Honeywell

A Guide to Understanding Indoor Air Quality Solutions

THERMOSTATS | ZONING | AIR CLEANERS | HUMIDIFIERS | DEHUMIDIFIERS | ULTRA VIOLET SYSTEMS | VENTILATION | WATER SOLUTIONS

Why Is Indoor Air Quality Important?

Poor indoor air quality (IAQ) is a serious problem facing homeowners today, according to the American Lung Association.® The roots of this problem can be traced directly to the desire for energy-efficient homes to minimize the effects of higher energy costs. Unfortunately, making homes tighter and more energy efficient also reduces the naturally occurring exchange of indoor and outdoor air. Fresh outside air stays out, while air pollutants, excessive humidity and/or overly dry conditions stagnate the indoor air over time.

While homeowners can't see the majority of indoor air contaminants, they certainly see the effects. These microscopic particles slowly stain walls, ceilings, furniture, drapes and carpets. Lack of humidity control can keep a home damp and sticky, while excessive dryness can crack woodwork and antiques, or create static electricity and dry skin. Particles attaching to your home's interior have to be scrubbed, laundered or dry cleaned away at the expense of the homeowner's time, money and effort.

But costly cleaning isn't the only consequence of dirty, humid, or dry indoor air. It is estimated that one in ten people living in North America suffer from asthma or allergies, and pollen, mold spores and dust-mite debris are among the most troublesome triggers of such ailments. Likewise, bacteria and viruses that can be found in indoor air have the potential to cause and spread disease.

Every cubic foot of air breathed carries a mixture of millions of these tiny annoyances. In small concentrations, these particles and gases may cause discomfort in the home. In significant concentrations, they can cause sickness.

Indoor air quality is maintained in three ways — source control, dilution and reduction

Controlling Indoor Air Pollution

Source Control

Involves eliminating air pollutants before they enter the home. For example, by not allowing people to smoke or have pets in the home, homeowners practice source control. Such examples are not always practical. Installing whole-house humidifiers, dehumidifiers and UV Treatment Systems help stop the problem before they start. By maintaining optimal relative humidity levels in the home with humidity control equipment, and sterilizing pathogens with UV Treatment Systems, homeowners deter such harmful contaminants as mold, mildew, bacteria and viruses from forming.

Dilution

Replaces a portion of the indoor air with fresh outdoor air. This process occurs naturally in all homes, but at different rates depending on the structure's tightness. Opening windows is one way to increase the pace of air exchange, although it can be an energy-wasting solution. Energy-efficient ERV and HRV ventilation systems exchange indoor air for outdoor air while recovering most of the energy used to heat or cool the air being exhausted. Controlling fresh air entering the home allows it to be conditioned by an efficient air cleaner, dehumidifier and UV Treatment System prior to passing through the home's furnace or air conditioner.

Reduction

Filters or neutralizes particulates found in indoor air. Air cleaners installed just ahead of the heating and cooling equipment remove a portion of airborne pollutants each time air is pulled into the return air ducts.

Their Home. Your Solution.

To offer homeowners the best solution for maintaining good air quality in their homes, use the key questions below to uncover their concerns and pressure points:

- Are there smokers, pets or sources of pollen or bacteria in the home?
- Do you have dry air?
- Do odors linger in the home?
- Does the air feel sticky or damp?
- Do family or friends have allergies or asthma?
- Are there children living in the home?
- Do you have static cling or experience static shocks in the winter?
- Are there wood furnishings, woodwork, artwork, musical instruments or collectibles that need to be protected and preserved?
- Do you have condensation on windows when temperatures drop?

Why Honeywell Indoor Air Quality Solutions?

Proven Experience

With over 100 years in the heating and cooling business and over 50 years in the IAQ product business, Honeywell knows the HVAC system inside and out. It's that experience and knowledge — combined with feedback from hundreds of contractors across North America — that allows us to develop IAQ product solutions that work with today's varying systems and unique applications. When it comes to comfort and indoor air quality, you can count on Honeywell to deliver solutions that maximize efficiency, effectiveness and performance.

