- Installation
- Operation
- Maintenance

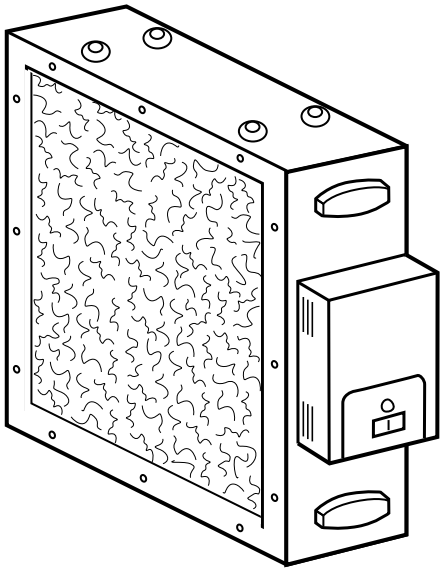
ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

18-HE17D7-1

Electronic Air Cleaner

⚠ WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER BEFORE SERVICING

This document provides installation, operation and maintenance for your Electronic Air Cleaner.



To reduce the risk of electric shock, this equipment has a grounding type plug that has a third (grounding) pin. This plug will only fit into a grounding type power outlet. If the plug does not fit into the outlet, contact a qualified personnel to install the proper outlet. Do not alter the plug in any way.

⚠ WARNING

This information is for use by individuals having adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

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October 24, 1997

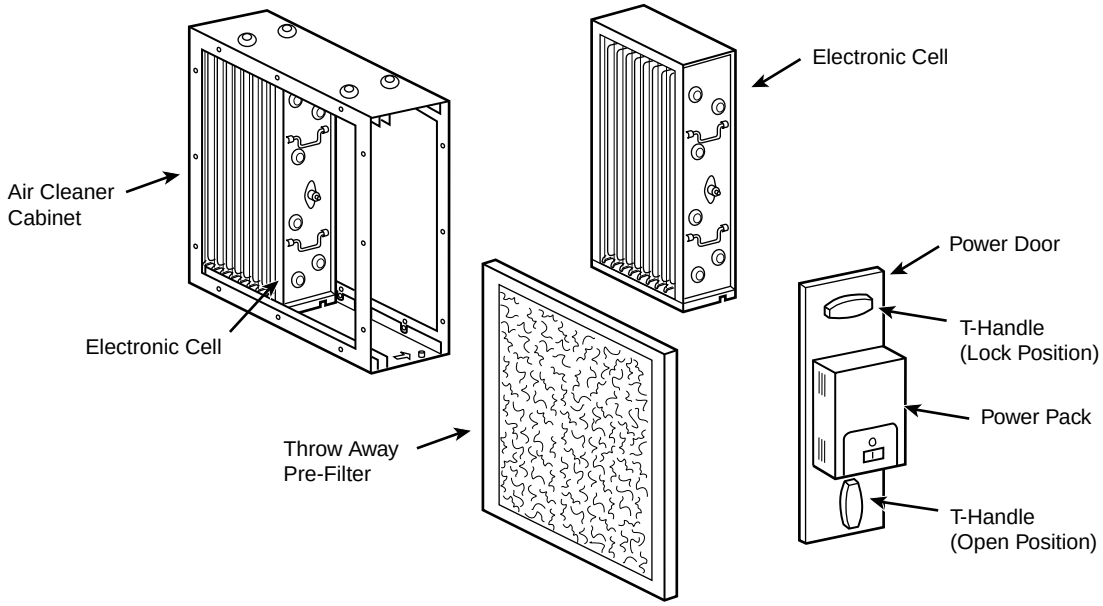

Figure 1. Electronic Air Cleaner Cabinet with 1" Throw Away Pre-Filter

CONSTRUCTION OF THE AIR CLEANER

The basic components of the air cleaner, and their functions, are as follows: (See Figure 1)

Cabinet - mounts to the furnace and duct work and houses the collecting cells and pre-filter.

Throw Away Pre-filter - traps large particles such as hair and lint before they can enter the cell section.

Collecting Cell - performs the actual collecting of dust, dirt, and other impurities from the air. It contains the ionizing and collection sections.

