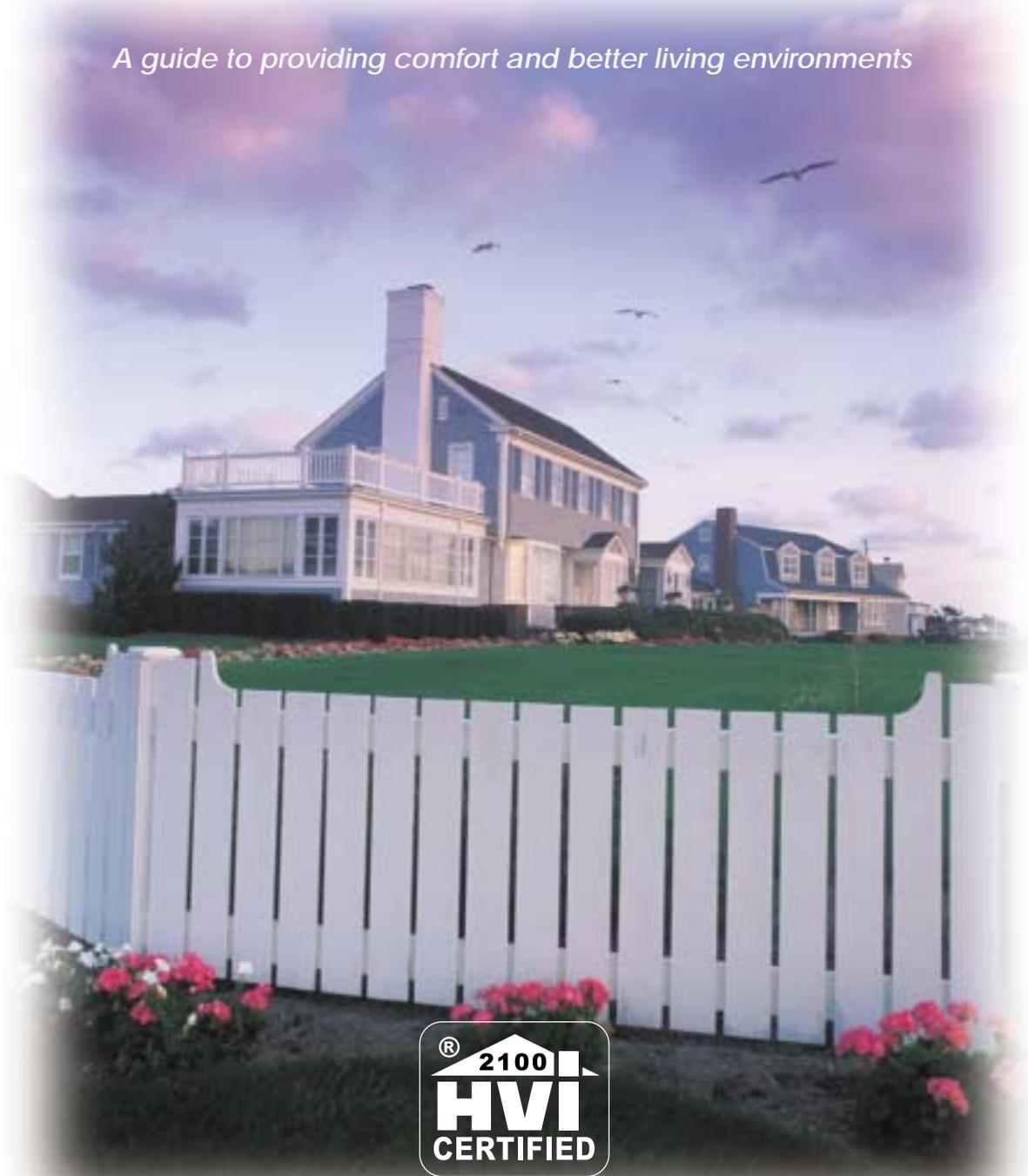


Home Ventilation & Indoor Air Quality

A guide to providing comfort and better living environments



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CIRCLE 30 ON READER SERVICE CARD

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Publishing Offices:

 **Penton**

1300 East 9th Street
Cleveland, OH 44114-1503
216/696-7000
www.contractingbusiness.com

Alex Carney, *PUBLISHER*, Contracting Business
Mike Murphy, *EDITOR-IN-CHIEF*, Contracting Business
Lisa Murton Beets, *SUPPLEMENT EDITOR*
Gwen Hostnik, *GROUP MARKETING DIRECTOR*, Contracting
Business
Lois Walsh, *PRODUCTION MANAGER*, Contracting Business
Angela Vannucci, *CUSTOM MEDIA GROUP*
Lynn Cole, *MEDIA SERVICES MANAGER*, Custom Media
Group
Dave Bosak, *ART DIRECTOR*, Custom Media Group

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**Contracting
Business**

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Founded in 1955, HVI today represents a wide range of home ventilating products including bathroom fans, kitchen range hoods, downdraft kitchen fans, inline fans, heat/energy recovery ventilators, single and multiport exhaust fans, exterior-mounted fans, balanced ventilators, whole-house cooling fans, powered attic ventilators, passive fresh air inlets, and static ventilation devices for attics and crawl spaces.

Today, HVI Certified products are sold by 58 companies in the U.S., Canada, Asia, and Europe, producing more than 85% of the residential ventilation products sold in North America.

HVI's Certified Rating Programs were created to provide a fair and credible method of comparing ventilation performance of similar products. Not only are products certified, but a random verification program ensures that those products continue to meet their original performance. Laboratories independent of any manufacturer perform all testing for certification and verification. The test standards utilized for testing are, in most cases, developed by HVI using national and international consensus methods. A complete list of certified products, manufacturers, and products can be found in the Certified Product Directory at the HVI Web site (www.hvi.org).

HVI certification has been accepted and recognized as the method of performance as-



surance by many agencies including the U.S. Department of Housing and Urban Development, U.S. Department of Energy – Bonneville Power Administration, National Building Code of Canada, R2000 Housing Program – Canada, Washington State Building Code, Minnesota State Building Code,

Building Officials and Code Administrators International (BOCA), International Conference of Building Officials (ICBO), and the National Electrical Manufacturers Association.

In March 1999, HVI launched a two-phase Sound Refinement Program. Improvements include a new sound test laboratory, up-to-date methods and equipment, and a comprehensive field verification of product performance. We are currently winding down with both phases. Products that have completed the refinement testing will carry new, more accurate, and reliable “HVI 2100” Certified Ratings.

We hope you find this Guide a practical resource for learning more about the products produced by HVI members and how you can apply them to create more healthy, comfortable living environments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Dale Rammien', written over a white background.

Dale Rammien
Director of HVI

For more information, contact:

Home Ventilating Institute (HVI)
30 West University Drive
Arlington Heights, IL 60004-1893
Phone: 847-394-0150
Fax: 847-253-0088
E-mail: general@hvi.org
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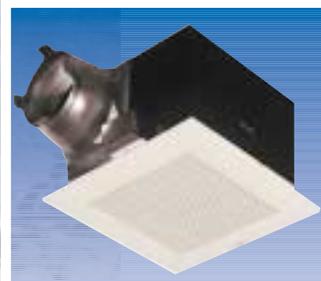
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Every home needs ventilation – to protect people from unhealthy indoor pollutants and to protect the house from excess moisture and heat. Good ventilation also contributes to occupant comfort.

Today's homes are built tight, which helps make them more energy-efficient. However, without an appropriately designed, installed, and maintained ventilation system – which translates into a lack of fresh air – occupants can suffer a multitude of negative consequences.

When many consumers think of buying, building, or updating a home, they all too often focus on aesthetic features rather than factors such as the quality of the indoor air. In fact, according to the American Lung Association, in 1999 85% of Americans didn't realize the air in their homes might be a health hazard.

The good news, however, is that more are becoming increasingly aware of the importance of indoor air quality and health. Slowly but surely, they are demanding better comfort and healthier air – and who better to satisfy their needs than HVAC contractors and builders?

Ventilation is a system of exhaust and supply that creates a flow of air. Effective systems require a *proper balance* of exhaust and supply air. A good home ventilating system provides a wide array of benefits, which are highlighted in this Guide. Addi-

tionally, offering these systems gives HVAC contractors and builders an edge. Those who discuss the benefits of proper ventilation with their customers and prospects – and show them how to achieve it – demonstrate a sincere regard for the customer, perhaps opening their eyes to considerations the competition isn't even mentioning.

THE BENEFITS OF GOOD VENTILATION

There have been more than 17 million single family homes constructed since the late 1970s. Built and insulated to be extremely tight, they are also those homes with the highest incidences of indoor air quality problems.

Common pollutants from the home, people, and contents, along with temperature and humidity conditions, can create an unhealthy environment. They include:



Moisture

Too much moisture can cause allergy problems and structural damage by encouraging the growth of mold, mildew, bacteria, dust mites, dry rot, and insects.



