

## F50E Duct Mounted Electronic Air Cleaner

### PRODUCT DATA



### APPLICATION

The F50E high efficiency electronic air cleaner is mounted in the return air duct of a forced air heating, cooling, or ventilating system. It captures a significant amount of the airborne particles 0.5 microns and larger from the air circulated through it.

### FEATURES

- Available in two sizes to fit most ducts; adapts to air flow from either side.
- Has two cells.
- Capacity of 1400 cfm (2380 m<sup>3</sup>/hr) or 2000 cfm (3400 m<sup>3</sup>/hr), depending on size.
- Solid state power supply is self-regulating and maintains peak efficiency over a wide range of cell dirt loading conditions.
- Pressure drop is approximately equal to that of a regular fiberglass filter.
- Optional W8600E Solid State Performance Indicator monitors air cleaner performance, reminds homeowner when a cell and prefilter wash is past due, and when to check system.
- Electronic cells can be washed in most home dishwashers.
- Remote mount kit is available for mounting power supply and junction box separately when access space is not available.
- Galvanized cabinet protects against rust.
- Automatic interlock switch disconnects power and discharges cell when door is opened.
- Test button checks system operation.
- Troubleshooting guide mounted inside cell access door.
- Permanent wash reminder schedule mounted on top of power supply box.
- Prefilter screens protect cells from large dirt particles.

### Contents

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## SPECIFICATIONS

### IMPORTANT

*The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not match the listed specifications exactly. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

### Model:

F50E Electronic Air Cleaner. Includes cabinet, access door, solid state power supply, junction box, 2 electronic cells and 2 prefilters.

### Electrical Ratings:

Voltage and frequency: 120V, 60 Hz.  
 Power consumption: 33W maximum.  
 Current draw: See Table 1.  
 Ionizer voltage: 8150 Vdc.  
 Collector voltage: 4075 Vdc.

Table 1. F50E Current Draw.

| F50E Size |           | No. Cells | Maximum Current (A) |                  |
|-----------|-----------|-----------|---------------------|------------------|
| in.       | mm        |           | 120V                | 240V or 220/240V |
| 16 x 25   | 406 x 635 | 2         | 0.3                 | 0.2              |
| 20 x 25   | 508 x 635 | 2         | 0.3                 | 0.2              |

### Capacity, Efficiency, Pressure Drop:

See Fig. 1.

### Temperature Ratings:

Operating Ambient: 40°F to 125°F (4°C to 52°C).  
 Temperature of Airflow through Cells: 40°F to 125°F (4°C to 52°C).  
 Maximum Cell Washing Temperature: 220°F (140°C).  
 Storage and Shipping Ambient: -40°F to +140° F (-40°C to +60°C).

### Mounting:

Mounts in the return air duct of a forced air heating, cooling, or ventilating system. Should be mounted upstream of atomizing humidifier. See Planning the Installation.

### Weight:

See Table 2.

### Dimensions:

See Fig. 2.

### Approvals:

Underwriters Laboratories Inc. Listed:  
 File No. E30954, Guide No. AGGZ.  
 Canadian Standards Association Certified:  
 File No. LR20633—L, Guide No. 2010.

### Option:

W8600E Solid State Performance Indicator (SSPI).

### Accessories:

S688A Sail Switch.  
 136377A Remote Mounting Kit for power supply and junction box. Kit includes galvanized steel base (5 in. [127 mm] wide x 16-1/2 in. [419 mm] long x 13/16 in. [21 mm] deep), prewired flexible conduit with connectors (10 ft. [3m] long), knockout plug, and mounting hardware.

### Repair Parts:

See Parts List section.

## ORDERING INFORMATION

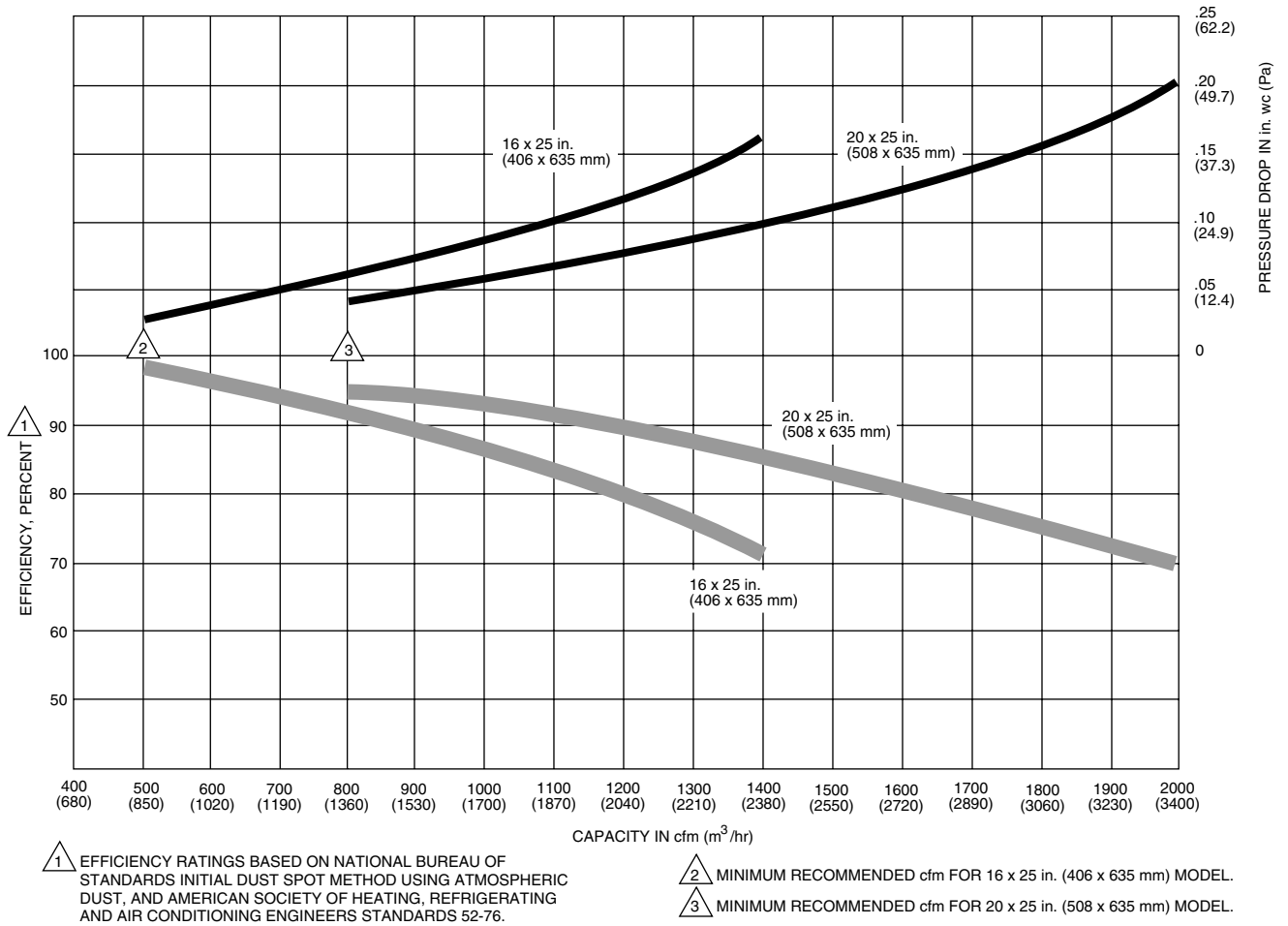
When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number .

1. Order number.
2. Voltage and frequency.
3. Dimensions: 16 x 25 or 20 x 25 in. (406 x 635 or 508 x 635 mm).
4. Accessories, if desired.
5. W8600E Solid State Performance Indicator (SSPI), if desired.
6. Model with or without solid state air flow switch.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Relations  
 Honeywell, 1885 Douglas Drive North  
 Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitee, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9. International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

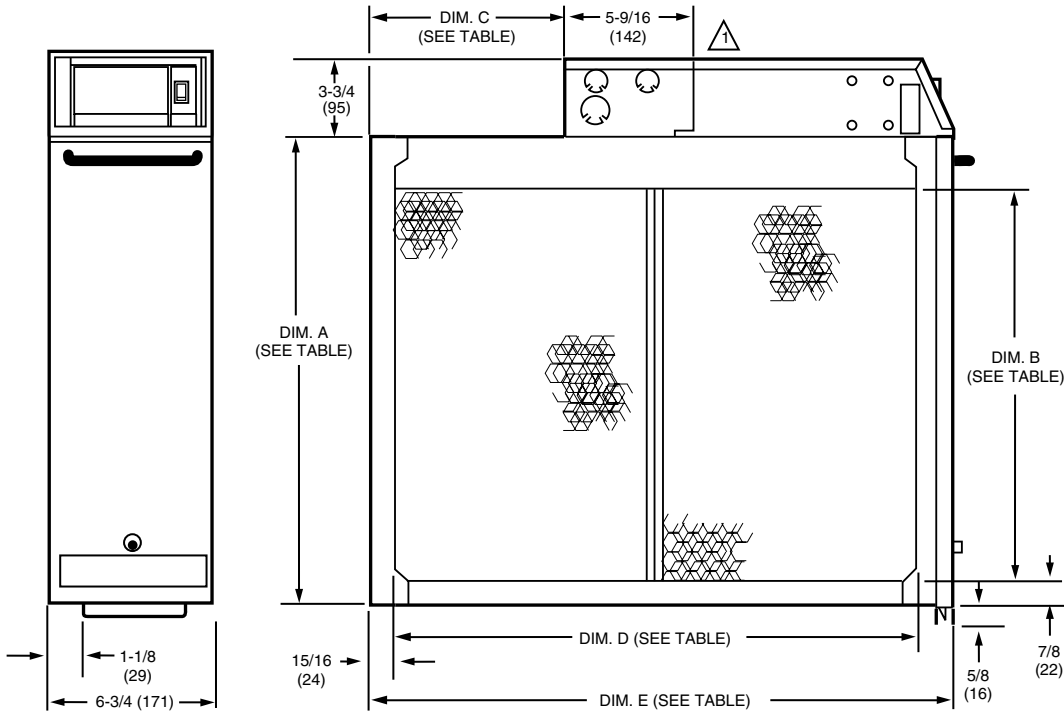


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Fig. 1. Air cleaner efficiency and pressure drop at various airflow rates.

Table 2. Shipping and Installation Weight.

|                                   | Weight                     |      |                            |      |
|-----------------------------------|----------------------------|------|----------------------------|------|
|                                   | 16 x 25 in. (406 x 635 mm) |      | 20 x 25 in. (508 x 635 mm) |      |
|                                   | lb.                        | kg   | lb.                        | kg   |
| Electronic Cell (each)            | 6-1/2                      | 3.0  | 8-3/16                     | 3.7  |
| Shipping Weight                   | 38                         | 17.2 | 43                         | 19.5 |
| Installed Weight (cells included) | 33                         | 15.0 | 38                         | 17.2 |



| UNIT SIZE |           | DIM. A |     | DIM. B |     | DIM. C  |     | DIM. D |     | DIM. E |     |
|-----------|-----------|--------|-----|--------|-----|---------|-----|--------|-----|--------|-----|
| IN.       | MM        | IN.    | MM  | IN.    | MM  | IN.     | MM  | IN.    | MM  | IN.    | MM  |
| 16 X 25   | 406 X 635 | 17-3/4 | 450 | 14-3/8 | 365 | 10-7/16 | 265 | 23-1/4 | 591 | 25-1/2 | 648 |
| 20 X 25   | 508 X 635 | 21-3/4 | 553 | 18-3/8 | 467 | 10-7/16 | 265 | 23-1/4 | 591 | 25-1/2 | 648 |

JUNCTION BOX AND POWER SUPPLY CAN BE REMOTE-MOUNTED USING 136377A REMOTE MOUNT KIT.

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**Fig. 2. Installation dimensions in in. (mm in brackets) of 2-cell electronic air cleaner.**

## PLANNING THE INSTALLATION

### Application

The F50E is used in a forced air heating, cooling, or ventilating system. It operates when the system blower is on. Models with internal solid state air flow switch require only line voltage connection. Models without the air flow switch can be energized through the fan switch, a dpdt fan relay or an air flow switch such as the S688 Sail Switch. Unless the F50E with solid state air flow switch is used, an isolating fan relay or air flow switch is required if the system has a multispeed or modulating blower motor.