Each cell must be installed with the ionizing wires on the entering air side. Each cell must be oriented with the handles and contact button toward the front.

Power Door - contains power on and operating lights as well as the solid state power supply components that convert the supplied line voltage to the high-voltage, direct current required for the collecting cell. Also allows access to the electronic cells and pre-filter.

PREINSTALLATION

LOCATING THE AIR CLEANER CABINET

This air cleaner cabinet must be mounted in the return air duct of a central forced-air system, on the entering air side of the furnace. (See Figure 2 for example.)

Select a location that meets the following:

1. The face of the cell will be at a right angle to the air stream.
2 Allow clearance of 28 inches in front of the air cleaner to permit removal of cells and pre-filter.
3. If an atomizing spray type humidifier is used, it must be installed totally downstream away from the filter.

NOTE: The air filter is not to be placed in the discharge air stream of either the heating or cooling unit.

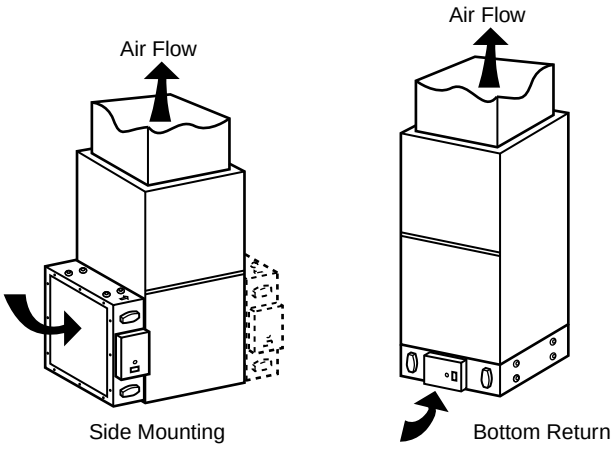

Figure 2. Mounting Location of Air Cleaner

DIRECTION OF AIR FLOW THROUGH THE AIR CLEANER CABINET

The air cleaner is shipped from the factory with single-direction air flow. An arrow on the cabinet shows the direction air must flow. (See Fig. 3.)

The pre-filter must be on the entering air side of the cabinet (the same side as ionizing wires). The mounting flange on this side of the cabinet has the single row of holes for attaching ductwork.

If necessary, for proper air flow direction, turn the cabinet upside down. This will reposition the pre-filter on the entering air side. The cell guide key installed in the cabinet will allow the cells to be installed in only the proper direction. Air flow direction must agree with arrows embossed on the end of collecting cells and cabinet.

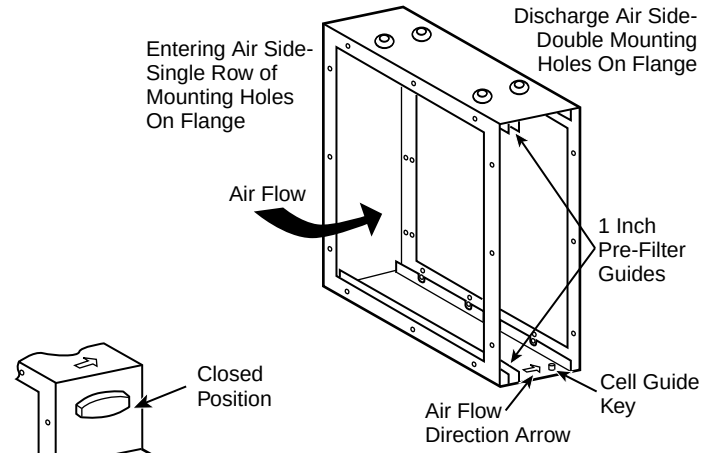

Figure 3. Air flow Direction

INSTALLATION

Side Installation (14" and 17.5" sizes only)

1. Rotate the two T-Handles on the power door inward to remove the power door from the cabinet (see Fig. 4) and set it aside. Remove the collecting cells and pre-filter, and set aside until the cabinet is installed.
2. Lay the furnace on a protective pad on the floor with the surface on which the air cleaner cabinet will be installed in the up position.