Common Household Chemicals

- Cleaning supplies
- Paints and solvents
- Formaldehyde from furniture, carpet, and building materials
- Pesticides
- Volatile organic compounds
- Odors



Particles

- Dust and dust mites
- Pet dander
- Lead
- Pollen
- Asbestos

- Do you like what you see in this Guide?
- Do you want all your customers to know about proper home ventilation?
- Do you want to be the company to tell them about it?

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Tobacco Smoke

A health risk to smokers and non-smokers alike – children are especially at risk.



Combustion Products

These are produced by fuel-burning heating equipment, gas water heaters, fireplaces, woodstoves, gas ranges, and candles, and include:

- Carbon monoxide
- Carbon dioxide
- Nitrous oxides
- Soot
- Unburned fuel
- Moisture



Heat

Overheating in the attic from sun exposure.

Ventilation systems and components are designed to:

- Remove excess moisture;
- Remove airborne chemicals, particles, tobacco smoke, and odors;
- Help keep humidity levels in proper balance;
- Help control combustion byproducts; and
- Keep attics under control to avoid water damage in the winter and overheating in the summer.

These factors come together to enhance the comfort and indoor air quality of the home and to help keep occupants safe. A quality ventilation system also contributes to preserving the structural integrity of the home, reduced maintenance costs, and adding to the home’s value.

Strategies for use throughout a home, as depicted in **Figure 1**, include:

1. Local ventilation – for bath, kitchen, and other moisture- or odor-producing areas.

2. General ventilation – to remove stale, polluted air and bring in outdoor air. May be provided by using local ventilation fans and intakes, or centrally ducted continuous ventilation systems such as heat or energy recovery ventilators (HRVs/ERVs).

3. Proper placement of vents and ventilators – to protect the attic and crawlspace.

Manufacturers of home ventilation products try to ensure that their products are simple and require little to no maintenance. However, no matter how well products are made, it’s up to the HVAC contractor to select the right products for the particular application and to install them properly. It’s also important that contractors educate customers about the importance of regularly scheduled system checkups to ensure that the *entire* home comfort system is operating efficiently, as intended.

PROVIDING WHOLE-HOUSE SOLUTIONS

Tomorrow’s most successful contractors will be providers of “whole-house” solutions. Ventilation is an important part of that mix. No matter how terrific the core equipment offering is – be it a furnace, boiler, air conditioner, heat pump, etc. – the home will not achieve maximum comfort without proper, balanced ventilation.

It’s always a good idea to periodically evaluate an existing home’s ventilation system. HVAC contractors can conduct these evaluations when they are in a home:

- Providing preventive maintenance services (e.g., during annual checkups).
- Diagnosing a failing system near the end of its useful and/or efficient life.

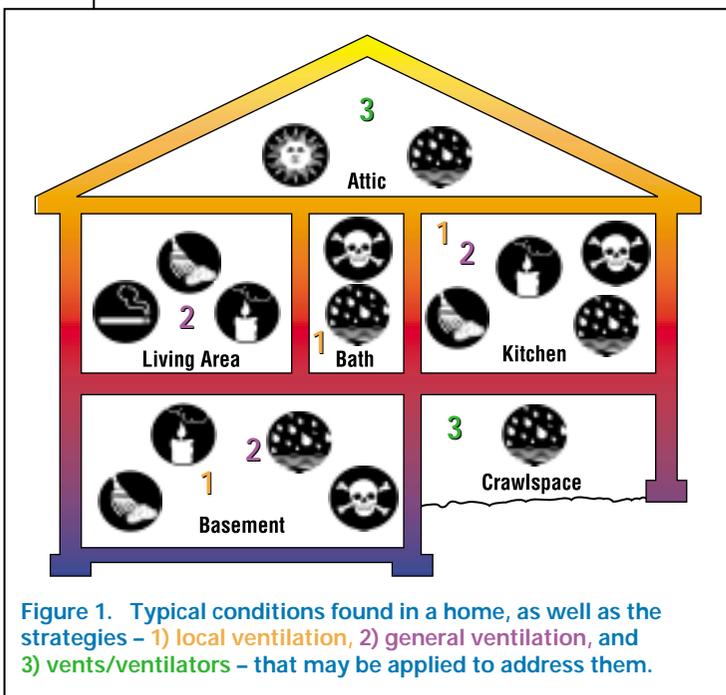


Figure 1. Typical conditions found in a home, as well as the strategies – 1) local ventilation, 2) general ventilation, and 3) vents/ventilators – that may be applied to address them.

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**Certified Bathroom,
In-line, Dryer Booster Fans
Range Hoods**

FIRE RATED CEILING FANS



Models Available:

	<u>CFM</u>	<u>SONES</u>
GM - 130	120	1.0
GM - 180	170	2.0
GM - 280	280	4.5

Models Available:

	<u>CFM</u>	<u>SONES</u>
GM - 120FD	116	1.6

**ZONEX Fans are the perfect solution for
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Models Available:

	<u>CFM</u>
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IL - 180	192
IL - 280	278

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DRYER FANS



Models Available:

	<u>CFM</u>
DBF-150	158

Available with air flow switch

RANGE HOODS



Models Available:

	<u>CFM</u>	<u>SONES</u>
DKH - 300	317	5.5
QKH - 300	200	4.0

ZONEX - Quality solutions for better ventilation

ECONOMY SERIES



Models Available:

	<u>CFM</u>	<u>SONES</u>
GM-90	90	2.5
GM-110	110	4.0

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Brampton, Ontario, Canada

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CIRCLE 33 ON READER SERVICE CARD

Asthma, allergies, and other respiratory ailments are serious problems affecting millions of people nationwide. And considering that people spend about 90% of their time indoors (65% in their homes), it's no surprise that researchers study the affects of indoor air on these ailments.

According to 1998 data presented by the American Lung Association (ALA), 26 million Americans have been diagnosed with asthma in their lifetimes. Of these, 8.6 million are under age 18. Hospitalizations due to asthma have increased 25% since 1979, and asthma deaths increased 109% between 1979 and 1998.

Researchers have no definitive answers to explain the dramatic rise in asthma – the issues are complex. While certainly not the only factor, tight homes – built since the 1970s to address energy-efficiency issues – without proper ventilation have been suspected as a culprit in contributing to the rise in respiratory ailments over the last two decades.

According to results of a 1996 ventilation product manufacturer's survey of homeowners in the U.S. snowbelt region, 8% of residents in homes built before 1971 had asthma. That number increased to 17% for residents of homes built between 1985 and 1996.

The findings also suggested a greater incidence of respiratory ailments in homes built after 1971 (45%), compared to those built before 1971 (34%).

Furthermore, the survey showed that in 58% of the homes, at least one humidity-related or respiratory problem was present in the form of allergies, asthma, persistent coughs, and/or nasal congestion. In 36% of the homes, at least one household member suffered from at least one respiratory ailment.

In its educational literature, ALA stresses that ventilation is an important strategy for helping to alleviate the symptoms of asthma, allergies, and other respiratory ailments. Along with incorporating proper ventilation strategies in the home, ALA also recommends controlling trigger sources and cleaning the air.

Contractors who exceed customer expectations often gain the image of the "comfort expert." These contractors develop repeat business, referrals, generate service agreements, and often win "customers for life."

New construction is another area where ventilation awareness is important. Today's builders must be in tune with ventilation, now more so than ever. Building codes and requirements are dire components of their business. Good builders prefer to work with sub-contractors who know the requirements, know how to properly select and apply ventilation components, and who can be relied upon to provide quality installations. Additionally, when contractors keep up with the ventilation market – and can be there to educate builders, prospects, and homeowners about it – they save those builders the time required to become their own "ventilation experts."

Builders who discuss home ventilation with their customers also set themselves apart from the competition. In a market where the home's indoor air quality and comfort are rarely or briefly discussed, consumers appreciate learning about these issues. When builders address these topics, it demonstrates that they care about the customer's well-being, comfort, and satisfaction, as well as the home's maintenance costs and value in years to come. Many tools are available today to help builders learn more about ventilation as well as how to educate consumers about it.

ABOUT HVI

- Responding to calls about a lack of comfort and/or allergy or respiratory problems.

In addition to providing an evaluation during a call for service, HVAC contractors may offer ventilation evaluations as a separate service. If a homeowner calls for an inspection, the contractor may also evaluate the home's heating and cooling equipment. Even if it's in good condition, a relationship is established, and the homeowner may look to the contractor to provide more "whole-house" solutions and services in the future.