### Review Installation Requirements

The air cleaner should be installed where all the air passing through the system circulates through it. The best location is in the return air duct next to the blower compartment so the air cleaner can help keep the blower motor and evaporator coils clean. Do not mount in the discharge air duct.

For most efficient air cleaning, airflow must be spread evenly across the face of the air cleaner. If the duct is a different size than the air cleaner cabinet, gradual transitions are recommended. If the duct turns sharply just before the air cleaner, turning vanes are recommended.

### Applications with Air Conditioning

The air cleaner should be installed upstream of the evaporator coil. The air cleaner helps keep the coil clean, reducing maintenance. Also, if the air cleaner is downstream, the high relative humidity of the cooled air leaving the evaporator coil can cause water condensation on the cells, reducing air cleaner efficiency.

### Applications with a Humidifier

An evaporative humidifier can be mounted upstream of the air cleaner. An atomizing humidifier should be mounted downstream of the air cleaner, even though hard water salts will be blown into the living space and deposited as dust. If an atomizing humidifier must be mounted upstream of the air cleaner:

1. Mount it as far as possible upstream of the air cleaner.
2. Install a standard disposable furnace filter between the humidifier and the air cleaner to trap water droplets and hard water salts.
3. Clean the air cleaner frequently to prevent a hard water salt buildup.
4. Note that the volume of water that passes through an atomizing humidifier can overload the air cleaner, resulting in hard water salts being deposited as dust in the living space.

### Applications with an Activated Carbon Filter

If desired, an activated carbon (charcoal) filter can be used to remove odors or other gaseous contaminants (not particle-based), which are not removed by the air cleaner. Locate the carbon filter:

- Downstream from the air cleaner. This means, of course, that dust from the carbon filter will not be collected by the air cleaner and will be deposited in the living space.
- Outside the air cleaner cabinet. Some carbon filters are combustible, and contact with high voltage could result in smoke or fire.
- Where carbon granules cannot fall into the electronic cell(s). Use a disposable furnace filter if necessary between the carbon filter and the electronic cell(s).
- With proper transitions, if the activated carbon filter requires a different size duct than the air cleaner. Allow 20 degrees expansion per side, per fitting.

### Applications with Outdoor Air Intake

Return air temperature must be at least 40°F (4°C). Lower temperatures can cause ionizer wire failure. If outdoor air is used, warm it ahead of the air cleaner by:

- Making sure the outdoor intake is far enough ahead of the air cleaner so the return and outdoor air is thoroughly mixed. Stratified air can dump a stream of very cold air into one section of the air cleaner.
- Adding baffles ahead of the air cleaner to force thorough air mixing.
- Installing a preheater, if large amounts of outdoor air are used. The preheater, which could be an electric strip heater or hot water coil, should be controlled by a thermostat. Hot water or steam coils should be protected by a freeze-up control.

### Choose Location

Choose a location that is readily accessible for regular inspection and cleaning. Allow at least 13 in. (330 mm) in front of the access door for removing the prefilters and electronic cells. Allow enough room above the power supply so the power supply can be serviced without removing pipes, ducts, or other heating system components.

The air cleaner *must* be installed where the temperature will not exceed the ratings in the SPECIFICATIONS section.

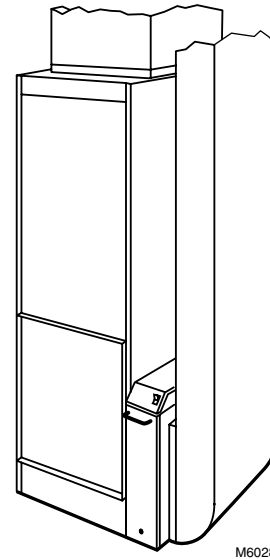
### Choose Mounting Position

#### **WARNING**

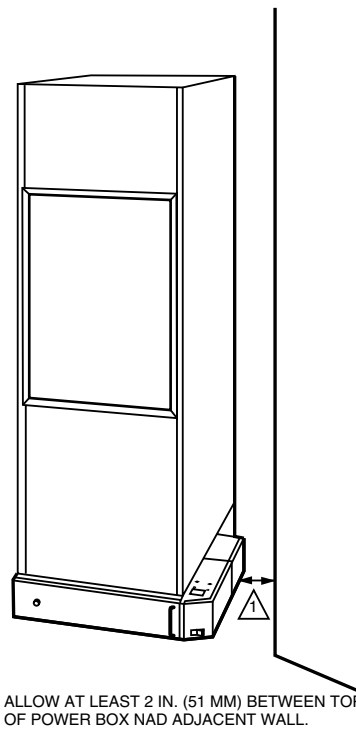
**Heavy Equipment.  
Can cause injury or equipment damage.**

If the access door faces down, the latch may not hold, and the cells and prefilters can fall unexpectedly. Also, nothing holds the cells and prefilters in place once the access door is opened.

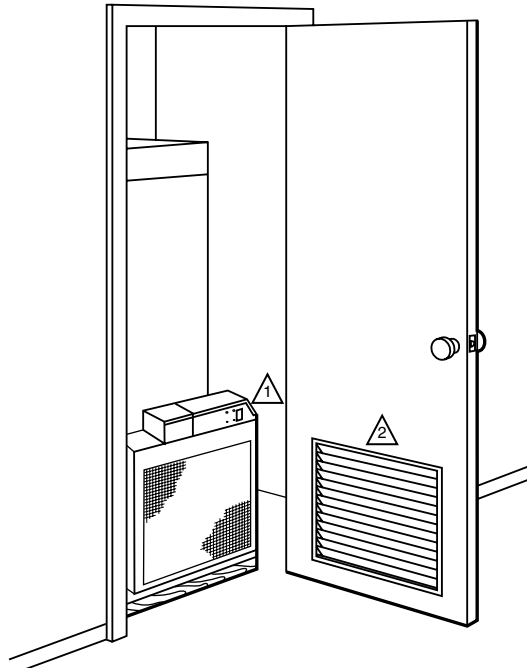
The air cleaner can be mounted in any position except with the access door facing down. Figs. 3-10 show proper air cleaner mounting with a variety of furnace installations.



**Fig. 3. Highboy furnace, side installation, air cleaner is mounted vertically where return enters side inlet of furnace.**



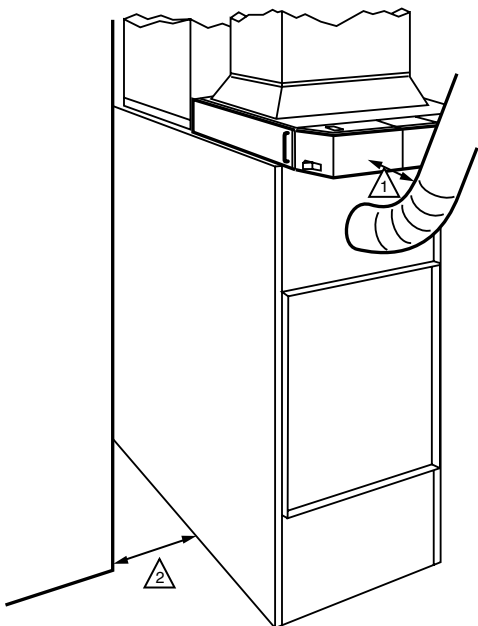
**Fig. 4. Highboy furnace. Installation beneath furnace (air cleaner cabinet can easily support weight of furnace and air conditioner coil). Air cleaner is mounted horizontally where return enters from below.**



- 1 ALLOW AT LEAST 13 IN. (0.3M) CLEARANCE BETWEEN ACCESS DOOR AND WALL FOR CELL AND PREFILTER MAINTENANCE.
- 2 LOCAL CODES MAY PRESCRIBE GRILLE DESIGN AND PROVISION FOR MAKE UP AIR. A SEAL FROM F50 TO GRILLE MAY BE REQUIRED.

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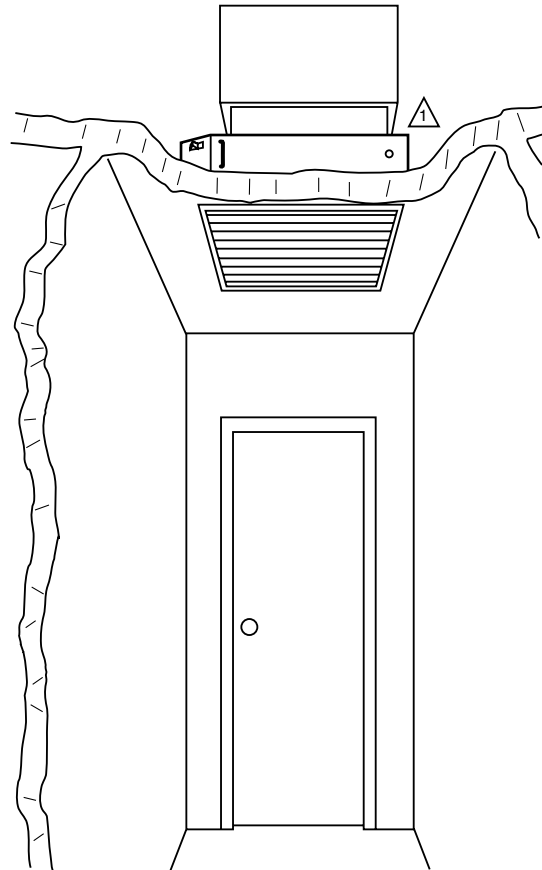
**Fig. 5. Highboy furnace. Closet installation. Air cleaner is mounted vertically on furnace between furnace and louvered return air opening in closet door.**



- 1 ALLOW AT LEAST 2 IN. (51 MM) CLEARANCE BETWEEN POWER BOX AND FLUE PIPE.
- 2 ALLOW AT LEAST 13 IN. (0.3M) CLEARANCE BETWEEN ACCESS DOOR AND WALL FOR CELL AND PREFILTER MAINTENANCE.

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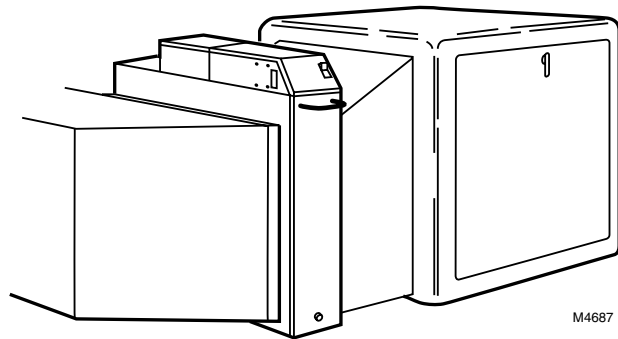
**Fig. 6. Lowboy furnace. Air cleaner is mounted horizontally in return plenum just above furnace, opposite supply plenum.**



- 1 ACCESS TO AIR CLEANER FROM ATTIC IS REQUIRED FOR CELL AND PREFILTER MAINTENANCE. CONSIDER USING F52E CEILING MOUNT AIR CLEANER.