NOTE: This allows maximum downward force to be exerted on the power drill when installing the attaching screws.

3. Align the rear of the air cleaner cabinet flush with the rear of the furnace. Align the bottom of the air cleaner cabinet 1/4 inch above the bottom of the furnace (see Fig. 5). Scribe a line on the furnace as a guide to cut the opening to match the inside of the air cleaner cabinet mounting flange. Move the cabinet and cut the opening.

NOTE: Do **NOT** use the standard furnace indents for the opening. The opening for the air cleaner must be larger than the standard furnace opening.

4. Install the self-adhesive gasket material onto the flange of the discharge-air side of the cabinet. This flange has double holes (see Fig. 6).

IMPORTANT: The gasket material provides a seal between the cabinet and the furnace. It should be placed toward the inside edge of the flange. The inner edge screw holes on the cabinet flange will be used to attach the air cleaner cabinet to the furnace.

5. Position the air cleaner cabinet on the furnace with the gasket against the furnace. Align the rear of the cabinet with the rear of the furnace. Align the bottom of the cabinet 1/4 inch above the bottom of the furnace. The front of the cabinet will NOT align flush with the front of the furnace.
6. Check that the front of the air cleaner cabinet is facing the front of the furnace.
8. Securely attach the air cleaner cabinet to the furnace using all twelve heavy-duty self-tapping sheet metal screws provided. Use a power drill to install the screws.

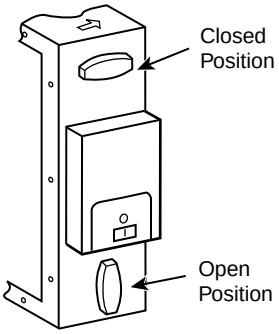

Figure 4. Power Door

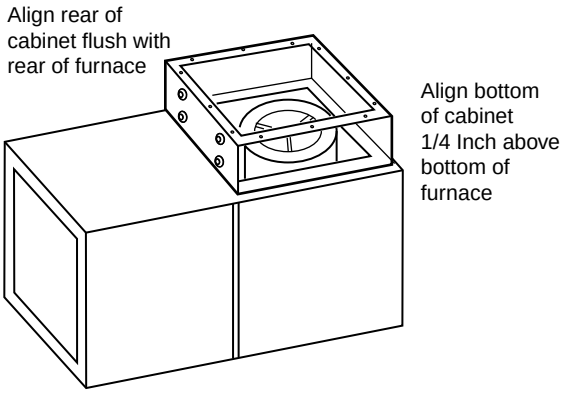

Figure 5. Installation on Side of Furnace

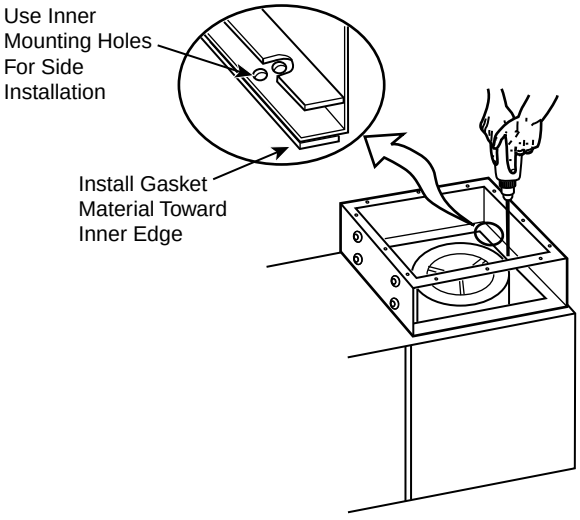

Figure 6. Side Installation Details

Bottom Installation (All Sizes)

1. Rotate the two T-Handles on the power door inward to remove the power door from the cabinet and set it aside. Remove the collecting cells and pre-filter and set aside until the cabinet is installed.
2. Position the furnace on a protective pad on the floor with the bottom of the furnace in the up position (see Fig. 7).

NOTE: This allows maximum downward force to be exerted on the power drill when installing the attaching screws.

3. Install the self-adhesive gasket material onto the flange of the discharge-air side of the cabinet. This flange has double holes (see Fig. 8).

