RESIDENTIAL DUCT MOUNTED AIR CLEANERS

AIR CONDITIONER: Allow 400 cfm (cubic feet/minute) air cleaner for each ton cooling. Example: 3 1/2 ton air conditioner, use 1400 cfm air cleaner.

HEATING SYSTEM: Allow 1000 cfm air cleaner for each 100,000 BTU furnace. Example: 140,000 BTU furnace, use 1400 cfm air cleaner.

COMMERCIAL OR OFFICE AIR CLEANERS

The correct number of commercial or office electronic air cleaners require for a particular application depends upon:

- Type of contamination
- Use of the room
- Number of occupants

The number of air changes per hour determines the amount of air cleaning obtained. More air changes per hour than recommended in the graph above are usually unnecessary as the ASHRAE data for which it was constructed is conservative. Fewer air changes per hour than recommended in the graph may mean allowing the entrance of more outdoor air to maintain acceptably low containment levels, or tolerating a partially cleaned atmosphere, which may be acceptable to some users.

EXAMPLE 1
Sizing By Air Changes Per Hour And Room Area
Using the graph on this page:

1. Extend a horizontal line from the desired number of air changes per hour until it intersects with a vertical line drawn upward from the area of the room.
2. The intersection point indicates the number of units required.

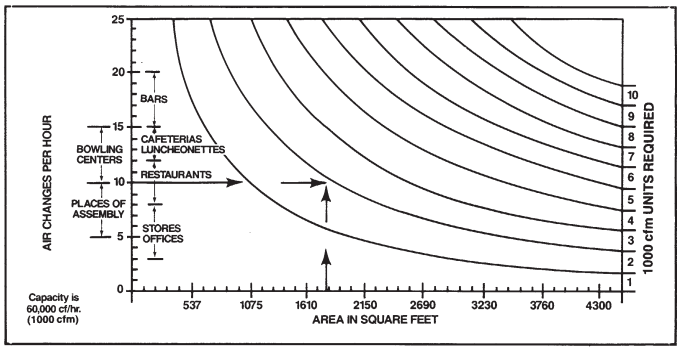
A restaurant has a 35 x 45 foot dining room. How many air cleaner units would be installed?
Solution:

1. Find floor area, 35 ft. x 45 ft. = 1575 sq. ft.
   Assuming that 10 air changes per hour would be adequate and an 1575 sq. ft. area, the graph indicates a requirement for two thousand cfm. Three 750 cfm units or one 1500 cfm and one 750 cfm units meet this requirement.

EXAMPLE 2
Sizing By Air Changes Per Hour And Room Volume
Restaurant proprietor wants to use electronic air cleaning to remove cigarette and cigar smoke from the air. The dining area is 25 x 40 feet with a 15 ft. ceiling. How many air cleaners will be required on this job?
Solution:

1. Calculate the volume of room, 25 ft. x 40 ft. x 15 ft. = 15,000 cu. ft.
2. Determine the volume of air to be circulated each hour.
   10 air changes per hour is used on the assumption that the intent is to substantially reduce, but not necessarily eliminate smoke.
   15,000 cu. ft. x 10 air changes/hour = 150,000 cu. ft./hr.
   150,000 cu. ft./hr ÷ 60 min./hr = 2,500 cu. ft./min.

SIZING CHART FOR COMMERCIAL AIR CLEANERS



3. Determine the number of air cleaners required.
   Desired Circulation ÷ Air Cleaner Capacity = units required
   2500 cfm ÷ 750 cfm = 3.3. Three or four 750 cfm units meet this requirement.

EXAMPLE 3
Sizing By Occupant Load
A cocktail lounge averages 85 occupants. Using the ASHRAE recommended minimum of 35 cfm per person.
Solution:
85 people x 35 cfm/per person = 2975 cfm
2975 cfm ÷ 1000 cfm = 3.9 (Four 750 cfm units or two 1500 cfm units)

SIZING AND OZONE

Ozone is an active, natural form of oxygen produced by electrical discharge, ultraviolet lights and other natural causes. All electronic air cleaners generate small amounts of ozone as a by-product of the particle-charging process. Correctly installed and sized air cleaners do not generate ozone in amounts that are health hazards.