Customer-Driven Innovation

When it comes to product design, Honeywell's experience is just the beginning. Just as important are insights from contractors and homeowners about how they wish products worked, installation issues they'd like solved and more. It's the practical use of these insights that make Honeywell innovations true innovations — the kinds that contractors are comfortable installing and homeowners are comfortable using.

- TrueSTEAM™ Humidifiers — Installation ease and flexibility with a more consistent level of humidity independent of the HVAC system.
- PopUP™ Media Replacement Filter — A high efficiency filter with no assembly required, less storage space and increased replacement sales.

From Air Cleaners to Dehumidification, Honeywell has and will continue to listen to your needs and provide the highest-quality, innovative HVAC product solutions.

Industry-Leading Support

Honeywell backs every product — and every contractor and homeowner — with unmatched technical, product and sales support. From a network of knowledgeable local sales reps and toll-free support to online and on-site training to product websites, Honeywell delivers support as innovative and top-quality as its products.

Online Resources

- www.forwardthinking.honeywell.com
- www.customer.honeywell.com
- www.literature.honeywell.com

Toll-Free Customer Service

- Homeowner and Dealer Support 1-800-468-1502
- TrueSTEAM, Ventilation and Dehumidification Support 1-800-814-9452
- Contractor PRO™ Priority Support 1-877-880-3383
- Order Support Lines

Local Support Through Your Honeywell Contractor Development Specialist

Learn more about available Honeywell support on the back cover.

All-In-One Control

Honeywell's experience and understanding of HVAC products shine through in the convenient, efficient ways Honeywell products work with the home's system.

Easier To Use

All-in-one controls combine temperature control and IAQ control into one convenient unit. So rather than a thermostat, humidistat and ventilation control, homeowners can have one attractive, easy-to-use control on the wall.

