ENVIROFLEX® MK2400
ELECTRONIC AIR CLEANERS

OWNER'S MANUAL

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INTRODUCTION

Description

The MK Series Electronic Air Cleaners are self-contained units comprised of a two part collecting cell, an electrical control panel, a fan and motor assembly, complete cabinet housing, prefilters, after filters and an optional charcoal filter.

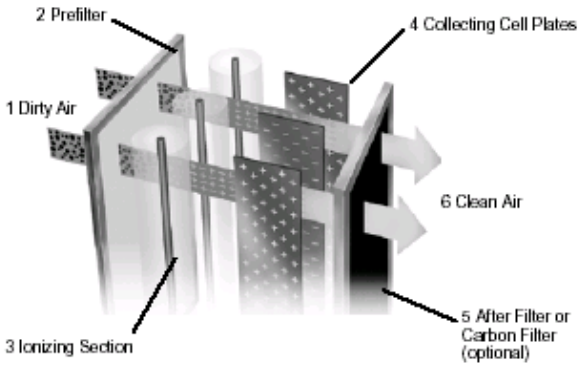
There is one size available:

MK2400 up to 2400 CFM capacity at 90% efficiency

The efficiency of the above units are rated on the removal of particulate matter down to .01 micron including welding fumes, automotive grinding dust, oil mist and black carbon dust. On larger particulate matter such as .03 micron, it is possible for efficiencies to reach as high as 99 %. This is based on the ASHRAE standard Dust Spot Test.

How it Works

The Electronic Air Cleaner is an electrostatic precipitator which operates on a two-stage principle. The contaminated particulate is drawn through the Intake Grill and initially passes through the prefilter. It then passes through the ionizing section and receives a positive DC voltage charge. Particulate then passes into the collecting cell which contains alternately charged and grounded collecting plates. The particulate is repelled by the positive charge and collected on the grounded collecting plates. The particulate remains on the grounded plates until the cell is washed with Precipiclean™. Clean air is then dispersed through the exhaust grill.



Electrostatic Precipitation

MAJOR COMPONENTS

Cabinet

The cabinet is fabricated out of 18 gauge steel. The unit has an interlocked cell access door, and two blower access doors. The intake grill is 20 gauge expanded metal screen. Air is discharged through a 4-way directional diffuser. Weld nuts to accept 1/2 in. threaded rods are incorporated into the cabinet top to facilitate hanging the unit.

Prefilters

The prefilter is constructed of multi-layers of aluminum mesh to filter out the larger particles. The prefilter is 16 X 20 inches (40.6 cm X 50.8 cm).

After Filter

The after filter is identical to the prefilter. Its purpose is to maintain back pressure to spread the air evenly over the collecting cell.

Collecting Cells

The two part collecting cell includes support bracket, collecting plates, support tubing, insulators, end plate, spring contact, access handles, and separate ionizing section, ionizing wires, ionizing wire support.

Blower and Motor Assembly

The motor is a 3/4 HP TEFC, 1725 RPM belt driven. The blower is a dual inlet, centrifugal fan with forward curved blades.

Electrical Compartment

The control panel on the front of the unit contains the two lighted rocker switches to control the motor and power supply board, and a performance indicator light, indicating high voltage.

The power supply board is an open printed circuit board with a variable voltage control. The output is 10,000 volts DC @ 3.5 milliamps for the ionizer and 5,000 volts DC for the collector cell. The circuit board has a 1.5 amp fuse on it. The board also contains a large bleed off resistor to allow the high voltage to dissipate from the cell when the unit has been turned off. This removes a potential voltage

buildup on the cells and prevents a shock as the cells tend to act like a capacitor and store a charge. This charge is removed by the bleed off resistor. Quick disconnects on the board allow for easy removal for troubleshooting or repairs. **THE SERVICE INDICATOR LIGHT SHOULD BE ON DURING NORMAL OPERATION.** The indicator light indicates whether you have high voltage to the ionizing section and the collecting cell. If it goes out the following could be the problem:

1) Light malfunction.
2) Power supply defective.
3) Short in the cell or ionizing sections or some other area

Air Velocity

Air velocity is critical to the operation of the unit and should not exceed 500 FPM. Do not adjust drive to exceed this velocity

	MK2400
Intake Velocity	500 FPM
Discharge Velocity	2100 FPM
Internal static	.25 in. WG

External Static

These units are not normally set up for ducting. Should ducting be necessary, consult the factory regarding blower and motor combinations.

Sizing and Location

The following are the general guidelines for sizing and location of units.

General Air Cleaning

Sizing of equipment is based on the recirculation of clean air in the contained area. Determine the total cubic footage of the area to be cleaned. Determine the number of air changes per hr. that would be appropriate. This total is the actual cubic ft. of air per hour necessary. Divide this figure by 60 to convert to CFM (cubic ft. of air per minute). Then divide the capacity of the unit (2400) that will be used and this determines the number of units required.

General Air Cleaning

Example: Body Shop
Desired air recirculation = 10 air changes/hr.
Size of room (L x W x H) = 100 x 75 x 20 ft.
Maximum CFM of MK2400 = 2400 CFM

$$\frac{L \times W \times H \times \text{Air Changes/Hour}}{60} = \text{Total CFM}$$

$$\frac{150{,}000 \times 10}{60} = 25{,}000 \text{ CFM} = \text{Total CFM}$$

$$\frac{25{,}000}{2400} = 10 = \text{No. of Units}$$

In this example above, 10 units should be placed so that a uniform air flow pattern is developed. A good air flow will ensure good cleaning.