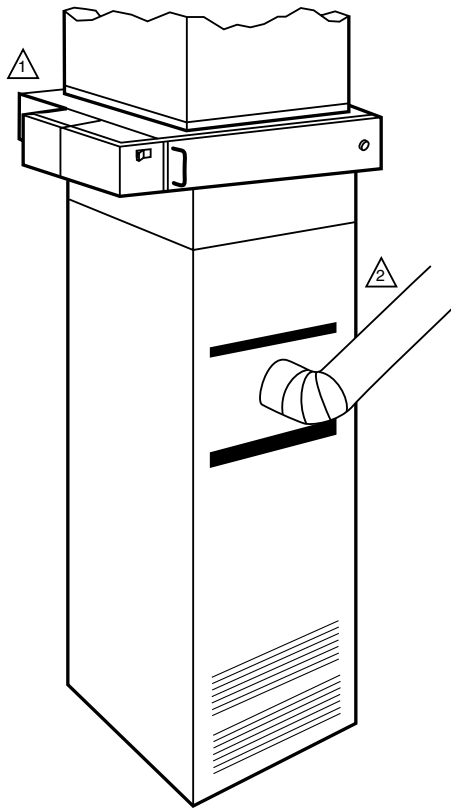
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**Fig. 7. Horizontal furnace. Air cleaner is mounted horizontally above ceiling. Unless air cleaner is easily accessible from attic, consider using F52 ceiling mount air cleaner instead.**



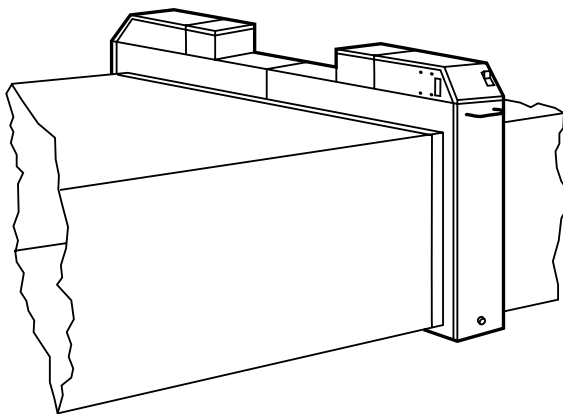
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**Fig. 8. Horizontal furnace. Air cleaner is mounted vertically in the return duct near the furnace. Note transition.**



- 1 IN CLOSET INSTALLATION, AIR CLEANER MUST BE BELOW TOP OF DOOR FRAME FOR CELL AND PREFILTER MAINTENANCE.
- 2 IF FLUE PIPE IS IN FRONT OF AIR CLEANER, ALLOW AT LEAST 13 IN. (0.3 M) CLEARANCE BETWEEN ACCESS DOOR AND FLUE PIPE. M4688

**Fig. 9. Counterflow furnace. Air cleaner is mounted horizontally in return duct or plenum just above furnace.**



- 1 ALLOW AT LEAST 13 in. (0.3 m) CLEARANCE BETWEEN ACCESS DOORS AND ANY OBSTRUCTION FOR CELL AND PREFILTER MAINTENANCE. M4689

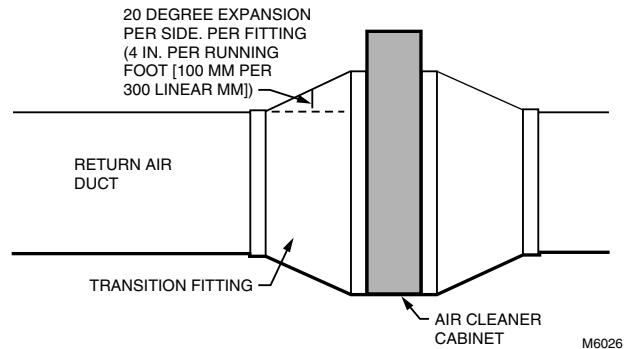
**Fig. 10. High capacity system. Two or more air cleaners can be used together. At least 13 in. (0.3m) clearance is required between access doors and walls for cells and prefilter maintenance.**

### Determine Sheetmetal Requirements

The air cleaner is adaptable to all new or existing residential forced air heating, cooling and ventilating systems. Sheetmetal transitions, turning vanes, or offsets may be needed in some applications.

### Transitions

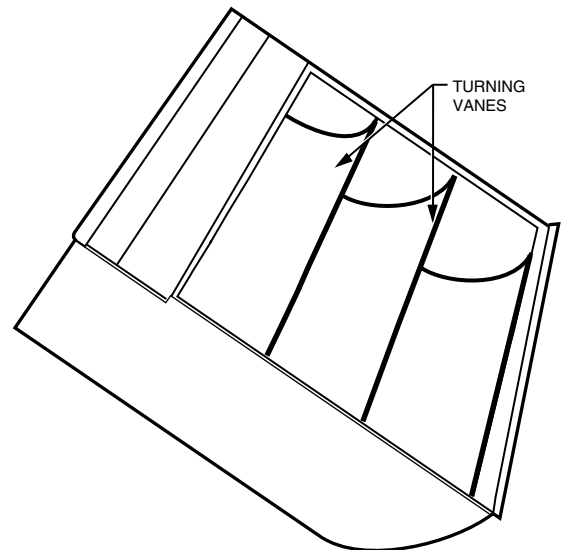
Transitions are needed when the duct is a different size than the air cleaner cabinet. Gradual transitions reduce air turbulence and increase efficiency. Limit expansion to 20 degrees (about 4 in. per running foot [100 mm per 300 linear mm]) on each side of a transition fitting. See Fig. 11.



**Fig. 11. Change duct size gradually to minimize turbulence.**

### Turning Vanes

If the air cleaner is installed close to an elbow or angle fitting, install turning vanes inside the angle to distribute airflow more evenly across the face of the cells. See Fig. 12.



**Fig. 12. Turning vanes installed in a bend help distribute airflow evenly over the face of the electronic cells.**

## Offsets

If the duct connection to the furnace in a side installation allows less than 7 in. (178 mm) for mounting air cleaner cabinet, shorten the lateral trunk or add an offset to the elbow. See Fig. 13.

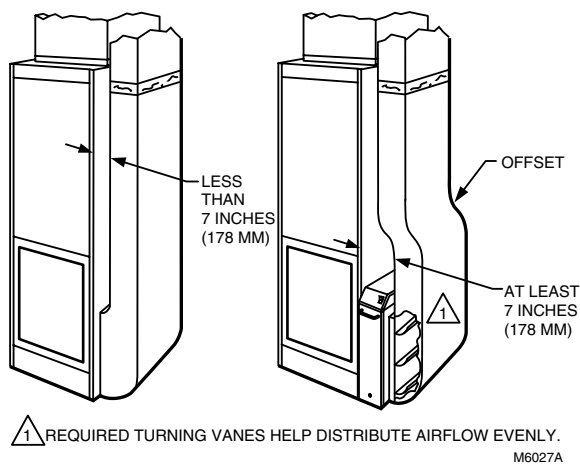


Fig. 13. Typical use of duct offset to make room for electronic air cleaner.

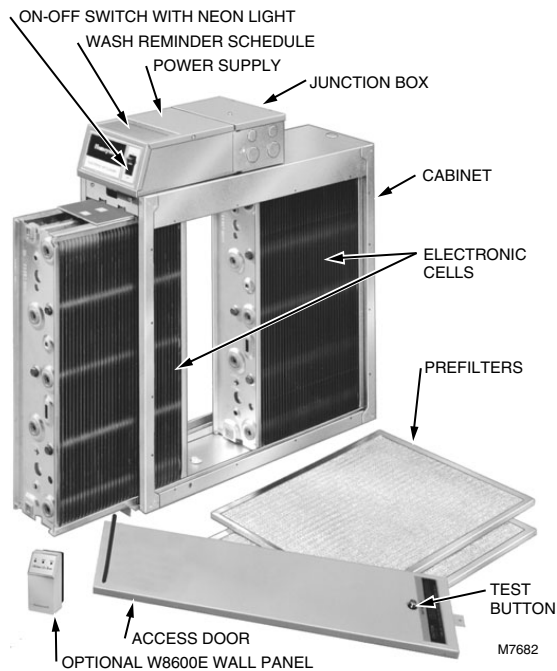


Fig. 14. Components of the F50E Air Cleaner (2-cell model shown).

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

## ⚠ CAUTION

**Electric Shock Hazard.**  
Can cause electrical shock or equipment damage.  
Disconnect power supply before installing air cleaner.

### Unpack Electronic Air Cleaner

- ❑ Check that all components are included. The electronic air cleaner is shipped assembled. See Fig. 14. The unit consists of:
  - Galvanized steel cabinet.
  - Power supply with on-off switch and neon light.
  - Junction box.
  - Two electronic cells.
  - Two prefilters.
  - Access door with test button.
  - Literature package.
- ❑ W8600E (optional) and mounting hardware must be ordered separately.

### Clean Blower Compartment

- ❑ Remove and discard the existing furnace filter.
- ❑ Thoroughly clean the blower compartment.
- ❑ If possible, power vacuum ductwork to remove accumulated dust in existing home, or construction dirt in a new home. The electronic air cleaner cannot remove dust that has settled in the blower compartment and distribution ducts.
- ❑ Check the edges of the furnace fan blades for dirt buildup and clean as necessary. The fan will not deliver the rated cfm if the blades are dirty.

### Review the Installation Plan

- ❑ Temporarily place the cabinet on the floor; position as it will be when installed.
- ❑ Remove and set aside the access door, electronic cells and prefilters, checking that the selected location provides enough clearance for easy removal and replacement of these components. Unless the power supply will be remotely mounted, make sure there is room above the unit to wire and service the power supply, including the optional W8600E.
- ❑ Make sure that shop-fabricated sheetmetal components, such as turning vanes, are on hand.

### Remote Mount Power Supply, if Desired

- ❑ If remote mount is not desired, go on to Fasten the Cabinet to the Furnace section.



**! CAUTION**

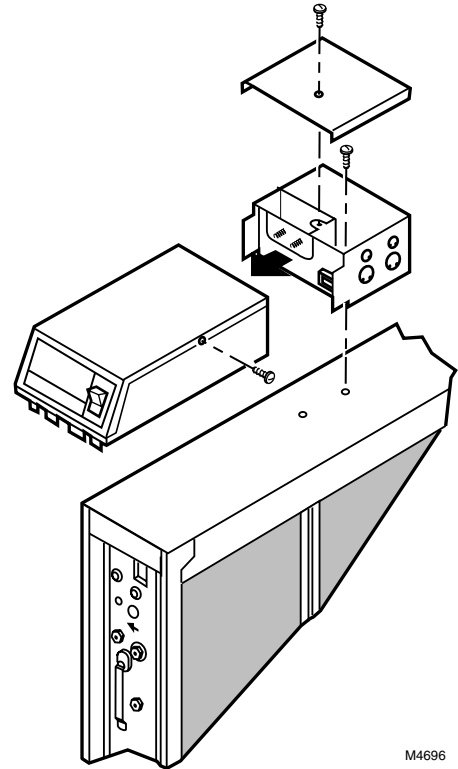
**Electric Shock Hazard.**  
**Can cause personal injury or equipment damage.**  
 Do not attempt to remote-mount the power supply without the remote mount kit. The special high voltage wire in the kit has extra thick insulation to protect against electric shock from the high voltage carried between the air cleaner cells and the power supply. Standard NEC class 1 wire is rated for only 600 volts and will fail if used. Do not try to pull any other wires through the flexible conduit in the kit.

**Mount Remote Base**

- ❑ Select an easily accessible location for the power supply within reach of the conduit assembly. Make sure the on-off switch and neon light are readily visible.
- ❑ Mount the remote mounting base using four screws (obtained locally).

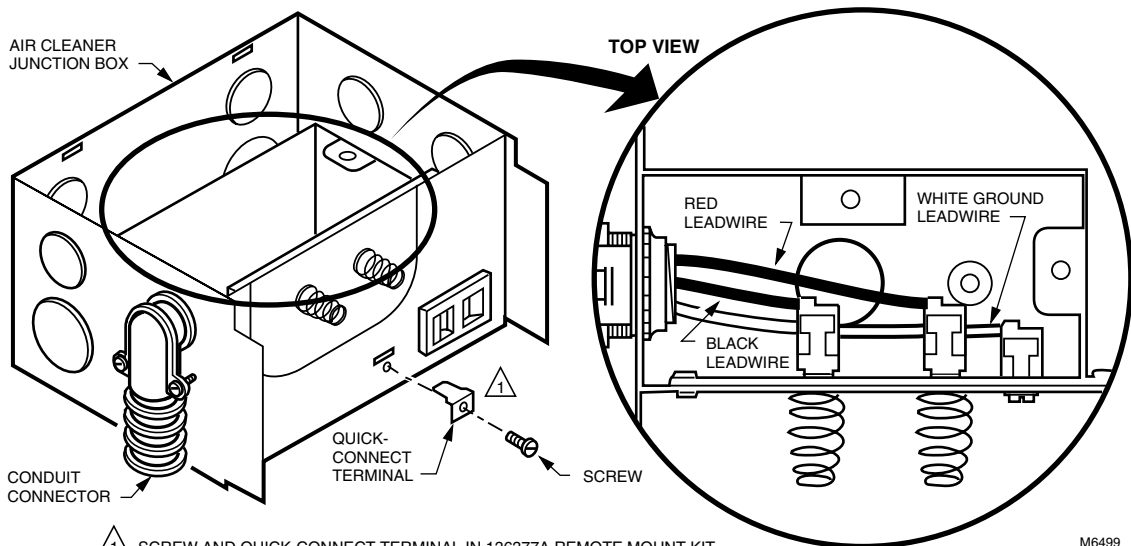
**Mount Power Box and Junction Box**

- ❑ Loosen the screws holding the power supply; lift it slightly to clear the screws, then pull it straight away from the junction box to remove. Remove and retain screws. Set aside.
- ❑ Remove the cover from the junction box. Set aside.
- ❑ Disconnect the two leadwires from the quick connect terminals in the junction box. See Fig. 15.
- ❑ Remove the junction box from the cabinet.
- ❑ Remove the knockout on the side of the junction box and connect the end of the conduit assembly with the shorter leadwires. See Fig. 16.
- ❑ Install ground terminal in junction box. See Fig. 16.
- ❑ Connect the leadwires as shown in Fig. 16.
- ❑ Fasten the junction box to the base with the two screws removed earlier.
- ❑ Replace the junction box cover and secure with screw removed earlier.
- ❑ Loosely reinsert screws into power supply base. Plug the power supply into the junction box. Push it straight in to avoid bending the plug. Tighten screws. See Fig. 17.



