

“How to select a portable vacuum collection system for residential air duct cleaning”

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Blueprint for Success

Why is this important?

Selecting a portable vacuum collection system for your residential air duct cleaning business can have a major impact on your productivity and your operating costs. Two key factors in determining your success!

Approximately 95% of the cost of air duct cleaning is your labor cost so increasing or maximizing your productivity will have a big effect on your profitability. Minimizing your operating cost means more savings!

Overview of residential collector options

There are many choices to consider when looking at vacuum collection systems for residential air duct cleaning. Lets look at some of the advantages (+) and disadvantages (-) of the major types.

Truck Systems:

- + Best performance (suction)
- + No zoning off required
- Highest first cost
- Highest maintenance cost
- High operating cost - gas
- Can't do multi story buildings

Trailer/Van Mount & Gas Portables Systems

- + Very good performance (suction)
- + Zoning off not normally required

- High first cost
- High maintenance cost
- High operating cost - gas
- Can't do multi story buildings

Electric Portables

- + Good performance (suction)
- + Lowest first cost
- + Lowest operating cost - filter replacement
- + Can do single and multi-story buildings
- Zoning normally required

Electric portable vacuum collection systems will give you the ability to clean not only homes and single story light commercial buildings like the truck and gas powered systems but you will also have the ability to clean multi story buildings like apartments, condos, and multi story light commercial and some commercial applications.

This greater flexibility plus the lower first cost and operating cost make electric portables a very good choice for residential air duct cleaning. We'll now take a closer look at how to select the best electric portable vacuum collection system.

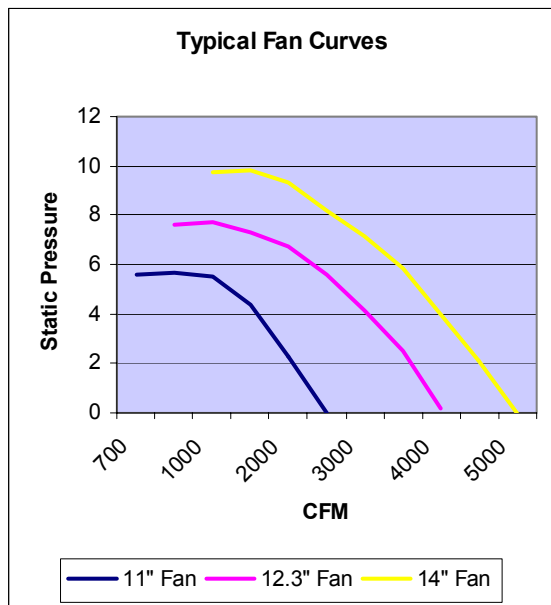
Understanding Fan Performance

Most electric portable units use a backward inclined airfoil fan. In the

typical fan cure chart (top page 3) you will see the fan curves of three fans one fan manufacturer offers. A fan curve is a measurement of fan performance. It shows the relationship between cfm and static pressure. As you travel down the fan curve you can see that the static pressure decreases and the cfm increases. You can also see that the larger the fan diameter the better the performance (suction).

All of these fans have a maximum rpm of approximately 3,500 rpm. Most 1.5 hp electric motors used in electric portable collectors also have a maximum rpm of approximately 3,500 rpm. These fans and most 1.5 hp motors work well together. The two smaller size fans, once they are installed in a unit with all the filters in place have amp draw requirements that will work on a 15-amp 110-volt circuit. The largest fan however typically exceeds the 15-amp limit once it is installed and is not used on residential collectors. It is used on some commercial units that have variable frequency drive however.

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“Free Air” verses “Measured CFM”

“Free air” is a term some manufacturers suggest in their marketing is the performance of the electric portable collector. This is just not true. If you look at the fan curve chart again the:

- 11” diameter fan is typically called a 2,500 cfm free air fan,
- 12.3” fan is typically called a 3,500 cfm free air fan
- 14” fan is typically called a 5,000 cfm free air fan.

These numbers however do not translate into the performance of the unit because that fan in the fan curve is not in a cabinet and no filters are in place. A better number to look at is “Measured cfm.”

Measured cfm is a measurement of the cfm (typically at the inlet) of

the unit when the fan is in a cabinet with all the filters in place.

Collector performance is important because it affects your productivity. The better the suction the easier it will be for you to clean the system and the more productive you will be. Don’t settle for a “free air” number that really doesn’t mean much, ask the collector manufacturer for the “measured cfm” number.