The Home Ventilating Institute (HVI), a division of the Air Movement and Control Association (AMCA), is a nonprofit association representing 58 companies that sell HVI Certified home ventilating products. Its mission is to serve consumers and members by advancing residential ventila-

tion. HVI offers a variety of services including, but not limited to, the development of test standards and certification programs for airflow, sound levels, and watts for bath, kitchen, and indoor air quality fans and energy performance for heat and energy recovery ventilators; participation in selected build-

Types of Fans

Bathrooms, Kitchens, and Other Rooms

Many types of fans are available to meet any application requiring local ventilation. They include:

- **CEILING-MOUNTED FANS** – These fans are mounted in the ceiling between joists and discharge either vertically through the roof or horizontally through the exterior wall.
- **FAN-LIGHTS** – These fans offer the convenience of built-in illumination in combination with bathroom ventilation. They are installed in the ceiling and use 3- or 4-in. round duct.
- **EXTERIOR-MOUNT FANS** for ceilings or walls – These mount outside the building and pull, rather than push, the air through the duct. Much of the mechanical sound stays outside, so these fans maintain a low sound level inside the house.
- **INLINE FANS** – Duct-mounted, these fans are available in single-port or multiport versions to exhaust air from several areas with one main fan, located remotely (for more information, see the sidebar on page 14).
- **WALL FANS** – Made to be located in and exhausting through an outside wall. The fans are installed without any ducting and may have integral switches and outside weather hoods that close when the fan is turned off.
- **RANGE HOODS** – A fan with an enclosure designed to capture odors and humidity from a cooking surface. Most range hoods are located over the cooking surface and have an internal fan, but there are also downdraft units designed to pull air across the cooking surface, as well as hoods designed for remote-mounted fans.

Control options. A wide variety of controls are available. They include electronic variable-speed controls, timers, humidistats, and dual fan-light and/or fan-heater combinations.

DISCOVER THE ADVANTAGE OF NUVENT'S NEW VENTILATION SOLUTIONS ...

NuVent introduces a complete line of patented residential ventilation products that provide builders, contractors and homeowners with new solutions for all their home ventilating needs. Selection includes models which feature NuVent's "Quiet" technology to give you powerful ventilation that's quiet too.

Look for the following innovative features:

- Uniquely Styled Curved Grilles
- Universal Housings™ for Easy Installation and Upgrades
- Directional Heat Discharge on Our New Triple-Function Heat-Vent-Light



S Series Quiet Fans
and Fan-Lights



M Series Round Fans
and Fan-Lights



New!
DHVL Heat Vent Light



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ing code activities; and market support. HVI holds numerous meetings throughout the year to discuss and address industry issues.

Through a Certified Ratings Program, HVI provides a voluntary means for residential ventilation manufacturers to report comparable and creditable product performance information based on uniformly applied testing standards and procedures performed by independent laboratories. Together these activities help to promote the health and

With the information, users can compare rated performance. The products in the Certified Products Directory bear the HVI Tested/Certified label, so users can be confident that the products function as stated.

All HVI ratings for fans are based on independent tests at the AMCA lab located in Arlington Heights, IL. Each fan is tested under specific air resistance and other conditions related to actual application, as distinct from “free air” or other nonstandard conditions.

Home ventilating fans carry dual ratings, for quietness as well as ventilating performance. Simple, validated numbers provide the air movement in CFM and the sound output in sones.

CFM simply means the number of cubic feet of air that a fan will move in one minute.

The sone is an internationally recognized unit of loudness, which simplifies reporting of sound output. The sones translate laboratory decibel readings into numbers that correspond to the way people sense loudness. Sone readings offer a quick, easy, and accurate way to compare sound levels.

In technical terms, the sone is equal to loudness to a pure tone of 1,000 cycles per second at 40 decibels above the listener’s threshold of hearing. Double the sone is double the loudness. In everyday terms, one sone is approximately equivalent to the sound of a quiet refrigerator in a quiet kitchen. So the lower the sone rating the quieter the fan.

No matter what their intended task, you can depend on products with the HVI label to provide the performance for which they are rated.

VENTILATING LIVING AREAS

A home’s interior living area may be ventilated by using two strategies:

1) Applying local, or “intermittent,” ventilation in bathrooms, kitchens, and other rooms with fans that exhaust polluted air to the outdoors, combined in some cases with intakes that provide outside makeup air.

2) Applying continuous ventilation for the entire living area with whole-house ventilators that constantly work to expel old air and bring in fresh, conditioned air.



growth of the home ventilation industry while providing consumers with valuable information and confidence in their choices.

HVI members gladly provide information to contractors, builders, and homeowners about how to properly choose and apply their products. The HVI Web site (www.hvi.org) lists all the association’s members and includes links. The downloadable Certified Products Directory, available at the Web site, is updated every 30 days. It is divided into three main sections:

- **Home Ventilating Fans** – Lists certified air flow and sound ratings for bath fans, ceiling/wall exhaust fans, exterior-mount room ventilators, inline fans, range hoods, downdraft ranges, power attic ventilators, and whole-house fans.

- **Static Products** (Non-Electrically Powered Ventilating Devices) – Lists certified net free area in square inches for gable end, roof, sidewall, and under-eave ventilators.

- **Heat and Energy Recovery Ventilators** – Lists certified ventilation and energy performance data.

*If the problem
is ventilation...*

The quiet solution is Fantech.



For years, Fantech has been providing products to solve ventilation problems in residential applications. Fans and accessories manufactured to exacting standards for quality and performance. Products designed to answer the demands of today's homeowners for improved indoor air quality. Products that provide powerful yet quiet ventilation because the fan is located away from the living area. Whether it's dryer boosting, bathroom exhaust, kitchen ventilation, or radon mitigation...

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Fantech's highly-trained technical support staff is at your service. Not an automated line, but real people who can advise you on the right way to tackle the problem at hand. Plus, Fantech's customer service representatives are always available to help expedite your order to meet your schedule. Add it all up and it's a combination that can't be beat. So, next time you need residential ventilation products, call Fantech.

We think you'll find working with us a breath of fresh air.

Remote-mounted fans take the noise out of the living area resulting in powerful yet quiet ventilation.



Multiple vents ducted to one remote-mounted fan remove odors and humidity at the source for more effective ventilation.



Bathroom Exhaust Fans – Operate one or more vents or vent lights in the bath with one remote-mounted fan.



Dryer Booster Fans – Improve dryer operation with a Fantech booster fan designed for use with longer duct runs.



Quiet Kitchen Ventilation – 100% speed controllable remote-mounted fans, silencers and liners for custom kitchen range hoods.

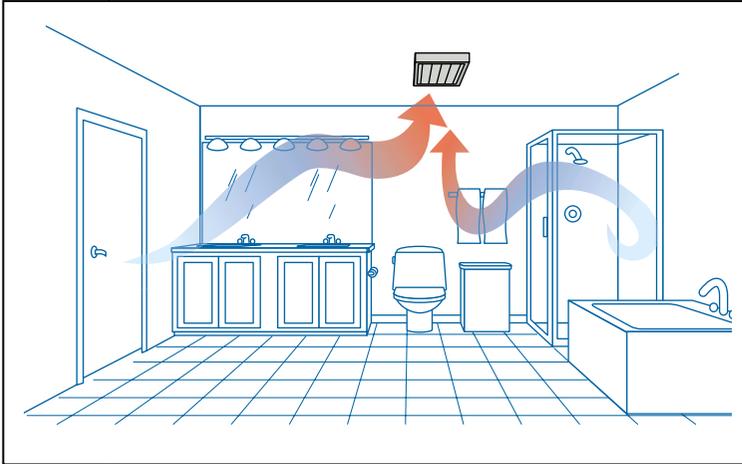
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To begin, let's look at the first strategy, applying local ventilation.

BATHROOMS

Moisture control where it's needed most

During a bath or shower, the humidity level in a bathroom is like that in a tropical rain forest – uncomfortable, hot, and destructive.

Unless the bathroom is properly ventilated, all that moisture has no place to go but into cracks and crevices, into plaster and drywall, through ceiling fixtures into the attic insulation, roof sheathing, and framing members.

Excess moisture has tremendous potential for damaging the home. It can cause deterioration of joists and framing above the bathroom. It cracks and peels paint, ruins gypsum wallboard, causes exterior paint failure, warps doors, and rusts cabinets and fixtures. As it condenses on walls, ceilings, and cabinets, it attracts dirt and makes more frequent cleaning and decorating necessary. It encourages mildew on tile grout and generally provides an environment for increased bacterial growth.

Exhaust fans, ducted to the outside to remove moisture, are designed to expel excess humidity and prevent these types of problems in bathrooms and spa areas. Not only will occupants be more comfortable after a bath, shower, or jacuzzi, but the room will also be rid of odors, potentially health-hazardous aerosol vapors, and other pollutants. Additionally, the potential for home damage will be minimized, saving the homeowner the cost

of making repairs to correct problems that could have been prevented in the first place.

Attractive Options to Complement Decor

Today there are many attractive options for bath fans. Existing homes – where old fans may be ineffective and noisy – can benefit from upgrades. In new construction, bathroom ventilation products can be used to complement the interior design, in styles ranging from simple to lavish.

All bathroom exhaust fans have the ability to free the room of moisture many times faster than with no fan at all. Bathrooms are required by code to have either an operable window or a minimum 50 CFM capacity exhaust fan. Fans should be installed as near to the shower as possible and, if marked as suitable for this location, directly over it to capture the moisture as directly as possible.

For specific types of products available for the bath, see the sidebar on page 9.

