this part controls the operation of the unit by sensing the movement of air within the duct. This helps to reduce power usage and prevents the possible buildup of ozone within the duct.

How to Identify Which Air Cleaner Model you own

The model number and part number for your electronic air cleaner can be found on the data label located on the inside of the Access Door. This part number will be a nine (9) digit number.



FACTS YOU SHOULD KNOW ABOUT YOUR NEW ELECTRONIC AIR CLEANER

Dusting and "White Dust"

Your new electronic air cleaner will efficiently clean and filter your household air. Unfortunately, it will not eliminate the need for regular dusting of your furniture and belongings. Due to the design of all duct-mounted air cleaners, they can only clean the air that reaches the air cleaner. Therefore, if the particulates are not being carried to the air cleaner in the air stream, the air cleaner cannot remove them from your home.

Occasionally a "white dust" may be noticed in bedrooms or newly furnished rooms. This is mainly composed of lint which, because it is heavier than other particulates, settles before it reaches your unit. This "white dust" is not mixed with airborne dirt particles, therefore, it is clean and has no staining or soiling properties. However, running the furnace blower continuously, day and night, will help reduce this from occurring.

Ozone

Under normal operating conditions all electronic air cleaners produce minute quantities of ozone as an incidental by-product. In fact, all electric products, such as televisions, cordless phones and refrigerators, produce some amount of ozone. The average homeowner can detect the smell of ozone concentrations as low as 25 to 100 ppb (parts per billion). The design of this unit has been tested and ozone production is approximately half of the published permissible limits established by the Environmental Protection Agency. These limits recommend that the concentration of indoor ozone not exceed 50 ppb. Ozone is not harmful in these concentrations. In fact, the ozone level in major cities can sometimes reach as high as 100 ppb on a summer day. The addition of optional charcoal after-filters can help reduce this.

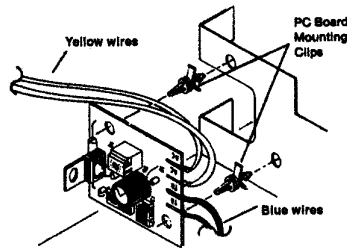
Normally, a new unit will produce more ozone than one that has been in operation for several weeks. This is due to sharp corners or manufacturing burrs on the ionizing-collecting cell(s) and is normal. As the electronic air cleaner arcs and zaps, the voltage is vaporizing these areas and tends to round them off. This is part of the breaking-in period of ownership and the issue is self-correcting. Also, high-altitude locations can be more susceptible to noticing the presence of ozone.

An ionizing-collecting cell that has been damaged or bent (the designed spacing between electrically charged and ground components has been decreased) may also produce an abnormal amount of ozone.

How the Air Flow Sensor Works (available on specific models)

Trion developed the electronic AFS to provide an efficient and reliable method of controlling the operation of the air cleaner when the dealer is unable to wire the unit directly into the furnace blower. The electronic AFS utilizes a thermistor that heats up to approximately 130° F. The AFS then stabilizes at this temperature and when the furnace blower turns on and air flows through the ductwork, the same vacuum effect pulls cooler air over the hot surface. This air movement cools down the thermistor and this cooling down effect allows the electronic AFS to understand that the furnace blower is moving air and the electronic air cleaner must turn on to provide air cleaning.

If the air cleaner is installed in a location that is dusty and dirty, the sensor on the AFS can become coated with dirt and lint. This coating can insulate the AFS and keep it from operating properly. To clean the thermistor, take a cotton swab dipped in rubbing alcohol and carefully insert it into the hole located on the right hand side of the power pack assembly (when facing the unit). The hole is $\frac{3}{16}$ " in diameter and is located approximately 3" from the front and 1" from the bottom of the power pack assembly. Carefully twirl the cotton swab between your fingers, making sure the tip is lightly in contact with the grey disc. This will clean the dirty coating from the thermistor and allow the AFS to function properly.



AFS TROUBLESHOOTING

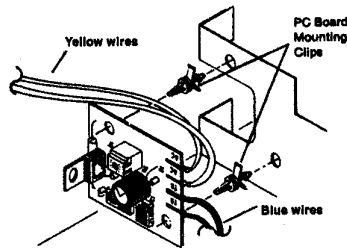
Trion recommends that the following procedure only be performed by an authorized HVAC contractor. Failure to do so may expose an individual to personal injury.

1. Make sure the furnace blower is not operating, the rocker switch is OFF and the circuit breaker is turned OFF.
2. Remove the power pack access cover.
3. Locate the AFS. It is a circuit board with a small grey disc connected to the circuit board by two (2) silver wires. Carefully bend the thermistor so that it is located in the center of the opening and approximately $\frac{1}{8}$ " from the inside edge of the power pack assembly.
4. Reinstall the power pack access cover and test the unit.

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4. Reinstall the power pack access cover and test the unit.

High Altitude Operation

Because the air is less dense at higher altitudes, there is a possibility of nuisance arcing. To reduce this, cut the red jumper wire on the power supply printed circuit board. This will slightly reduce the output voltage, minimize arcing and reduce ozone production. The red jumper wire must be cut in installations over 5,000 feet (Figure 1).

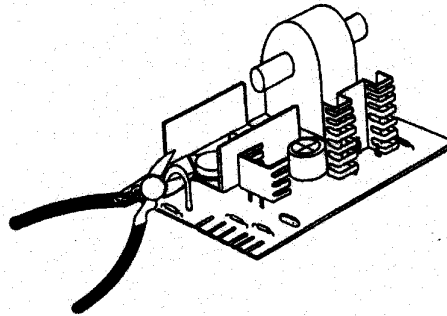


Figure 1

REPLACING THE IONIZING WIRES

Ionizing wire breakage is minimal because of the constant tension design and fixed location of the ionizing wire supports. When an ionizing wire breaks, the efficiency of the electronic air cleaner will decrease. However, the unit will continue to operate with broken ionizing wires as long as the broken wires have not caused a short circuit of the unit. Remove all loose and broken wires as soon as they are identified.

Wires are supplied in a coiled spring configuration, with a clinch nut on each end of the wire. Replacement requires a pair of needle nose pliers. Exercise caution in removing any broken wires in the collector cell. This will prevent accidental shorting of the cell and reduce the need for further maintenance.

Use the following procedure when replacing an ionizing wire.

1. Ensure that all power to the electronic air cleaner is OFF and remove the ionizing-collector cells from the unit.
2. Carefully remove all remains of the broken wire.
3. Grip the new wire at each end of the wire with your thumb and index finger. While stretching the wire to approximately 6" allow one end of the wire to uncoil between your thumb and index finger.
4. Place one end of the wire in the slot of the stainless steel support on the collector cell from the front of the cell. This support is partially covered by the cell brace in front of the support.
5. Grip the other end of the ionizing wire with needle nose pliers and insert the terminated end of the wire into the slot on the support bar of the opposite end of the collector cell.
6. The wire should be tight enough to be self supporting and remain suspended between the two support slots in the support bar.

Common Questions & Answers

Q. Why isn't my air cleaner cleaning my air?

A. The air cleaner is most likely working just like it was designed. However, many factors can affect the performance of the unit. Are cold air registers located in the ceiling? If so, it will be difficult for the air flow to carry heavier particulates to the air cleaner. If the dirt doesn't get to the air cleaner, it can't be removed from the air. If the unit is an IAQ Series, are both the Red and Green lights illuminated? If not, then the unit may be in need of servicing. Contact your local Trion HVAC dealer for assistance.

Q. It still isn't cleaning my air the way I want it too. What can I do?

A. Trion recommends that you run the blower continuously so that the air movement will carry the dirt to the air cleaner. Unfortunately, there will always be some dirt that is left behind on appliances, furniture, etc. Regular dusting is recommended to stir up these pockets of dust so that they can enter the airstream and be removed by the electronic air cleaner.

Q. When I turn on my electronic air cleaner, the lights come on for a couple of seconds and then turn off. The air cleaner isn't working!

A. The air cleaner is fine as long as the Red and/or Green light(s) are coming on. Try turning the HVAC blower OFF and then turning the electronic air cleaner on. This should solve the problem.

Q. What is the zapping noise I'm hearing from my unit? Should I be concerned?

A. The zapping or popping noise that you are hearing is the sound of larger particles being "vaporized" by the ionizing-collector cell. This is normal and is no cause for alarm. As your HVAC system blower moves the air through the ductwork and allows the electronic air cleaner to clean the air, this noise will diminish. However, there will always be instances when larger particles enter the ionizing-collector cell.

