Decorating with comfort

Facts about the new

Ultimate Comfort Heating

and Air Conditioning Systems.

We bring good things to life.

The purpose of this booklet is to acquaint you with the new high-efficiency heating and air-conditioning options that can substantially increase the level of comfort you experience with your central, forced-air system.

If you are remodeling or building a new home, make sure you discuss the ideas in this booklet with your HVAC contractor so you can select the Ultimate Comfort System that's right for you.

Take this Comfort test.

1. *Does the temperature in your house vary noticeably up and down?*
2. *Do you feel uncomfortable even after your air conditioner has run?*
3. *Is your heating and cooling system noisy?*
4. *Is your upstairs always warmer than your downstairs?*
5. *Is the south side of your house always warmer than the north side?*
6. *Is the air in your house stale?*
7. *Does someone in your family suffer from allergies or asthma?*
8. *Is your house too dry in winter?*
9. *Do you have high utility bills?*

If you answered "yes" to any of these questions, then your system may be deficient in controlling temperature and humidity. It may also waste energy and do little to improve indoor-air quality. An Ultimate Comfort System will address all these problems.

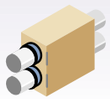
Introducing the Ultimate Comfort System

A. GE ECM™ Blower Motor
This is a GE ECM blower motor. It moves heated or cooled air through the ductwork. It's the most important component of an Ultimate Comfort System because it helps deliver just the right amount of airflow to your house.

B. Two-Stage, Variable-Speed Furnace or Heat Pump
This is a two-stage, variable-speed furnace. It's two furnaces (or heat pumps) in one. It runs on low fire on mild days and high fire on the coldest days. So it produces extremely even, comfortable temperatures.

C. Two-Stage, Variable-Speed Air Conditioner
A two-stage, variable-speed air conditioner is like having two air conditioners in one. It runs on low stage on mild days and high stage on the hottest days. It removes up to 6 times more humidity and produces extremely even, comfortable temperatures.

D. Balanced Ductwork
Properly sized and balanced ductwork is essential to the performance of an Ultimate Comfort System. For maximum efficiency and comfort, the static pressure in the system should be 0.5 inches or less.



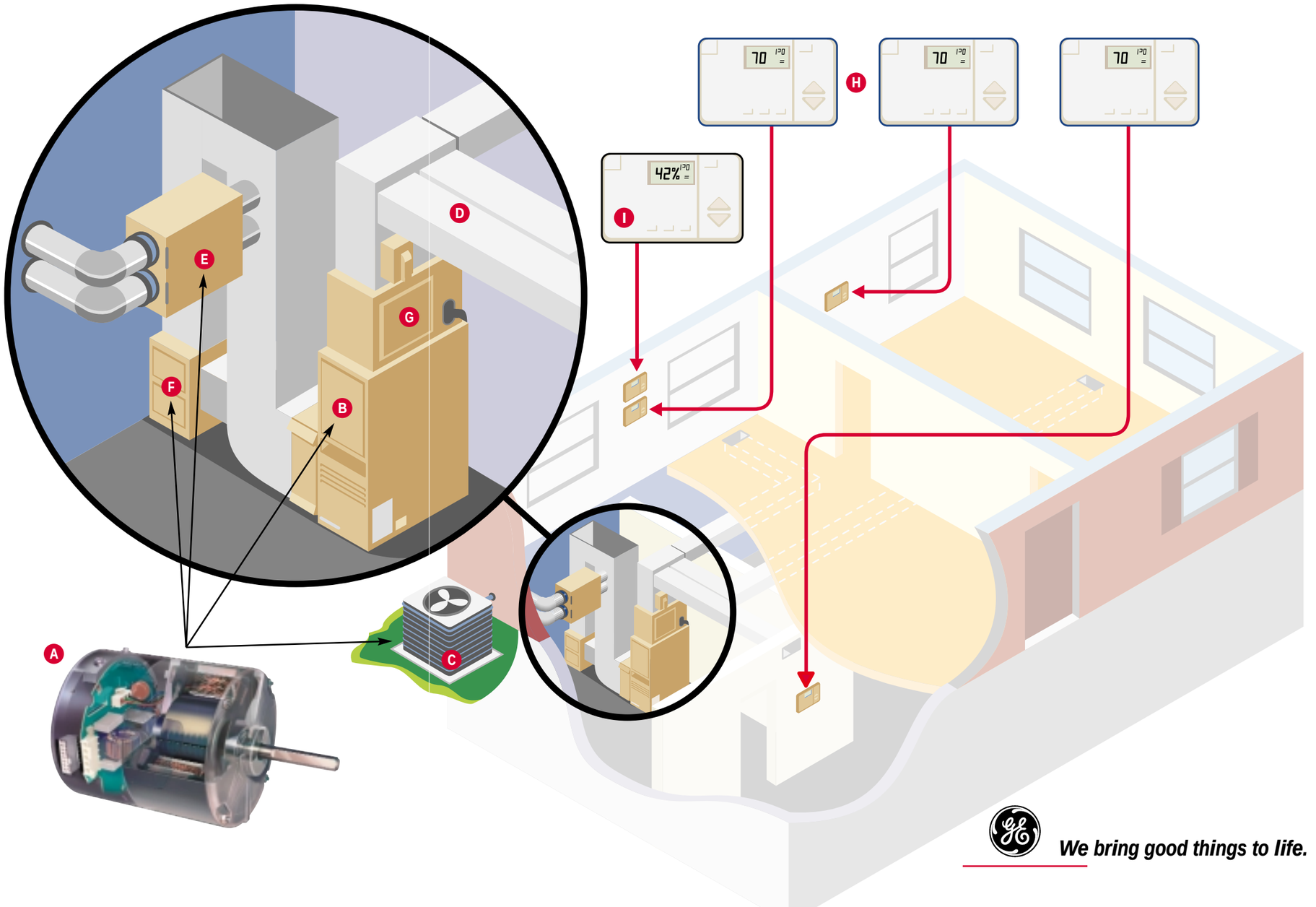
E. Energy-Recovery Ventilator w/ GE ECM Motor
An energy recovery ventilator brings fresh air in and takes stale air out. It transfers energy from the outgoing air to the incoming air so you save money while improving the quality of your indoor air.