KITCHENS

Cooking and gathering in comfort

Kitchens are one of the most popular gathering places in homes today. Cozy and comfortable, they serve as a place to relax, cook, catch up on daily events, and make plans.

For all the warm images a kitchen may conjure,



The Image Bank

something hidden lingers – pollution! In fact, kitchens may be a main source of pollutants in a home. Consider all the grease, smoke, undesirable odors, and moisture generated during the cooking process – pollutants that cling to walls, ceilings, carpeting, upholstery, and drapes – requiring frequent cleaning and all the troubles and expense that entails.

A wide array of products is available to keep kitchens ventilated properly. They include updraft range hoods, downdraft ventilators, and exhaust fans – all designed to keep the air fresh and the environment comfortable.

Updraft Range Hoods and
Downdraft Cook Top
Ventilators

Updraft range hoods not only expel heat, smoke, moisture, and odors quickly and directly, they are also attractive additions to the kitchen. Today they are available in a variety of styles, designer colors, or metal finishes. Most provide bright cooktop lighting that also can be turned down for a subtle night light.

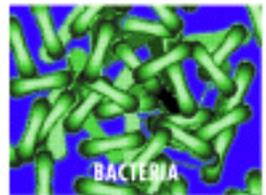
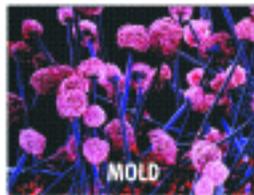
Updraft range hoods are installed directly over the range. A fan or blower pulls heated air, moisture, smoke, and odors upward, and exhausts them to the outside via ductwork through walls, soffits, or attics, between joists, or beneath the ceiling. An aluminum mesh screen filter traps grease and can easily be removed and cleaned.

Sometimes ducting to the outdoors is not possible. In such cases, ductless hoods are available. These models incorporate an activated carbon filter as well as an aluminum filter and return filtered air to the kitchen through

louvers in the front of the hood. These filters must be regularly cleaned according to the manufacturer's recommendations.

A range hood should be the same width as the cooking surface and mounted directly over it at a height of 18 to 30 inches above the cooking surface.

ULTIMATE INDOOR AIR QUALITY ULTRA-AIRE APD® AIR PURIFYING DEHUMIDIFIER



The ULTRA-AIRE APD® provides fresh air ventilation, air filtration and year-round humidity control. The Ultra-Aire APD can maintain indoor relative humidity levels below 50 percent, even in the Deep South. Ultra-Aire APD is

the only ventilation system that controls indoor air pollutant levels, eliminates mold, mildew and dust mites and filters pollen, spores and dust particles from the air. For more information and a free video call:

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Lung Association Health Houses*



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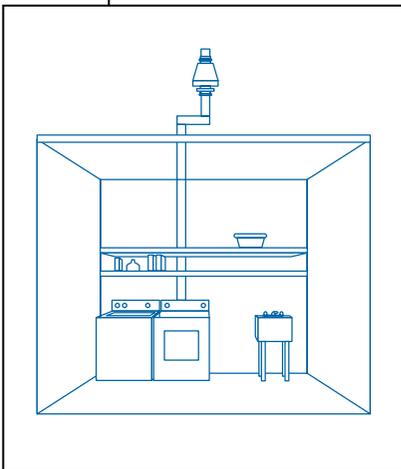
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<http://www.thermastor.com>

Units are available with two-speed control or with variable speed to provide a choice of a lower speed and quieter operation when lower air movement is required. Some ratings and CFM ratings vary. The appropriate CFM is determined by evaluating the cooking unit and the occupants' cooking habits. More demanding cooks usually require more CFM to handle loads resulting from things such as the moisture generated by boiling large pots of water or the smoke resulting from grilling or using a wok.

What about cooking surfaces in peninsulas or islands? They may be ventilated with downdraft ventilators, which are installed behind the cooktop. These ventilators pull air down and push it out through an exhaust duct that often runs under the floor and then to the exterior of the house. Downdraft ventilators are available with electronic controls that may include time delay and filter-cleaning indicators. They are stylishly designed to complement today's modern kitchens.

Kitchen exhaust fans may be used along with range hoods. They create a fresh air flow during periods when the cooking surface is not being used. Manufacturers should be consulted to determine the best installation location. The majority of kitchens in newly built homes are equipped with range hoods. Older homes present an opportunity for new installations of either updraft or downdraft ventilation. However, if neither is an option, homeowners may select kitchen exhaust fans, which will provide good general ventilation in the kitchen.

For information about the fans available for kitchens to complement range hoods, see the sidebar on page 9.



OTHER ROOMS

Better air for breathing

In addition to the areas we've looked at so far, there are plenty of other rooms in the house that can benefit from ventilation. Examples include laundry and utility rooms, workshops/hobby areas, family, and recreation rooms. Removing hot air, to-

Inline Fans

Inline fans present an attractive option for homeowners who want to locate the fan away from the room or rooms that need exhausting.

Inline fans are duct-mounted blowers. The fan has both an inlet and an outlet duct, which originate at the interior and on the exterior of the house, respectively. If the unit is located in an attic, for instance, it can be further defined as remote-mounted.

Inline fans may be used for several applications, including:

- To ventilate wet spaces such as bathrooms, kitchens, and laundries;
- As remote fans for range hoods;
- As duct boosters for ventilation systems and clothes dryers;
- As supply or exhaust fans for continuous whole-house ventilation; and
- In radon mitigation systems.

Inline fans are offered in many different configurations, sizes, and capabilities to meet air quality needs. They are available as simple single-port versions or versatile multiport versions. Single-port units have one incoming supply duct and one outgoing exhaust duct. Multiport versions have multiple ducts but always at least one inlet and one exhaust. These fans are housed within either a box-like shell or a molded bladder-like casing. The single fan can then orchestrate air movement to or from multiple locations (e.g., two bathrooms). By varying duct sizes, inserting "Y" fittings to branch duct runs, employing adjustable grille openings, and varying the fan speeds, different ventilation rates may be achieved for each location served by the fan ducts. Multiport versions offer ventilation capacity appropriate for larger-scale single-family, multifamily, and commercial buildings.

Inline fans are available in a range of airflow capacities from about 100 CFM, suitable for most housing needs, to 2,000 CFM. Manufacturers offer a variety of sizes, flow capacities, ducting configurations, controls, and accessories.

Control options. Remote, inline fans can be controlled in various ways. On-off switches are common, but more complicated controllers such as variable-speed controls, mechanical timers, or sensors are gaining popularity. Motion, humidity, carbon dioxide, and air pressure sensors can improve the operation of any ventilation system when properly integrated.



Are you in control of the air quality in your home?



Good things happen when you renew and purify the air in your home. Today's energy-efficient homes are so airtight that indoor pollutants, airborne contaminants and excess humidity can have a serious adverse effect on your family's health, damage your furniture and cause costly structural damage to your home.

Fortunately, there is a solution. Venmar's Advanced Ventilation Systems breathe in fresh outdoor air and exhale stuffy indoor air to control the air quality in your home. The process eliminates irritating pollutants and contaminants, controls excess humidity and optimizes energy efficiency.

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bacco smoke, odors, fumes, and humidity from these rooms – and encouraging air movement and a fresh air supply – means economical comfort and better air quality for the entire family.

Ventilation units for use in these areas are similar to those used for baths and kitchens. They are available in a wide range of CFM capacities and are stylishly designed to complement any decor.

One of the most important areas in the home to ventilate is the laundry room. Consider all the mold and mildew that can accumulate in this area, be it from damp clothes, splashing water, or other factors. Then there is the heat being exhausted from the clothes dryer. A ducted exhaust fan installed near the washing machine gets rid of heat and moisture that can make laundry an unwelcome chore.

While dryers must be vented to the outside, many newer homes have laundry rooms located away from exterior walls. This means the duct to exhaust the dryer to the outside is longer. In these cases, booster fans are usually required to push the air out effectively.

Other areas to ventilate include utility rooms, workshops, hobby areas, and family and recreation rooms. These are prime places for fumes from cleaning products, construction materials, glues, and tobacco smoke to accumulate. They may also suffer from moisture and humidity problems, whether or not they are located in basements.

CONTINUOUS WHOLE-HOUSE VENTILATION

Heat and energy recovery ventilators

Our discussion now moves on to using continuous ventilation to condition the entire living area. Continuous, whole-house ventilation can be provided by single and multi-port exhaust fans, air exchangers, and heat or energy recovery ventilators (HRVs or ERVs).