Q. Should I hear this zapping noise all the time?

A. All electronic air cleaners will occasionally zap or pop as larger particles pass through the ionizing-collector cells. However, if the sound is constant or is repetitive in nature, then a large particle may have become lodged in the ionizing-collector cells and they may require cleaning. If cleaning the ionizing-collector cells does not stop the noise and there are no large particles trapped in the ionizing-collector cells, then the cause could be a broken/loose ionizing wire, bent collector plate or other mechanical reason. Please contact your local Trion HVAC dealer for assistance.

- Q. What if I no longer hear any popping or zapping noises coming from my unit? Is it still cleaning the air?
- A. If the zapping noises stop and the air cleaner is not in need of servicing, then one of two situations have occurred. First, the electronic air cleaner has successfully removed all larger particles from the air and is cleaning microscopic particles which do not cause the zapping noise. Second, the blower and/or HVAC system is not running and air is not flowing through the ductwork. The electronic air cleaner cannot remove particles if the air stream is not moving.
- Q. I lost power to my home during a storm. Should I worry about the electronic air cleaner?
- A. The most common problem associated with power outages is the unit will not turn on properly after power is restored. If the Red and/or Green light(s) come on for a couple of seconds and then go off, the unit is OK. Just turn the HVAC blower off, turn the unit ON and then turn the blower back on. If the Red and/or Green light(s) do NOT come on after a storm, the power supply in the electronic air cleaner may be short circuited. Contact a local HVAC contractor for further information.
- Q. My installer told me to keep my blower on all the time, but I don't want to increase my power bill. What should I do?
- A. Trion recommends that you keep your HVAC system blower running all the time to achieve the maximum air cleaning efficiency. This will allow the electronic air cleaner to do what it was designed to do, which is clean the air. Remember, if the air does not reach the air cleaner, it cannot be cleaned. On average, your electronic air cleaner will use the same amount of electricity as a 55W light bulb. The energy usage of the HVAC system blower will depend on the age of your system, energy costs in your regional location and other variables. The best solution is to try running the HVAC system blower in continuous mode for a month or two to estimate your annual energy costs and base your final decision on what you feel most comfortable with.

NOTICE: Handle ionizing-collector cells with care as plates can be sharp and cause injury if not handled properly.

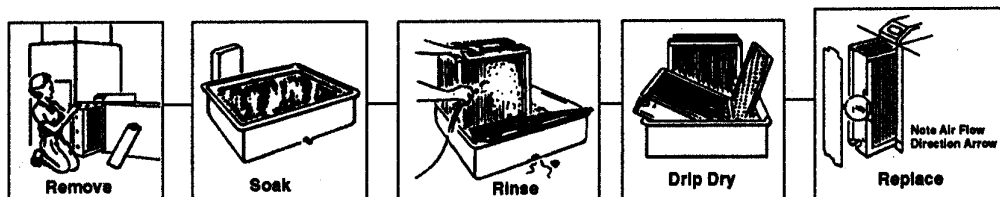


Figure 2

MAINTENANCE OF YOUR ELECTRONIC AIR CLEANER

WASHING CELLS AND PREFILTERS

Regular washing is necessary to ensure proper performance. A thorough washing once every two months will be adequate for most installations. More frequent washing (once a month) may be necessary on some installations (new homes for example) where there is new carpeting, plaster dust, or excessive cigarette smoke (Figure 2).

To remove cells and prefilter

1. Push air cleaner switch to the OFF position. Wait 15 seconds. Open access door.
2. Carefully remove cells and prefilter(s) and set aside in a safe place.
3. Do not drop the ionizing-collector cell. This could cause damage to cell plates or ionizing wires and cause excessive arcing and noise.

To wash cells and prefilter(s)

1. Place enough hot water in a utility tub to cover the first cell. Dissolve 2 to 4 oz. of granulated automatic dishwasher detergent (not laundry detergent) in the water.
2. Allow the cell to soak for 30 minutes. Agitate it up and down in the solution until it appears clean and remove.
3. Repeat with second cell.
4. Agitate the prefilters up and down in the solution until they appear clean.
5. With a hose, rinse the cells and prefilters. The hose should be held about 10" from the cell plates and at a slight angle for better cleaning results. Be careful not to spray the ionizing wires directly with the hose. The water pressure can cause the wire to snap and break. The cell frame should be thoroughly rinsed along the edges to dislodge any trapped lint or dirt. Carefully wipe a damp cloth or sandpaper (not emery cloth) along the ionizing wires.
6. Stand cells and prefilters up to drain. Let dry two hours. You may experience a slight discoloration of the aluminum collector cells after washing. This is a normal chemical reaction and will not harm your unit or affect its' performance.

To replace cells in air cleaner

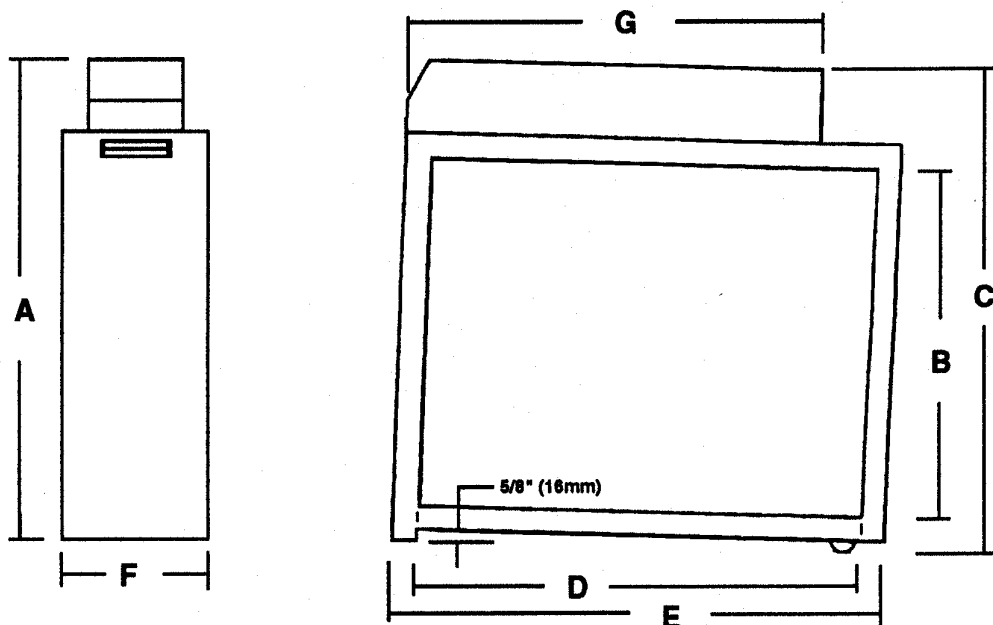
1. Replace prefilter and cells in cabinet. Check that arrow on cells points in same direction as air flows through the duct. (If you have to force it past the positioning screw on bottom, it is probably in a wrong position.)
2. Replace access door (engage tabs on lower edge of door into slots in cabinet). Carefully close door.
3. Turn air cleaner switch to ON.

COMMON TROUBLESHOOTING TECHNIQUES

SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
Rapid arcing or zapping OR Excessive ozone smell	Broken or loose ionizing wire(s)	Remove broken or loose wire and replace with new wire
	Dirty ionizing-collector cell	Clean as outlined on page 10-11
	Damaged or bent collector plates	Straighten plates with needlenose pliers or replace entire ionizing-collector cell
	Dirty insulator caps on ionizing-collector cell	Clean with warm soapy water and rinse well
Excessive ozone smell	Air cleaner is wired directly to a 120V power source	Qualified HVAC contractor must install AFS or rewire air cleaner to the HVAC system blower
	Loose high voltage connections	Repair or replace the component
	Radio or television interference	Uncommon occurrence -- check for good common ground for air cleaner
Hissing or sizzling noise	Poor electrical contact	Ensure that there is a good connection between the top of the ionizing-collector cell and the bottom of the contact board assembly Contact HVAC contractor
Red LED light is not ON (applicable for all models)	Loose wiring within power pack assembly	Check for secure connections Contact HVAC contractor
	Broken or shorted electrical component	Contact HVAC contractor
	Excessive dirt build up on ionizing wires	Clean wires with alcohol and allow to dry thoroughly before turning the unit ON
	Contact board assemblies are corroded or carbonized	Replace contact board assembly
	Broken ionizing wire	Remove broken wire and replace with new wire
	Dirty ionizing-collector cell	Clean as outlined on page 10-11
	Foreign object located between collector plates	Remove object from ionizing-collector cell
	Damaged or bent collector plates	Straighten with a pair of needle-nose pliers or replace cell
	Insulators are corroded or carbonized	Replace insulators or ionizing-collector cell
Green LED light is not ON (applicable for IAQ Series only)	No power available	Reset circuit breaker Replace fuse
	Loose wiring at ON/OFF switch	Check for secure connection
	Defective ON/OFF switch	Replace ON/OFF switch
	ON/OFF switch not in ON position	Turn the unit ON

