# OPERATION & MAINTENANCE MANUAL

# MODEL SC-924A
# SELF-CONTAINED
# ELECTRONIC AIR CLEANER

*IMPORTANT: PLEASE READ MANUAL BEFORE OPERATING UNIT*

**Certified for shock and electrical fire hazard only.**

## INTRODUCTION

### DESCRIPTION

The SC Series Electronic Air Cleaners are self-contained units comprised of collecting cell(s), electrical compartment, blower and motor assembly, complete cabinet housing, prefilter(s) and after filter(s) or optional carbon filter(s).

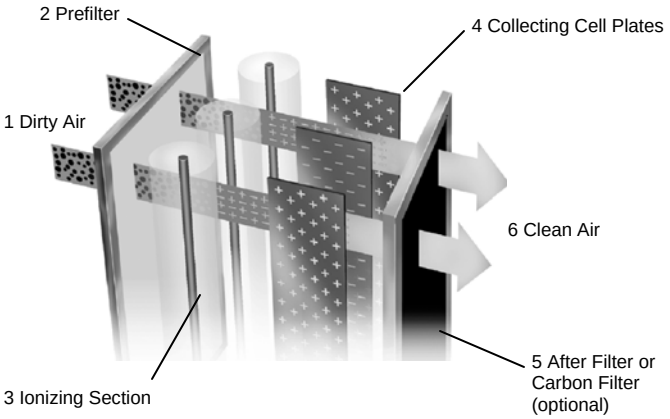
There are two sizes available:

Model SC-910: up to 1100 CFM capacity at 90% efficiency
Model SC-924: up to 2100 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 carbon black 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 operates on the principle of "Electrostatic Precipitation". Millions of airborne pollutants are drawn in through the intake grill on the front of the air cleaner and first pass through a prefilter where large particles are caught. Next, smaller particles move to a two-stage electrostatic collecting cell where they are given a powerful positive charge by the ionizing wires. Charged particles then move into the collecting area where they are attracted to a series of alternately charged and grounded plates. Pollutants are held on the plates like a magnet until washed away during cleaning. Clean air is then dispersed through the exhaust grill.




**Electrostatic Precipitation**

## MAJOR COMPONENTS

### CABINET

The cabinet is constructed of 18 gauge steel finished in a scratch-resistant, electrostatic powder coated finish. The unit has an interlocked cell access door, and two blower access doors. The removeable intake grill is 20 gauge expanded metal screen. Air is discharged through a 4-way directional defuser. Weld nuts to accept 1/2 in. threaded rods are incorporated into the cabinet top to facilitate hanging the unit.

### PREFILTERS

The washable prefilter measuring 16 x 20 in (40.6 x 50.8 cm) is constructed of multi-layers of aluminum mesh for maximum filtration of large particles.

### AFTER FILTER

The after filter measuring 16 x 20 in (40.6 x 50.8 cm) is constructed of multi-layers of aluminum mesh for filtration of agglomerated dust, and to maintain back pressure.

### COLLECTING CELL

The two part collecting cell include support brackets, collecting plates, support tubing, insulators, end plates, spring contact, access handles, and separate ionizing section; ionizing wires, ionizing wire support.

### MOTOR & BLOWER

The motor is 3/4 HP TEFC, 1725 RPM. The blower is a double inlet, centrifugal type with a forward inclined wheel.

### ELECTRICAL COMPARTMENT

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

The high voltage power board is located in a separate removable steel box mounted below the blower motor. The power board is an open printed circuit board with an adjustable output. The direct current output is 10,000 volts @ 3.5 mA. It is fused at 1.5 amps. A large value resistor bank will bleed off the high voltage from the cell when the unit has been turned off.

Quick disconnects on the board allow easy removal for troubleshooting or repairs. **The Performance Indicator Light should be on during normal operation.** The light will flicker with arcing in the cell or extinguish if the cell, ionizer or power board is shorted.

The cell access door is equipped with a safety interlock switch to cut the power to the unit when the door is

opened.

## AIR VELOCITY

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

| | SC-924 |
|---|---|
| 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 that would be appropriate. This total is the actual CFM necessary. Divide this figure by the capacity of the SC unit that will be used and this determines the number of units required.