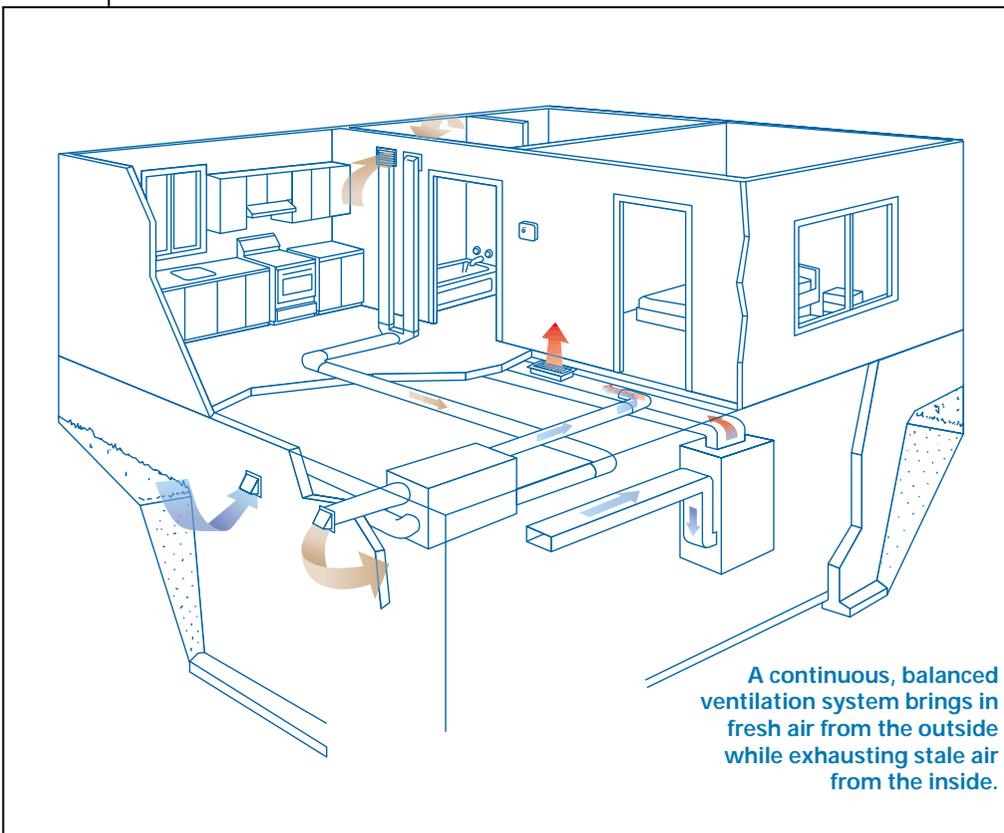
Heat and energy recovery ventilators bring in fresh air from the outside while exhausting stale air from the inside. They transfer energy between the two airstreams and distribute it to the home's living

areas. The fresh air conditions and improves the indoor air quality as well as occupant comfort, especially for those who suffer from allergies and respiratory ailments.

HRVs are usually recommended for colder climates with longer heating seasons. ERVs are preferred for warmer, humid climates with longer cooling seasons.

How They Work

HRVs. Mechanically, the HRV is a combination of fans, controls, and heat recovery elements that exhaust stale air from the home, bring fresh air in from outdoors, and transfer heat energy from one airstream to the other. An HRV provides a continuous



Inlets: An Option for Providing Makeup Air

supply of fresh air to the home, while recovering a portion of the energy normally lost through nonheat recovery ventilation.

In the winter, heat from the stale exhaust air is captured by the heat recovery element and transferred to the cold incoming air. In the summer, incoming air is cooled by the outgoing, air conditioned exhaust air.

HRVs have filters that minimize the entry of pollen and dust, and keep insects from entering the home with the fresh air. They may be used year-round. Models suitable for use in extremely cold climates are equipped with automatic defrost mechanisms, allowing continuous operation throughout the winter months.

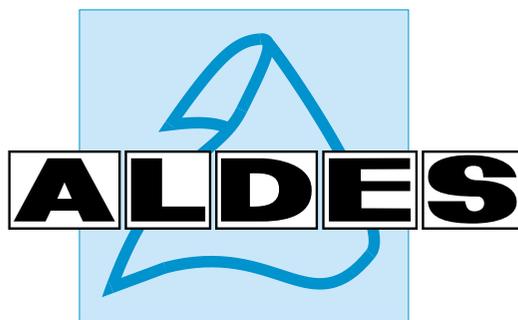
HRVs are available as stand-alone units for connection to independent ductwork, or they may be connected to existing forced air heating and cooling systems. Properly selected, installed, operated, and maintained, an HRV will:

It's important to ensure that exhaust air is replaced by outside air. If this is not addressed, a building can be depressurized. Air that would normally flow out chimney flues, water heaters, or furnaces can become sources of supply air to replace the fan-exhausted air. Dangerous concentrations of lethal exhaust gases can then be drawn into the home.

Inlets, also known as trickle ventilators, are interior space ventilators designed to provide fresh air from the outdoors (makeup air) to replace (compensate for) that which is exhausted out. Inlets are available for walls or windows in mechanical or nonpowered versions that occupants can adjust themselves. Standard self-regulating and humidity-controlled air versions are available. Features typically include adjustable airflow (volume and direction), insulation to eliminate condensation and reduce sound penetration, and dust and insect filters.

The introduction of fresh makeup air helps keep relative humidity levels under control and contributes to a healthy atmosphere.

THE ART OF VENTILATING



- HRV/ERV's
- SUPPLY/EXHAUST FANS

- AIRFLOW CONTROLS
- SOUND ATTENUATION

- Exhaust indoor pollutants and help to maintain good indoor air quality,
- Provide a continuous supply of fresh, filtered, and tempered outdoor air to the home
- Recover heat from exhaust air in winter,
- Control excess humidity,
- Cool incoming air in summer, and
- Provide an energy-efficient means for reducing acute indoor air-pollutant problems such as radon, formaldehyde, excess moisture, or odors.

time, fresh outdoor air is drawn in from outside. These two air columns flow past one another through an enthalpic core, where heat and moisture recovery occur. Warm, fresh air is then distributed throughout the home.

During the cooling season, the reverse happens. The cool indoor air is exchanged with the warm incoming air, reducing the temperature of the supply air. Additionally, moisture from the outdoors is transferred into the exhaust air stream before it reaches the house. This reduces the load on the air conditioner, enabling it to control the humidity more effectively, which can reduce operating costs.

Selecting a Model

There are many different models of HRVs and ERVs, each with its own advantages and uses. To select the right model for your application, consult HVI's Certified Products Directory, which contains performance-testing reports for HRVs and ERVs. Units that appear in the Directory bear the HVI label.

Airflow is an important consideration when selecting an HRV, as the unit's first function is ventilation. It is critical to select a unit suitable for use in the given climate. In cold climates, the unit's frost protection must be sufficient enough to ensure proper performance throughout the winter.

Other factors that affect selection include "sensible heat recovery efficiency," controls, type of defrost system, and power consumption.

To determine the best choice for your area, contact HVI manufacturers who have many years of experience with H/ERVs.

Control options. The controls for continuous ventilators range from simple to complex. HRVs are available with controls that permit variable ventilation rates, automatic high-speed operation (when bathrooms are in use, for example), automatic operation to control excess humidity, timed operation, and even air-quality sensors. In any case, continuous low-speed operation is recommended.

WHOLE-HOUSE FANS

Cost-effective comfort for the entire home

Whole-house fans provide an effective way to improve comfort in the entire house without air



ERVs. ERVs are capable of reducing the moisture content of the fresh incoming air. As a result, they can reduce the load on the air conditioning system during summer operation.

During winter, ERVs provide a continuous supply of fresh air while simultaneously discharging stale indoor air. For successful winter operation, ERVs must be equipped with a suitable defrost mechanism. Vents installed throughout the home draw indoor pollutants and vent them outside. At the same

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www.hvi.org 19

conditioning. If the home has air conditioning, whole-house fans may help reduce energy costs because the air conditioner doesn't have to work as hard.

Available in various models to fit any home, whole-house fans allow the house to "breathe freely" when summer breezes, if they are blowing at all, are not strong enough to cool the house. A properly located whole-house fan draws outside air

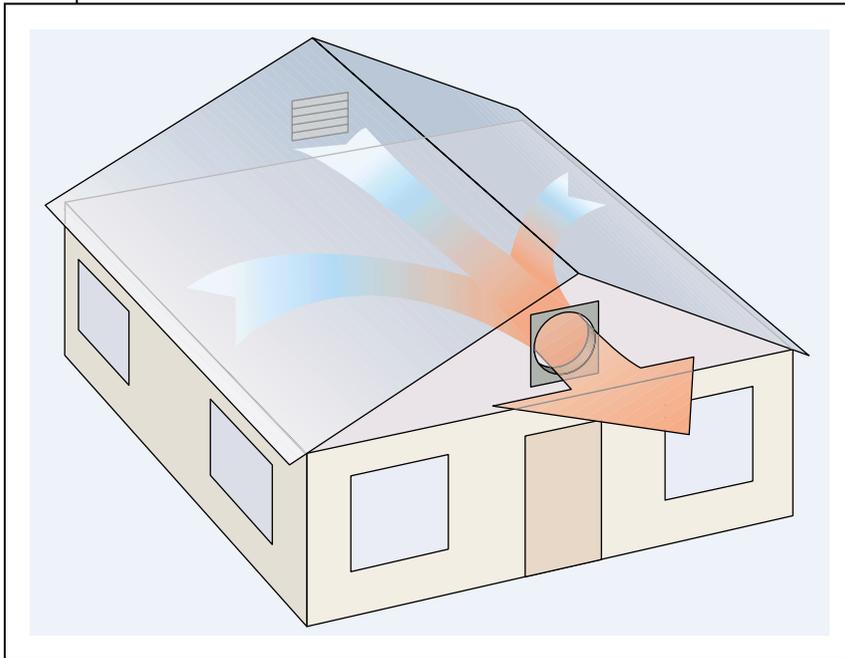
turn off the fan and close the windows and doors to store the cool air inside the house. Closing the drapes, especially on the sunny side, also helps keep the house cool.