F. HEPA Air Cleaner w/ GE ECM Motor
A HEPA (high efficiency particulate arrestance) is the most efficient air cleaner available. It helps remove smoke, odors, and microscopic air-borne particles that can trigger allergies and asthma.

G. Humidifier
Dry air in winter irritates sinuses, causes static electricity and can damage furniture and woodwork. A whole house humidifier attached to your ductwork can raise indoor humidity to a comfortable level.

H. Zone Controls
Zone controls give you precise temperature control in every area of your home. For example, it can send more air conditioning to the upstairs in summer or more heat to the cold north side in winter.

I. Humidistat
A humidistat works like a thermostat and gives you comfortable humidity year round. Set the level you want and in winter the humidifier will add moisture to the air. In summer, the two-stage, variable-speed air conditioner will remove humidity.

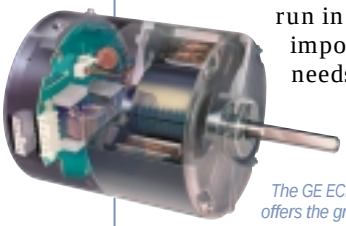


We bring good things to life.

The basics of home comfort.

The most important aspect of comfort is airflow control. In order to regulate temperature and humidity with any precision and have good air distribution throughout your house, the system must first be set up to deliver and maintain proper airflow.

The most precise airflow control comes with a GE ECM™ variable-speed blower motor coupled with balanced and properly sized ductwork. Unlike a conventional blower motor which is designed to operate at one speed, the GE ECM motor can run in a wide range of speeds. That's important because your blower needs to adjust its speed to deliver just the right amount of airflow needed by the system.



The GE ECM™ variable-speed motor offers the greatest efficiency and comfort along with much quieter operation.

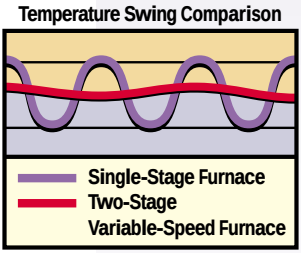
For example, cooling mode requires a different airflow than heating mode. A conventional blower motor cannot handle this change without sacrificing comfort. A GE ECM variable-speed motor, on the other hand, will automatically change its speed for heating or cooling mode to provide maximum comfort. The ECM motor will also help compensate for a dirty air filter by automatically increasing its speed to maintain airflow.