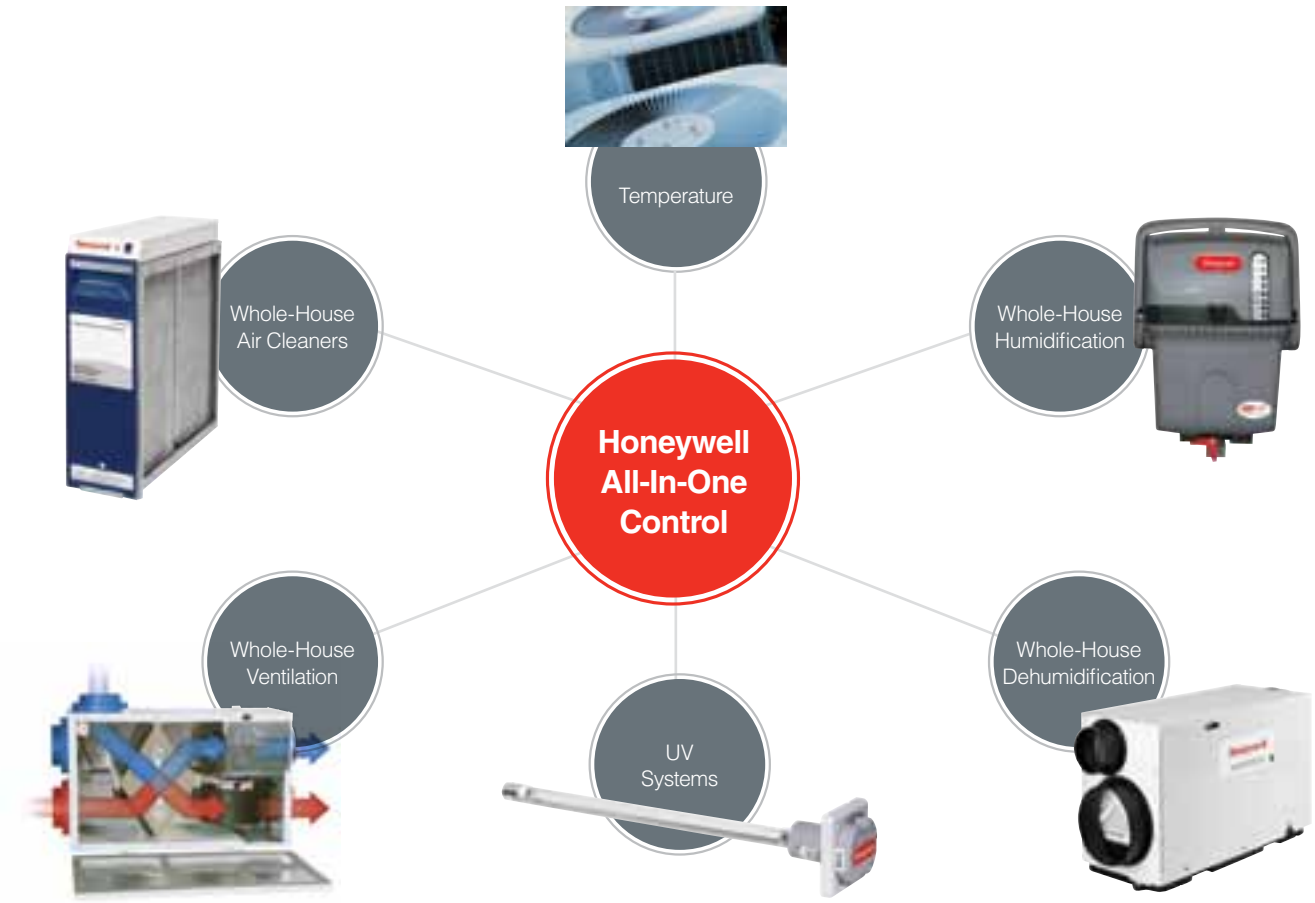
Easier To Install

Honeywell's complete selection lets you choose the all-in-one control with the options that best suit your needs: running fewer wires, integrating fan control, wireless sensors and more.

Easier to Control

Because all of the elements are integrated into one intelligent control, the home's system works more effectively.

Whether you need to control one IAQ product or an entire system from one control, Honeywell offers the ideal choice to meet your needs.



What are Airborne Particles and Where Do They Come From?

You may be surprised to learn that some common household items pollute the air you breathe, including:

- Pollen and spores
- Human skin flakes
- Candle soot
- Infiltrating dust
- Viruses, bacteria and fungi
- Pet dander
- Tobacco or wood smoke
- Cooking smoke and airborne grease
- Radon gas seeping through the walls and foundations
- Chemical fumes and volatile organic compounds generated by household cleaners

Every cubic foot of air you breathe carries a mixture of millions of such airborne particles — objects so small you could fit 749 of them in the eye of a needle!

Although the larger particles are more visible, and catch attention more easily, the smallest of these particles are of greatest concern for indoor air quality. Viruses, bacteria, smoke and grease are among the smallest and can be most damaging to the home and the individuals who live there.

Honeywell provides a wide variety of air filters and air cleaners that reduce the number of airborne particulates flowing into the home.

Air Filtration and Performance

You can help homeowners compare air-cleaning options by helping them understand the differences in air filtration efficiency ratings and the importance of maintaining airflow as the filter gets dirty.

Measuring Air Filtration Performance

Air filtration efficiency depends on the type of air cleaner used, and the type, number and size of the particles in the air stream. It varies from as little as 3% for ordinary throw-away fiberglass filters, to up to 100%[1] for Honeywell's electronic air cleaner.

Every time the furnace or air conditioner operates, the blower motor circulates air through the ductwork. The force it must overcome to move this air is called "static pressure." All air cleaners, because they are designed to capture particles, present a barrier to airflow. This barrier causes air pressure in the ductwork to drop as the blower motor pulls air through the air cleaner.

This is important because air cleaner efficiency ratings can be related to static pressure and pressure drops. Achieving an apples-to-apples comparison between different air cleaners can be a difficult task because manufacturers may measure efficiency at different airflows and pressures.