Table 1

UNIT DIMENSIONS - All dimensions in inches (mm)



Models	A		B		C		D		E		F		G	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Trim TX (16 x 25)	20 1/2	521	13 7/8	352	16 1/4	413	22 1/2	572	25	635	5 1/4	133	20 3/4	527
IAQ 1400 (16 x 25)	20 1/2	521	13 7/8	352	16 1/4	413	22 1/2	572	25	635	7-1/4	184	20 3/4	527
IAQ 1400 (20 x 20)	24 1/2	622	17 7/8	454	20 1/4	514	19	483	21 3/8	543	7-1/4	184	20 3/4	527
IAQ 2000 (20 x 25)	24 1/2	622	17 7/8	454	20 1/4	514	22 1/2	572	25	635	7-1/4	184	20 3/4	527

Dimensions are the same for both models with and without Air Flow Sensors installed

**The following section is to be
used by a qualified HVAC
contractor or installer ONLY.**

These procedures are not to be attempted by any person not qualified to work with high voltage or familiar with the installation of this type of air cleaner.

Trion cannot be held responsible for any injury or damage by any person not qualified to install this product.

TECHNICAL SPECIFICATIONS

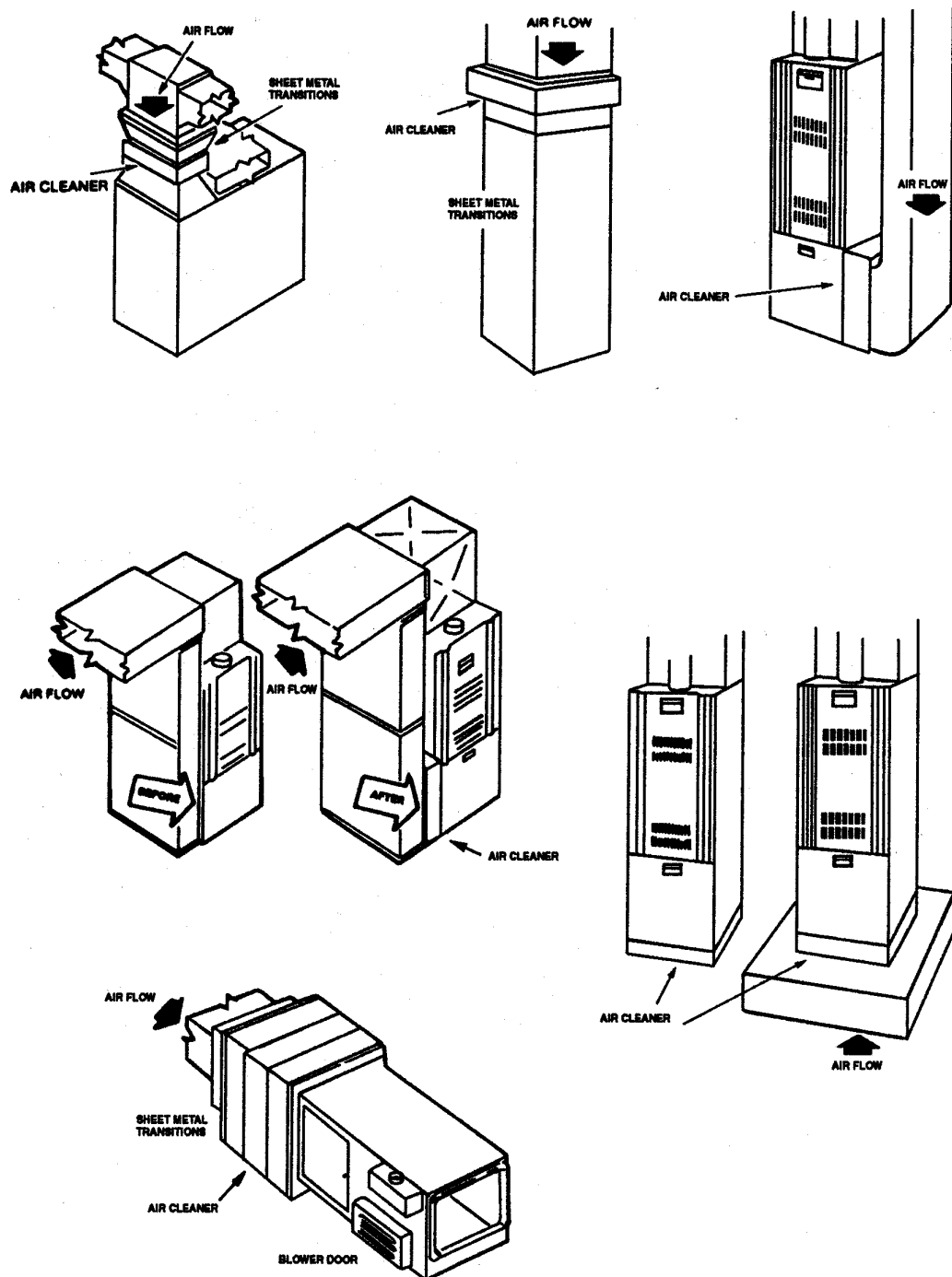
(Specifications subject to change without notice.)

MODELS WITHOUT AIR FLOW SENSOR INSTALLED AT FACTORY	IAQ 1400 (16" x 25")	IAQ 1400 (20" x 20")	IAQ 2000 (20" x 25")
PART NUMBER	441501-021	441890-017	441500-021
UNIT COLOR	Unpainted cabinet w/ grey Access Door	Unpainted cabinet w/ grey Access Door	Unpainted cabinet w/ grey Access Door
AIR FLOW SENSOR INSTALLED	NO	NO	NO
ELECTRICAL INPUT	120V, 60 HZ, 1 PH	120V, 60 HZ, 1 PH	120V, 60 HZ, 1 PH
MAXIMUM RATED AIR FLOW	1400 CFM (2380 m ³ /hr.)	1400 CFM (2380 m ³ /hr.)	2000 CFM (3400 m ³ /hr.)
MAXIMUM PRESSURE DROP	.10 inch w.g. @ 1400 CFM	.07 inch w.g. @ 1400 CFM	.10 inch w.g. @ 2000 CFM
CELL WEIGHT (2 CELLS IN EACH UNIT)	10 lbs each (4.5 kg)	9 lbs each (4.1 kg)	12 lbs each (5.4 kg)
UNIT WEIGHT	41 lbs. (18.6 kg)	41 lbs. (18.6 kg)	46 lbs. (18.6 kg)
MAXIMUM POWER CONSUMPTION	40 watts	40 watts	48 watts
ELECTRICAL OUTPUT	2.5 mADC @ 6200 kVDC	2.5 mADC @ 6800 kVDC	3.2 mADC @ 6200 kVDC

MODELS WITH AIR FLOW SENSOR INSTALLED AT FACTORY	IAQ 1400 (16" x 25")	IAQ 2000 (20" x 25")	Trim TX (16" x 25")
PART NUMBER	441501-031	441500-031	441502-010
UNIT COLOR	Unpainted cabinet w/ grey Access Door	Unpainted cabinet w/ grey Access Door	Beige
AIR FLOW SENSOR INSTALLED	YES	YES	YES
ELECTRICAL INPUT	120V, 60 HZ, 1 PH	120V, 60 HZ, 1 PH	120V, 60 HZ, 1 PH
MAXIMUM RATED AIR FLOW	1400 CFM (2380 m ³ /hr.)	2000 CFM (3400 m ³ /hr.)	1200 CFM (2040 m ³ /hr.)
MAXIMUM PRESSURE DROP	.10 inch w.g. @ 1400 CFM	.10 inch w.g. @ 2000 CFM	.07 inch w.g. @ 1200 CFM
CELL WEIGHT (2 CELLS IN EACH UNIT)	10 lbs each (4.5 kg)	12 lbs each (5.4 kg)	6 lbs each (2.7 kg)
UNIT WEIGHT	41 lbs. (18.6 kg)	46 lbs. (18.6 kg)	32 lbs. (14.5 kg)
MAXIMUM POWER CONSUMPTION	40 watts	48 watts	40 watts
ELECTRICAL OUTPUT	2.5 mADC @ 6200 kVDC	3.2 mADC @ 6200 kVDC	2.5 mADC @ 6200 kVDC

TYPICAL MOUNTING POSITIONS

Illustrations are for positioning use only



PLANNING THE INSTALLATION

Application

The air cleaners are used in forced air heating cooling and ventilating systems. The air cleaner should be installed in the system so that all the system air is circulated through the air cleaner. The air cleaner will only remove the airborne contaminants delivered to it. Maximum performance is obtained when the system blower is set for continuous operation.