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 SC-924 = 2100 CFM

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

$$\frac{\text{Total CFM}}{\text{Maximum CFM of Air Cleaner}} = \text{No. of units}$$

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

$$\frac{25{,}000}{2{,}100} = 11.9 = 12 \text{ units}$$

In the example above, 12 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,s ionizers, prefilters and after filters 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. For instance, in a welding shop you may be required to wash the cell every 3 days to 2 weeks depending on the work load of the unit.

Every environment will be different. Inspect the unit frequently until you determine the right washing schedule for your particular application.

If your unit is equipped with an **activated carbon filter** it will need to be refilled, depending on the environment, every 3 - 6 months. Do not wash the carbon filter as this will render it 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.

1. Turn both the fan and power supply switches **OFF** and wait 15 seconds for high voltage to dissipate.
2. Open the cell access door and remove the collecting cells, ionizers, prefilters and after filters.
3. If the cell plates are heavily coated it may be necessary to spray the cells with hot water to remove the excess contaminate before applying detergent. Allow excess water to drain off the cell before applying detergent.
4. Place the cell and ionizer in a tub and spray completely with **DAX Detergent**, allowing detergent to run down both sides of the plates and ionizing fins. Let sit for 5 minutes.
5. Rinse the cell well with hot water (140ºF / 60ºC maximum).
6. If dirt remains on plates, let the cell soak in hot soapy water for 30 minutes, then repeat the washing instructions listed above. **Never use any instrument to clean the cell, as this may damage the ionizing wires or cell plates.**
7. An alternate method to clean the cell and ionizer is to soak them in a tub of Dax for 10-15 minutes. The Dax can be reused numerous times as long as the cell is

kept from sitting in the sludge which will collect in the bottom of the tub. **Never allow the cell or ionizer to sit longer than 15 minutes in the DAX or they will discolour.** The tub should be covered when not in use to prevent evaporation.

8. Spray the prefilter and after filter with **DAX Detergent** and rinse well, applying water pressure against the air flow direction. This pushes contaminate out of the filter instead of forcing it through the filter..
9. To dry the cell and ionizer, tilt on a 45º angle against wall with the direction arrow pointing sideways. Allow to dry completely for at least 8 - 10 hours.
10. When the cells, ionizers, prefilters and after filters are dry, install them back into the cabinet. **The arrow on the cell and ionizing section should point toward the blower. The spring contact should line up with the fibreboard on the back wall of the cabinet.** Close the door. If the cells arc when the fan and power supply switches are turned on or if the performance indicator light does not come on, then the cells may still be wet. Allow more time for drying. You can leave the cell and ionizer in the unit, turn the fan switch **ON** and leave the power supply switch turned **OFF**.

    **A cell placed in the air cleaner incorrectly can burn out the power board.**

**WARNING**

Wear protective goggles, dust mask and gloves when cleaning the inside of the cabinet. Always turn both the fan and power supply switches **OFF** and **turn OFF the main breaker and lock out** the unit before cleaning.

11. The high voltage contact boards inside the cabinet need to be cleaned on a regular basis to insure a good contact with the cell and to prevent accumulation of contaminate behind the contact board. Clean the contact disc and surrounding red contact board with a dry cloth while the accumulation behind the contact can be removed with dry compressed air. Complete access to the back of the contact boards can be made from the outside of the cabinet by removing the small panels on the back side of the unit. The high voltage wires near the contact boards should be wiped when the contacts are cleaned and inspected annually by a qualified service technician for deterioration.
12. The accumulated contaminate under the cells and in the blower compartment should be removed at least twice a year with a vacuum. Dry compressed air can be used to remove the dust in the switch box and power box which houses the high voltage power supply. Do not apply air pressure too close to the components as this may damage them. Build up of contaminates on the blower wheel and housing can also be cleaned with dry compressed air. The motor should also be blown off with dry compressed air or vacuumed, particularly around the cooling fan intake at the back of the motor.