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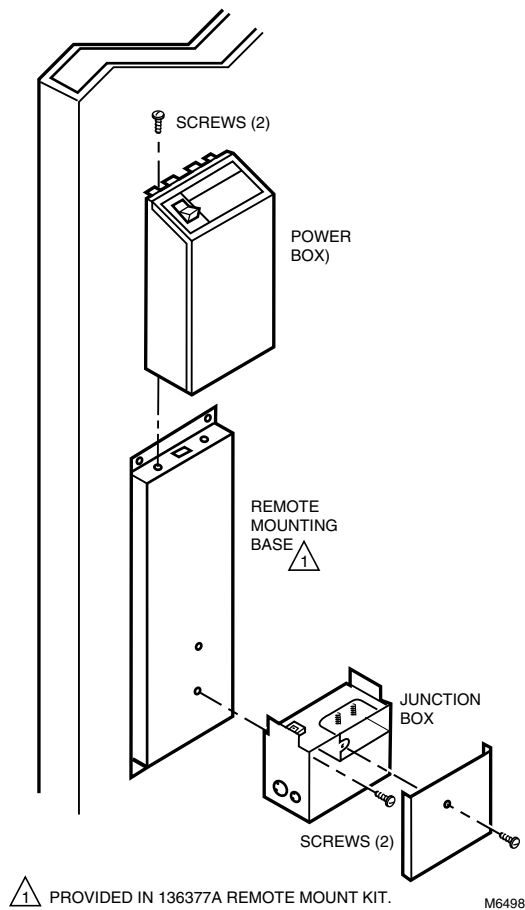
**Fig. 15. Disconnect the wires and remove the power box and junction box.**



**1** SCREW AND QUICK-CONNECT TERMINAL IN 136377A REMOTE MOUNT KIT.

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**Fig. 16. Make wiring connections in junction box.**



**Fig. 17. Mount the power box and the junction box on the remote base.**

### Connect Cable to Air Cleaner Cabinet

- Remove the screws holding the front of the contact tray in place and lower the contact tray. Remove and discard the two loose wires attached to the ionizer and collector terminals.
- Remove desired knockout from the top or back of the air cleaner cabinet and install end of conduit assembly with high voltage leadwire ends.
- Connect the black wire to the collector terminal and the red wire to the ionizer terminal. See Fig. 18.
- Mount one of the quick-connect ground terminals and the leaf spring supplied in the kit on the contact tray and connect the white wire to it. See Fig. 18.
- Replace the contact tray and secure with the two screws removed earlier. Be careful not to pinch the wires between the cabinet and tray.
- Plug the hole in the top of the cabinet with the metal plug provided.

### Fasten the Cabinet to the Furnace

**NOTE:** This procedure shows a side installation on a typical highboy furnace. You may need to alter the procedure to fit your application.

- Align the cabinet with the return air opening.
- Install a transition when the furnace and air cleaner openings are different sizes. See Fig. 11.
- Place blocks under the cabinet so the unit is firmly supported and level. The 5/8 in. (16 mm) mounting foot on the cabinet hinge plate provides the minimum clearance required for the access door hinge.
- Attach the cabinet securely to the furnace. The unit can be attached directly, as shown, or a starting collar can first be fitted in the furnace opening. Either drill holes and fasten with sheetmetal screws or rivets, or use slip joints. If you are drilling holes, locking pliers help to hold the unit in place during drilling. See Fig. 20.

### Install Turning Vanes

- Mount turning vanes inside the elbow or angle fitting that is directly against the air cleaner cabinet.

### Fasten Cabinet To Ductwork

- Install a transition when the opening in the air cleaner cabinet and the duct are different sizes. See Fig. 11.
- Fasten the other side of the cabinet to the elbow using sheetmetal screws, rivets, or slip joints, as appropriate.

### Install Optional W8600E Solid State Performance Indicator

When the W8600E Solid State Performance Indicator is part of the installation, install the W8600E in the desired location and run 4-wire thermostat cable (up to 18 gauge), independent of any other current-carrying wires, to the air cleaner's power box as follows.

#### W8600E Location

The styling of the W8600E is designed to blend with the Chronotherm III® Thermostats. A special mounting template is included in the bag assembly for mounting next to the thermostat. The W8600E Indicator can, however, be mounted at any other convenient location in the living area, or it can be mounted in the furnace room. It shares no electrical connections with the thermostat.

Make certain the location makes it convenient for the homeowner to observe the LEDs of the device.

#### Mounting W8600E

The following mounting instructions assume that the W8600E will be mounted next to a Chronotherm III® Thermostat. When installing the wall panel at another location, modify the procedure to fit the installation.

- Remove the cover from the W8600E.
- Hold the mounting template (included in the W8600E bag assembly) next to the thermostat as shown in Fig. 21.
- Hold the base for the W8600E next to the template and mark holes for screw anchors and access hole for 4-wire thermostat cable from the terminal strip on the F50E power box to the W8600E base.
- Remove the W8600E base and drill the holes. Install the anchors and screws so that the base is mounted firmly on the wall at the correct distance from the thermostat.

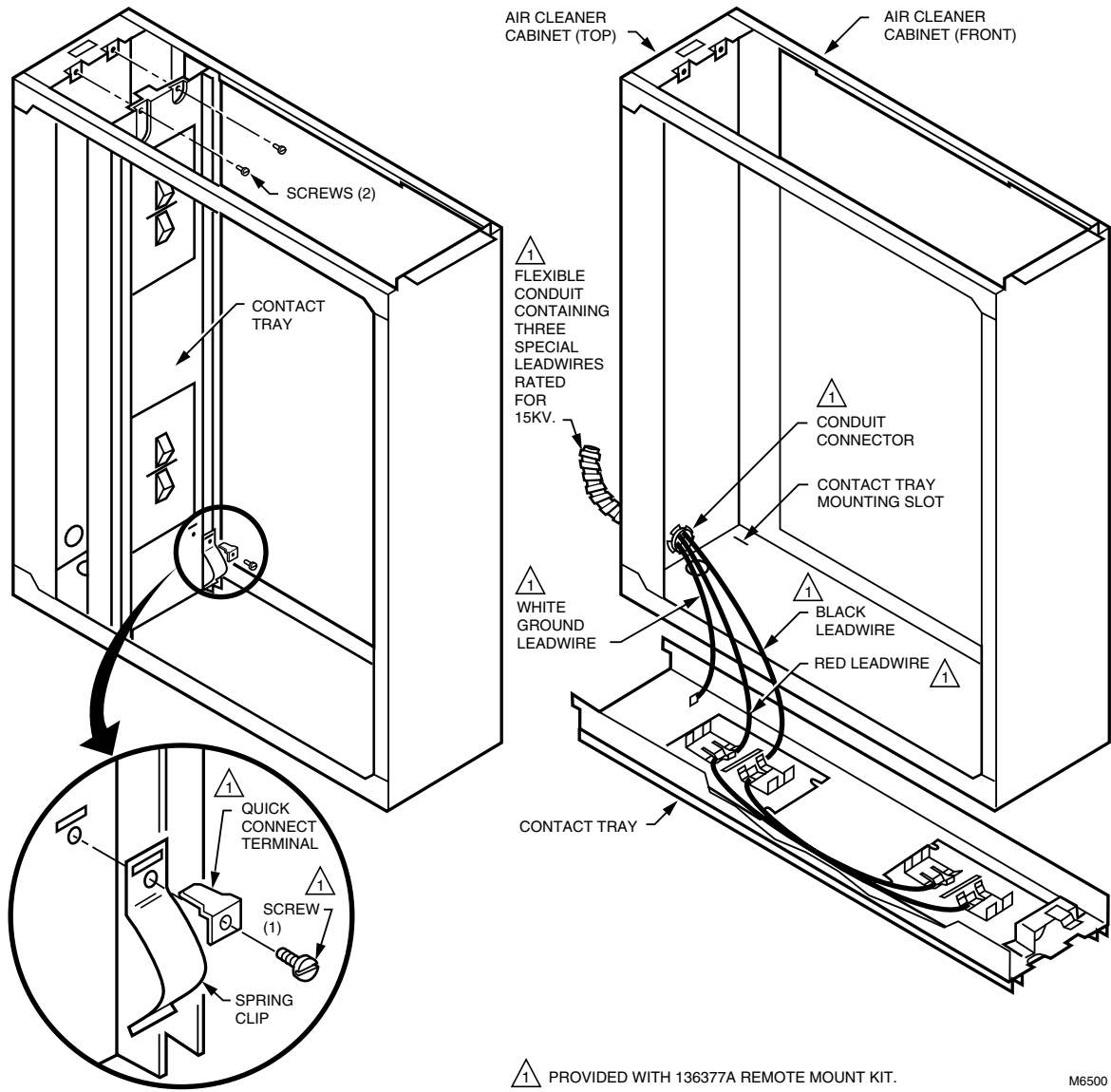


Fig. 18. Install the conduit on the cabinet and make wiring connections to contact tray.

**Wiring W8600E**

**IMPORTANT**

*Run wires separately from any other current-carrying wires.*

- ❑ All wiring must comply with local codes and ordinances.
- ❑ Run 4-wire thermostat cable (up to 18 gauge), independent of any other current-carrying wires, from the W8600E base to the terminal strip on the power box of the F50E.

- ❑ Strip 1/4 in. of insulation from the ends of the wires and connect them (1 to 1, 2 to 2, 3 to 3, 4 to 4) as shown in Fig. 22.
- ❑ Install the W8600E cover and visually check the installation appearance as shown in Fig. 23.

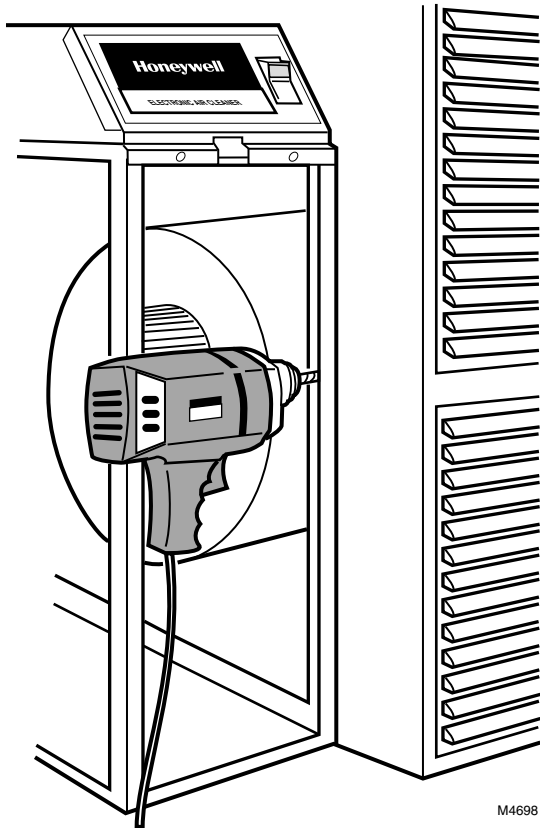


Fig. 19. Fasten cabinet to furnace.