A note about homes with air conditioning: By quickly and thoroughly ridding a closed-up house of hot air before the air conditioner is turned on, a whole-house fan can reduce air conditioning operating costs and help prolong compressor life.

Whole-house fans are mounted in one of three ways:

- **Horizontally** – suspended on joists over a ceiling opening in a central location and concealed by a ceiling grille or a shutter with automatically opening louvers.
- **Vertically** – usually installed in a gable end with a motor-operated ceiling grille in a central location.
- **Through the wall or roof** in houses that have no attic or houses with flat or hip roofs without sufficient static vent areas.

Whole-house fans are modular, requiring only minimal on-site assembly; manufacturers usually provide templates for cutting ceiling, gable, or wall



through screened windows and doors, pulls it up through the house, and exhausts it, usually through static vents in the attic. The result is a mild, cooling breeze throughout the house that can lower skin temperature by two to eight degrees – a significant cooling effect. In the evening, the fan provides relief from the day's heat by flushing the house with cool night air as the outdoor temperature drops.

Here's how they work:

- In the early evening, or when the temperature outside is 82°F or less, the homeowner opens the windows and turns on the fan.
- Later in the evening, the homeowner closes the windows and doors in unoccupied areas and opens the bedroom windows so the air flows only through the bedroom areas.
- In the morning, the homeowner opens the windows and lets the fan draw in cool air until the outside temperature rises, at which time they

openings.

Control options. Timers and thermostats are available for starting and shutting off fans automatically. Two-speed and infinite-speed controls are available on some models.

ATTIC VENTILATION

The advantages of air movement beneath the roof

Ideally, an attic ventilation system should be included when a house is built. If not, its importance is so strong that the homeowner should seriously consider a retrofit, especially if they are replacing the roof.

Reducing the heat buildup, which can reach 150°F on hot summer days, is only one reason to properly ventilate an attic. Perhaps more important is the long-term economic value. Attic ventilation is

the most important factor in preventing weather-induced home deterioration.

Heat and humidity can weaken the home's structural integrity and can cause plaster and drywall problems and exterior paint failure. The high costs of energy and of home repairs and maintenance alone should be incentive enough for the homeowner to make sure the attic is properly ventilated.

The purpose of attic ventilation is to *equalize temperatures inside and outside the attic* throughout the year. In summer, this equalization of temperatures helps make the living areas beneath the attic cooler and more comfortable; this can help reduce how hard the air conditioner needs to work, thus reduce its operating costs. This equalization also means the attic won't get so hot that the heat will distort and destroy roof shingles and cause the premature deterioration of roof boards, sheathing, siding, and insulation.

In winter, equalizing attic temperatures with outside temperatures prevents moist air, which seeps into cold areas from below, from condensing on the cold underside of roof surfaces and on beams and rafters. This condensation causes mildew, rotting of wood, and excessive rusting of fasteners and other metal components. It soaks insulation and can diminish its effectiveness.

One of the most apparent signs that an attic needs to be ventilated is the formation of "ice dams" in the winter. These occur when snow hits a home's roof where the sloping sides are warm. The snow then melts down the sides and piles up at the eave area of the roof, where it's colder. Here the mounds of snow often drip and form icicles. Some homeowners mistakenly think these problems are due to their gutters.



FPG International

Powered and Static Attic Ventilators

The principle of attic ventilation is simple: Place air vents at or near the roof peak to allow warm air to escape and intake vents in the soffit or under-eaves to allow outside air to enter the attic area.

Attics may be ventilated with power ventilators or by employing a system of fixed static vents.

Powered attic ventilators (PAVs) force air out of

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All PVP fans are ideally suited for a wide range of residential, commercial and industrial intake, exhaust, filtration, humidity removal and general ventilation applications. Designed for simple installation and many years of maintenance free operation, units can be mounted at any angle, and are designed to operate in high moisture, lint, and dust-laden air. Fully speed controllable. Complete range of accessories.

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the attic and are usually equipped with automatic thermostats, which activate the unit at a preselected temperature. An optional humidistat is also available to start the unit to remove excess moisture. They are mounted near the roof peak on the back



slope of the roof, where they are less visible from the street, or high on a gable wall.

Static vents, both intake and exhaust, are non-electrically powered and depend on natural air flow for movement. Intake vents are necessary whether using a static exhaust system or a powered ventilator.

Static exhaust vents include ridge vents, roof vents, gable vents, and turbines.

- **Ridge vents** are installed at the peak of the roof, often along its entire length. **Roof vents** cover holes cut in the roof near the peak to let air escape and to prevent rain, snow, and insects from entering the attic.
- **Gable vents**, generally triangular or rectangular in shape, have either adjustable louvers to fit a wide range of roof pitches or fixed louvers for a specific pitch. They are mounted at the highest point of the gable.
- **Turbines** are wind-driven ventilators. Under certain wind conditions, they can reduce air pressure in the stack and draw air from the attic space.

The intake vents, necessary to balance the systems, are:

- *Undereave, cornice, or soffit vents.*

To be effective, *both intake and exhaust vents must be present to promote air movement, and*

they must be in balance.

Manufacturers offer guidelines for determining which type of static vents are suitable for the particular application, which often is related to the type of roof on the house.

Static ventilators are also available for installation in side walls to reduce peeling of siding paint or moisture damage.

CRAWL SPACES

Preventing damage and unhealthy conditions

Crawl spaces need to be ventilated to prevent damaging and unhealthy conditions from developing. Foundation vents are designed to remove condensed moisture on the underside of the floor that leads to mildew and rot. The vents should have a minimum net free area equal to 1/150th of the ground area in the crawl space, or 1/1,500th if the crawl space has a vapor barrier and one such ventilation opening is within three feet of each corner of the structure. Foundation vents may also be used to remove the moisture and odors from unconditioned basements.

Crawl spaces may also be vented using an exhaust fan. The minimum code prescribed ventilation rate is 20 CFM per 1,000 square feet of floor area.

FOR MORE INFORMATION...

The HVI Web site (www.hvi.org) is a good starting point for anyone interested in learning more about home ventilation.

At the Web site you will find the downloadable Certified Products Directory, which is updated every 30 days. The HVI Web site also provides detailed information on ventilation rates and strategies for specific areas in the home, and contains links to product manufacturers.

Keep in mind that building codes in different areas call for different ventilation requirements, so it's important to keep current with the local situation. Also, different climates require different design strategies.

HVI members are ready to assist by providing code and design information for their ventilation products. ■

Determining Capacity

Ventilation Guidelines

Because fans have differing capacities for moving air, it is important to make sure the fan has ample capacity for the application. The fan's certified CFM rating appears on the product or on the HVI label displayed on each unit, in the manufacturer's literature describing the fan, and in the HVI Certified Products Directory available at www.hvi.org.

To help you determine the minimum fan capacity required, consider the following guidelines.

Bathrooms, Kitchens, and Other Rooms

For adequate ventilation, HVI recommends the following guidelines for ventilation rates:

Bathrooms (intermittent ventilation)

- Small (up to 100 square feet) – 1 CFM per square foot, approximately 8 air changes/hr.
- Large (over 100 square feet) – add up the needs of each fixture:

- Toilet 50 CFM
- Shower 50 CFM
- Bath tub 50 CFM
- Jetted tub 100 CFM

Enclosed toilet rooms must have an operable window or a fan. Exhaust points should be over or near the shower or tub and in an enclosed toilet room. Bathroom doors need to have sufficient clearance to the finished floor to allow entry of makeup air. A timer should be used to ensure that ventilation continues for a minimum of 20 minutes after use of the bathroom.

For steam showers, a separate fan in the steam room that can be turned on after use is recommended.

Bathrooms (continuous ventilation)

Ventilation may also be provided on a continuous basis at a minimum of 20 CFM in lieu of a 50 CFM fan.

The Ins and Outs of Attic Ventilation



Installing an effective attic ventilation system is simple. If you have the knowledge, and the right products. Get both from CertainTeed.

CertainTeed offers a full line of intake and exhaust ventilation products, so whether you go with power or if you want the best performing ridge vents on the market, we've got you covered. And, our technical experts can provide help when you need it, at 1-800-527-1924.