Installation Requirements

The best location for the air cleaner is in the return air duct next to the blower compartment. In this location, the blower motor and cooling coils will be kept clean.

***DO NOT INSTALL THE AIR CLEANER
IN THE DISCHARGE AIR DUCT.***

Before installing the air cleaner, consider the application and type of HVAC system present. Refer to the section entitled **Typical Mounting Positions**, for the most common types. If a transition between the ductwork and air cleaner is required, refer to section entitled **Transitions**. The unit must be readily accessible for periodic inspection and cleaning of the prefilters and electronic cells to maintain maximum efficiency and trouble-free operation.

Air Conditioning

The air cleaner should be installed upstream of the cooling coil. This will keep the coil clean and reduce air conditioning coil maintenance. Improved cooling efficiency is the result and directly affects energy costs. A clean coil will reduce utility costs. If the air cleaner is downstream of the cooling coil, condensation will form on the cooled collector plates when the air conditioner cycles. This will allow water droplets to form on the collector plates and cause nuisance arcing. Arcing will reduce air cleaner efficiency and reduce the life of the high voltage power supply.

Evaporative Humidifiers

An evaporative type humidifier, such as the Trion G-100, G-200, 447-C1 or 465-C1, can be mounted either upstream or downstream of the air cleaner, depending upon the desired humidification capacity.

Atomizing Humidifiers

If an atomizing humidifier such as a Trion 50 Mister is installed, it must be mounted downstream of the furnace to ensure proper evaporation of the water droplets into the warm air.

If an atomizing humidifier, such as a Trion 707 Series humidifier, is installed, it must be mounted upstream of the air cleaner.

1. Mount it as far upstream as possible. (Recommended distance is at least 10 feet.)
2. Install a standard disposable furnace filter between the humidifier and the air cleaner to trap water droplets and hard water deposits.
3. Clean the air cleaner more frequently to prevent a hard water buildup.

Sheet Metal Installation

The electronic air cleaner is adaptable to all new or existing residential forced air furnace and cooling systems.

Transitions

If the air duct does not fit the air cleaner cabinet opening, gradual transitions are recommended to reduce air turbulence through the air cleaner and maximize efficiency. Not more than 20° (about 4" per running foot) of expansion should be used on each side of the transition fitting (Figure 3).

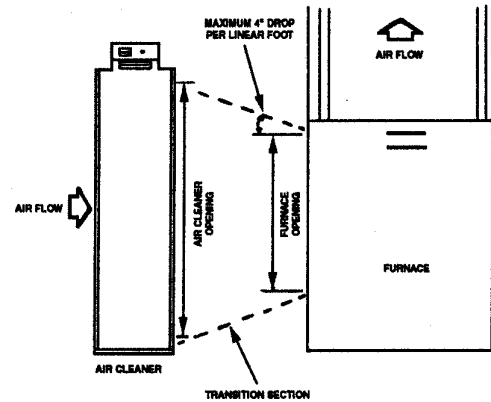


Figure 3

Outdoor Air

When outdoor air is added to the return air duct, sufficient heat should be added to maintain the return air temperature at 40°F (4°C) minimum. Lower temperatures can cause ionizer wire failure.

Turning Vanes

If the air cleaner is installed adjacent to a 90° duct elbow, add turning vanes inside the duct to improve air distribution across the face of the air cleaner (Figure 4).

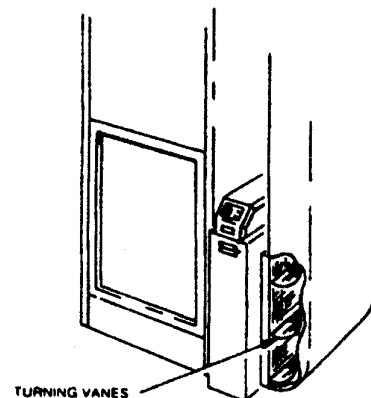


Figure 4

SELECT LOCATION FOR AIR CLEANER

Remember to select a location that is readily accessible for periodic inspection and cleaning of this air cleaner. Allow a minimum of 18" clearance in front of the access panel and 12" clearance above the power pack cover plate for component removal and service space. For complete dimensions required refer to the section entitled **UNIT DIMENSIONS**.

DIRECTION OF AIR FLOW THROUGH THE AIR CLEANER

This air cleaner is set up for left to right air flow when you are facing the access door.

For right to left air flow, follow these directions:

1. Remove the prefilter(s) and cells from the cabinet. A plastic positioning spacer is located inside the bottom of the cabinet. This spacer is secured to the cabinet using a #6-32 round head Phillips drive thread cutting screw to allow installation of the cells in the proper position with respect to air flow (Figure 5).

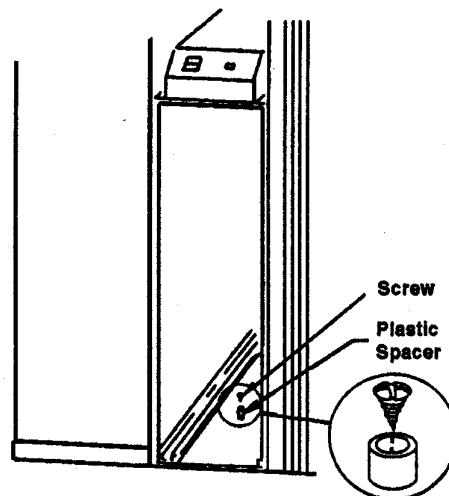


Figure 5

2. Remove the screw and reposition the spacer in the alternate hole at the bottom of the cabinet.
3. Replace the screw to insure the plastic spacer is not accidentally knocked out of place during normal maintenance. It must be installed in the hole provided closest to the air leaving side of the cabinet. Seal the unused hole with duct tape.
4. Turn cells around, replace in cabinet and replace prefilters on the air entering side. The directional arrows on the cell end plates must point in the direction of air flow.

INSTALLATION

CAUTION: Only a trained, experienced serviceman should install this electronic air cleaner. The power supply should be removed before installation. To remove the power supply, remove the two (2) screws (See Figure 6) in the top front of the cabinet. Remember to keep this hardware for reinstallation of the power supply when the air cleaner installation is complete. A thorough checkout of the unit installation should be completed before unit operation.

INSTALLER HELP LINE

If you have any questions on installation issues or problems, please call our Technical Support Department at **1-800-227-3917**

PHYSICAL INSTALLATION OF AIR CLEANER

This electronic air cleaner can be installed in any position, except with the access door facing down. The section entitled **TYPICAL MOUNTING POSITIONS** show examples of proper air cleaner mounting with a variety of furnace installations.

Prior to installing this product . . .

1. Read rules and instructions carefully for safe operation. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given on the product to make sure it is suitable for your application.
3. Select a location for the air cleaner.
4. Remove the old furnace filter and discard.
5. The air cleaner cannot remove existing dirt from the blower and ducts.

Clean the area thoroughly before you begin.

6. Remove unit access panel, and slide the prefilters and ionizing-collecting cells out of the cabinet. Place them safely aside with the warranty registration card.

NOTE: The following is a typical installation of the air cleaner on a highboy furnace. You may have to alter the installation to fit your particular application.

7. Locate the cabinet in the cold air return duct so that all of the return air flows through the unit (Figure 6). If the furnace and air cleaner openings are different, use a transition (Figure 3).
8. Mounting holes are provided for ductwork attachment (Figure 6). The .140" holes are sized for #8 sheet metal screws, or $\frac{1}{8}$ " rivets. If the adjoining ductwork is flanged, install the screws so that the screw heads are inside the cabinet. This will prevent damage to the prefilters and optional charcoal after-filter during removal and installation after cleaning.
9. After the unit has been secured, seal seams air tight with duct tape or caulking.