Maintenance Schedule

The collecting cell, ionizer, prefilter and after filter must be cleaned on a regular basis for the unit to function at its peak efficiency. The frequency of cleaning will vary from one environment to another. The following is an average wash cycle:
****Please note if the service indicator light starts going on and off this is an indication that the cell needs cleaning due to arcing in the cell.**

- Body Shops = **1 week**
- Welding Shops = **1 Week**
- Lounges, Bars = **1 Week**

If your unit is equipped with an activated carbon filter, it will need to be refilled, depending on the environment every three to six months. Do not wash the carbon filter as this will render them useless.

Washing Instructions

CAUTION

Avoid washing the cell or ionizer with a high pressure cleaner as this may cause damage to the cell plates or fins.

CAUTION

The cell plates are sharp. Handle with care. Take care not to damage the cell by hitting the cell plates. The cell plate spacing is critical for proper operation of the unit.

2. Open the cell access door. Take an insulated handled screwdriver and short the positive and negative plates to assure a charge has not built up on the plates to avoid a potential shock. Remove the collecting cell, ionizer, prefilter and after filter.

The cells should be sprayed with Precipiclean™ and allowed to soak for 5 minutes and then hosed down with warm water. Precipiclean™ is available in 5 gallon containers.

Service Maintenance

1. To determine if the air cleaner is performing properly please check the following:

   - Power switch is **ON**
   - Fan Control switch is **ON**
   - Performance indicator is **ON**

2. If both switches are normal and the fan and motor are running and the power supply light is on, there should be no problems

3. If the performance indicator light fails to light, check the cell to ensure it has been installed properly.

   The arrow on the ionizing section should be pointing toward the fan. Be sure the spring loaded contacts line up with the high voltage contact on the wall of the air cleaner.

   A cell placed in the air cleaner incorrectly will burn out the power supply board. The arrow on the cell has to point up toward the fan looking at the cell from the front of the machine.

   A simple test to ensure that the cell is in correctly is to take a couple of long plastic handled screwdrivers and short the cell between the frame of the air cleaner and the bolt head on the porcelain insulators. Check plates and ionizer for a spark. The switch for the fan should be left off. The power supply switch should be on. Be sure to activate the safety interlock switch on the front door before checking the voltage. Be careful! You are dealing with high voltage.

4. If in doubt and if the cell is not collecting any particulate then consult your dealer. The dealer should have sufficient knowledge to determine any problems.

5. **Troubleshooting Tips**

Question:
I just cleaned the complete machine and installed all components back into the machine. However, the service indicator light is out. What is wrong?
Answer:
The purpose of the service indicator light is to monitor the high voltage output out of the transformer. This light should be on at all times. If it should go out other than a defective light it is telling us that we have lost high voltage. If you just cleaned your cells and the light was on prior to cleaning the cells and went out after the cells were cleaned then we have lost our high voltage. This is most likely due to moisture or water in our high voltage terminals or ceramics. After you clean the cells and/or ionizers you should have them dry prior to applying the high voltage. You do this by either leaving them out overnight to dry or insert them in the machine and apply the blower only switch. At about 1hr. intervals you should turn on the high voltage to see if the service indicator light comes on. If it doesn't come on then keep repeating the process. If after 2 or 3 tries the light still does not come on follow the next Q&A regarding troubleshooting a short circuit.

Question:
If I cleaned the cells and repeatedly tried drying off the cells and the service indicator light is still off what do I do next?

Answer:
The next thing we have to do is try to isolate whether the problem is the power supply or an external short on the output of the power supply. In most cases it is an external short.
Step 1: Remove all cells and ionizers. Check to see if the light comes on. If it does then you have to insert the cells and ionizers (1) at a time until the light goes out. We have now isolated the problem. It now requires further inspection or blowing off that isolated component.
Step 2: If the light is still off when the cells and ionizers are removed the problem is either the

power supply itself or more than likely the red fiber contact boards have either moisture in them or a lot of metal dust. You should clean and inspect them. To isolate the fiber boards you can remove the cell and ionizer high voltage leads coming out of the power supply. These boards are removable for cleaning. If the light comes on then you have to isolate if it is the ionizer or cell red fiber board. If removing the (2) high voltage wires from the power supply do not light up the light we more than likely have a defective power supply.

If the above tips do not help please call our service department at **877-ENV-FLEX** or email us at info@enviroflex.com with a detail of your troubleshooting methods

Limited Warranty

Your Electronic Air Cleaner is guaranteed for one (1) full year from the date of original purchase, against electrical and mechanical defects in material and workmanship. The warranty does not include the prefilter or after filter. The warranty does not cover damage caused by misuse, negligent handling, or use on voltages other than that stamped on the air cleaner.

This warranty does not cover any personal injury, property damage, or any incidental or consequential damages of any kind, resulting from defect, malfunctions, misuse, or alteration of the product.

This guarantee is in lieu of any other warranty, either expressed or implied.

If warranty service is required, send the part(s) prepaid to your dealer or nearest authorized service center, with a proof of purchase. Ensure that sufficient packing material is used. If part(s) arrive damaged due to improper packaging, warranty will be void. Please enclose a note explaining the nature of your difficulty.

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