Types of Efficiency Testing

Fractional Efficiency Testing measures the efficiency of media filters and electronic air cleaners by size of particle captured. The higher the test figure, the higher the efficiency.

Minimum Efficiency Reporting Value (MERV) based on Fractional Efficiency Testing, MERV measures the efficiency of media air filters and cleaners that have been in service for a period of time. The higher the media MERV rating, the better the efficiency over the life of the filter. See page 10 for more detail.

Weight Arrestance Testing measures the weight of particles trapped by the air cleaner. This efficiency method is typically used for filters that have a MERV less than 4. A small fraction of all particles (10%) account for 99% of the weight of all particles in the air. These heavy particles tend to settle from the air before reaching an air cleaner.

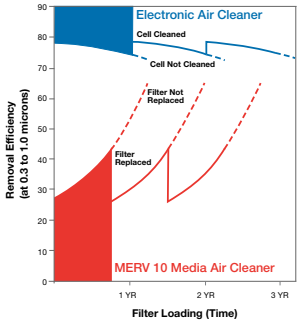
Initial pressure drop measures the decrease in air pressure across brand-new media filters or recently cleaned electronic air cleaners. The lower the pressure drop, the better the airflow in the HVAC system.

Honeywell air cleaners are tested using the Fractional Efficiency Testing, MERV Testing, and Initial Pressure Drop measurements, Weight Arrestance Testing does not differentiate high-efficiency filters.

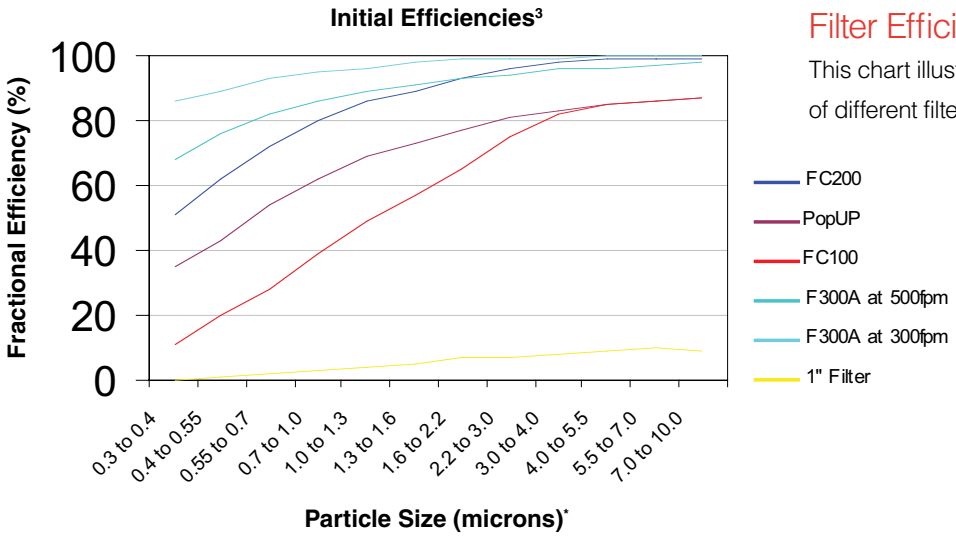
Comparing Efficiency of Electronic Vs. Media as They Get Dirty

Minimal increase in static pressure when loaded. Efficiency starts high and stays high.

Significant increase in static pressure when loaded. Efficiency starts good and increases as the filter gets dirty

