RDS Systems

HOW IT WORKS

Heat Pump
Get super efficient heating in the winter and air-conditioning all summer long

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Patented in 1927. the heat pump became popular after the energy crises of the 1970s. Homeowners realized they could heat and cool their houses with a single appliance and with a highly efficient, money-saving system. Fuel prices are again, making the heat pumps the system of choice. About one-third of U.S. homes currently have them, and newly designed heat pumps stands ready to increase that percentage even more.

Basically, a heat pump is an air conditioner that also heats. Like a central air system, it has an outside unit with a compressor and an electrically powered fan. Indoors it has an air-handler (Fan Unit) connected to ducts which deliver warm or cool air throughout the house. The major difference is air conditioners use chemical refrigerants that moves through copper tubing in one direction, pulling heat from the indoor air and sending it outside. (Note :heat always travels to cold). Heat pumps, use this same refrigerant that circulate in both directions, which will allow it to capture heat from both the indoor and outdoor air. From indoor in summer and from outdoor in winter. The air must contains more heat than the refrigerant. This is when heat is transferred to the refrigerant that carries heat where desired. This transfer of heat is measured in Btus (British Thermal Units).

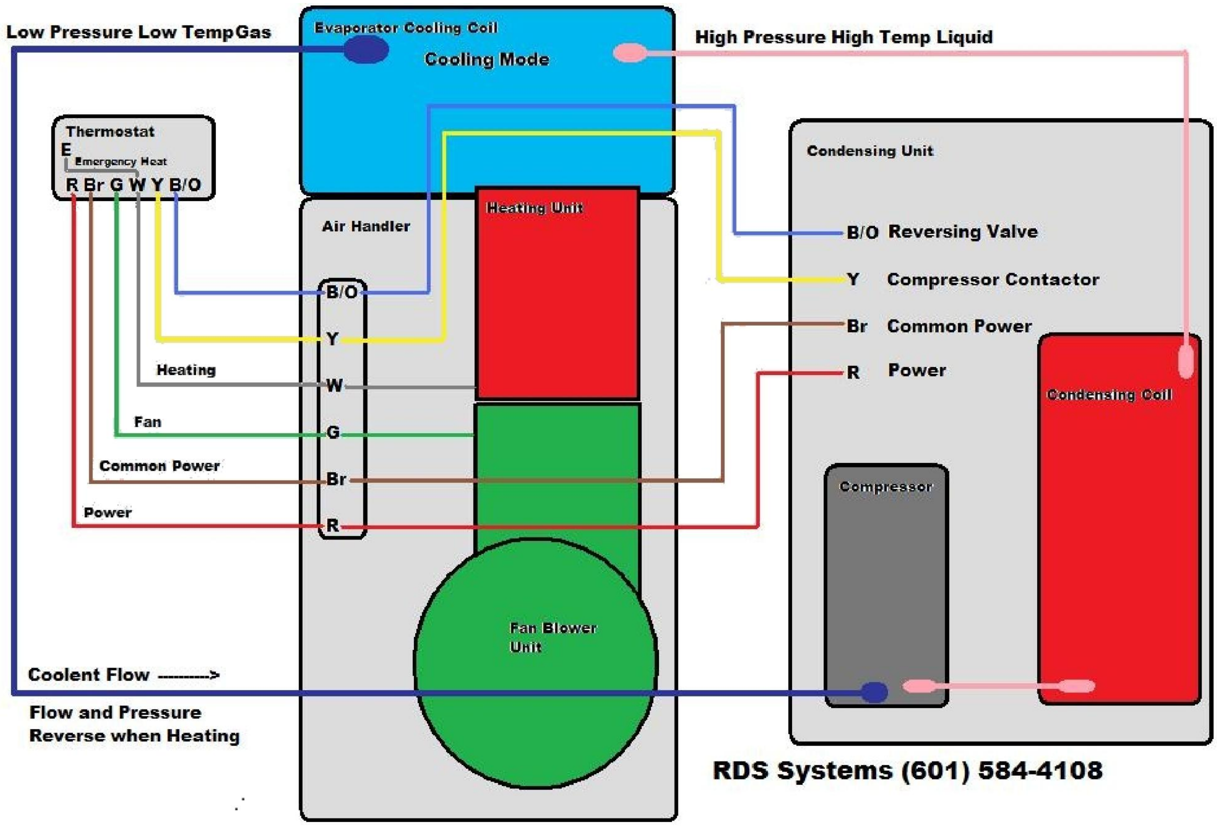
Because heat pumps only capture and move heat, instead of creating it through burning of fuels, 1 unit of electricity can yield up to 4 units of heat. This results in efficiencies up to 300 percent in ideal conditions. (The most efficient oil or gas furnaces have only a 96 percent fuel efficiency.) This bolstered performance is due to current advances such as two-stage compressors and variable-speed fans in the air handler units that fine-tune the flow of refrigerant and air, respectively, that adjust to the fluctuations of the outdoor and indoor temperatures.