Just as the HVAC system requires a GE ECM motor to produce the optimum airflow, it also requires the proper ductwork to carry that airflow quietly and efficiently. To achieve balance, your house must have adequate supply air coming from the furnace or air conditioner going to every room of the house. It must also have adequate return air, which refers to the ducts that pick up air from the rooms and return it to the furnace or air conditioner. HVAC systems are designed to work best at .5 inches of pressure or less in your duct system. If the pressure exceeds this measurement, ask your dealer about ways to reduce it.

Home Comfort Solutions

1. Does the temperature in your house vary noticeably up and down?

A single-stage furnace and a two-stage, variable-speed furnace may look identical, but there is a very important difference. A single-stage furnace is sized to heat your home on the coldest days of the year. That means it delivers its full heating capacity, even on mild days. As a result, it produces uncomfortable temperature swings (see purple line).



A two-stage, variable-speed furnace reduces temperature swings because it is two furnaces in one: low fire for mild days and high fire for only the coldest days. A two-stage variable-speed furnace typically operates in low fire 80% of the time which produces much more even heating (see red line).

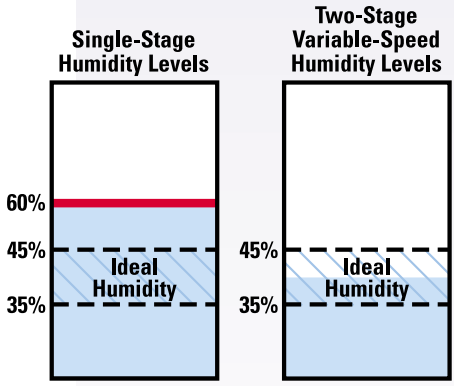
In addition, because the system runs for longer cycles, the air is filtered more often. Temperature stratification (the effect of warm air rising and cool air sinking) is also lessened because the air is circulated more often.

The following components address comfort problem #1:

- *GE ECM™ Blower Motor*
- *Two-Stage, Variable-Speed Furnace or Heat Pump*
- *Balanced Ductwork*

2. Do you feel uncomfortable even after your air conditioner has run?

Like a single-stage furnace, a single-stage air conditioner only runs at full capacity. On mild days, the AC runs less often allowing humidity to build up to an uncomfortable level. A two-stage, variable-speed AC runs for longer cycles which removes up to six times more moisture than a conventional unit. Plus with a humidistat and GE ECM variable-speed blower motor, the air conditioner is able to extract even more moisture from the air. Here's how it works: when the humidistat senses that the humidity is high, the motor will automatically reduce airflow so that the air conditioner can remove more moisture from the air. With lower indoor humidity, you may set the thermostat higher and save on electricity while increasing your comfort.

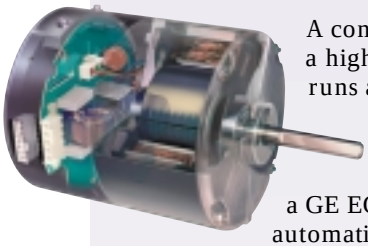


For example, turning your thermostat up three degrees can reduce your annual cooling bill by as much as 5%.

The following components address comfort problem #2:

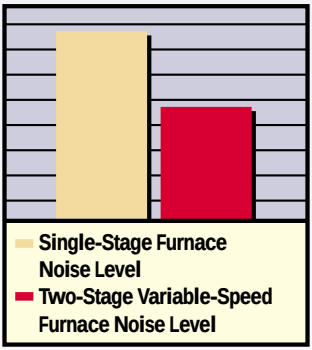
- *GE ECM™ Blower Motor*
- *Two-Stage, Variable-Speed Air Conditioner*
- *Balanced Ductwork*
- *Humidistat*

3. *Is your heating and cooling system noisy?*



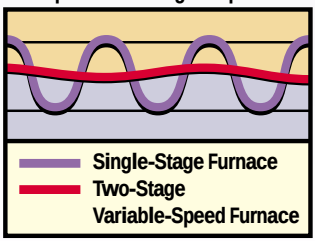
A conventional motor produces a high level of noise because it runs at full speed continuously. A two-stage, variable-speed heating and cooling system uses a GE ECM motor which automatically runs slower in low stage which makes for extremely quiet operation. In addition, the GE ECM variable-speed motor is designed to ramp up to speed slowly, so it eliminates the sudden blast of air found in conventional systems.

Noise Level Comparison



A two-stage system with a variable-speed blower motor offers the most quiet operation of any central HVAC system.