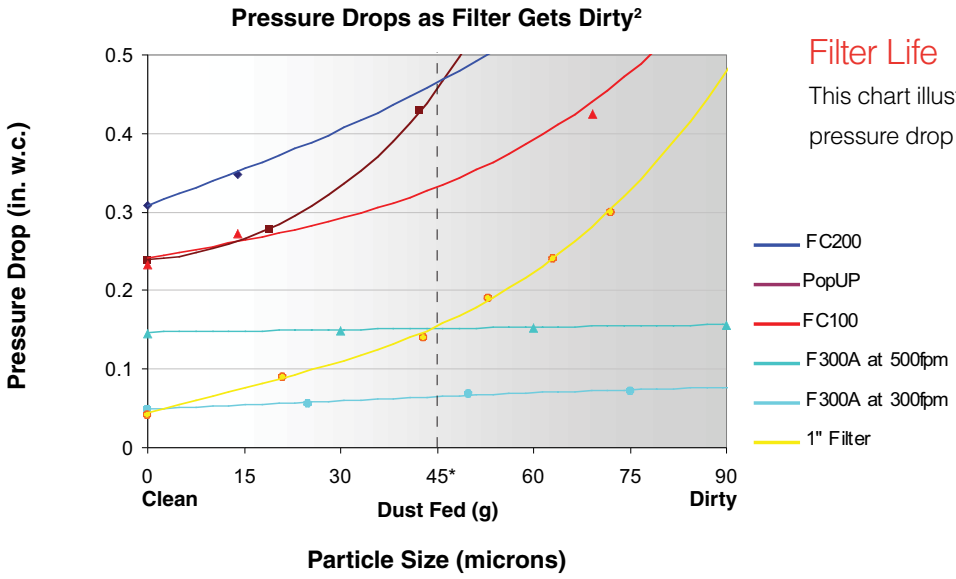


Common knowledge says that media air cleaners get more efficient and electronic air cleaners get less efficient as they get dirty. What you may not know is that Honeywell's electronic air cleaners stay highly efficient – even more efficient than a dirty media filter. That's what you get when you work on a design for 50 years.



Filter Efficiency

This chart illustrates the efficiency of different filter types based on particle size.



Filter Life

This chart illustrates increasing pressure drop as the filter gets dirty.

*Approximately 6 months.

Growing Demand

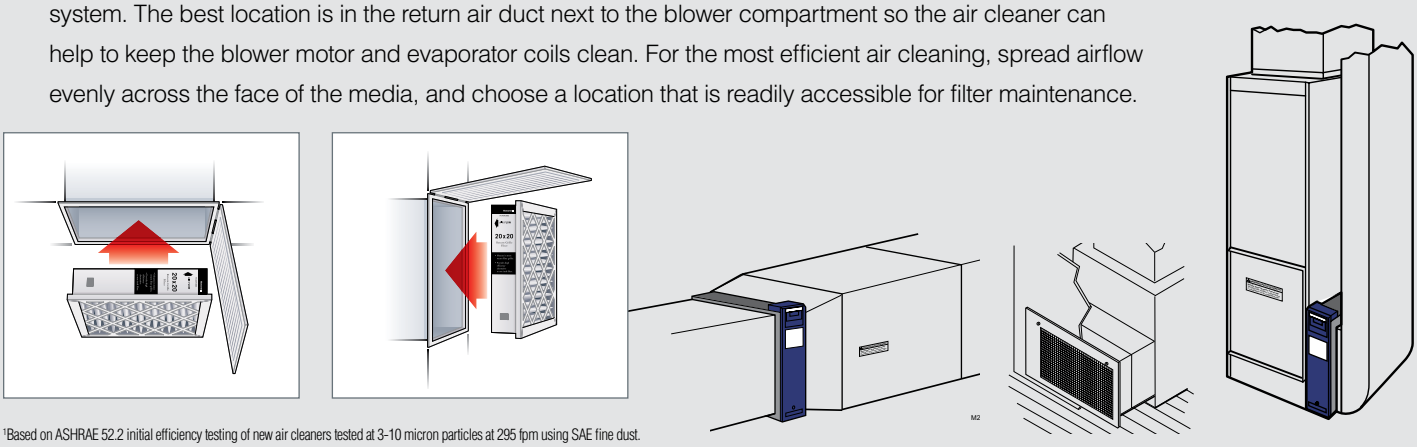
Consumer demand for air cleaners has been on the rise in recent years. According to the Environmental Protection Agency (EPA), indoor air can be 2 – 5 times more polluted than outdoor air. Informing homeowners of how filtered air can increase overall comfort is an important selling point.