Ozone is always present in the air we breathe. The amounts of ozone vary in different parts of the world. Many scientific research organizations throughout the world have performed and/or continue to perform extensive tests in order to determine the effects of ozone on humans, plants and animals. They have measured the level of ozone in many areas of the world to determine what maximum limits exist in both clean and polluted environments. In general, the latest scientific research established a maximum figure of 0.1 parts per million for humans with no more than eight hours exposure. The United States Department of Health, Food and Drug Administration has established a maximum ozone concentration of 0.050 ppm.

Scientific measurements taken with the most accurate equipment available show the range of ozone emitted from White-Rodgers' electronic air cleaners is between .005 and .02 ppm. This is between 1/20 and 1/5 of the established safe limits of 0.1 ppm. It is a negligible figure, in fact, if this amount of ozone is considered to be harmful it would be dangerous to take an afternoon walk in the park on a summer day.

HOW ELECTRONIC AIR CLEANERS WORK

Electronic air cleaners are by far the most efficient cleaners of indoor air. Unlike standard or media air filters that merely collect relatively large particles, electronic air cleaners attract and retain pollutants like a powerful magnet. Using electrostatic precipitation principles, they are even effective on particles so small an electron microscope would be required to see them.

All electronic air cleaners from White-Rodgers clean the air using the following steps. As particles enter the air cleaner, the larger particles are trapped by the ① **Prefilter Screen** (most models), while smaller particles pass through to the ② **Charging Section**, where they're given a positive electrical charge by a series of tungsten wires. The charged particles are then drawn into the ③ **Collection Section**. Here a series of positive plates repel the positive particles, and drive them forcefully onto a series of negative plates, which hold the positive particles like a magnet. Contaminants are held in this section until washed away during cleaning. In some models the clean air is also circulated through an optional ④ **Charcoal Filter**, where odors are absorbed. The fresher, cleaner air is then discharged from the unit. Electronic air cleaners are 10 to 20 times more efficient than standard filters as they remove up to 98 percent of the dirt, dust and smoke that otherwise circulate through the air.

Why choose a White-Rodgers Electronic Air Cleaner?

VISIBLE WITH NAKED EYE		VISIBLE WITH MICROSCOPE			VISIBLE WITH ELECTRON MICROSCOPE	
PARTICLE SIZE IN MICRONS*	100 10	1.0	0.5	0.1	0.01	0.001
ELECTRONIC AIR CLEANER (3" to 5" cell depth)						
Bacteria						
Pollen						
Plant Spores						
					Viruses	
			Cooking Smoke and Grease			
			Tobacco Smoke			
		Atmospheric & Household Dust				
Coal Dust						
		Animal Dander				
		Insecticide Dust				
MEDIA AIR FILTER (typical 3" to 8" depth media filter)						
Bacteria						
Pollen						
Plant Spores						
					Viruses	
			Cooking Smoke and Grease			
			Tobacco Smoke			
		Atmospheric & Household Dust				
Coal Dust						
		Animal Dander				
		Insecticide Dust				
STANDARD FILTER (typical 1" aluminum or media filter)						
Bacteria						
Pollen						
Plant Spores						
					Viruses	
			Cooking Smoke and Grease			
			Tobacco Smoke			
		Atmospheric & Household Dust				
Coal Dust						
		Animal Dander				
		Insecticide Dust				

*One micron equals 1/25,000 of an inch.

AIR CLEANER EFFICIENCY

White-Rodgers has one of the broadest lines for residential and commercial applications whether used with or without a forced air heating/cooling system.

Applications are divided into two types: ① Those that use the central system blower to move the air through the air cleaner (Whole House) and ② The self-contained models that use their own built-in blower (Self-Contained) for air circulation.

No matter which White-Rodgers Electronic Air Cleaner you choose, it's designed to remove up to 98% of the particulates from the air. This includes airborne particulate matter such as cooking smoke and grease, aerosol spray propellants, tobacco smoke, animal dander, ashes, bacteria, pollen and fungi in the air. Compare this with a media filter which has an efficiency of 25% to 35%, an electrostatic filter at 16% to 30% or a standard filter, which is only 3% to 5% efficient – that's why the best way to clean indoor air is with a White-Rodgers Electronic Air Cleaner!

White-Rodgers, a leader in the research and manufacturing of electronic air cleaners for more than 45 years is the one to choose for quality, reliability and efficiency!