**How Ductless Heat Pumps Can Solve Problems in Older Homes**

Oftentimes, older homes suffer seasonal comfort and energy efficiency issues. The majority of homes built between 1900 and 1940 used the same simple structure: basement, main floor, and top floor(s). The basement furnaces in these homes were typically powered by coal, oil, sawdust, or even wood. Oftentimes, older homes’ air distribution systems were minimal–some employ steam radiators to this day. When these homes were built, the thinking was that the home would be comfortable enough with a furnace in the basement, since warm air rises. Energy efficiency was a non-factor when these homes were built; central air conditioning was unheard of.

When upgrading these homes, the major challenge for heating and cooling contractors is improving the air distribution system. Older homes were almost never designed with adequate ductwork. Many of them have no ductwork at all on the top floor, where the bedrooms are typically located. This makes cooling nearly impossible. A knowledgeable contractor will tell you that it’s impossible to stay equally comfortable on all levels of a home without some way to distribute heated or cooled air to all stories.

Let’s fast forward to the 21st century. The majority of homeowners prefer the comfort of sleeping in an air-conditioned bedroom. Likewise, energy efficiency is a concern, as contemporary property owners recognize that efficient heating and cooling systems can cut energy costs. Toward this end, many homeowners would like to have zoning HVAC systems, so that only the occupied level or rooms of the home must be heated or cooled at any given time. [Learn more about zoning systems here.](https://www.aaaheatingandcoolinginc.com/residential/controls/zoning-systems/)

Enter ductless heat pump technology—the bridge between older homes and modern comfort. Here at AAA Heating & Cooling, we have had success with installing these systems on the top floor of older Craftsman-style homes. These [heat pump systems](https://www.aaaheatingandcoolinginc.com/residential/heat-pumps/residential-heat-pumps/) provide efficient heating in the winter and extremely effective cooling in the summer. In contrast with what you may have heard about older heat pumps, today’s technology allows quiet systems with superb energy efficiency and comfortable performance, even in the face of extreme outdoor temperatures.

For a stronger understanding of how heat pump technology works, we turn to Michael Thoen, Home Comfort Advisor for AAA Heating & Cooling, Inc.

How Heat Pump Inverter Technology Offers Year-Round Comfort

For decades, it’s been possible to use heat pumps in reverse for air conditioning. However, new inverter technology is improving performance, according to heating and cooling expert Michael Thoen.

“Inverter technology doesn’t come with every unit,” says Michael. “It’s the way of the future—not just an upgraded option or feature.”

The inverter is part of a heat pump compressor. It boosts the ability of the heat pump to do its job. On a basic level, the job of a heat pump is to pull warmth out of external air, making it much more cost-effective than running a furnace. When a heat pump runs in reverse, it pulls heat out of a residence or commercial building and disperses it outside, making it cooler indoors.

“It’ll look like the air conditioner,” Michael Thoen reports. “If you order a new air conditioner and heat pump, they’ll be the same size. The only thing the heat pump needs is the reversing valve that’s inside the unit itself.”

The cost of adding a heat pump to an air conditioning unit will run from “a couple hundred dollars” on up, depending on the size of the unit, Michael explains. “But it will more than recover the cost in a relatively short time.”

That’s something Michael Thoen mentions to potential customers when they are looking to replace their current air conditioning system.

“My customers are looking to curb utility costs,” he points out. “On average, electric costs went up $25, but gas went down $60. For someone in rural America using heat oil and LP (liquid propane), a heat pump is a no-brainer, especially (for) oil users. We were up to $4 a gallon for heating oil. With a heat pump, that will (be) offset.”

“Depending on its efficiency level, a unit also may be eligible for federal tax credits and credits from Consumers Energy,” Michael says. Inverter technology is most commonly seen in mini-split units in Europe and Japan.

There are two different major parts in a heat pump. The indoor unit is called the evaporator, and the outdoor section is called the condensing unit. The two are connected, and offer the flexibility of both heating and cooling.

Traditional air conditioning compressors work at a constant, fixed speed until the room reaches the desired temperature, at which time they turn off. When the temperature rises again, the compressor turns back on. In contrast, inverters work continually, at varying speeds, without starts and stops. That can mean less wear and tear on components, and savings on energy costs, in addition to the possible federal tax savings.

“Inverter technology has been around a bit, but in heating and cooling, only much more recently, in the mid-2000s,” Michael Thoen said. “It’s starting to take off, but it’s not quite blossomed yet.”

Adding inverter technology as well as a heat pump will increase overall HVAC savings.

“There’s not really a number to it yet but … it’s going to be more prevalent in the next few years,” Michael says.

Heat pumps with inverters—the new way to stay cool.

Next, let’s turn our attention to the big question for most consumers—whether or not they actually need a new heat pump to enjoy efficient heating and cooling.

Do You Need a Heat Pump?

While we think of air conditioners primarily as cooling devices, they do offer opportunities beyond that. In fact, the very name of the air conditioner suggests that it can regulate temperature, irrespective of what the climactic conditions are outside. So, ideally, an air conditioner should keep rooms warm and cozy during winters.

Many air conditioners do provide that facility. These units come with a heat pump, which helps the conditioner keep a room warm when needed. What the heat pump actually does is reverse the refrigeration cycle. So, even at temperatures of -15 degree Fahrenheit, a properly equipped air conditioner can keep a room warm.

Now, if you already own an air conditioner, the question is whether it’s worthwhile to invest in a heat pump. The answer would depend on a few factors. If you are staying in an area where you have ready access to natural gas, it might be wise to stick to conventional cooling and heating devices. Since natural gas is a highly energy efficient, cost-effective source of energy, investing separately in electricity just for the heat pump wouldn’t make much sense.

Things, however, are very different if you use fuel oil or electric resistance for heating. In such cases, investing in a heat pump can bring substantial savings. Of course, electrical-resistance heating would be much less expensive to install than a heat pump. But a heat pump can produce at least 1.5 to 2.5 times more heat using the same energy. That would make a heat pump significantly more efficient than a conventional electric-resistance heater.

There is, however, a problem with heat pumps, in that when the outside temperature falls significantly, the efficiency the heat pump drops as well. So when the outdoor temperature is below the “balance point,” which lies between 30 and 45 degrees Fahrenheit, the efficiency of the heat pump nosedives. In those cases, you might need additional sources of heat. This often doesn’t work out to be cost effective. [Further information on heat pumps can be found here.](https://www.aaaheatingandcoolinginc.com/residential/heat-pumps/)

Cost-Benefit Analysis

So before deciding to invest in a heat pump, it is best to do a cost-benefit analysis. What are the factors you should consider? Of course you need to consider the cost and efficiency of the heat pump itself. But you also need to factor in the type and price of fuel in your region, as well as the heating and cooling needs for your home, according to common winter temperatures. It is only after you have considered all these that you will be able to choose wisely.

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