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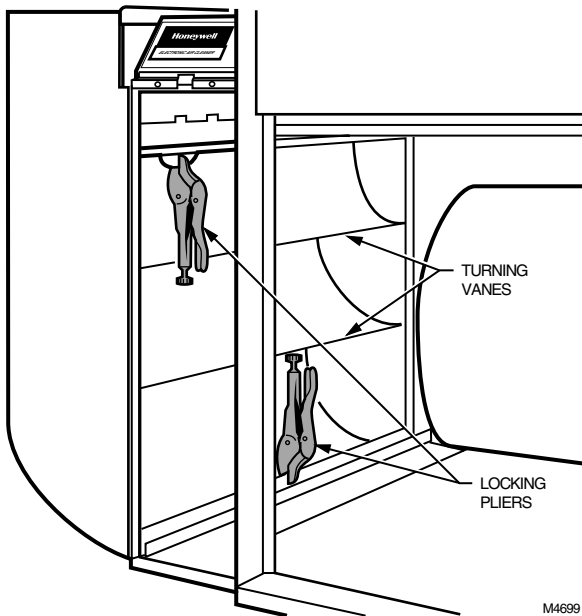


Fig. 20. Connect ductwork to air cleaner. Note turning vanes. Locking pliers hold duct to air cleaner cabinet during installation.

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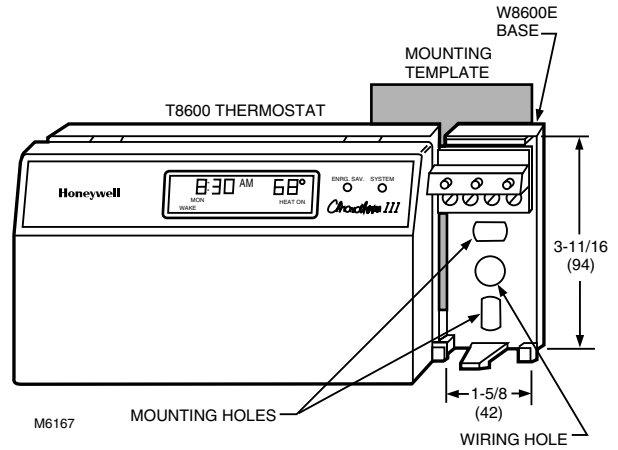


Fig. 21. Mounting the W8600E indicator next to the T8600 thermostat, dimensions in in. (mm).

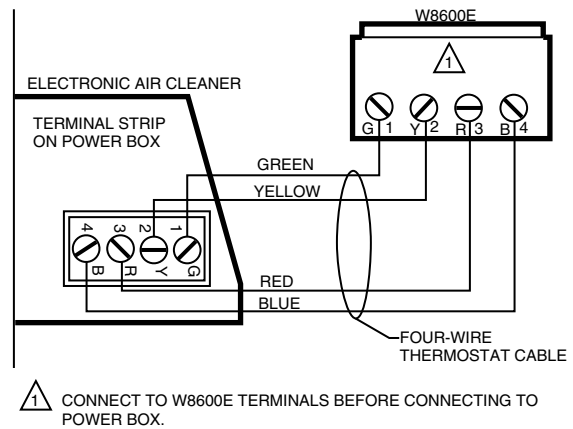


Fig. 22. Wiring W8600E to air cleaner power box terminal strip.

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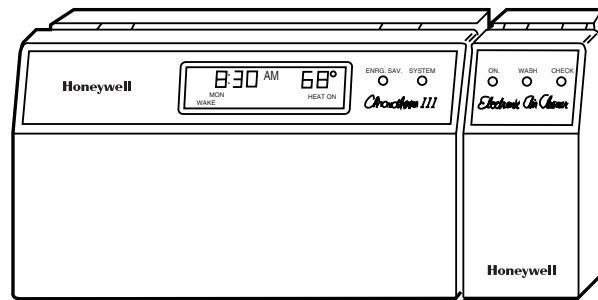


Fig. 23. Completed T8600/W8600E installation.

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## Complete Wiring

### ⚠ CAUTION

**Electric Shock Hazard.**  
**Can cause personal injury.**

- The line voltage power source must match the voltage and frequency printed on the label inside the access door.
- Opening the access door disconnects high voltage power and discharges the cell. Always turn off the air cleaner and open the access door before touching any internal components.
- The air cleaner must be permanently connected to the power source and properly grounded. Do not use an extension cord.

- ❑ Disconnect power source before beginning wiring to avoid electrical shock or equipment damage. All wiring must comply with local codes and ordinances.

### IMPORTANT

*In a multispeed blower application, isolate the air cleaner with a dpdt fan relay or sail switch. The air cleaner overheats and burns out if it is connected in parallel with one winding of a multispeed fan motor, and a different winding is powered during a thermostat call for cooling.*

- ❑ Wire the air cleaner to run only when the system blower is running.
  1. If the system blower is driven by a single-speed, single-phase motor, wire the air cleaner into the fan circuit. See Fig. 24.
  2. If the system blower is driven by a 3-phase, variable speed or a 2-speed motor, the air cleaner *must* be isolated from the blower motor. Use a sail switch mounted in the return air duct (see Fig. 25), a dpdt fan relay (see Fig. 26), or furnace manufacturer supplied terminals. Connecting the air cleaner in parallel with one speed of a multispeed motor can create an *auto-transformer effect*. If connected with the high speed, voltage supplied to the air cleaner at low speed is too low, and the air cleaner may not operate at all. If connected with the low speed, voltage to the air cleaner at high speed is too high and the air cleaner will burn out.

## Connect Ductwork

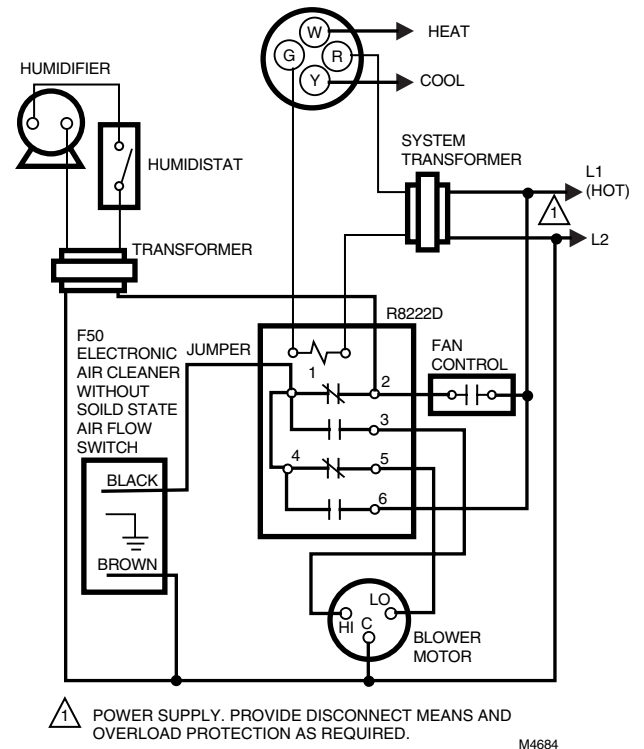
- ❑ Connect the vertical duct section to the elbow. If the vertical drop of the duct is less than 7 in. (178 mm) from the side of the furnace, shorten the horizontal trunk or attach an offset fitting to the elbow.
- ❑ When ductwork is properly aligned, connect vertical duct to horizontal trunk. See Fig. 25.

## Seal Joints

- ❑ Seal all joints in the return air system between the air cleaner and the furnace to prevent dust from entering the clean airstream.

## Disable Unused Prefilter Guide

- ❑ Crimp the end of the downstream (closest to furnace) prefilter guide to prevent incorrect prefilter installation following cleaning. See Fig. 26.



**Fig. 24. Two-speed blower motor. F50 without solid state air flow switch is controlled through a dpdt fan relay. Note power humidifier connections.**



**Fig. 25. Complete the duct installation.**

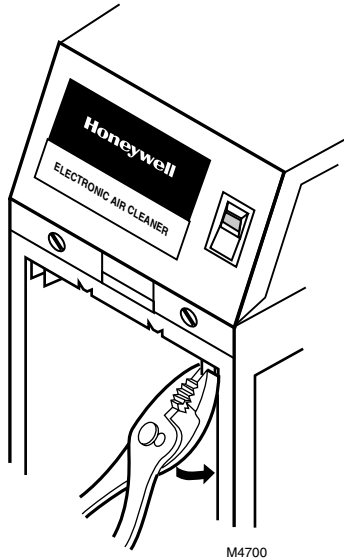


Fig. 26. Crimp End Of Unused Prefilter Guide.

### Position Cell Key

- ❑ The electronic cells must always be installed so the ionizer section is on the upstream side. A factory-installed cell key on the bottom of the cabinet allows the cells to be inserted in only one direction. As long as the arrow molded into the plastic key points the same direction as the airflow, the ionizer is always on the upstream side.
- ❑ If the position of the key must be reversed, proceed as follows:
  1. Remove electronic cells.
  2. Loosen the screw holding the cell key in place. See Fig. 27.
  3. Turn the key around and place it over the opposite holes. The tab on the bottom fits into the larger hole, and the screw fits into the smaller hole. Make sure the arrow on the key points in the direction of air flow (downstream).
  4. Tighten the screw.
  5. Insert the electronic cells. The ionizer section is now on the air-entering (upstream) side of the cabinet.

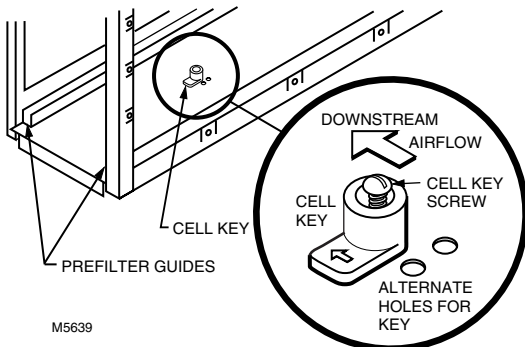


Fig. 27. Position of cell key determines orientation of cell. Arrow on key must point downstream.

### Attach Cell Handles

- ❑ The cell handles are included in the packet of literature. They must be installed on the end of the cells that will be closest to the access door. To install:
  1. Orient the cells as they will be when installed. The red contact board must be up and the airflow arrow stamped into the cell must point downstream.
  2. Hold the handle sideways and insert the solid tab on the back of the handle into the slot in the cell. Turn the handle 90 degrees clockwise to align the divided tab with the square hole. See Fig. 28.
  3. Insert the divided tab into the square hole.
  4. Fold up the wedge and insert into the divided tab to lock the handle in place. When necessary, press with a blunt instrument like the end of a pliers.

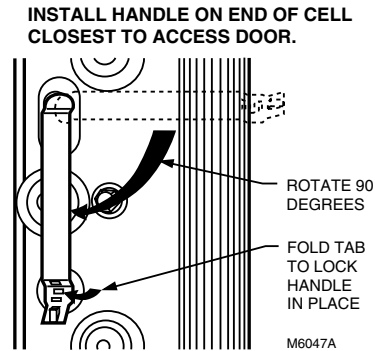


Fig. 28. Install handle on end of cell that will be closest to access door.

### Reassemble Air Cleaner

- ❑ Insert the electronic cells with the red contact board up and the airflow arrow pointing downstream. If the cells do not slide easily into the cabinet, check the orientation of the cell key.
- ❑ Insert the prefilters on the upstream side of the cabinet in the guides provided.
- ❑ Replace the access door. Insert the tab on the bottom of the door into the slot in the cabinet, then swing closed and press into place. See Fig. 29. The door must be firmly in place or the air cleaner will not operate.
- ❑ If the cell washing schedule on the power box is not conveniently located, mount the schedule from the literature package on the furnace or other convenient location near the air cleaner.



**Fig. 29. Close access door to complete air cleaner installation.**

## CHECKOUT

### Inspect the Installation

Make sure:

- Turning vanes and transitions, as needed, are properly installed.
- Sheet metal joints between air cleaner and furnace are sealed.
- All sheet metal connections are complete.
- Original furnace filter was removed and the blower compartment cleaned.
- If an atomizing humidifier is installed upstream of the air cleaner, that a disposable furnace filter is installed between the humidifier and the air cleaner.
- If the furnace has a multispeed or modulating blower (and an air cleaner without solid state air flow switch is used), that an interlock (sail switch or dpdt relay) provides electrical isolation.
- Outside air, if used, is mixed with return air or heated as necessary before it can reach the air cleaner.
- The high voltage contacts on the cell touch the spring contacts in the contact tray.
- The airflow arrows on the electronic cells point downstream.
- The prefilters are on the upstream side of the cells.
- The cell handles face outward.
- The electronic cells and prefilters are clean and dry.
- The wiring connections inside the junction box or power box are properly made. See Fig. 24.
- That W8600E (if included) wiring connections are properly made.