IMPORTANT: The gasket material will provide a seal between the cabinet and the furnace. It should be placed toward the outside edge of the flange. The outer edge screw holes on the cabinet flange must be used to attach the air cleaner.

4. Position the air cleaner cabinet on the furnace with the gasket against the furnace. Align the rear of the cabinet with the rear of the furnace and the two sides of the cabinet with the sides of the furnace. The front of the cabinet will NOT align flush with the front of the furnace.
5. Check that the front of the air cleaner cabinet is facing the front of the furnace.
6. Securely attach the air cleaner cabinet to the furnace using all twelve heavy-duty self-tapping sheet metal screws provided. Use a power drill to install the screws.

Installing Ductwork and Transition Fittings

Attach duct work to the upstream side of air cleaner cabinet. If an elbow is attached, sheet metal turning vanes inside the elbow will improve air distribution over the face of the cells. (See Fig. 9.)

If the air duct does not fit the cabinet opening, a transition fitting should be used. Gradual transitions are preferred for greatest efficiency. Four inches per linear foot (approximately 20° angle) should be allowed, space permitting.

1. Connect the vertical duct section to the elbow.
2. Seal all joints in the return air system, downstream from the air cleaner with duct tape or mastic tape to prevent dust from entering the airstream. Tape is usually applied on the outside of ducts.

NOTE: Do NOT use a silicon base sealant. This causes a coating on the ionizing wires that will decrease the efficiency of the Air Cleaner.

3. After the furnace is installed, install the pre-filter and the collecting cells. A keyway in the air cleaner cabinet allows the collecting cells to be installed only the proper way.

NOTE: The contact button and handles on the cells must be facing the front of the cabinet and the ionizing wires must be on the entering air side.

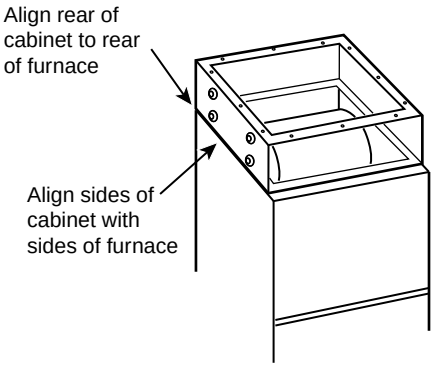

Figure 7. Installation on Bottom of Furnace

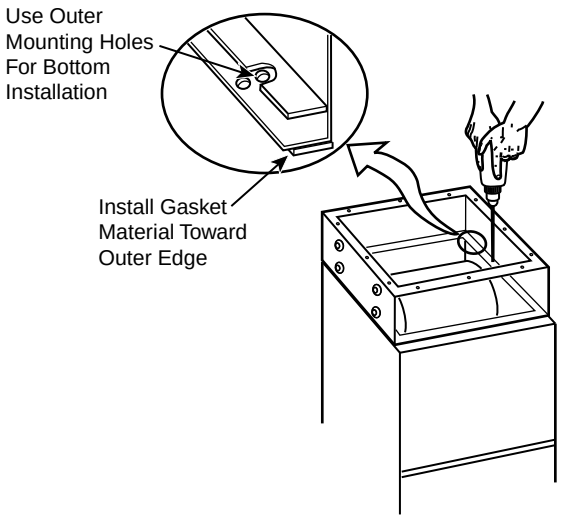

Figure 8. Bottom Installation Details

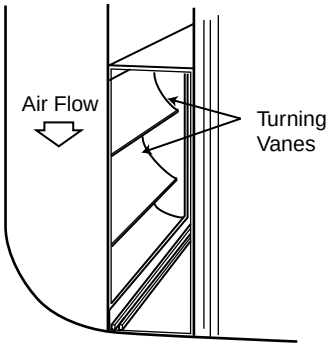

Figure 9. Turning Vanes

4. Install the power door and rotate the T-Handles outward to lock.
5. This air cleaner unit has an air flow sensor installed. It does not require electrical wiring through the furnace controls. This unit requires a 120 VAC outlet within the length of the power cord. A 15 amp circuit is more than adequate.
6. Plug the power cord into the receptacle below the switch on the air cleaner power door and to power source outlet.

