



buy a furnace with a variable speed motor

h.e.l.p. sheet

overview

Throughout British Columbia, you'll find that the most common heating appliance is the gas forced air furnace. While the bulk of the energy used by this appliance is natural gas, a furnace does require a substantial amount of electricity to power the blower motor that moves air throughout the home. In many cases, these motors can use twice the amount of electricity as a new refrigerator. A high efficient motor can change that.

Motor Speeds

Today's furnace systems can provide not only heating, but also ventilation and cooling functions for the home. Each of these functions requires a different motor speed, so that the blower can deliver the appropriate amount of air.

- **Heating** — requires one or two medium speeds
- **Cooling** — requires the highest speed to deliver the heavier, cool air
- **Ventilation** — requires the lowest speed to provide continuous circulation

High Efficient Furnace Motors

While the conventional PSC (permanent split capacitor) motor can be made to operate at multiple speeds, it is most efficient at its highest operating speed. When the PSC motor is operated at slower speeds its efficiency drops off quickly — often by 20% or more — meaning you pay more than you need to for its service.

Fortunately there is a high-efficiency option — the brushless DC motor. Also known as a variable speed motor, or by the initials ECM™ or ICM™, its speed is precisely controlled with electronics to maintain efficiency at any speed.

Benefits of Variable Speed Motors

Reduced operating cost

Throughout their operating range high efficient motors use less energy than conventional motors. At higher speeds the savings are typically $\frac{1}{3}$; at lower speeds, even greater. That can add up to hundreds of dollars per year. So while it will cost more initially, the reduced operating costs can offset that in a matter of a few years.

Two-stage furnaces are designed to add to the furnace's gas efficiency and occupant comfort by operating for longer periods of time than a single-stage furnace. While designed to operate at high- or low-fire - depending on how much heat the house requires - most of the time they operate at the low-fire stage. At low-fire the blower operates at a slower speed and here is where the high efficient motor can provide big electrical savings compared to a conventional PSC motor.

In a home with a conventional motor, the average annual consumption of the furnace motor is expected to range from 900 kWh/yr for heating only to 3,000 kWh/yr for heating and continuous circulation. With a high efficient variable speed furnace motor, the expected annual electricity savings similarly range from 400 kWh to 2,300 kWh annually.¹

¹From NRCan's Furnace Motors Report, 2003.

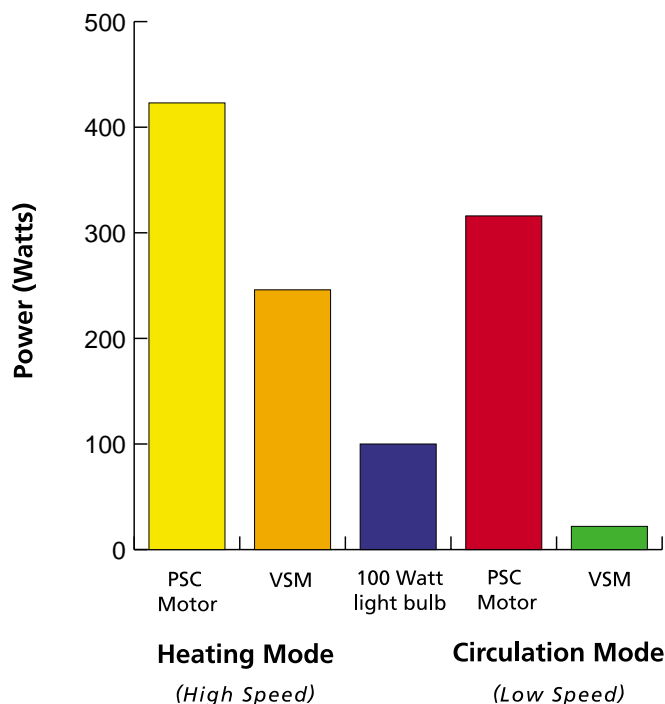
Greater occupant comfort

The variable speed feature can add to occupant comfort if the furnace is being used for either heating or ventilation. In ventilation mode, the airflow can be adjusted to ensure that the volume of air being circulated is just right. Too great an airflow can create uncomfortable drafts and excessive noise through the duct work. This discourages use of the furnace's ventilation feature where and when it would be most beneficial. Some furnaces even allow occupants to adjust the air circulation rate right from the thermostat.

In heating mode, variable speed motors can be programmed to start slowly then speed up as the furnace comes up to temperature preventing an initial uncomfortable blast of cool air. The variable speed feature will also provide for better temperature control throughout the house.



Comparative Power Requirements¹



¹From NRCan's Furnace Motors Report, 2003.

Long motor life

High efficient motors and controls are generally made with higher quality components and are less susceptible to overheating and stress on the motor components. Check around – some manufacturers offer longer warranties on their variable speed motors.

Greater functional capability

With variable speed capability, these motors are well suited to providing zoning, which can reduce gas consumption. They may also offer you greater flexibility. Able to operate over a greater range of speeds, you may choose to purchase air conditioning, a more efficient air filter or simply to circulate air continuously at a later date.

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