## CLEANING AND SERVICE

The use of **DAX Detergent** is recommended for cleaning as it is a heavy duty solution used expressly for removal of accumulated pollutants on cell plates. If used as directed, **DAX** will not harm aluminum or steel if used as directed. Any problem arising out of the use of another cleaning agent will void the warranty.

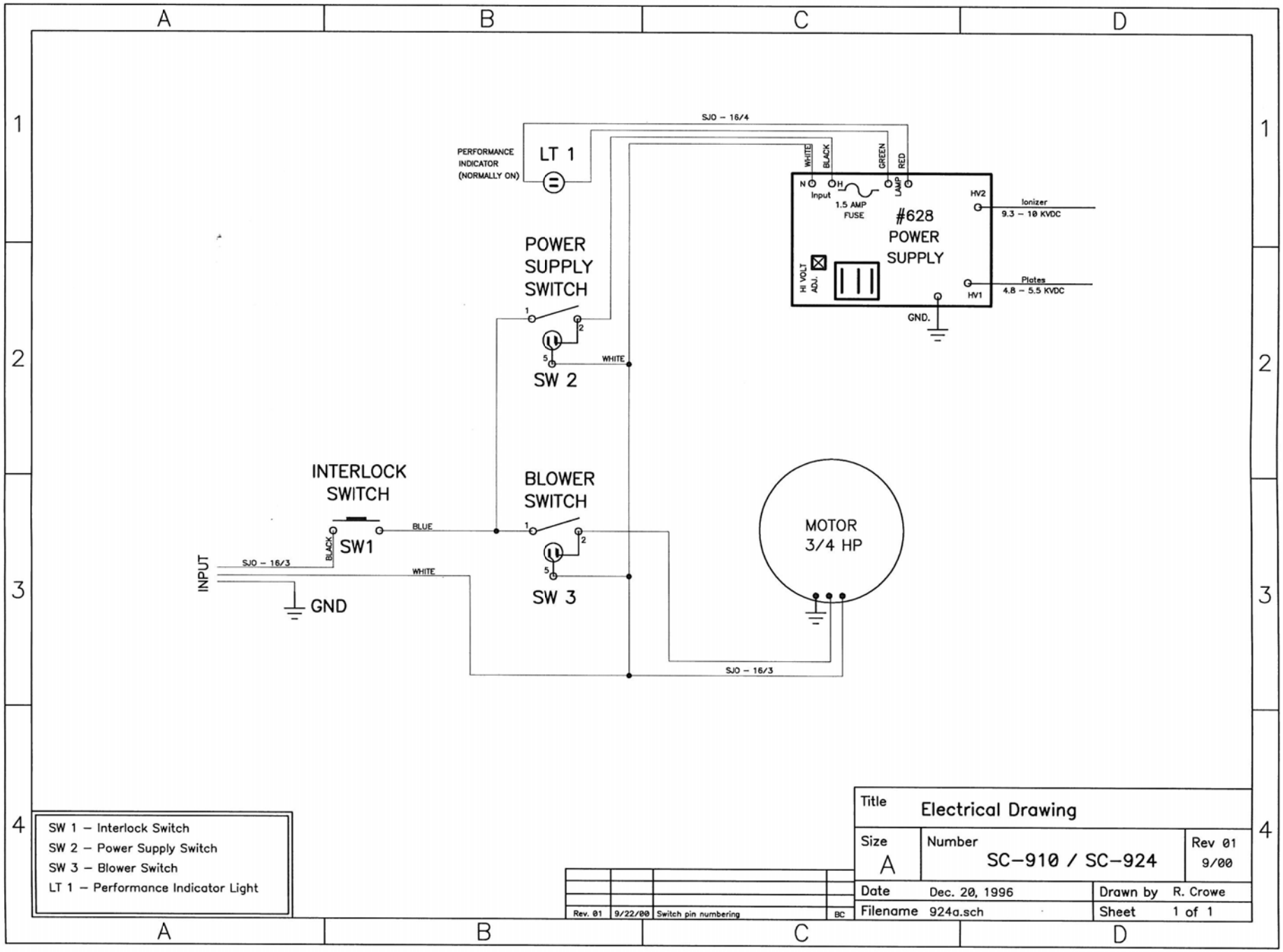
**DAX Detergent** is available in 1 gallon (4.5 L) and 4.4 gallon (20L) containers, as well as 45 gallon drums (205 L).