OPERATION

1. With line voltage turned on at the circuit breaker, push the air cleaner ON-OFF switch to the “ON” position . The POWER light will turn ON and the green light will turn ON for approximately ten seconds, then turn OFF.
2. With the furnace blower running, the green light will be ON to indicate that the air cleaner is operating. An arcing or “snapping” sound may be heard. This will occur occasionally, however the unit is operating properly.

NOTE: An occasional flicker of the green light accompanied by harmless sparking or snapping noise may occur. It is caused by trapping large dirt particles. If arcing is continuous, the cell should be washed or check for service problems.

3. When the furnace blower stops, the green light will turn OFF.

MAINTENANCE

For maximum efficiency the air cleaner cells should be inspected and cleaned and throw away pre-filter should be replaced on a regular basis.

MAINTENANCE/REPLACEMENT SCHEDULE				
	Fan ON (Continuous)		Fan AUTO	
Conditions	Dusty	Normal	Dusty	Normal
Throw Away Pre-Filter	14-30 Days	30-60 Days	30-45 Days	45-90 Days
Collector Cells	1-2 Months	3 Months	3 Months	6 Months

The maintenance/Replacement Schedule is dependent on the amount of air passing through the filter as well as the amount of dust (pollen, smoke, etc.) in the air. The above schedule shows estimated time periods and may be increased or decreased based on actual conditions. If the filter appears dirty, it is in the best interest of the heating and air conditioning equipment to change the filter.

CLEANING

1. Turn the air moving system “OFF”
2. Push the On-Off switch on the power door to the “OFF” position (Figure 20). Disconnect the power cord from the receptacle. Wait 15 seconds for the power pack and the collecting cells to discharge.

⚠ CAUTION

High voltage is present within the Air Cleaner for operation. Before removing the power door, wait at least 15 seconds to allow this voltage to be discharged.

3. Remove the power door from cabinet and set aside.
4. Remove the pre-filter and discard.
5. Remove the cells from cabinet. Using a solution of warm water and low sudsing detergent, soak cell(s) for 20 to 30 minutes.

NOTE: Ionizing wires may become coated causing loss of cleaning ability by the collecting cell. Using a pencil eraser, wipe each ionizing wire, exercising care to avoid damage to them.

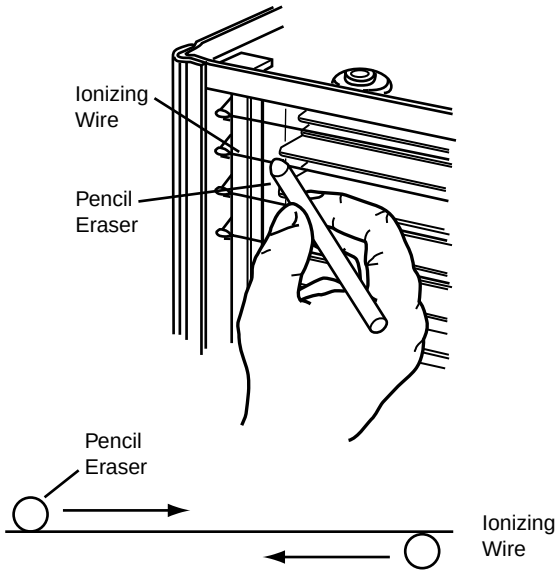

Figure 10. Cleaning Ionizing Wires

6. Remove the cell(s) from solution and rinse thoroughly with clean water.
7. Allow cell(s) to drip dry for 15 to 20 minutes**.** The cell(s) may be tipped at a slight angle to expedite the drip-dry process.
8. Reinstall the cell(s) and a new throw away pre-filter in the cabinet.
9. Replace the power door. Turn the furnace fan on. After 30 minutes push On-Off switch on the power pack to the “ON’ position.

A moderate amount of arcing or “snapping” may occur at this time, which will indicate that the cell(s) are still damp. If the noise is objectionable, push the On-Off switch to the “OFF” position and allow additional time for cell(s) to dry.