## Check Air Cleaner Operation

With all components in place, turn on the air cleaner switch and energize the system blower. Check the following points of operation:

1. The neon light in the on-off switch is on. If a W8600E is part of the installation, also check the wall panel and make sure the ON LED is lit.
2. Turn off the system blower. The neon light should go off. The neon light comes on to show that the air cleaner is energized and the high voltage power supply is working properly. If W8600E is used with air cleaner that has air flow switch, the neon light shows only that the air cleaner is energized. The CHECK LED will come on if there is a problem with the high voltage power supply.
3. Turn the system blower back on. With the air cleaner energized, push the test button. A snapping sound indicates that collector voltage is present on the cells. On air cleaner with a W8600E, the CHECK LED will come on.
4. With a multispeed blower, repeat steps 1 through 3 for each fan speed.
5. With a meter, check the ionizer voltage between P3 (red lead) and ground, and the collector voltage between P4 (black lead) and ground. The correct voltages are printed on the label inside the access door.
6. If operation is not as described, refer to the Electrical Troubleshooting section.

## SERVICE



### CAUTION

**Sharp Edges.**

**Can cause personal injury.**

Handle the cells carefully or wear protective gloves to avoid cuts from the sharp metal edges.

## Cleaning the Cells and Prefilters

When enough lint accumulates to block the air flow, the prefilter can quickly become clogged. Inspect the prefilters monthly, and clean if necessary to prevent possible lint clogging. The cell washing can also be done at this time, or can wait until next inspection if cells still look clean.

Regardless, clean the cells and prefilters regularly—every one to six months. Variables such as number of family members, pets, activities and whether anyone smokes indoors determine how often cleaning is required. Use the wash reminder schedule on top of the air cleaner to record dates of cell washings, to help establish and to maintain a regular cleaning schedule.

If the air cleaner has the optional W8600E Solid State Performance Indicator, the WASH LED will come on to remind you that a cell and prefilter washing is past due. If the WASH LED seems to light soon after a cell washing, thorough wiping of the ionizer wires may be all that is needed. Cells should be washed and ionizer wires wiped frequently enough to prevent WASH LED from coming on. The WASH LED will not come on when the prefilters get clogged; clean the prefilters every time the cells are cleaned.

**NOTE:** If an ultrasonic room humidifier is used often, especially when filled with tap (undistilled) water, the cells will require more frequent washing. A white residue will accumulate on the cells from the minerals in the water.

The cells can be washed in many home dishwashers, by soaking in a tub or at a do-it-yourself, coin-operated car wash. The prefilters can be vacuumed, brushed, sprayed with a garden hose, or washed with the electronic cells

## Automatic Dishwasher



### CAUTION

#### Burn Hazard.

#### Can cause personal injury.

Allow the cells to cool completely in the dishwasher at the end of the wash cycle or wear protective gloves to avoid burns. Hot water can accumulate in the tubes supporting the collector plates; tip the cells so these tubes drain.

### IMPORTANT

- Check your dishwasher owner manual. Some manufacturers do not recommend washing electronic cells in their dishwashers.
- If the dishwasher has upper and lower arms, carefully position the cells to allow good water circulation.
- Use care to avoid damaging the cells when placing them in the dishwasher.
- Very dirty cells, especially from tobacco or cooking smoke, can discolor the plastic parts of the dishwasher. This discoloration is not harmful. To minimize it, wash the cells more frequently or try a different brand of detergent.
- Do not allow the dishwasher to run through the dry cycle. This bakes on any contaminants not removed during the wash cycle and reduces air cleaner efficiency.

1. Put the cells on the lower rack of the dishwasher with the airflow arrow pointing up. It may be necessary to remove the upper rack. Do not block water flow to the upper arm, if provided on your dishwasher.
2. If you are washing the prefilters with the cells, place them where they will not block the water flow to the electronic cells.
3. Using the detergent that works best for normal dishwashing, allow the dishwasher to run through the complete wash and rinse cycle. Do not use the dry cycle. To avoid burns, let the cells cool completely before removing, or wear protective gloves when removing the cells. Remember that water may be trapped in the tubes that support the collector plates; tip the cells so these tubes can drain.
4. Wipe each ionizer wire and red contact board on top of the cell with a clean cloth.
5. Inspect the dishwasher. You may want to rerun the wash and/or rinse cycle with the dishwasher empty if you see dirt or residue from washing the cells. If dirt or residue seems excessive, wash the cells more often or try a different detergent.

## Soaking in Tub



### CAUTION

#### Hazardous Chemical.

#### Can cause personal injury.

Do not splash the detergent solution in eyes. Wear rubber gloves to avoid prolonged detergent contact with skin. Keep detergent and solution out of reach of children.

NOTE: Always wash the cells first, then the prefilters to keep heavy lint from getting caught in the cells.

1. Use a container such as a laundry tub or trash container that is large enough to hold one or both cells.

NOTE: Sharp corners on the cells can scratch the surface of a bathtub.

2. Dissolve about 3/4 cup of automatic dishwasher detergent in enough very hot water to cover the cells. If the detergent does not dissolve readily, or forms a scum on the water, try another brand, or use softened water.
3. After the detergent is completely dissolved, place the electronic cells in the container and let soak for 15 to 20 minutes. Agitate the cells up and down a few times and then remove.
4. Next, wash the prefilters the same way. Empty and rinse the wash container.
5. Rinse the cells and prefilters with a hard spray of very hot water; rinse the tub clean then fill the tub with clean, hot water and soak for 5 to 15 minutes. Rinse until the water draining from the cells and prefilters no longer feels slippery.
6. Wipe the ionizer wires and red contact board on the end of cell with a clean cloth.

## Car Wash

Use the hand sprayer at a coin-operated car wash to wash the cells and prefilters. Hold the nozzle at least two feet away from the unit to avoid damage from the high pressure stream of water. Follow the same sequence of wash and rinse as recommended for cars. However, do not wax the cells or the prefilters. Rinse until the water draining from the cells and prefilters no longer feels slippery.

## Reinstall the Cells and Prefilters

1. Inspect the cells for broken ionizer wires and bent collector plates. Repair as necessary.
2. Slide the prefilters into the upstream prefilter guides.
3. Slide in the air cleaner cells so the air flow arrow points downstream and the handles face outward.
4. Firmly close the access door.
5. Turn on the air cleaner. If the cells and prefilters are wet, the neon light may not come on and you may hear arcing. If the arcing is annoying, simply turn off the air cleaner for two to three hours, or until dry.

## Ionizer Wire Replacement

Broken or bent ionizer wires can cause a short to ground, often resulting in visible arcing or sparking. On air cleaners without a W8600E, any short in the ionizer section causes the neon light to go out. On air cleaners with a W8600E, any short in the ionizer or collector section lights the CHECK LED on the wall panel. The cell should not be used until the pieces of broken wire are removed. It can be used temporarily with one wire missing, although the wire should be replaced as soon as possible. See the Parts List section for order number.

Replacement wires come cut to length with eyelets on both ends for easy installation. To install:

1. Hook the eyelet on one end of the wire over the spring connector on one end of the cell. See Fig. 30. Be careful to avoid damaging the spring connector or other parts of the cell.



2. Hold the opposite eyelet with a needlenose pliers and stretch the wire the length of the cell. Depress the opposite spring connector and hook the eyelet over it.

### Reducing Ozone Odor



## CAUTION

### Electric Shock Hazard.

### Can cause personal injury.

Always disconnect power and open the access door to discharge the high voltage power supply before opening the power supply cover.

The electronic air cleaner generates a small amount of ozone in normal operation. During the first week or two of operation, the amount may be higher because of sharp edges on some of the new high voltage metal parts. However, normal use dulls these edges in a short time.

The average person can detect the odor of ozone in concentrations as low as 0.003 to 0.010 parts per million (ppm). The electronic air cleaner contributes 0.005 to 0.010 ppm of ozone to the indoor air. The U.S. Food and Drug Administration and Health and Welfare Canada recommend that indoor ozone concentration should not exceed 0.050 ppm. As a comparison, the *outdoor* ozone level in major cities is sometimes as high 0.100 ppm. However, if desired, the ozone generated by the air cleaner can be reduced in one of two ways:

1. Install an activated carbon filter downstream of the air cleaner. Make sure particles from the air filter cannot fall into the air cleaner.

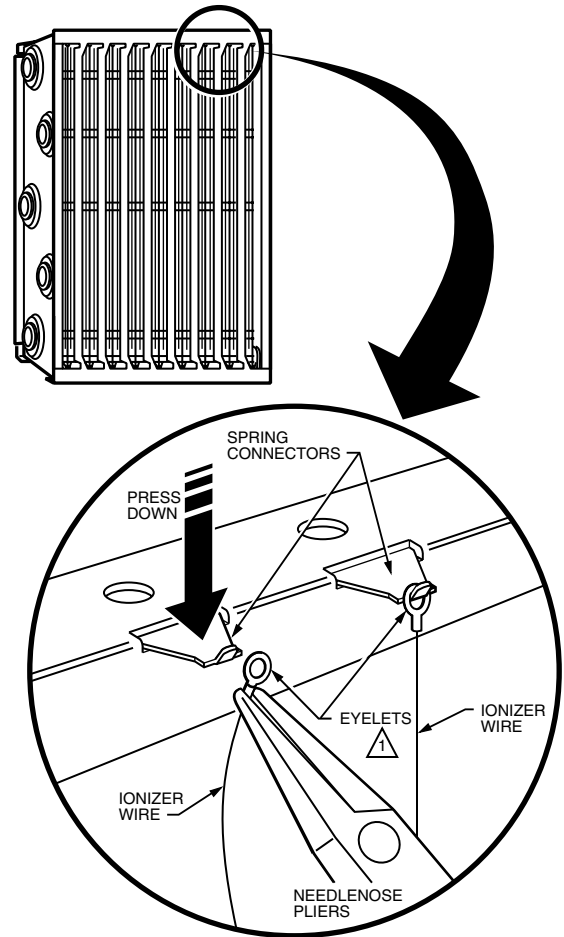


## CAUTION

Only a trained service technician should perform the following procedure.

2. Clip out the J2 jumper on the power supply. This reduces ozone production about 20 to 25 percent, and reduces efficiency about 7 to 10 percent, depending on actual airflow delivered by the furnace blower.
  - a. Turn off power to the air cleaner.
  - b. Open the access door to discharge the high voltage power supply.
  - c. If power supply is remotely mounted, make sure the access door is left open. Remove the power box cover. See Fig. 32.
  - d. Find the J2 jumper and clip it out. See Fig. 31.
  - e. Replace power supply cover and access door. Turn on power.

### REPLACING AN IONIZER WIRE.



1 TWO EYELETS HOLD IONIZER WIRE TO CELL.

M1540B

**Fig. 30. Install new ionizer wire by hooking eyelets over spring connectors.**

CLIP OUT J2 JUMPER TO REDUCE OZONE PRODUCTION ABOUT 20 TO 25 PERCENT.

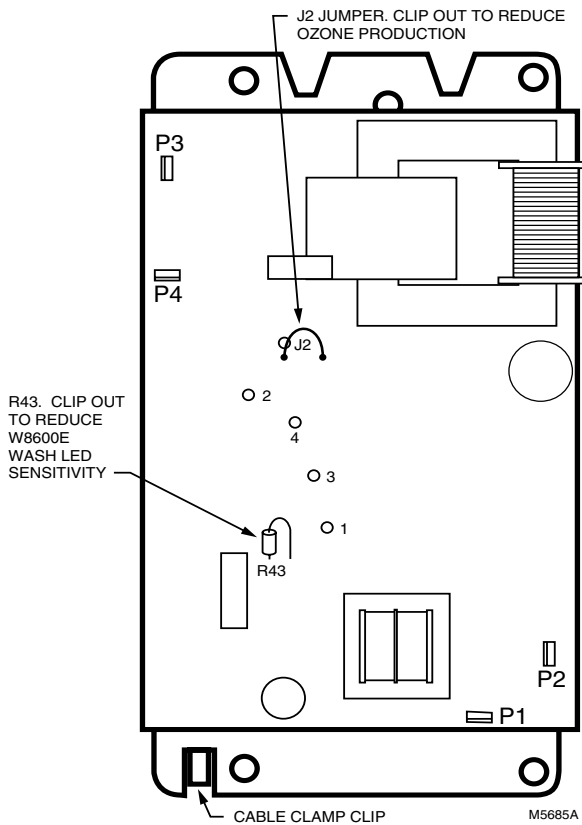


Fig. 31. Clip out J2 jumper to reduce ozone production about 20 to 25 percent.