Temperature Swing Comparison



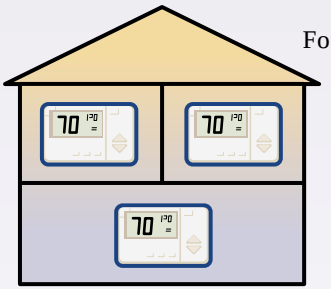
A two-stage system operates for longer cycles and keeps the temperature in your home more even.

The following components address comfort problem #3:

- *GE ECM™ Blower Motor*
- *Two-Stage, Variable-Speed Furnace or Heat Pump*
- *Two-Stage, Variable-Speed Air Conditioner*
- *Balanced Ductwork*

4. Is your upstairs always warmer than your downstairs?

Trying to keep every room comfortable with one thermostat is like controlling all the lights in your house with one switch. That's why more and more homeowners are insisting on zone controls to better manage comfort in their homes.



With zone controls, you can maintain the same temperature in every zone of the house.

For example, a house is typically warmer upstairs because heat rises. Zone controls can alleviate the problem by dividing the house into zones, each with its own thermostat. When the upstairs zone calls for cooling, the system sends cooling to that zone independent of the rest of the house. When the thermostat is satisfied, the damper closes. This method delivers just the right amount of heating or cooling to each zone.

A properly designed zoning system must have three things: 1.) a system that can adjust the amount of heating or cooling it delivers; 2.) a variable-speed blower motor that can adjust the airflow to match the output of the system; and 3.) ductwork that can direct the air to the proper zones.

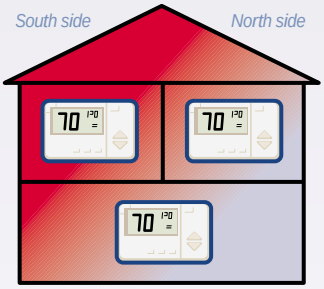
A two-stage, variable-speed heating and cooling system with a GE ECM motor is best for the varying demands of zone controls. Such a system can provide the right amount of heating and cooling with the right amount of airflow to maintain comfort in every zone of the house.

The following components address comfort problems #4 and #5:

- *GE ECM™ Blower Motor*
- *Two-Stage, Variable-Speed Furnace or Heat Pump*
- *Two-Stage, Variable-Speed Air Conditioner*
- *Balanced Ductwork*
- *Zone Controls*

5. Is the south side of your house always warmer than the north side?

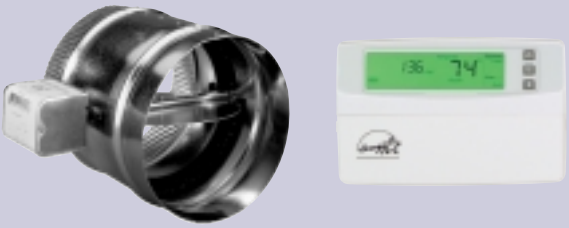
Sunshine can raise the temperature in a room 10 degrees or more. To compensate for this added heating, a zone-control system will automatically deliver more cooling in summer and less heating in winter so you can enjoy perfect temperatures year-round anywhere in the house.



With zone controls, you can maintain the same temperature in every zone of the house, even with solar gain.

A two-stage variable-speed heating and cooling system with a GE ECM motor is the best solution for the varying demands of zone controls. It can provide just the right amount of airflow to maintain comfort in every zone of your house.

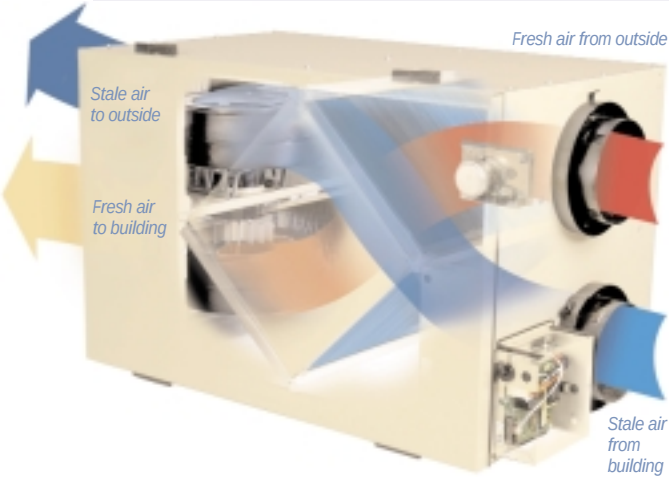
In addition, because the system runs for longer cycles, the air is filtered more often. Temperature stratification (the effect of warm air rising and cool air sinking) is also lessened because the air is circulated more often.