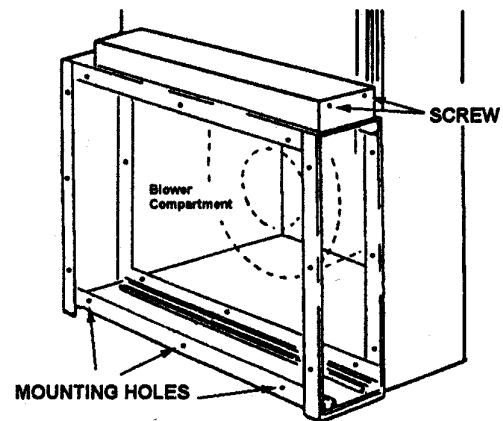


Figure 6

ATTENTION:

On electronic air cleaners that have the Air Flow Sensor installed at the factory, be especially careful not to cover the air flow sensor orifice when sealing the air cleaner and ductwork. This hole is located on the right hand side of the power pack assembly (when facing the unit). The hole is $\frac{3}{16}$ " in diameter and is located approximately 3" from the front and 1" from the bottom of the power pack assembly. In applications with minimum air flow, it is helpful to seal any openings on the power pack assembly or cabinet. This will increase the velocity of air flowing over the air flow sensor, enabling the air flow sensor to turn the electronic air cleaner on and off. The only opening required for actuation of the air flow sensor is the $\frac{3}{16}$ " diameter hole previously described.

9. Refer to the section entitled **DIRECTION OF AIR FLOW THROUGH THE AIR CLEANER**
10. Install prefilters and ionizer-collector cells.
11. Reinstall power supply on top of cabinet.
12. Reinstall cabinet front panel door assembly.

ELECTRICAL INSTALLATION

CAUTION:

If the electronic air cleaner is wired directly to the integrated accessory control on the furnace, it is imperative that the ampere rating of the control is sufficient to handle the current required by the air cleaner. All wire shall be in accordance with the National Electrical Code.

CAUTION:

Do not wire directly to a multiple speed blower motor. Wiring to a multiple speed blower motor will damage the power supply and void the warranty.

The electronic air cleaner (without the AFS installed at the factory) is designed to take advantage of the integrated accessory control panel available on most furnaces. The 120V electronic air cleaner tap on the furnace will provide power to the air cleaner only when the HVAC system blower is in operation.

Read the instructions in the furnace installation manual carefully before attempting installation or operation. Failure to follow these instructions may result in improper installation and therefore void warranty.

An optional electronic air flow sensor kit is available if the air cleaner is not equipped with an AFS. This air flow sensor will sense the air movement within the duct and turn the electronic air cleaner on and off accordingly.

PROCEDURE FOR WIRING ELECTRONIC AIR CLEANER TO INPUT POWER SOURCE

CAUTION:

- These procedures should only be attempted by a qualified HVAC technician or electrician.
- Risk of personal injury could occur by attempting to troubleshoot or repair this unit by untrained persons.
- Exercise the usual precautions when working with high voltage.
- When the circuit has been de-energized, always discharge any residual current in the secondary with an insulated handle screwdriver.
- Always ground power supply and ionizing-collecting cell when bench testing.

This electronic air cleaner is rated at either 120V or 240V AC and the input power can be picked up from a variety of sources. Trion recommends that you wire an electronic air cleaner directly to the integrated power taps located on the HVAC system. If the HVAC system does not have these power taps, then one of two methods of powering the unit can be used: current sensing relay (not provided) or an AFS (available on certain models)

CAUTION: Do NOT wire this electronic air cleaner directly to a multi-speed blower. Damage to the unit will occur and the manufacturer's warranty will be voided.

1. Remove power pack cover plate.
2. A field wiring compartment (with knock out holes) is located at the rear of the power pack assembly (Figure 7). The wiring should be directed from the integrated control panel of the furnace to the wiring compartment of the air cleaner.

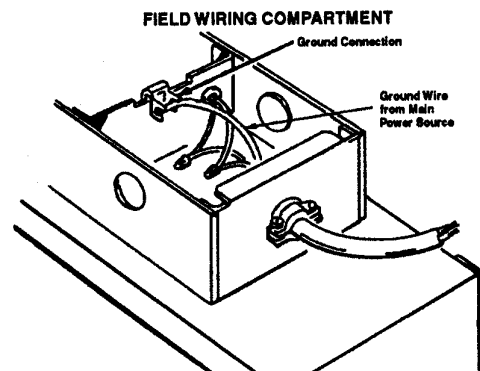


Figure 7

BYPASSING THE AFS

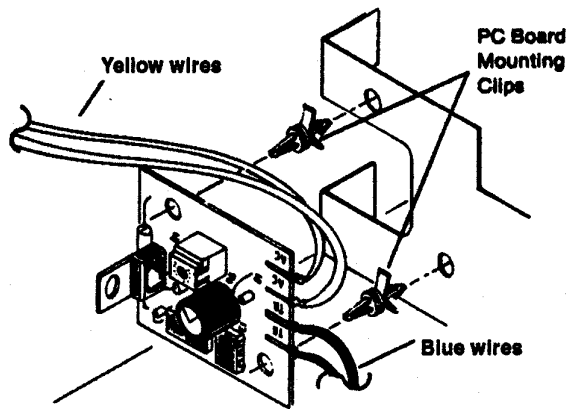
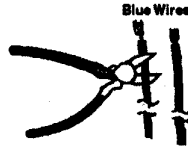


Figure 8

To bypass the AFS and operate the electronic air cleaner from integrated power terminals provided in the HVAC system follow these instructions carefully:

1. Turn the air cleaner OFF using the ON/OFF rocker switch on the front panel.
2. Disconnect the input power to the air cleaner at the circuit breaker panel controlling the air cleaner.
3. Remove the door from the front of the unit to gain access to the two (2) screws holding the power supply assembly to the top of the air cleaner (see Figure 8).
4. Remove the screws to gain access to the inside of the power supply assembly.
5. Place screws in a safe place for re-installation after modification is complete.
6. Remove the two (2) blue wires from the air flow sensor by carefully sliding the connectors from the board (See Figure 8).
7. Cut the terminals from the end of both blue wires.

8. Strip the wires $\frac{1}{2}$ " to expose the bare copper wire.



9. Using a wire nut or pigtail connector suitable for connecting two (2) 18 gauge wires, connect the ends of the wires together. Ensure that the connection is secure and that contact between the wires is present.



10. After connection of the wires in the wire nut or pigtail connector, pull on the wires to insure a good electrical connection.

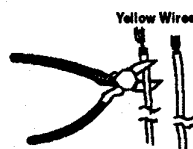


11. Remove the two (2) yellow wires from the air flow sensor (see Figure 8).

12. Cut the terminals from the ends of the yellow wires to expose the bare copper wire.

13. Double back the end of one (1) wire onto itself approximately 2" and tape with electrical tape.

14. Repeat the procedure for the second yellow wire.



15. Replace the power supply assembly cover and secure with screws removed in Step 4.



16. Replace the access door to the front of the air cleaner.
17. Your electronic air cleaner will now operate when the door is in place, the ON/OFF rocker switch in the ON position and proper input voltage is present in the junction box.

SYSTEM CHECKOUT

WARNING:

The following procedures should be conducted by a qualified HVAC contractor or repair person **ONLY**. These procedures will expose hazardous electrically energized components. Disconnect power between checks and proceed carefully.

To ensure your personal safety, be sure the HVAC system blower is turned OFF. After installing the electronic air cleaner, switch the ON/OFF rocker switch to the ON position. **A bright red segment of the rocker switch should be visible.**

1. The Red OUTPUT voltage light should now be on.
2. The light should go out in approximately 20 to 60 seconds. This is the normal time for the electronic air flow sensor to complete its stabilization period (see **HOW THE AIR FLOW SENSOR WORKS**).
3. Turn the HVAC system blower to the ON position. The red light should illuminate.
4. Check to ensure that the red light goes out when the following conditions occur:
 1. Cell access panel is removed
 2. Rocker switch is switched to the OFF position
 3. HVAC system blower is not running.

TROUBLESHOOTING

CAUTION:

- These procedures should only be attempted by a qualified HVAC technician or electrician.
- Risk of personal injury could occur by attempting to troubleshoot or repair this unit by untrained persons.
- Exercise the usual precautions when working with high voltage.
- When the circuit has been de-energized, always discharge any residual current in the secondary with an insulated handle screwdriver.
- Always ground power supply and ionizing-collecting cell when bench testing.

Recommended Service Tools

- Screwdriver, 8" common with insulated handle (plastic)
- Screwdrivers Phillips #1 and #2 with plastic insulated handles
- Needle nose pliers
- Multimeter
- High voltage probe

Indication of Electrical Trouble

The air cleaner is equipped with an Red OUTPUT voltage LED light for indicating proper unit operation. When the unit is in normal operation (with the HVAC system fan running, access door in place and rocker switch in the ON position) and the Red OUTPUT voltage LED light is not lit, the problem is a shorted secondary. Although failure of the indicating light should not be overlooked, this condition is unusual and rather remote.