## SERVICE MAINTENANCE

1. Determine if the air cleaner is performing properly by seeing that:

    - Fan switch is **ON**
    - Power Supply switch is **ON**
    - Performance indicator light is **ON**

2. The performance indicator light, when lit, shows that the power board is functioning properly and should be lit during normal operation. The light will flicker with arcing in the cell or extinguish if the cell, ionizer or power board is shorted.
3. If the performance indicator light fails to light, check the cells to ensure they have been installed properly.
4. If the light still does not come on, remove the cells and ionizers and close the door. Turn the unit on. If the light now comes on inspect the cells or ionizers for damage or water. Check the high voltage wires for deterioration. **Do not run the unit for more that 1 minute with the cell and ionizer removed.** If the light still is not on then the problem could be in the light or the power board. Check the fuse on the power board for continuity.
5. A simple test to ensure that the cell is in correctly and there is high voltage to the cell is to take a long plastic handle screwdriver and short the cell between the frame of air cleaner and bolt head on the porcelain insulators. Check both the cell and ionizer for a spark. The fan and power supply switches should be **ON**. Be sure to activate the safety interlock switch before checking the voltage. **CAUTION: You are dealing with high voltage.**
6. If in doubt and if cell is not collecting any carbon, tars or body shop dust, then consult your dealer or factory service center. The installing dealer should have sufficient knowledge to determine any problems.




SW 1 – Interlock Switch
SW 2 – Power Supply Switch
SW 3 – Blower Switch
LT 1 – Performance Indicator Light

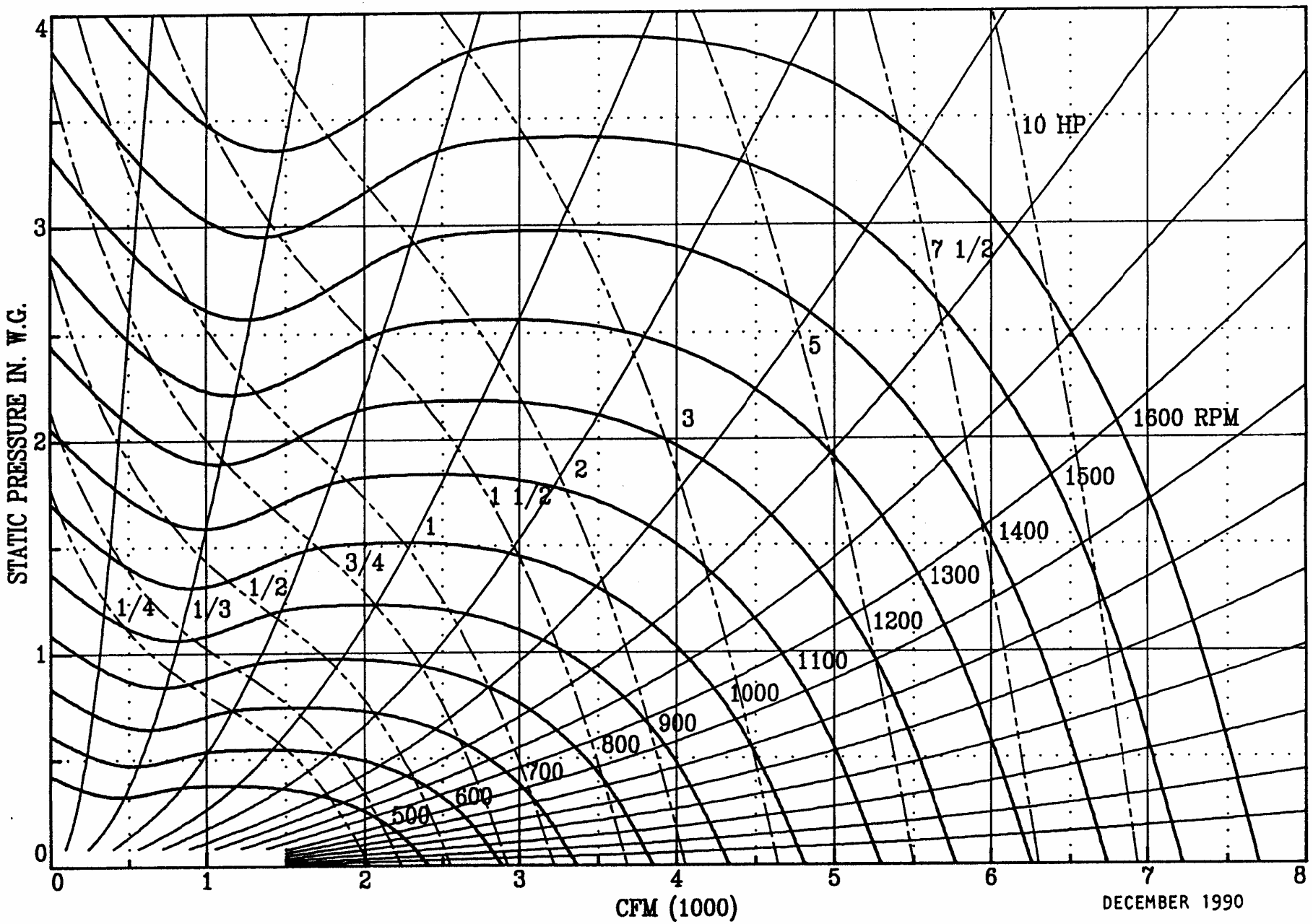
| Rev. | Date | Description | |
|---|---|---|---|
| Rev. 01 | 9/22/00 | Switch pin numbering | BC |