Zone controls include dampers and individual zone thermostats such as the ones above. These provide precise temperature control to every area of your house. In turn, they deliver greater comfort because they can maintain a set temperature in every area of your home. Zone controls can also save energy because the temperature in unoccupied spaces can be set back when not in use.

6. Is the air in your house stale?

Most homes built within the last 15 years are so tightly insulated that very little fresh air can enter and little stale air can exit. This means that VOCs (volatile organic compounds given off by carpet, plywood, etc.), household chemicals, smoke, radon, and odors have no way to escape, resulting in indoor air that can be 10 times worse than the smoggiest city. (Source: EPA)



The best energy-recovery ventilators provide a complete change of air every three hours and exchange both heat and humidity.

A properly sized Energy Recovery Ventilator (ERV) provides a complete change of air every 3 hours. It also recovers up to 90% of the energy spent to heat or cool your house by taking it from the outgoing air and transferring it to the incoming air.

The GE ECM is the most efficient motor available in an ERV. It can save you $112 annually (@ $.08/kWh) compared to a conventional motor and is practically silent when it runs.

The following components address comfort problem #6:

- *GE ECM™ Blower Motor*
- *Balanced Ductwork*
- *Energy-Recovery Ventilator w/ GE ECM Motor*

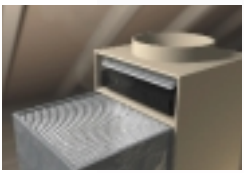
7. Does someone in your family suffer from allergies or asthma?

A stream of sunlight coming through a window will reveal the dust floating in the air. That dust not only winds up on floors and furnishings, it is also the bane of many allergy and asthma sufferers.

The air filter in your furnace helps take dust out of the air, but it is important to know that some filters work better than others. Grocery store air filters, for example, are only about 15% efficient and provide little help. In contrast, a HEPA filter can remove up to 99.97% of air-borne contaminants .3 microns or larger.

1. The polyester filter removes larger dust particles

2. The charcoal filter removes smoke and odors



3. The HEPA filter removes up to 99.97% of all respirable particles .3 microns or larger

The most efficient, whole-house air-cleaning system is one that uses a HEPA filter equipped with a GE ECM motor (see illustrations at left). This HEPA unit is three filters in one: the top polyester filter removes larger, visible particles; the charcoal filter removes smoke and odors; while the HEPA filter removes the most minute respirable particles from the air passing through it. The HEPA may also be set up to bring in outside air through an ERV. It is powered by a GE ECM motor which means you can clean the air continuously for pennies a day.

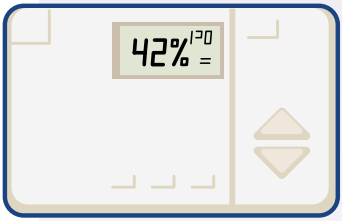
4. The high efficiency GE ECM motor is used to draw air through the dense HEPA filter.

The following components address comfort problem #7:

- *GE ECM™ Blower Motor*
- *HEPA Air Cleaner w/ GE ECM Motor*
- *Energy-Recovery Ventilator w/ GE ECM Motor*

8. Is your house too dry in winter?

In winter the air in your house can be drier than most deserts. That dry air irritates sinuses, causes static electricity and can damage furniture and woodwork. A whole house humidifier attached to your ductwork can raise indoor humidity to a comfortable level.



The humidifier is controlled with a humidistat. It works like a thermostat and allows you to set a comfortable level of humidity. In summer the humidistat can be set to work with your ECM-powered air conditioner to pull more moisture from the air when humidity is excessive.

Humidifiers can help lower heating bills because humidified air feels warmer. For example, a 69° F temperature at 35% relative humidity feels just as warm as 72° F setting at 19% relative humidity. Lowering your thermostat setting by three degrees can reduce annual heating bills by as much as 5%.

Humidifiers like this can add as many as 25 gallons of water vapor a day to your home.