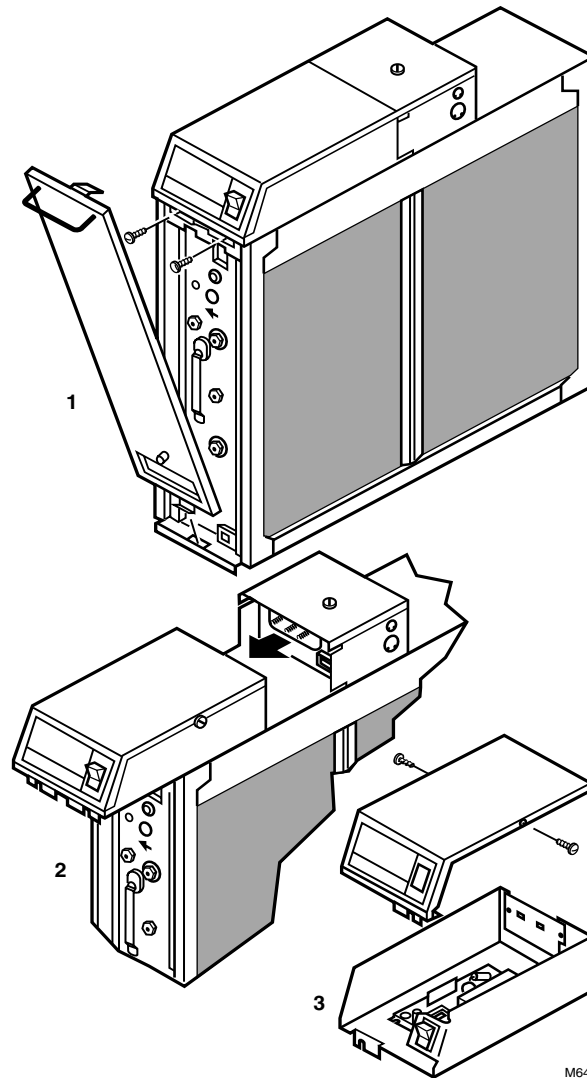


Fig. 32. You must remove two-cell model power box from air cleaner to remove cover.

## ELECTRICAL TROUBLESHOOTING

### ⚠ WARNING

**Electric Shock Hazard.**  
**Can cause personal injury or equipment damage.**  
 The following procedures expose hazardous live parts. Disconnect power supply between checks and proceed carefully.

### ⚠ CAUTION

The following instructions are for use by qualified personnel only.

### Tools and Equipment

Troubleshooting the electronic air cleaner requires only a few tools:

- Needlenose pliers for stringing ionizer wires.
- Test meter.

### Troubleshooting Procedure

The Electronic Air Cleaner Troubleshooting Charts, Fig. 34 and 35, show how to quickly isolate a problem in the air cleaner. Although a meter is needed for some steps, (see Fig. 33) the primary diagnostic tools are the neon light on air cleaners without a W8600E, the CHECK LED on air cleaners with W8600E, and the test button.

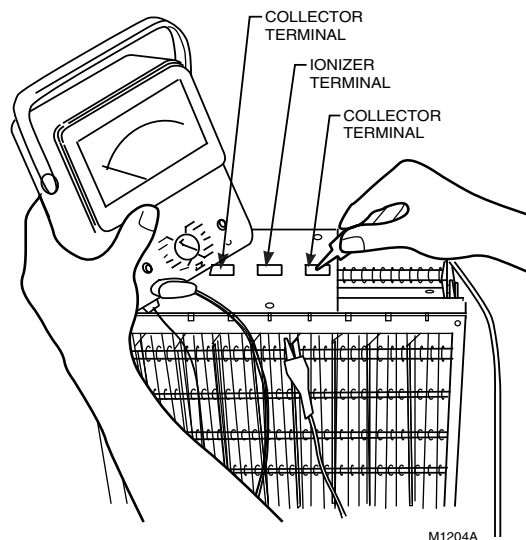
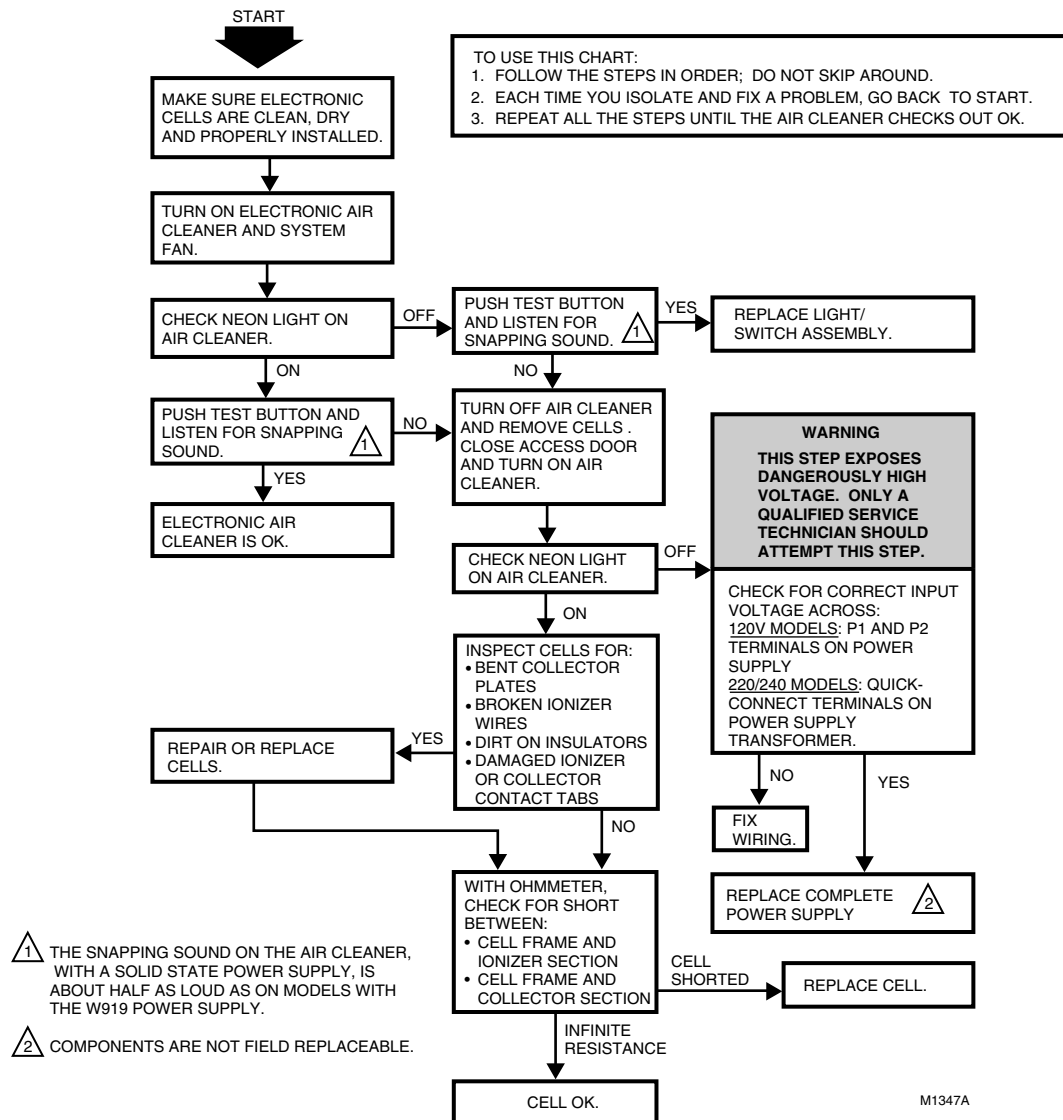


Fig. 33. Use an ohmmeter to check the electronic cells for short circuits.

**TROUBLESHOOTING F50E AIR CLEANERS WITHOUT SOLID STATE PERFORMANCE INDICATOR TERMINALS ON POWER BOX**



**Fig. 34. Electrical troubleshooting procedure for F50E electronic air cleaners without a W8600E.**

**Neon Light**

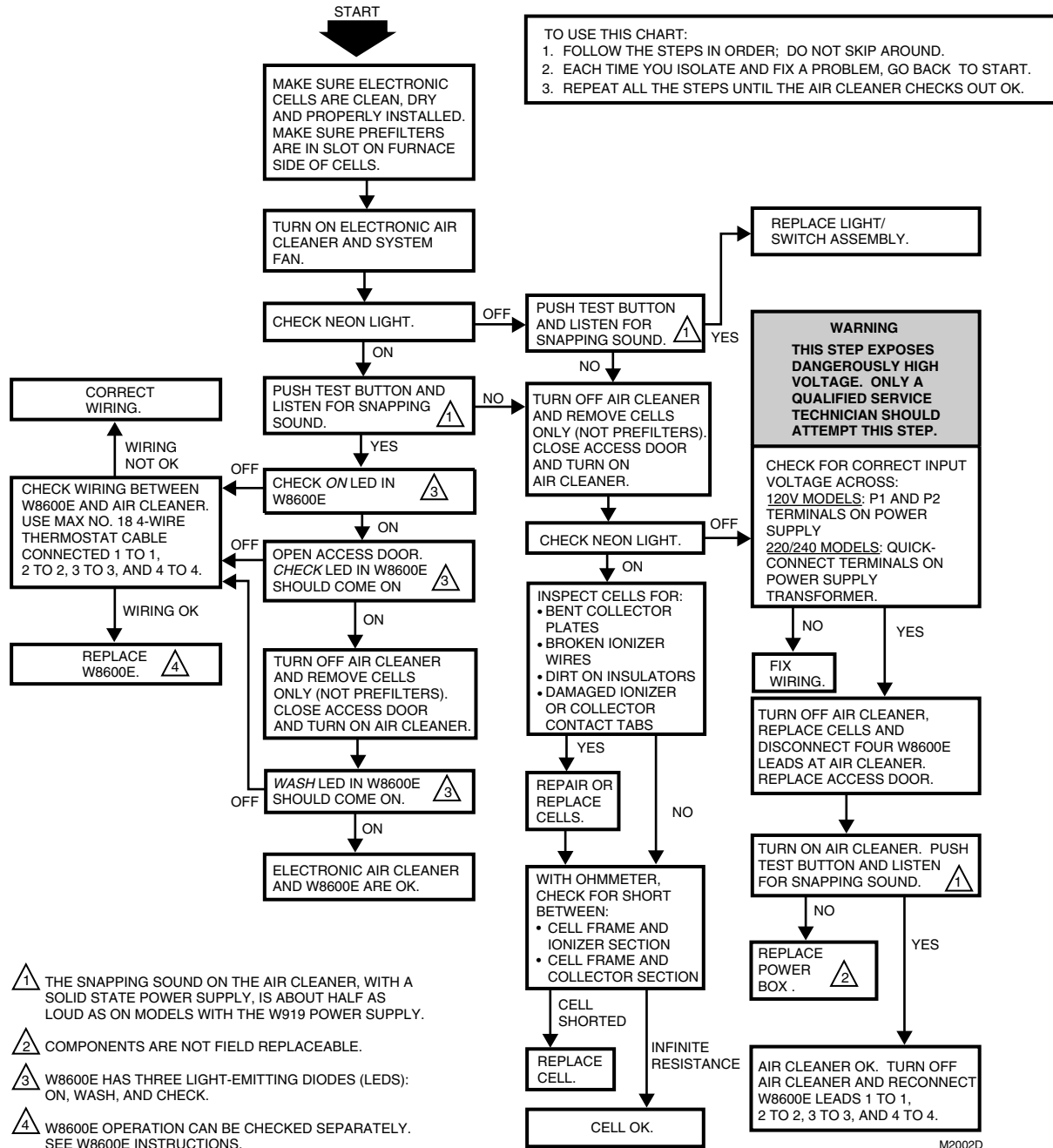
The NEON LIGHT is in the on-off switch. It is powered through the power supply and is ON when the power supply is working properly. See internal schematic, Fig. 36.

On models with the W8600E printed wiring board, the neon light in the on-off switch indicates only that the air cleaner is powered. See internal schematic, Fig. 36.

**CHECK LED (air cleaners with W8600E)**

The CHECK LED is on the W8600E. It lights to indicate the following problems: excessive dirt loading (beyond that required to activate the WASH LED), partial shorting of the collector, continuous ionizer or collector arcing, power supply failure, excessive ionizer current, or any condition causing a major reduction in high voltage.