Signs That A Home Needs Air Filtration

- Pets
- Allergy issues
- Portables in multiple locations
- Central air conditioning

Typical Installations

The air cleaner or filter should be installed where maximum air circulation is passing through the HVAC system. The best location is in the return air duct next to the blower compartment so the air cleaner can help to keep the blower motor and evaporator coils clean. For the most efficient air cleaning, spread airflow evenly across the face of the media, and choose a location that is readily accessible for filter maintenance.



[1]Based on ASHRAE 52.2 initial efficiency testing of new air cleaners tested at 3-10 micron particles at 295 fpm using SAE fine dust.
[2]Based on ASHRAE 52.2 efficiency testing of new air cleaners using SAE fine dust.
[3]Based on ASHRAE 52.2 initial efficiency of new filters.

Honeywell Air Cleaners and Filters

	Model	Type	OS#	Size	Application	Rated Airflow	Electric Rating	Efficiency (MERV not applicable to electronic air cleaners)	Initial Pressure Drop at Rated airflow	
	F500	HEPA	F500A1000	Conditioned Space	Bypass or Stand Alone	360 CFM	120V	0.3 microns=99.97%	N/A	32006
			F500B1009	Unconditioned Space						3200602
										320060
	F300E	Electronic	F300E1001	16X20	Inline air filtration	1200 CFM	120V	Initial efficiency at 295 FPM 0.3 to 1.0 microns=91% 1.0 to 3.0 microns=98% 3.0 to 10.0 microns=100%	0.05 at 295 0.26 in. w.c.	50
			F300E1019	16X25		1400 CFM				50
			F300E1027	20X20		1400 CFM				50
			F300E1035	20X25		2000 CFM				50
	F300A,B		F300A1620	16X20	Inline air filtration	1200 CFM	120V	Initial efficiency at 492 FPM 0.3 to 1.0 microns=78% 1.0 to 3.0 microns=92% 3.0 to 10.0 microns=97%	0.15 at 492 0.21 in. w.c.	50
			F300A1625	16X25		1400 CFM	120V			50
			F300A2020	20X20		1400 CFM	120V			50
			F300A2025	20X25		2000 CFM	120V			50
			F300A2012	20X12.5		1000 CFM	120V			50
			F300B2012	20X12.5		1000 CFM	240V			50
	F52F		F52F1048	20X12.5	Central return grille	1000 CFM	120V	0.3 to 1.0 microns=73% 1.0 to 3.0 microns=88% 3.0 to 10.0 microns=95%	0.2 in. w.c.	
			F52F1055	20X25		2000 CFM				
	F200E	Media	F200E1003	16X20	Inline air filtration	1200 CFM		MERV 13 at 492 FPM 0.3 to 1.0 microns=63% 1.0 to 3.0 microns=90% 3.0 to 10.0 microns=97%	0.3 in. w.c.	F
			F200E1011	16X25		1400 CFM				F
			F200E1029	20X20		1400 CFM				F
			F200E1037	20X25		2000 CFM				F
	F100F	Media	F100F2028	16X20	Inline air filtration	1200 CFM		MERV 10 at 492 FPM 0.3 to 1.0 microns=25% 1.0 to 3.0 microns=62% 3.0 to 10.0 microns=85%	0.23 in. w.c.	F
			F100F2002	16X25		1400 CFM				F
			F100F2036	20X20		1400 CFM				F
			F100F2010	20X25		2000 CFM				F
			F100F2044	25X20		2000 CFM				F
			F100F2051	25X22		2000 CFM				F

Central system air cleaners and filters are generically categorized by:

Basic Furnace Filters, which come standard with most HVAC systems. These filters only protect the furnace from bulk dust that can clog equipment; they do little to remove smaller particles from the air.