The following components address comfort problem #8:

- *GE ECM™ Blower Motor*
- *Balanced Ductwork*
- *Humidifier*
- *Humidistat*

9. Do you have high utility bills?

During heating or cooling cycles, the GE ECM motor uses much less electricity than a conventional blower motor. As a result, an Ultimate Comfort System saves money in five ways:

1. *A heating and cooling system equipped with a GE ECM motor can save you approximately $125 a year in electricity cost.*

2. *Running your GE ECM blower motor continuously to circulate the air can save you another $290 annually.*

3. *A GE ECM-equipped energy recovery ventilator can save you approximately $112 a year in electricity cost.*

4. *A GE ECM-equipped HEPA air filter can save you approximately $160 a year in electricity cost.*

5. *A two-stage heating and cooling system with a humidistat can save you additional energy costs because you can set your thermostat up in summer (e.g. change setting from 70° to 72°) and down in winter (e.g. change setting from 72° to 70°) and still feel comfortable.*

NOTE: The above figures are based on the average energy savings (@ 8¢/kWh) of a GE ECM motor when compared to a conventional blower motor. Your actual savings will vary depending on your climate, ductwork, insulation, thermostat setting, and energy cost.

The following components address comfort problem #9:

- *GE ECM™ Blower Motor*
- *Two-Stage, Variable-Speed Furnace or Heat Pump*
- *Two-Stage, Variable-Speed Air Conditioner*
- *HEPA Air Cleaner w/ GE ECM Motor*
- *Zone Controls*
- *Energy-Recovery Ventilator w/ GE ECM Motor*

How do I select a contractor?

The contractor you use is as important as the system you buy. The following guidelines will help you find a contractor with the proper qualifications.

Make an appointment with your licensed contractor. If you don't have one, ask a friend for a referral or check with your local Better Business Bureau or the local chapter of the Air Conditioning Contractors of America (ACCA).* Make sure to follow these guidelines:

- Insist on a room-by-room load calculation using the ACCA Manual J to determine the exact amount of heating and cooling required for each room. DO NOT ACCEPT RULES OF THUMB. This calculation should be done on a computer and take into account: air-leakage rates, insulation in walls and ceilings, the size and location of doors and windows, the location of the house in relation to the sun, and external factors such as trees or overhanging porches.

- A precise load calculation will ensure that your system is properly sized so it delivers the comfort and efficiency you expect. Doing a precise load calculation may also save you money by avoiding the purchase of a system that's too large for your house.

- Ask your dealer if he sells two-stage systems equipped with a GE ECM variable-speed blower motor.

- Ask your contractor to follow the ACCA Manual D guidelines when designing and installing your ductwork.

- Ask for references of others who have purchased these systems.

- Insist on a written cost estimate and written work contract. Inquire about product warranty and service contracts.

Use the contractor locator at ACCA's web site: www.acca.org

Customers speak out.

“One side of our house is largely glass so we experience a lot of solar gain. Consequently the upper level was always quite a bit warmer than the lower level. When we had our new two-stage, variable-speed furnace installed, they recommended we run the fan continuously to circulate the air. After one summer, we could tell a big difference.

The upstairs was cooler and the unit was so quiet we couldn’t even hear it. On top of that, my contractor showed me that the motor only uses 75 watts when it’s on constant fan.”

-Jack Goldman, Mount Vernon, IL

“Our cathedral ceilings made it difficult to keep the temperature even throughout the house. It always seemed too hot in one room or too cold in another. Now our new two-stage, variable-speed furnace holds the temperature rock steady in every room.

We also needed a furnace that was extremely quiet because the unit sits right outside my recording studio in the basement. When we first installed it, I was skeptical about the claims the dealer made. But when it ran, I couldn’t hear it at all and, more importantly, the microphone didn’t pick it up either.”

-Jim Bordner, Fort Wayne, IN

“Being a transplant to Florida from up north, my experience with whole house air conditioning was limited to my workplace... To my delight, my home here is even more comfortable than my previous residence up north! As a matter of fact, I had to change my temperature setting to 78˚ as 76˚ was too cold.”

-Bruni Mecabe, Jacksonville, FL

Manufacturers using GE ECM technology:

Amana, American Standard, Armstrong, Bard, Bryant, Carrier, Climate Master, Florida Heat Pump, Frazer Johnson, Frigidaire, Goodman, Hydrodelta, Janitrol, Lennox, Luxaire, Magic Air, Nordyne, Pure Air, Rheem, Ruud, Stirling, Trane, WaterFurnace, York

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GE Industrial Systems

visit us on the web at: http://www.GEindustrial.com /comfort

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