In some cases the green light will remain OFF during this initial activation of the air cleaner. This would indicate that the cell(s) are not completely dry. The green light should turn ON once the drying is complete.

FUSE REPLACEMENT

The fuse is located in the fuse holder next to the electrical receptacle below the power switch on the power pack. The fuse protects the power supply components against damaging electrical current. This fuse has a rating of 1 amp, 250 Volts.

To open the fuse holder:

Press on the edge of the access panel indicated by the word “PRESS”.

Grasp both edges of the access panel and pull the holder out.

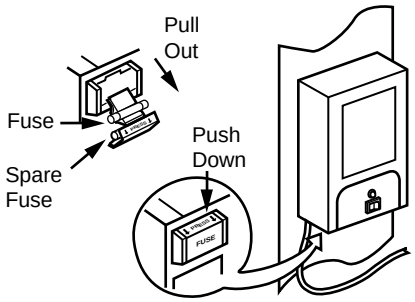

Figure 11. Replacing Fuse

NOTE: The fuse holder cannot be pulled completely out. Do not pull with excessive force.

Check the fuse in the clip on the fuse holder. Replace fuse if necessary. Push the fuse holder back in until it snaps in place. Ensure that fuseholder is fully closed or unit will not receive power to operate.

A spare fuse is stored in an area behind the face of the access panel.

REPLACING AN IONIZING WIRE

If an ionizing wire should break, it can be replaced as follows:

1. Remove all pieces of broken wire. Make sure supports at each end are in good condition and not bent out of shape.
2. Hook the new wire onto the support at one end.
3. Hold your finger against the support at the other end Figure 21) and hold the ionizing wire between thumb and forefinger as shown or use needle nose pliers. Press on spring and on wire loop until it slips over the end of the support.
4. Make sure wire is securely anchored at each end.

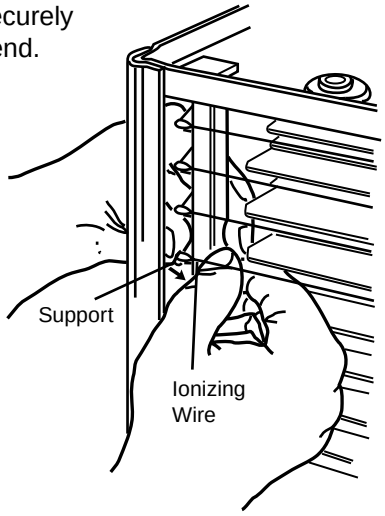

Figure 12. Replacing Ionizing Wire

TECHNICAL REPAIR GUIDE

This guide contains service checks to assist service personnel in locating and correcting any malfunction that might occur to render the air cleaner ineffective or inoperative. This air cleaner has replaceable components, such as the power tray assembly, which allows the servicer to simply replace a faulty component rather than attempt repairs of such components in the field.

The “Basic Service Guide” will probably cover many user complaints. If after checking the items listed, the air cleaner still fails to operate properly, continue with the “Complete Checkout Procedure” until the trouble has been located.

⚠ WARNING

Risk of Electrical Shock

These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained In the operating Instruction unless you are qualified to do so.

NORMAL OPERATION

On/Off switch “ON”, POWER Light “ON”, furnace blower “ON”, green Operating Light “ON”:

Voltage on power pack contact and air cleaner cells (either ionizer or plates) should be 6100 to 6800 VDC (with ozone reduction jumper in NORMAL position).

On/Off switch “ON”, POWER Light “ON”, furnace blower “OFF”, green Operating Light “OFF”:

Voltage at power pack cell contact and air cleaner cells is removed.

When the power switch is turned on, the green Operating light will be ON for about ten seconds whether the blower is on or not. This is the normal “warm-up” period for the air flow monitor.

OZONE REDUCTION FEATURE

All electronic air cleaners produce a small quantity of ozone that is within established limits. Some customers may notice an odor especially at high altitudes, low air flow rates or temporarily after the installation of new cells (new cell ozone production will decrease after a few hours of operation).