Heat pump's is have greater savings and efficieccies respectively in middle America and other countries of like enviorment where air-conditioning is a must in the summer and winters are milder but aren't frigid. Places where winter temperatures regularly drop below freezing for long extended periods heat pumps have a more difficult time extracting warmth from the outside air, so their heating efficiency drop. At about 30 degrees F, heat output becomes minimal requiring backup heating elements in the indoor unit (Air Handler), usually electric coils, kick in to warm things up until the temperature moderates.

Although new technologies have come on line and the costs of oil and gas rises hybrid or dual-fuel systems will use a traditional backup furnace as a back-up when it gets too cold for the heat pump. Hybrids systems will be able to monitor and compare fuel cost and electrical cost to select the less expensive option for heating.

The Acadia is one such unit although it isn't cheap; a 4-ton unit, which is large enough to heat and cool 2,200-square-foot retails for nearly $14,000. The case with things mechanical up front cost to save money in the end you will have to spend much more of it up front.

This cold-weather heat pump, promises to extend the heat pump's area of service farther north. The Acadia is the only unit available today it was introduced in 2005 by Hallowell International. It can operate without any backup system at temperatures as low as -30 degrees F. It does this by using a second booster compressor and a device that absorbs residual heat from the refrigerant. The Acadia's efficiencies are equivalent to that of geothermal systems.



An Heat Pump is

An appliance that in the summer removes heat from indoor air spaces and in the winter pulls small amounts of warmth's from outdoor air to create warm air inside**.**

Who Is It For?

Homeowners stuck with electric heat, oil. or propane, Heat pumps can shave 30 to 40 percent off energy bills. Depending on the climate and the efficiency of the heat pump, Natural gas users can expect a savings 5 to 10 percent.

How To Size for Heat Pumps.

Look for a model s that will provide approximately 100 percent of your calculated cooling load. Sizing for your cooling needs and adding supplemental heat is the more efficient and cost effective way to lower your energy needs**.**

Look For.

Two-stage compressor and Variable-speed fans that adjust the airflow which will lower energy use in moderate temperatures and add greater comfort levels. Reversed refrigeration sensor stops ice buildup on outdoor coils. This is much like defrosters in refrigerators. Built-in or Plug-in diagnostics that can pinpoints problems during regular checkups.

Bells and Whistles (Extras).

Internet connections that send performance reports directly to your HVAC professionals and also allow you monitor and adjust the house temperature remotely through a computer or ceil phone**.**

Cost Can Be?

$4,000 to $13,000 depending on its size, efficiency, and features. Remember installation and ductwork are extra.

Important Specifications

HSPF (heating season performance factor): The larger this number, the more efficiently a heat pump will gathers heat in the winter. **Energy Star-rated** heat pumps have an HSPF of 8.2 or higher.

SEER (seasonal energy efficiency ratio): The larger the SEER, the lower the summer operating costs. **Energy Star-rated** units are rated 14 or higher.

In winter, the compressor pumps hot refrigerant gas at high-pressure through the reversing valve, which sends it toward the indoor coil. A fan blows indoor air over the hot coil and into the house, as the refrigerant looses its heat to the inside air it condenses into a warm liquid. This liquid will move through the expansion valve, lowering the gas pressure thus cooling it down. Now the cool refrigerant will flow through the outdoor coil. When the outside air temperature is above freezing, the heat in this gas is released to the outside by blowing air over the outside coil making it colder. This gas then returns to the compressor to be compressed at a high pressure which makes the gas hot, and the cycle begins again.

In the summer, the reversing valve redirects the hot refrigerant gas in the other direction to the outside coil. A fan sucks air over the coil causing the refrigerant lose its heat and condense into a warm liquid. The liquid moves through the expansion valve lowering its pressure and cooling down. As it reaches the indoor coil, a fan will blow indoor air over the cold tubing and into the house. This refrigerant gas absorbs the warmth in the air, becoming a cool gas. The gas flows back to the compressor, which squeezes it into a hot gas, allowing the cycle to repeat

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Should you Upgrade?

Department of Energy's website, http://www.energystar.gov/

(Type "heat pump calculator" in the search box.)

The calculator will compare the costs of several different heat pumps, buying and operating them and will do this based on your electricity rates and climate. It will estimate the time of payback on your investment. Payback longer than seven years is usually not economical. If you anticipate a steep rise in electricity rates it may become economical. If so use the calculator to see how much rates would have to go up for an upgrade to be worthwhile.