PRIMARY CIRCUIT WITH FURNACE BLOWER OPERATING

If there is supply line voltage at the connections and no input voltage to the power supply, the outage can be located by checking operation of the safety switch and the interconnecting wiring with a multimeter. Refer to Circuit Diagram, (Figure 9) to check operation of the switches.

Follow these steps to test for proper operation of the circuit board and power supply assembly:

1. Ensure that the circuit breaker controlling the furnace blower is in the ON position and the main fuse is not open.
2. Set the multimeter for reading AC voltage at a 200 volt full scale for 120 volt units.
3. Connect one lead of the multimeter to the load side of the interlock switch. Connect the other lead to the common (white) lead at a convenient place in the power supply assembly. Depress the switch and measure the voltage. If there is no voltage reading, the switch is defective and should be replaced.
4. With the white lead still connected as in Step 3, connect the multimeter test lead to the load side of the ON/OFF switch. ON/OFF switch should be in the On position. Actuate the interlock switch and measure the voltage. If there is no voltage reading, the ON/OFF switch is defective and should be replaced.

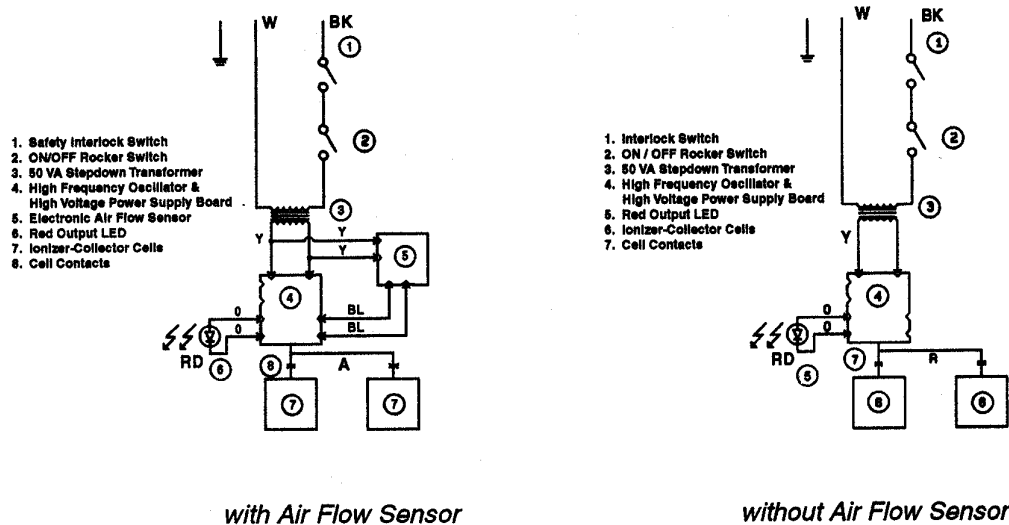


Figure 9

SECONDARY CIRCUIT

IONIZING-COLLECTING CELL

The cell is electrically energized through a contact terminal located at the top center of the cell. The ionizing wires and alternating collector plates are electrically charged while the interleaving plates are grounded.

If the space between the charged and grounded plates is bridged with conductive or semi-conductive material, a short circuit develops. The bridging or short may be caused by damaged plates, or foreign material lodged between/on the components. Since the cell should be periodically removed from the unit to wash away collected dirt, it is susceptible to physical damage. The cell also contains the ionizing wires which, due to their function, have been designed with minimal structural support and are susceptible to breakage. However, trouble related to a shorted collector cell is readily shown by the output indicating light and can be quickly isolated by a simple procedure.

To determine if a short exists in one or both of the collector cells, turn the electronic air cleaner OFF and remove both electronic cells from the cabinet. Shut the door and repower the unit. If the red performance light comes on, an electrical short exists in one or both of the electronic cells. Replace the cells in the unit, one at a time, to determine which cell is shorted.

Most troubles in the cell can be visually detected and corrected (Table 1).

NOTE: The ionizer collector cells are not designed for field repair. Ionizing wires and insulators can be field replaced. It is not recommended that you attempt to replace other cell components (i.e. collector plates, end plates, ionizer supports).

CHECKING THE UNIT FOR PROPER OPERATION

The primary and secondary circuits can be checked for proper output voltages using a multimeter and high voltage probe.

To check for proper operation, follow these steps:

1. Make sure the furnace blower is operating, the rocker switch is ON and input voltage is 120 volts, 60 Hz.
2. Remove front access door.
3. Remove power pack access cover.
4. If the unit has an AFS installed, bypass it by following the procedures outlined in the section entitled **BYPASSING THE AFS** on page 25.
5. Check the high voltage contact board assembly(s) for damage or carbon tracking.

NOTE: The cell contacts should be visually checked for corrosion, excessive dirt build up, and electrical arc tracking (Carbon path from stainless steel spring to grounded metal). Clean or replace as required.

6. Make connections from the high voltage probe to the multimeter in accordance with the operator's manual. The meter should be set for reading DC voltage on the 20 volt full scale.

7. Attach the high voltage probe ground lead to the cabinet. While depressing the safety switch lever, touch the ionizer wire support bar with end of the high voltage probe (Figure 10). The meter reading should be 6.2 kVDC or 6.8 kVDC \pm .2 kVDC (depending upon the specific model). See the section entitled **TECHNICAL SPECIFICATIONS** for more details.

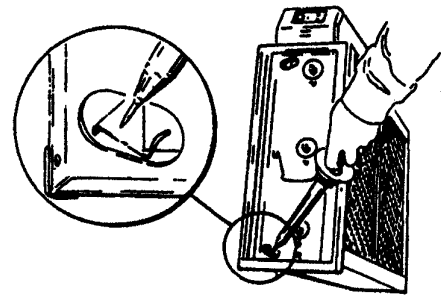


Figure 10

8. If no voltage is measured, remove the first cell and check the second cell. The meter should read 6.2 kVDC or 6.8 kVDC \pm .2 kVDC (depending upon the specific model).

9. If proper voltage is measured, the first cell is shorted.

10. If no voltage is present, remove the second cell. Install cell number one and measure voltage as described above. If voltage is present, the second cell, which is now out of the cabinet, is shorted.

11. If no voltage is present, remove both cells and measure the power supply output. While depressing the safety switch, touch the end of the high voltage probe to either the front or rear contact board assembly (Figure 11). The meter should read 6.2 kVDC or higher (depending upon the specific model).

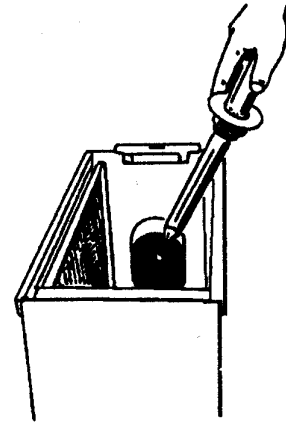


Figure 11

12. If no voltage is present, check the power supply. Set the multimeter for reading AC voltage at the 200 volt full scale and attach meter test leads.