**TROUBLESHOOTING F50E AIR CLEANERS WITH A W8600E  
SOLID STATE PERFORMANCE INDICATOR AND AIR FLOW SWITCH**



**Fig. 35. Electrical troubleshooting procedure for F50E electronic air cleaners with a W8600E and solid state air flow switch.**

**Test Button**

The TEST BUTTON is near the bottom of the access door. When pushed, it shorts from a hot collector plate to ground. See internal schematic, Fig. 36. The resulting arcing sound indicates that high voltage is being supplied to the collector. The solid state power supply controls current flow to the collector, so the arcing sound is only about half as loud as the sound on air cleaners with W919-style power supplies. On air cleaners with a W8600E, the CHECK LED comes on when the test button is pushed.

**Power Supply Problem**



**CAUTION**

**Electric Shock Hazard.**

**Can cause personal injury.**

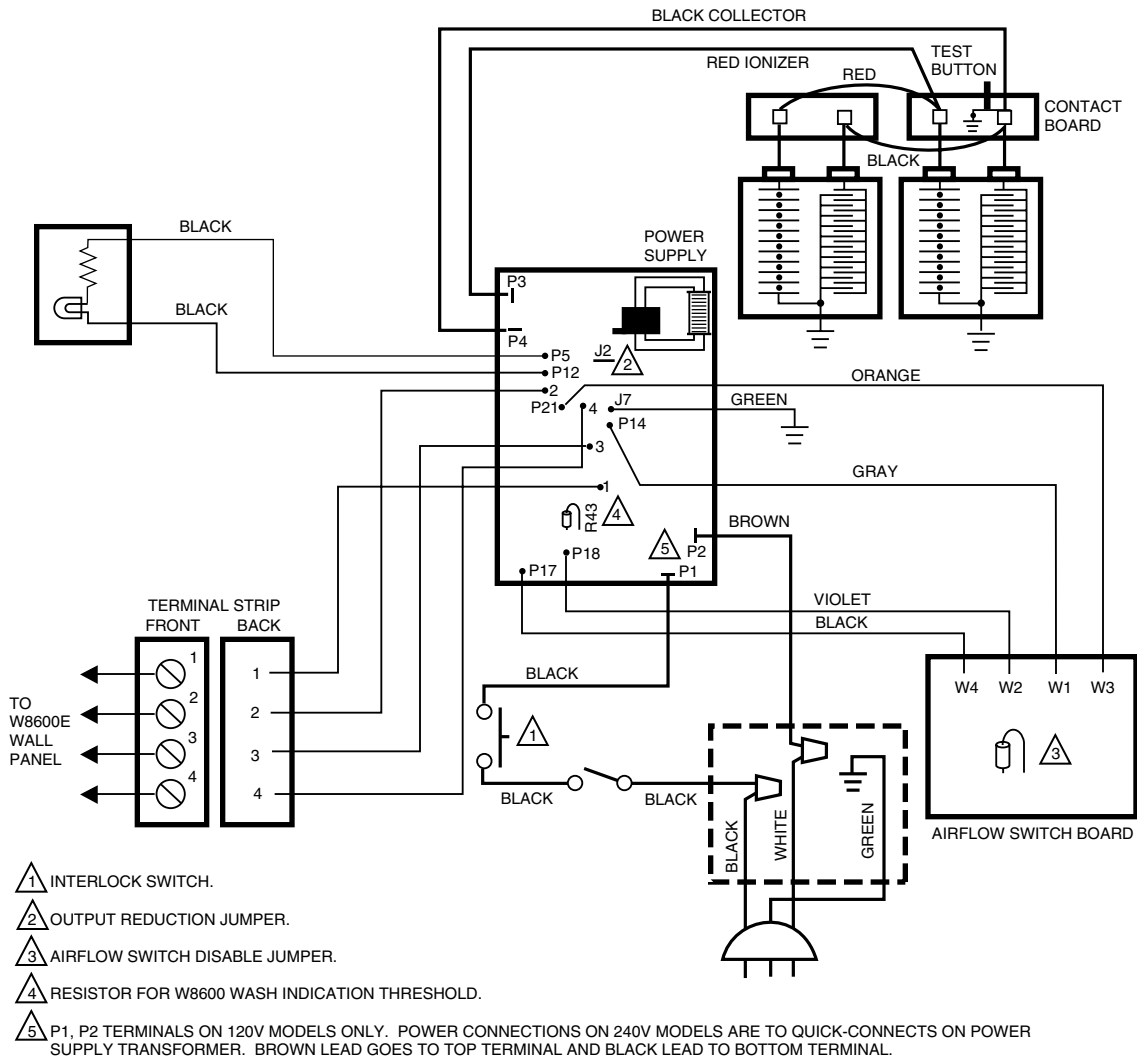
Always turn off power and remove access door before removing power box or its cover.

The solid state power supply provided in this air cleaner has no field-serviceable components. If troubleshooting indicates a power supply problem, replace the entire power supply. See Parts List section for order number.

**To Access Power Supply**

1. Turn off power.
2. Remove the access door and loosen the two screws holding the power box. See Fig. 32.
3. To pull the plug connector out of the receptacle in the junction box, lift slightly to clear screws, then pull the power box straight toward you.
4. Take out the two screws holding on the cover. Remove the cover.
5. Replace the power box by resting it on the cabinet, lifting slightly to clear two screws, and pushing it straight toward the junction box. Do not bend the spring contacts sideways. The power plug must slide straight into the receptacle.
6. Replace the access door and restore power.

**INTERNAL SCHEMATIC FOR ELECTRONIC AIR CLEANER WITH W8600E.**



M4702

**Fig. 36. Internal schematic of an F50E Electronic Air Cleaner with a W8600E.**

## PARTS LIST

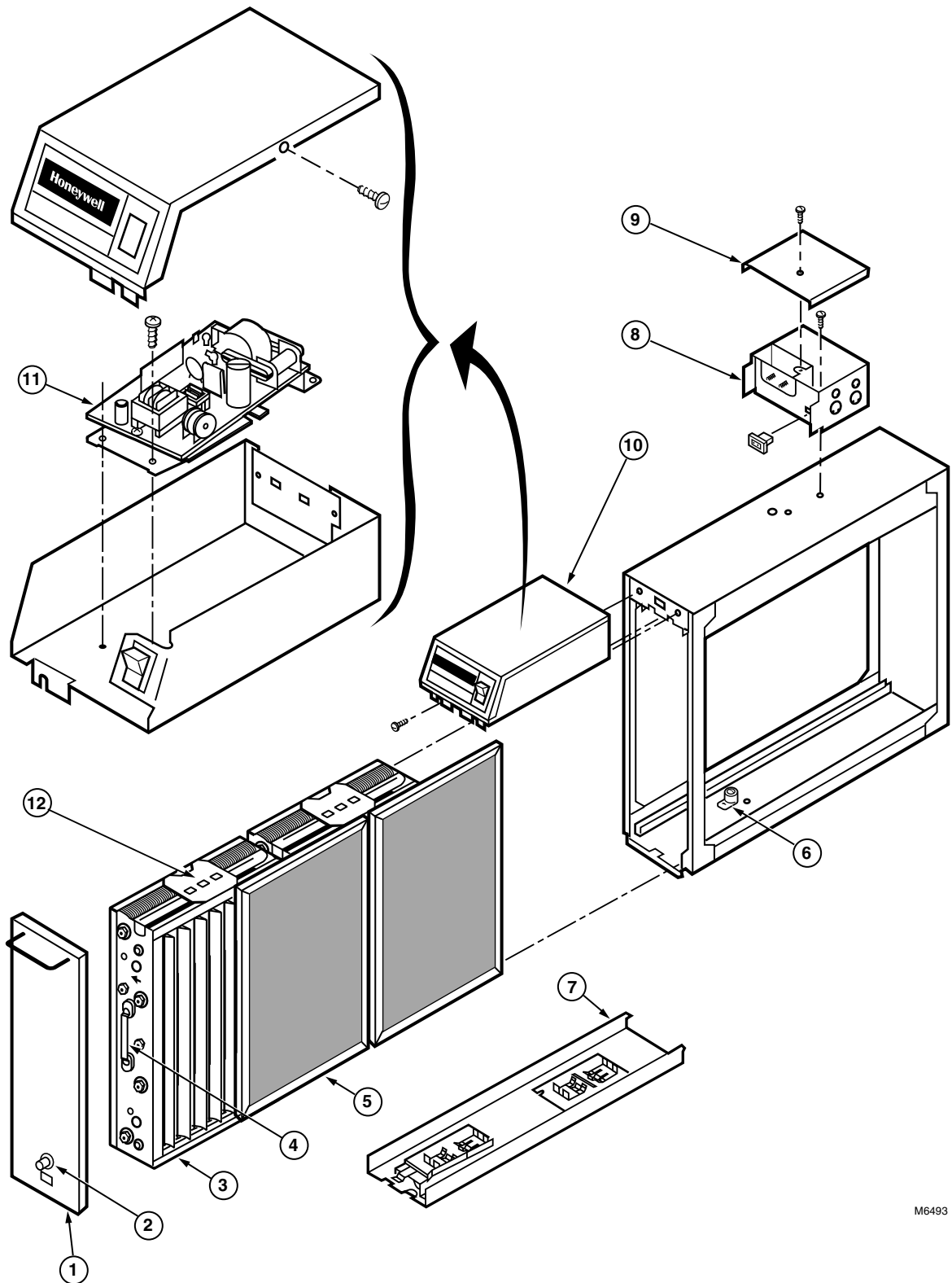
| No. | Description  | Nominal Return Air Opening |                            |
|-----|--|----------------------------|----------------------------|
|     |  | 16 x 25 in. (406 x 635 mm) | 20 x 25 in. (508 x 635 mm) |
| 1   | Access Door includes #2  | 136393AL (1)               | 136392AQ (1)               |
| 2   | Test Button Assembly   | 137980A (1)                | 137980A (1)                |
| 3   | Electronic Cell  | FC37A1130 (2)              | FC37A1064 (2)              |
| 4   | Cell Handle  | 137266 (2)                 | 137266 (2)                 |
| 5   | Prefilter  | 203371 (2)                 | 203372 (2)                 |
| 6   | Cell Key   | 136518 (1)                 | 136518 (1)                 |
| 7   | Contact Panel Assembly   | 136399A (1)                | 136399A (1)                |
| 8   | Junction Box Assembly  | 136394B (1)                | 136394B (1)                |
| 9   | Junction Box Cover   | 136386 (1)                 | 136386 (1)                 |
| 10  | Power Box Assembly With W8600E capability<br>120V, 60 Hz   | 200583B (1)                | 200583A (1)                |
| 11  | Power Supply, 120V, 60 Hz  | 203327F                    | 203327D                    |
| 12  | FC37A Bag Assembly for cell repair.<br>Contains 2 Connector Clips, 1 Terminal Board<br>and Instructions. | 4074EHG                    | 4074EHG                    |

(#) = Qty Required Per Unit

## Parts and Accessories Not Illustrated

| Description                                  | Nominal Return Air Opening |                            |
|--|----------------------------|----------------------------|
|  | 16 x 25 in. (406 x 635 mm) | 20 x 25 in. (508 x 635 mm) |
| Ionizer Wires (multiples of 5)               | 136434BA                   | 136434AA                   |
| Remote Mount Kit                             | 136377A (1)                | 136377A (1)                |
| Remote Mount Base                            | 136377 (1)                 | 136377 (1)                 |
| Conduit Assembly (10 ft.)                    | 136376A (1)                | 136376A (1)                |
| Cabinet Knockout Plug                        | 136743 (1)                 | 136743 (1)                 |
| Mounting Screws                              | 136375 (6)                 | 136375 (6)                 |
| Quick-Connect Terminal                       | 111690 (2)                 | 111690 (2)                 |
| Spring Leaf Contact                          | 136529 (1)                 | 136529 (1)                 |
| Sail Switch                                  | S688A1007 (1)              | S688A1007 (1)              |
| Replacement Sail                             | 123773A (1)                | 123773A (1)                |
| 2-Stage EAC Cell for F50 with Collector Clip | FC37A1247 (2)              | FC37A1239 (2)              |

(#) = Qty Required Per Unit



M6493

**Fig. 37. Components of F50E Electronic Air Cleaner (2-cell model shown).**

This equipment is a class B digital apparatus which complies with Canadian Radio Interference Regulations, CRC c. 1374.

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