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Kitchens**15 changes/hr. for general ventilation.**

Recommended range hood ventilation rates vary greatly and depend on the type of cooking performed. The minimum rates are 40 CFM per lineal foot for a hood placed along a wall and 50 CFM per lineal foot for island hoods. HVI recommends 100 CFM per lineal foot for wall-mounted hoods and 150 CFM for island hoods. Hoods equipped with multiple speed settings allow low-level, quiet ventilation for light cooking to be combined with effective ventilation when needed.

Downdraft hoods require high ventilation rates since the steam and odors have to be pulled across the cooktop instead of being captured by a hood. The ventilation rates depend on the design and height of the unit, and HVI recommends the cooktop manufacturer's recommendations be followed.

Other Rooms**6 changes/hr.****Heat and Energy Recovery Ventilators**

For continuous indoor air quality ventilation, a heat or energy recovery ventilator should be operated to provide .15 air changes per hour. The complete occupied volume of the house must be considered in this calculation. In addition to this minimum, continuous ventilation rate, H/ERVs often have additional capacity which can be used to boost ventilation rates as required to meet the occupants' needs. These needs could occur as a result of a gathering of people; smoking; a hobby or activity using paint, glues, or other air-quality contaminants; or for any other reason to improve indoor air quality.

Local codes may require different continuous ventilation rates – always check with your building officials to determine your specific requirements.

Whole-House Ventilating Fans

The recommended minimum capacity for whole-house fans is based on the HVI guideline, which requires one complete air change every two minutes within the occupied area. This may be determined by multiplying the gross square footage of the entire house (including nonoccupied areas like closets) by 3. Be sure to include the “upstairs” area of multi-level homes. This formula assumes an 8-ft. ceiling

and offsets typical nonoccupied areas.

For proper ventilation and efficient operation, any whole-house ventilator requires adequate, unobstructed outlets in the attic through soffit vents, grilles, or louvers.

To calculate the amount of attic exhaust area you will need, divide the fan's capacity in CFM by 750. Example: 4,800 CFM divided by 750 = 6.4 square feet of attic exhaust area required.

Powered Attic Ventilators

Powered attic ventilators should provide at least 10 air changes/hr. Multiply the total square footage of the attic by 0.7 to get the minimum CFM necessary. For dark roofs, add 15% to this number. For particularly steep roofs, a slightly higher rating is recommended.

Only soffit vents should be used as fresh-air intakes for powered attic ventilators. Gable vents should *not* be used, as rain and snow can be drawn into the attic.

To calculate the total minimum vent intake area, divide the CFM of the powered attic ventilator by 300 and multiply the result by 144. This will give you the net free area, *in square inches*, that should be installed. A minimum of one square foot of inlet area for every 300 CFM of HVI Certified fan capacity is required for proper fan operation.

Static Attic Ventilation

HVI recommends that 60% of the *net free area* of the required ventilation be placed at the undereave location and 40% at the roof or gable location. HVI guidelines recommend one square foot of ventilator net free area for each 150 square feet of attic floor space. When an adequate ceiling vapor barrier is used, the net free area may be reduced by one-half. If no ceiling vapor barrier is used, the net free area of ventilation should be doubled.

To Calculate Net Free Area

To determine static ventilation needs, first multiply the attic length by attic width to find square feet, then divide that number by 300 to find required net free area. Because most vents are marked in square inches of net free area, multiply the above number by 144. The total of static vents you install should equal that number in total square inches. If no vapor barrier is used, multiply the total square inches by two. ■



BATHROOM HEATERS

The three-in-one DHVL multi-function bathroom heater mounts in the ceiling to provide 1,400 watts of fan-forced heat, 70 CFMs of ventilation, a ceiling light, plus Directional Heat Discharge that allows homeowners to direct heat where they want it. – *NuVent*

Circle 115

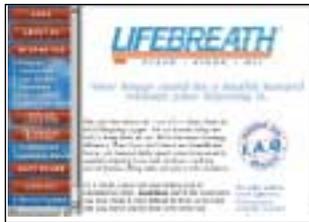


MEET NUVENT

NuVent's Web site introduces you to the company, which produces a complete line of ventilation products that provide solutions for all home ventilating needs – from bathrooms to kitchens to specialty applications.

– www.nuventproducts.com

Circle 116



IMPROVED IAQ

Nutech Energy Systems Inc. produces LIFEBREATH products, which it highlights at its Web site. The site also explains health and indoor air quality issues, has a FAQ section, describes how to assess needs, and more.

– www.lifebreath.com

Circle 117

TWO-SPEED FANS

Panasonic's Two-Speed Ceiling-Mount Ventilating Fans offer low noise levels, low input wattage, long motor life, and two-speed controls. Model



FV-11VQD2 features a high-speed control for spot

exhaust while the lower speed is utilized for continuous whole-house ventilation. – *Panasonic*

Circle 118



PANASONIC'S WEB SITE

Panasonic's Web site spotlights the company's ventilating fans including WhisperCeiling™, WhisperLite™, and WhisperWall™. Features such as energy efficiency, quiet operation, and long life are highlighted.

– www.panasonic.com/buildings

Circle 119



ERV CONTROL

RenewAire introduces its PT24, proportional time control, for its EV130 and EV200

residential energy recovery ventilators (ERVs). The homeowner or installer may set the control to provide proper ventilation rates, as determined from house size and a simple chart. Features include easy installation and single-speed operation. – *RenewAire LLC*

Circle 120



ALL-PURPOSE HOME VENTILATION

This brochure explains how RenewAire energy recovery ventilators (ERVs) can

prevent moisture damage in

homes and control indoor pollutants, while circulating fresh air at maximum energy efficiency. Specs are included. It is downloadable from www.renewaire.com.

– *RenewAire LLC*

Circle 121



VENT LIGHT

The VLC-64 Vent Light with its small-scale grille and halogen light is an attractive option for today's baths/showers. One or more can be paired with a remote-mounted Fantech Exhaust Fan to quietly and effectively ventilate the bath to protect it from the damaging effects of moisture, mold, and mildew. – *Fantech*

Circle 122



AIR IN MOTION

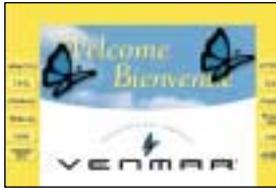
Any time you need "air in motion" for residential or commercial ventilation projects, look to Fantech's Web site at www.fantech-us.com. You'll find complete information on Fantech remote-mount fans and ventilators from 108 to 6,993 CFM and TurboFlo commercial ventilators up to 45,000 CFM.

– www.fantech-us.com

Circle 123

HEALTHY HOMES

Venmar Ventilation Inc.'s Web site features products including range hoods, attic ventilators, whole-house recovery units, and filtration systems – all while

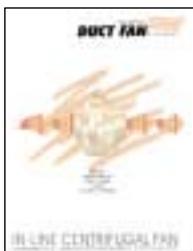


addressing important issues about indoor air quality and strategies for keeping a home healthy. – www.venmar-ventilation.com
Circle 124

COMMERCIAL HRVs



American ALDES offers small to mid-capacity commercial heat recovery ventilators (HRVs) for providing effective ventilation to remove indoor air pollutants, with a balanced fresh air supply tempered by a heat recovery core. A wide range of models, with air flows from 500 to 2,500 CFM is available to meet a variety of ventilation requirements. – *American ALDES Ventilation Corp.*
Circle 125



DUCT FANS
 This brochure spotlights ALDES' Duct Fan "P" Series in-line centrifugal fans for residential

applications, which may be selected for single or dual exhaust or supply point applications. The fans may be mounted outdoors or in wet locations. – *American ALDES Ventilation Corp.*
Circle 126



VENTILATORS

Soler & Palau, S.A.'s Web site showcases products it distributes including axial, centrifugal, inline fans, kitchen hoods, and more. There is a product search section and detailed catalogs that may be downloaded. – www.soler-palau.com
Circle 127



INLINE FANS

Spruce offers inline fans for applications including bathroom exhaust, fresh air supply, laundry room exhaust, dryer

boosting, kitchen exhaust, duct boosting, and more. Fans are compact and lightweight, and may be mounted remotely. Several are rated for continuous operation. – *Spruce Environmental Technologies, Inc.*
Circle 128



BROAN.COM

Find over 15 different product lines including bath fans, range hoods, inline fans, ventilators, chimes, and more at Broan-NuTone LLC's Web site. Discusses indoor air quality and includes several resources to learn more, including a CD, and a dealer and product search function. – www.broan.com
Circle 129



HRVs & MORE

Therma-Stor Products, Div. of DEC-Intl., manufactures heat recovery systems, ventilation systems, and dehumidifiers. Residential-specific products highlighted at its Web site include supply and exhaust ventilation systems, fresh air inlets, spot ventilation products, heat recovery ventilators, and inline tube fans. – www.thermastor.com
Circle 130



DISTRIBUTOR ON THE WEB

Learn more about the products National HVAC Products Inc./Airex Inc. distributes at its Web site. They include heat recovery and ventilation units; air diffusers, grilles, and registers; gas detection systems; commercial and industrial intake and exhaust fans; variable air volume terminals; and more. – www.airex.on.ca
Circle 131