The power pack has a three position jumper (located internally on the corner of the high voltage circuit panel). The jumper will be in the "NORM" position from the factory. Moving the jumper to position "A" will somewhat limit the production of ozone by limiting maximum output power. Moving the jumper to position "B" will limit ozone & power even more. Please note that operating efficiency will also be reduced as ozone reduction is increased.

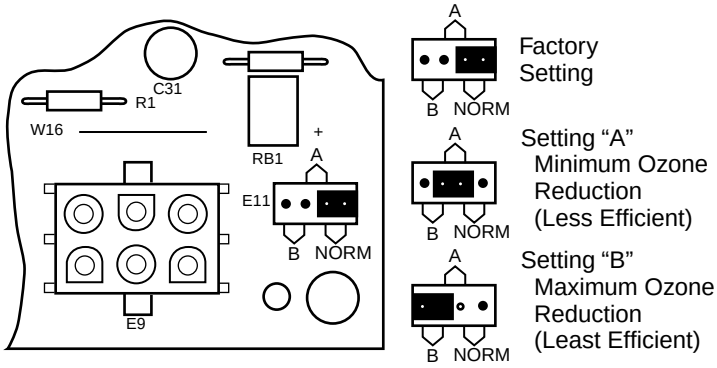

Figure 13. Ozone Reduction Jumper

COMPLETE CHECKOUT PROCEDURE

If a malfunction has not been eliminated in the "Basic Service Guide", proceed to the "Checkout Procedure" to locate the problem. When the faulty component is discovered and replaced, the air cleaner will resume normal operation.

All voltage measurements indicated can be made with a high voltage DC probe and a general purpose volt ohm meter, for example: Simpson 260 or equivalent.

For testing the power pack, the air flow monitor may be disconnected from the system, eliminating the need for air flow through the sensor tube.

CHECKOUT PROCEDURE

CONDITION 1- ON/OFF SWITCH "ON," OPERATING LIGHT "OFF."

1. Turn On/Off switch to the "OFF" position and remove the power pack from cabinet.
2. Check collecting cells for foreign object between plates, broken ionizing wires, cracked insulator, bowed or bent plates. Wash cells if required paying particular attention to

BASIC SERVICE GUIDE

SERVICE INDICATION	SERVICE CHECKS
• Red POWER light OFF • Blower ON • Green operating light OFF	1. Power is not being supplied to the air cleaner. A. Check that power switch is "ON" B. Check that the power cord is connected to the outlet and the power door. C. Check for voltage at air cleaner supply. If none, check fuse or circuit breaker at power input line. D. Check the fuse on the power door. NOTE: Air cleaner should not be wired to fan motor taps or furnace control.
• On/Off switch "ON" • Red POWER light ON • Blower ON • Green operating light OFF	While observing the green operating light, push POWER switch to "OFF" position and wait 30 seconds. Return POWER switch to "ON" position. 1. If the green light momentarily flickers when power is turned "OFF" or "ON", check for shorted or wet cells. 2. If the green light illuminates for 10 to 20 seconds when power is turned "ON", then turnd "OFF": A. Check for obstruction in air flow sensor tube. B. Check for missing or improper media filter. C. Check for proper air flow or blower speed in return supply.
• Red POWER light ON • Blower "ON" • Green operating light "ON"	1. Check media filter for obstructions or excessive dirt. Replace filter. 2. Replace power tray.
• Red POWER light ON • Blower "ON" • Green operating light flickering (usually accompanied by a "snapping" sound)	Remove and check cells: 1. If dirty, clean cells thoroughly NOTE: Ionizing wires should be clean with no build-up on wires. 2. Check for foreign material lodged in cells. 3. Check for loose or broken ionizing wires. 4. Check for cracked or broken insulators.

cleaning all ionizing wires and the extended portions of the front frame.

3. Using the method described in the section “Cell Test,” check the voltage of both collecting cells. The voltage should be 6100 to 6800 VDC. With the ozone reduction jumper in the NORMAL position, if the voltage is below 6100 VDC, disconnect collecting cells.
4. Check voltage at power pack cell contact. Open circuit voltage should be 6100 to 6800 VDC.
5. If voltage at cell contact is 6100 VDC or above, problem is in collecting cells. Recheck in accordance with Step #2.
6. If voltage at cell contact is below 6100 VDC, problem is in power pack. Turn off power and remove back panel from power pack.
7. Check all wiring points and connectors inside the power pack for tightness.