| | | | |
|---|---|---|---|
| Title | Electrical Drawing | | |
| Size A | Number SC–910 / SC–924 | | Rev 01 9/00 |
| Date | Dec. 20, 1996 | Drawn by | R. Crowe |
| Filename | 924a.sch | Sheet | 1 of 1 |

# MODEL: G12-9/912-9

PERFORMANCE CURVES BASED ON TEST MADE IN ACCORDANCE WITH A.M.C.A. 210-85. TESTED WITH DISCHARGE DUCT. HORSEPOWER DOES NOT INCLUDE DRIVE LOSSES. STANDARD AIR DENSITY 0.075 LB./CU.FT.

DELHI INDUSTRIES INC.
523 JAMES STREET
DELHI, ONTARIO N4B 2Z3
TEL:(519)582-2440 FAX:(519)582-0581




DECEMBER 1990

# LIMITED ONE YEAR WARRANTY

Your Electronic Air Cleaner is guaranteed for one (1) year from the date of original purchase, against electrical and mechanical defects in material and workmanship, under normal use and maintenance, which will be repaired or replaced without charge, upon inspection by an authorized service center. The warranty does not include the prefilter, after filter, carbon filter or ionizing wires.

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

ELECTRO-AIR CANADA will not be responsible for:

1. Normal maintenance as outlined in the Operation & Maintenance Manual including cleaning of electronic collecting cells and/or replacement of carbon filters.
2. Damage or repairs required as a consequence of faulty installation or application by others.
3. Damage or repairs needed as a consequence of any misapplication, negligent handling, improper servicing, unauthorized alteration, or improper operations.
4. Failure to start due to voltage conditions, blown fuses, open circuit breakers or other damages due to the inadequacy or interruption of electrical service.
5. Damage as a result of floods, winds, fires, lightning, accidents, corrosive atmosphere, or other conditions beyond the control of ELECTRO-AIR CANADA.
6. Parts not supplied or designated by ELECTRO-AIR CANADA.
7. ELECTRO-AIR CANADA products installed outside the continental Canada, U.S.A., Alaska, and Hawaii.
8. Any personal injury, special indirect or consequential property or commercial damage of any nature whatsoever.

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.

| | |
|---|---|
| Model No. | Serial No. |
| Date of Purchase | Dealer Name |
| Owner's Company Name & Address | |
| | |

RETAIN THIS CERTIFICATE WITH YOUR VALUABLE DOCUMENTS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