Portability:

Portability in residential air duct cleaning is very important because it affects your productivity. You need to unload the collector from your vehicle or trailer, move it into the home or building, and position it in the home or building which many times means going up and down stairs. A unit’s weight and number of sections determines its portability.

Most residential units have built in dolly with wheels and easily fit through a 30” wide doorway. Weight varies between units by as much as 75 lbs., however. A 115 lbs unit will be easier to move around than a 175 lbs unit. A single cabinet design will mean only one trip into the home verses a unit that breaks down into two or three sections which will require

additional trips.

Operating Cost

The major operating cost for any electric portable collector is filter replacement cost. All filters get dirty and will need to be replaced periodically. You want to minimize these costs because they add up over time. Filter replacement cost can far exceed the original cost of the collector cost over the life of a unit.

Many collectors have three stage filtration systems, which tend to be the most costly. The first stage is a mesh cloth or screen (which are cleanable) to collect the largest dirt particles. The second stage is a pleated bag filter that will have to be replaced frequently (1-4 times a month). The third stage is the final HEPA filter, which will need to be replaced 1-3 times a year depending on the number of jobs you doing a year. Typical filter replacement cost for a three stage filter system will range from \$400 to \$1,200 per year. After just 5 years that \$2,000 to \$6,000.

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Other collectors have two stage filtration systems, which can cost much less. The first stage is a cleanable pre-filter drawer, which collect all but the finest particles and only needs to be replaced if it get ripped/torn. The second stage is the final HEPA filter, which the manufacture recommends be replace once a year. Typical filter replacement cost for this two-stage filter system will be approximately \$130 a year for the HEPA filter or a 5-year cost of \$650. If during that 5 years a pre-filter cleanout drawer is needed add another \$150. This would raise the 5-year filter replacement cost to \$780.

Power Requirements

Most residential collectors are designed to run on 110 volt/15 amp circuits. Collectors with one motor and fan require one 110-volt/15-amp circuit. Collectors with two motors and fans require two separate 110-volt/15-amp circuits.

One Fan verses Two Fan Collectors

Most residential air duct cleaning collectors have either one or two fans/motors. You should look closely at both one fan systems and two fan systems and decide which one best fits your requirements. You should look at the

following features and decide what is most important to you:

- **Performance:** A collector with one 2,500 cfm free air fan will have measured cfm of 1,800 to 2,000cfm. A collector with one 3,500 cfm free air fan will have measured cfm of 3,000 to 3,200. A collector with two 2,500 cfm free air fans will have measured cfm of 3,600 to 3,800 cfm.
- **Price:** Collectors with two fans and motors will cost more than a one fan and motor collectors.
- **Weight:** Collectors with two fans motors will weight more than a single fan and motor units.
- **Size:** Collectors with two fans tend to be bigger than single fan collectors but not always.
- **Filter Replacement:** Units with two stage filtration (single or dual fan) with a cleanable first stage will have lower filter replacement cost than units with 3 stage filtration (single or dual fan). Some two-fan collectors have two sets of filters (one for each fan), which means even higher operating costs.
- **Power Requirements:** Two fan collectors require two separate circuits.

Dare to compare

You need to get the best value for your dollar so side by side comparisons will show you the differences between collectors. Some manufactures already have this data but it's a good idea to do compile the information yourself. We recommend you look at the following:

- Delivered price (list price less any discount plus any shipping cost)
- Measured cfm.
- Five year filter replacement cost estimates.
- Power requirements.
- Weight and number of sections.
- Warranty and any Performance Guarantees.

If you take a close look at these characteristic you will find the collector that best fits your needs and gives you the best value!

Why is this important again?

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vacuum
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Thank you for the time you spent reviewing the Blueprint for Success—How to select a portable vacuum collection system for residential duct cleaning. We hope it has been useful. Our goal is to help you succeed. If you have any questions about this publication or any aspect of air duct cleaning please contact:



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“Blueprint for Success” is a series of articles and publications developed by Vac Systems International to help you succeed as an air duct cleaning contractor. In addition to this publication they include:

- Residential Planning Guide.
- Commercial Planning Guide.
- Selecting the Right Cleaning Tool for the Job.
- How to Select a Portable Vacuum Collection System for Commercial Air Duct Cleaning .
- Introduction to Coating HVAC Systems.
- How to Market Commercial HVAC System Cleaning Services.
- “The air duct cleaning opportunity for HVAC Contractors” article.