DC. POWER SUPPLY SPECIFICATIONS AND REPLACEMENT

The power supply is a Solid State, High Frequency AC to DC power source and is not designed for individual component part replacement. All power supply components are mounted on a removable metal tray attached to the door. If a power supply fails, the complete power tray must be replaced as a unit.

Input voltage

Furnace or Air Handler Units ..... 120 VAC, 60 Hz
Air Handler Units ..... 208 /240 VAC, 60 Hz

H.V. Output ..... 6100 - 6800 VDC

CELL TEST

1. Place collecting cell on a well insulated work bench with the cell contact button pointing upward.
2. Select a power pack that reads between 6100 and 6800 VDC at the cell contact in an open circuit mode with the ozone reduction jumper in NORMAL position.
3. Place the power pack on top of the collecting cell ensuring that there is proper contact between the cell contact and the power pack contact.
4. Apply appropriate voltage to power pack. Turn On/Off switch “ON’
5. Measure voltage at collecting cell ionizer or cell plates. Voltage should be 6100 to 6800 VDC.
   A. If voltage is above 6100 VDC, test other cell (if applicable).
   B. If voltage is below 6100 VDC, check cell as prescribed in Step #2, Condition #1.

NOTE: When replacing collecting cells in cabinet, ensure that the arrows on cells point in the same direction as the air flow through duct work. Cell contact buttons must point toward the power pack.

AIR FLOW MONITOR TEST

NOTE: The air flow monitor is a true differential pressure sensor capable of operating in a completely sealed air handling system. It is designed to operate in a return air temperature range of 40° to 100°F. Operation outside this range will cause the limit circuitry to shut down the power supply until the return air temperature is within the operating range.

When power is first applied and the circulating blower is off, the green operating light should come on for about 10 seconds, then go off. The operating light should then come on whenever the blower is operating.

POWER UNIT REMOVAL AND REPLACEMENT

To replace a faulty power tray or gain access to the ozone reduction jumper, observe the following procedure.

1. Disconnect power cord from the power door and remove power door from air cleaner.
2. On the inside of the door, remove four screws holding the power pack to the door and remove power pack.
3. Separate power tray and cover.

NOTE: When reassembling the power tray and cover, ensure that tray wiring is positioned to avoid interference

4. After servicing the ozone switch or after replacing a faulty power tray, reassemble the cover and power tray. When reassembling, be sure that power switch plate is on the outside of the cover and the tab on the power switch plate slides into the opening on the cover. Be sure also that tab on bottom of power tray is on the outside of the cover (see fig 14).
5. Position power unit on door and reattach using four screws previously removed. Replace power cord.

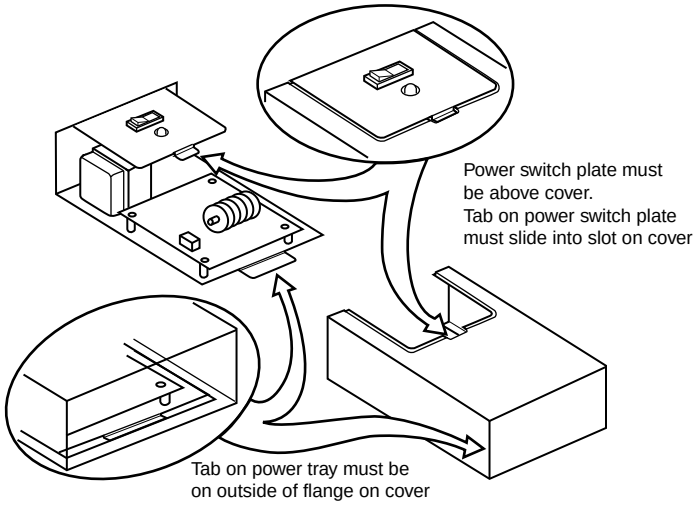

Figure 14. Assembling Power Tray and Cover