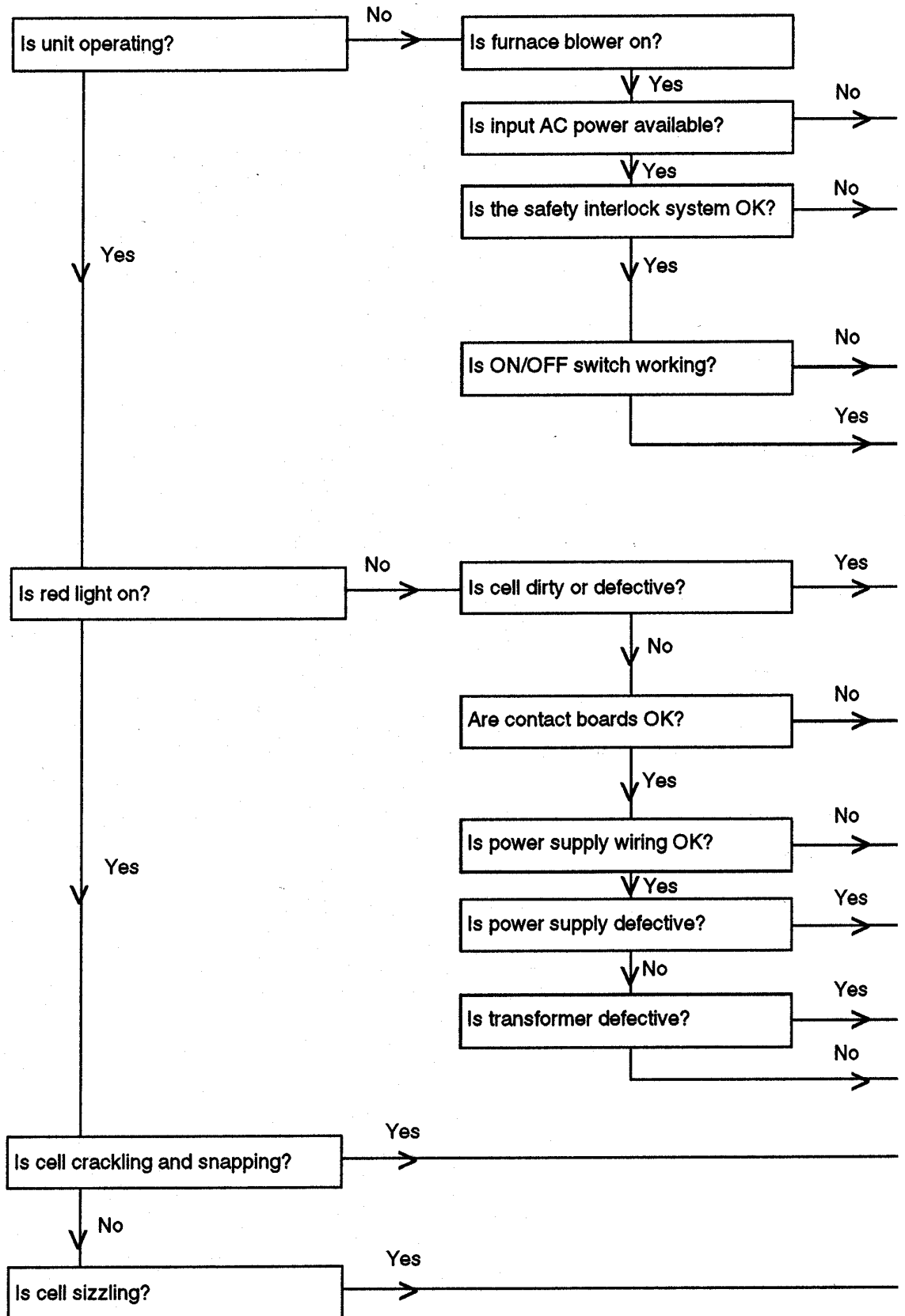
13. While depressing the safety lever, touch the two transformer output lead junctions to the power supply board with the meter leads and read the meter.

14. If there is no output voltage from 24V transformer, replace 24V transformer and power supply board.

15. If there is proper output voltage from 24V transformer, replace power supply.

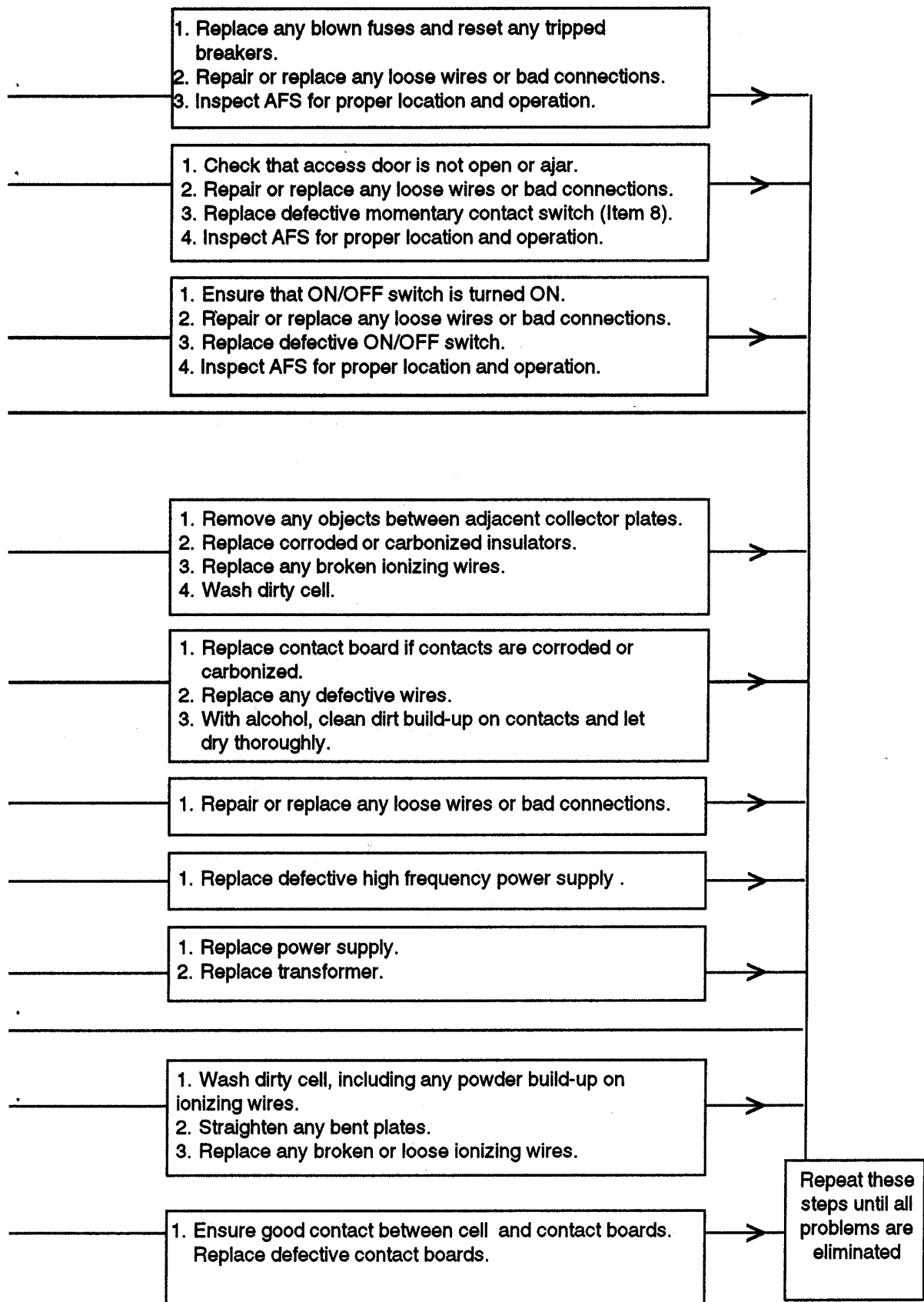
16. If necessary, reinstall the AFS that you disconnected in Step 4.

