

What is a Two-Stage Heat Pump/AC?

A two-stage heat pump/AC operates much more efficiently than a single-stage. It provides the right amount of heating/cooling to efficiently satisfy your home and family's needs. In addition, a two-stage heat pump/AC is much quieter since it doesn't operate at 100% capacity every time it runs. This also results in less wear and tear on the unit. If you are in the market for a new heat pump/AC, then without a doubt, two-stage heat pump/AC might be your best choice, especially if your home would benefit from a Variable Speed Furnace. We will also present the scenarios when a two-stage heat pump/AC may not be the best choice for your home.

How Does it Work?

For most climates, the first stage operates the majority of the time, and runs at about 65% of the heat pump/AC's full capacity. When the temperature outside becomes extremely hot or cold and the first stage is not sufficient, the second stage kicks on to provide the additional heating/cooling requirements. This allows air to be distributed into your home more evenly, which helps to reduce air fluctuations. Furthermore, this cuts down on the heat pump/AC rapid cycling. The reason for this is that a properly sized heat pump/AC is sized for the more extreme temperature days of the year. A single stage unit will come on at full capacity even during milder days resulting in the unit cycling on and off at a frequent rate which creates more wear and tear on your system. Two-stage heat pump/AC's also help to increase comfort on moderate-temperature days since they will, in most cases, remain on the low stage. They also provide a higher level of comfort due to a steady flow of warm/cool air during the most extreme weather days.

When coupled with a Variable Speed Furnace the airflow of the furnace is also moderated so as to produce less airflow during the first stage and increase the airflow when your heat pump/AC goes in to second stage.

- **Reduced Wear and Tear** - Heat pump/AC's with two-stage technology make the distinction between mild and extreme weather, delivering the level of heating/cooling output necessary to maintain optimal comfort conditions inside of your home. By operating at the lower capacity during milder weather you reduce the strain on the system and eliminate short cycling which can be common with single stage equipment.
- **Increased Comfort** - A two-stage heat pump/AC starts in first stage, operating at about 68% of its heating capacity. This reduced capacity is sufficient to keep your home comfortable when the weather outside is mild. Should the temperature suddenly change, the unit automatically adjusts to high output (second stage) to meet the comfort demands of your home. It's like having two heat pump/AC's for the price of one, and you don't have the hassle of constantly adjusting your thermostat.
- **Quieter Comfort**-Two-stage heat pump/AC's run at low stage most of the time, greatly reducing the operating sounds associated with traditional systems that turn on and run at full blast.
- **Improved Indoor Air Quality.** A two-stage heat pump/AC's provides a longer period of time at low-speed operation which increases the effectiveness of the furnace's filters, allowing them to capture and remove more contaminants.

When not to select a Two Stage Heat Pump/AC

- **Large poorly Insulated Homes** – This would completely defeat the purpose of a two-stage heat pump/AC. Loss of heating/cooling would result in the system having difficulties keeping up even on milder days. The unit would wind up running in high stage most of the time. The added cost of a two-stage unit would be a poor investment in this case.
- **Small well Insulated Homes** – The size of the heat pump/AC for a small well insulated home is such that the difference in capacity between first stage and second stage would provide few if any of the benefits normally achieved with a two-stage system. The added cost of a two-stage heat pump/AC in this scenario far exceeds the benefits.
- **Short term ownership** – If you need a new system and you are planning on selling your home in the next few years then it may not be worth it to get a two-stage heat pump/AC. The added longevity of the system, which is a very important benefit, would not be of any benefit to you.