High-Efficiency Particulate Air (HEPA) Filters use deeply folded media to trap a minimum of 99.97% of 0.3 micron particles passing through the filter. HEPA filters come in portable, bypass ducted and stand-alone configurations. The Honeywell F500 HEPA filter can be used as a bypass or in-line configuration. Beware of manufacturers who use terms like “HEPA-style” or “HEPA-like” filters. Many manufacturers offer HEPA-style filters, but they may only be "close to" HEPA efficiencies or achieve HEPA efficiencies by circulating air through the filter numerous times. The Honeywell F500 meets the true definition of HEPA by removing 99.97% of the hardest to filter particles the first time through the filter.

1. Media Filters, which filter the air using webs of polypropylene fibers. Honeywell offers several media air cleaners and replacement filters, including space and time saving products like the PopUP™ media replacement filter. The PopUP™ simplifies installation and maintenance with a design that collapses down for space-saving shipping and self-assembles without the need for combs, pleat spacers or end caps.

Features and Functions							Warranty
Replacement Filter/ Postfilter	Standard Efficiency Enhancing Postfilter with Anti-Microbial Coating	AIRWATCH™ Maintenance Reminder	Maintenance Cycle	Self Regulating Power Supply	Dual Voltage Output Efficiency Optimization	Test Button Operating Verification	
6026-001 Carbon 7-001 2-inch Prefilter 28-001 HEPA Filter		Wireless reminder included	Carbon = up to 4 months 2-inch Prefilter = up to 16 mo. HEPA Filter = up to 5 years.				5 Year
0000293-001 0000293-002 0000293-003 0000293-004	Yes	Optional	Vacuum prefilter = up to 6 months Wash cells = up to 1 year Replace posfilter = 6 months	Yes	Yes	Yes	5 Year
0000293-001 0000293-002 0000293-003 0000293-004 0000293-004 0000293-004	Optional	Optional	Vacuum prefilter = up to 3 months Wash cells = up to 1 year	Yes	Yes	Yes	5 Year
		Optional	Vacuum prefilter = up to 3 months Wash cells = up to 1 year	Yes	Yes		5 Year
FC200E1003 FC200E1011 FC200E1029 FC200E1037		Wireless RF with pressure sensor included	Replace filter = up to 1 year				5 Year
FC100A1003 FC100A1029 FC100A1011 FC100A1037 FC100A1037 FC100A1037		Optional	Replace filter = up to 1 year				5 Year

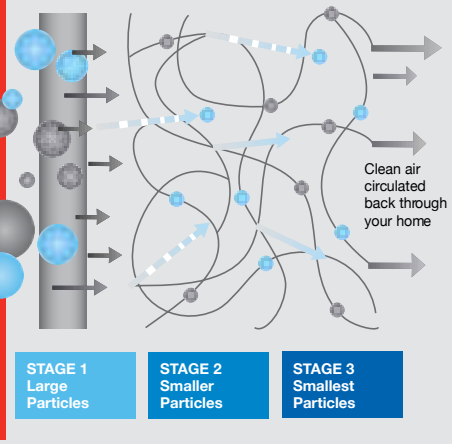
2. Electronic Air Cleaners, which electrically charge and collect airborne particles on a collection grid. The Honeywell F300 EAC captures up to 100%[1] of airborne particles passing through the product. The design of the F300's collection grid section offers the most surface area available for collecting these charged particles. The F300 power supply also increases voltage based on the amount of particles collected on these plates, so that efficiency over time stays high; an important aspect in EAC selection.

1

Here's How It Works

Media Filters clean the air in three ways straining, interception and diffusion.

First, coarse particles are strained out of the air like cooked pasta is strained when poured into a colander. Smaller particles are bumped and jostled about (interception) and move in random patterns (diffusion) until they run into a media fiber and are removed from the air stream. A magnetic charge can be added to the media fiber to attract naturally charged particles in the air and improve the removal efficiency.



2

Here's How It Works

The scientific name for the air cleaning process is—Two-Stage Electrostatic Precipitation

Most large particles are caught on the pre-filter screen. Smaller particles flow through the screen to the first section of the cell where they are zapped by an electrical charge. Charged particles are then trapped in the collecting section. The electronically cleaned air is circulated back to your home.