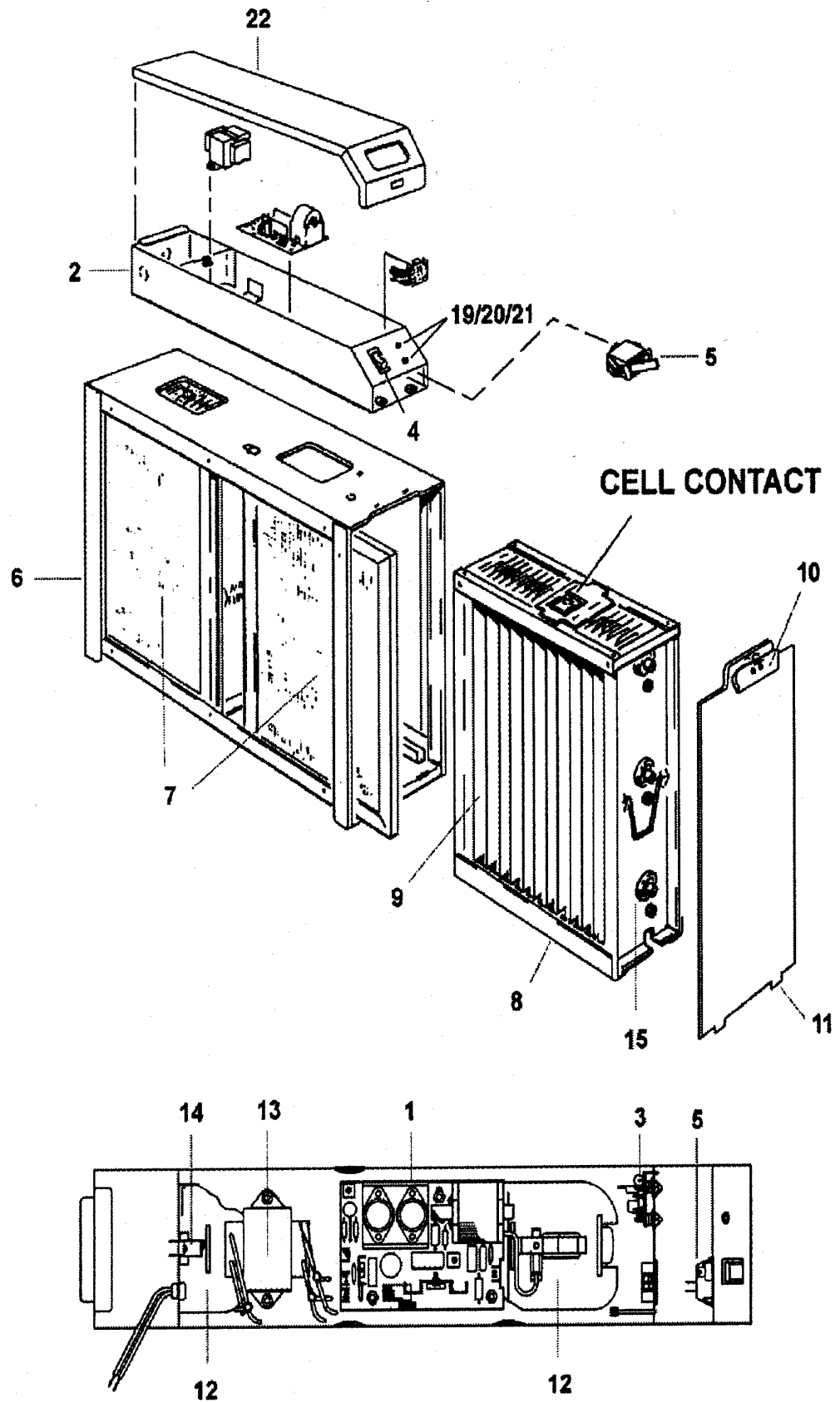
TROUBLE SHOOTING THE DUCT MOUNT ELECTRONIC AIR CLEANER



WARNING:

The following steps will expose hazardous live parts. Disconnect power between checks and proceed





PARTS LIST

DESCRIPTION		Trim TX (16" x 25")	IAQ 1400 (16" x 25")	IAQ 1400 (20" x 20")	IAQ 2000 (20" x 25")
1	HIGH FREQUENCY POWER SUPPLY	341677-601B	341677-601B	341677-601B	341677-601A
2	POWER PACK ASSEMBLY (120 VOLT)	441891-042	441891-048	441891-049	441891-047
3	ELECTRONIC AIR FLOW SENSOR KIT	244501-001	144501-004	144501-004	144501-004
4	ON/OFF SWITCH	138586-001	138586-001	138586-001	138586-001
5	SAFETY INTERLOCK SWITCH	244833-001	244833-001	244833-001	244833-001
6	CABINET ASSEMBLY	338751-007	338892-102	339517-101	338892-101
7	PREFILTER (2 REQUIRED)	123324-008	123324-005	123324-007	123324-004
8	CELL, IONIZING-COLLECTING	441731-101	441730-102	441729-102	441729-104
9	IONIZING WIRE ASSEMBLY (1 WIRE)	220111-021	220111-020	220110-029	220111-029
10	HANDLE	241831-005	241831-002	241831-002	241831-002
11	ACCESS DOOR	341892-015	348452-002	348452-003	348452-001
12	CONTACT BOARD ASSEMBLY (2 REQUIRED)	345109-001	345109-001	345109-001	345109-001
13	STEP DOWN TRANSFORMER (120V TO 24V)	239071-001	239071-001	239071-001	239071-001
14	GROUND CLIP	138885-001	138885-001	138885-001	138885-001
15	INSULATOR	246287-001	246533-001	246533-001	246533-001
16	PLASTIC POSITIONING SPACER [NOT SHOWN-SEE FIG 5]	143839-001	143839-001	143839-001	143839-001
17	CHARCOAL FILTER (OPTIONAL-NOT SHOWN)	227833-003	227833-003	227833-006	227833-004
18	240V Conversion Kit (optional - not shown)	252453-103	252453-103	252453-103	252453-103
19	OUTPUT VOLTAGE LED ASSEMBLY (RED)	134516-006	134516-006	134516-006	134516-006
20	INPUT VOLTAGE LED ASSEMBLY (GREEN)	134516-007	-	-	-
21	LED MOUNTING CLIP	134513-007	133548-001	133548-001	133548-001
22	POWER PACK COVER	334370-014	334370-008	334370-008	334370-008

OWNER RESPONSIBILITIES

The completion and return of the Warranty Registration Card is a condition precedent to warranty coverage and performance. This warranty is not valid unless the warranty card is completed and mailed to the factory within fifteen (15) days of equipment installation.

ELECTRONIC AIR CLEANER & HUMIDIFIER LIMITED TWO-YEAR WARRANTY

This limited warranty covers Trion Residential Type Electronic Air Cleaners and Humidifiers, excluding duct work, wiring and installation. Trion, Inc. warrants that all new Trion Electronic Residential Air Cleaners and Humidifiers are free from defects in material and workmanship under normal, noncommercial use and service. Trion will remedy any such defects if they appear within 24 months from the date of original installation as evidenced by receipt of the warranty registration card, subject to the terms and conditions of this Limited Two-Year Warranty stated below:

1. THIS LIMITED TWO-YEAR WARRANTY IS GRANTED BY TRION INC., McNEILL ROAD, P.O. BOX 760, SANFORD, NORTH CAROLINA 27330-0760.
2. This warranty shall extend only to any noncommercial owner who has purchased the residential electronic air cleaner or humidifier other than for purposes of resale.
3. The completion and return of the Warranty Registration Card is a condition precedent to warranty coverage and performance.
4. All components are covered by this limited warranty except expendable items, such as charcoal filters, disposable dirt holding pads, evaporative pads, media filter pads and nozzles.
5. If within the warranty period any Trion residential electronic air cleaner or humidifier unit or component requires service it must be performed by a competent heating and/or air conditioning contractor (preferably the installing contractor). Trion, Inc. will not pay shipping charges, or labor charges to remove or replace such defective parts or components. If the part or component is found by inspection to contain such defective material and workmanship it will be either repaired or exchanged free of charge at Trion's option, and returned freight collect.
6. In order to obtain the benefits of this limited two-year warranty, the owner must notify the dealer or distributor in writing of any defect within 30 days of its discovery. If after reasonable time you have not received an adequate response from the dealer or distributor, notify in writing Trion, Inc., McNeill Road, P.O. Box 760, Sanford, North Carolina 27330. Console or portable models of the electronic air cleaner may be returned intact freight pre-paid, but electronic air cleaners or humidifiers which have been installed or become part of real estate cannot be returned. Trion will receive, freight prepaid, only removable parts or components of such defective electronic air cleaners or humidifiers.
7. This limited warranty does not apply to any part or component that is: damaged in transit or when handling, has been subject to misuse, neglect or accident; has not been installed, operated and serviced according to Trion's instruction; has been operated beyond the factory rated capacity; or altered in any such way that its performance is affected. There is no warranty due to neglect, alteration or ordinary wear and tear. Trion's liability is limited to replacement of defective parts or components and does not include the payment of the cost of labor charges to remove or replace such defective components or parts.
8. Trion will not be responsible for loss of use of any product; loss of time, inconvenience, or any other indirect, incidental or consequential damages with respect to person or property, whether as a result of breach of warranty, neglect or otherwise. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE LIMITATION OR EXCLUSION IN THE PRECEDING SENTENCE MAY NOT APPLY TO YOU.
9. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.
10. Any warranty work will be performed within a reasonable time, usually within 120 days after notice of defect and delivery to the Trion factory, subject to delays beyond Trion's control.
11. Any warranty be Trion of merchantability, fitness for use or any other warranty (express, implied or statutory), representation or guarantee other than those set forth herein, shall expire at the expiration date of this express limited warranty. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE LIMITATION IN THE PRECEDING SENTENCE MAY NOT APPLY TO YOU.
12. Trion reserves the right to make changes in the design and material of its products without incurring any obligation to incorporate such changes in units completed on the effective date of such change.

TRION *Inc*

P.O Box 760 • 101 McNeill Road • Sanford, North Carolina 27331-0760

Fax: (919) 777-6355 • <http://www.trioninc.com>

Part No. 148458-002 • 8/99

Supersedes Part No. 148458-002 • 7/97 & 141941-001 • 1/97