COMFORT/EFFICIENCY MONITORING/CONTROL

Enalasy™ technology allows contractors to diagnose comfort and efficiency levels in homes and light commercial buildings. An online monitoring system is also

available, which may be offered to customers who want to monitor the conditions at all times. Both are explained at the company's Web site. – www.enalays.com
Circle 132



WHISPER COOL™ FANS
 Whisper Cool Gable-Mount Power Attic Ventilators are housed in a patented series of rings

instead of a solid metal cylinder. The rings allow air to move through the fan with less restriction, resulting in a quieter, more efficient operation. Learn more at www.certainteed.com. – *CertainTeed*
Circle 133

FREE VIDEO ON RIDGE VENTING
 “The Principles of Ridge Vent Performance” fully explains how to construct an effective attic ventilation system using ridge vents. The video details how ridge vents are designed and why some applications are more effective than others. For your free copy, call 1-800 AIR-VENT or visit www.airvent.com. – *Air Vent Inc., a CertainTeed Company*
Circle 134

MULTI-ZONE DUCTLESS SYSTEMS
 Fujitsu has added to its line of multi-zone ductless systems. Two



9,000 BTU indoor units connect to one outdoor condensing unit. The new dual-zones complement

the existing dual 12,000 BTU A/C system and have standard features such as Auto Restart, Auto Louver, a Sleep Timer, and more. – *Fujitsu General America, Inc.*
Circle 135



DUAL-ZONE APPLICATIONS
 Wall-mounted air conditioners and heat pumps, universal and ceiling-suspended air conditioners, and dual-zone air conditioners are highlighted in this

brochure. It discusses applications and provides complete specifications. – *Fujitsu General America, Inc.*
Circle 136



Multi-Zone Ductless Systems

The possibilities are infinite. With Fujitsu's new line of multi-zone air conditioners and heat pumps you can now do more than you ever thought possible with conventional A/C systems.

Built in features like: Auto Swing Louver, Power Diffuser and four fan speeds; help create true Zone-Conditioning rather than single room cooling.

With its onboard computer it knows when to turn on, when to change fan speeds and even when to turn itself off; all to optimize efficiency.

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Manufacturers' Directory

The following companies provided advertising support for this Guide:

AMERICAN ALDES VENTILATION CORP.

4537 Northgate Court
Sarasota, FL 34234-2124
Phone: (941) 351-3441
Fax: (941) 351-3442
www.americandaldes.com
Contact: Dwight Shackelford
Exterior-Mount Room Ventilators, InLine Fans, HRVs/ERVs

BROAN-NUTONE LLC

926 W. State St.
Hartford, WI 53027-1098
Phone: (800) 548-0790
Fax: (262) 673-8638
www.nutone.com
Contact: Karen Collins

CERTAINTED CORP.

3000 West Commerce St.
Dallas, TX 75212-4842
Phone: (800) 527-1924
Fax: (800) 635-7006
www.certainteed.com
Contact: Marianne Horvat
Powered Attic Ventilators, Static Roof Ventilators, Whole-House Fans, Static Undereave and Sidewall Ventilators, Static Gable End Ventilators

ENALASYS (AFFILIATE, HONEYWELL INC.)

1885 Douglas Dr.
North Golden Valley, MN 55422-3992
Phone: (763) 954-5819
Fax: (763) 954-4440
www.honeywell.com

FAN AMERICA, INC.

1748 Independence Blvd.

Suite G-4
Sarasota, FL 34234
Phone: (941) 359-3616
Fax: (941) 359-3523
www.fanam.com
Contact: Marion Pye
InLine Fans, Kitchen Exhaust Fans, Bathroom Exhaust Fans, Blowers

FANTECH, INC.

1712 Northgate Blvd.
Sarasota, FL 34234-2112
Phone: (941) 351-2947
Phone #2: (800) 747-1762
Fax: (941) 359-3828
www.fantech-us.com
Contact: Kathie Perry
Fan Controls, InLine Fans, Kitchen Exhaust Fans, Bathroom Exhaust Fans, Fan Lights

FUJITSU GENERAL AMERICA, INC.

353 Rt. 46 West
Fairfield, NJ 07004
Phone: (888) 888-3424
Fax: (973) 575-2194
www.fujitsugeneral.com
Contact: Mark O'Donnell
Ceiling Fans/Wall Fans, Fan Heaters, Whole-House Fans, Blowers

NATIONAL HVAC PRODUCTS INC./AIREX INC.

5 Sandhill Court, Unit #C
Brampton, ON L6T 5J5
Canada
Phone: (905) 790-8667
Fax: (905) 790-1133
Contact: Enzo Iantorno
InLine Fans, Bathroom Exhaust Fans, Passive Ventilation Devices

NUTECH ENERGY SYSTEMS INC.

511 McCormick Blvd.

London, ON N5W 4C8
Canada
Phone: (519) 457-1904
Fax: (519) 457-1676
www.lifebreath.com
Contact: Roger Johnson
Ceiling Fans/Wall Fans, Fan Heaters, InLine Fans, Bathroom Exhaust Fans, HRVs/ERVs

NUVENT INC.

9624 Cincinnati-Columbus Rd.
Cincinnati, OH 45241
Phone: (513) 777-8846
Fax: (513) 777-8483
www.nuventproducts.com
Contact: Kathie Perry
Powered Attic Ventilators, Fan Heaters, Fan Controls, Kitchen Exhaust Fans, Bathroom Exhaust Fans, Fan Lights, Range Hoods

PANASONIC

HOME & COMMERCIAL PRODUCTS CO. BUILDING GROUP
1 Panasonic Way
Secaucus, NJ 07094-2999
Phone: (866) 292-7292
Fax: (800) 553-0384
www.panasonic.com
Contact: Brian Kiel
Fan Heaters, InLine Fans, Bathroom Exhaust Fans, Fan Lights

RENEWAIRE LLC

2201 Advance Rd.
Madison, WI 53718-6761
Phone: (608) 221-4499
Fax: (608) 221-2824
www.renewaire.com
Contact: Michael Brandt ERVs

SOLER & PALAU, Inc.

16 Chaplin Rd., Unit #903
P.O. Box #637
Pine Brook, NJ 07058
Tel: 888-272-1302

Fax: 973-439-1002
www.soler-palau.com
Contact: Carl Gordano
Ceiling Fans, Powered Attic Ventilators, Static Roof Ventilators, Exterior-Mount Room Ventilators, Fan Heaters, Fan Controls, InLine Fans, Kitchen Exhaust Fans, Bathroom Exhaust Fans, Blowers, Range Down Drafts, Range Hoods, Static Gable End Ventilators

SPRUCE ENVIRONMENTAL TECHNOLOGIES, INC.

187 Neck Rd.
Ward Hill, MA 01835-8027
Phone: (978) 521-0901
Fax: (978) 521-3964
www.spruce.com
Contact: Roger Zucchini
InLine Fans, Kitchen Exhaust Fans, Bathroom Exhaust Fans

THERMA-STOR PRODUCTS

A DIVISION OF DEC-INTERNATIONAL
1919 S. Stoughton Rd.
(53716-2299)
P.O. Box 8050
Madison, WI 53708-8050
Phone: (608) 222-5301
Fax: (608) 222-1447
www.thermastor.com

VENMAR VENTILATION INC.

550 Lemire Blvd.
Drummondville, QC J2C 7W9 Canada
Phone: (819) 477-6226
Fax: (819) 475-2660
Contact: Rene Dionne
HRVs/ERVs

Other companies that offer HVI Certified products. For detailed contact information, visit: www.hvi.org/manufacturers

Aerflo Inc.
Air for Life, Inc.
Air Movement Group Ltd.
Arabian Co. for Fans Mfg. Ltd.
B/S/H Home Appliances Corp.
Brock, Inc.
Bryant Heating and Cooling Systems
Butler Ventamatic Corp.

Carrier Corp.
Diversi-Plast Products
Domus Ventilation Limited
Fuji Industrial USA, Inc.
Headrick Building Products
Kanalfakt Canada, Inc.
Kanalfakt, Inc.
Kool-O-Matic Corp.
Lennox Industries (Canada) Ltd.
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LS50
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LS100

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Ventilation**

Broan-NuTone Proper Vent Matrix

Bathroom	House Type	Broan		NuTone		▲ Powder/Hall Bath Unit	● Full Bath Unit	■ Master Bath Unit
		Fan	Fan/Light	Fan	Fan/Light			
Powder Hall ▲	Entry	688	678	696N	763RLN			
	Move-up	671	712 741WH	671R	8664RP			
	Upper	S50U	S80LU	LS50	LS80L			
Full ●	Entry	671	712 741WH	671R	8664RP			
	Move-up	S90	S120L	QT90	QT100L			
	Upper	S80U	S110LU	LS80	LS80L			
Master ■	Entry	684	712 741WH	671R	8664RP			
	Move-up	S90	S120L	QT90	QT100L			
	Upper	S110U	S110LU	LS100	LS100L			

Call Broan Customer Service at 1-800-558-1711
Call NuTone Customer Service at 1-888-336-3948

