What's A Heat Pump?

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A heat pump is an air conditioner capable of also providing heating for your home by reversing the normal flow of refrigerant (freon) within the system.

How Does A Heat Pump Work?

To understand the operation of a heat pump, one must understand some basic principles of refrigeration. When air conditioners operate to cool our homes, they are not adding cool air, they are removing heat. The typical air conditioning system consists of three components which work together to move "heat" from one location (inside your home) to a more desirable location (outdoors).

the **condenser** is responsible for discharging the heat and is located outdoors

the **evaporator** absorbs heat from inside the home and is located at or near the indoor blower

the **blower** circulates air through the evaporator for heat to be removed

Refrigerant or freon is the medium by which the heat is carried from the evaporator to the condenser. During the cooling cycle the compressor (located in the condenser) compresses the heat-laden refrigerant returning from the evaporator and discharges it into the condenser coil. The fan pulling air across the coil removes the heat and discharges it to the outdoor air.

Once the heat is removed, the refrigerant condenses (changes from a gas to a liquid) and travels back to the evaporator. Once it reaches the evaporator it passes through a very small opening known as an orifice or a metering device. The extreme pressure drop created by the orifice causes the now-liquid Freon to "evaporate" and again become a gas. When a liquid evaporates it absorbs heat, much like getting a chill when stepping out of a swimming pool. The cycle is repeated over and over again and ends only when enough heat has been removed to cycle the thermostat off.

The Heating Mode

To provide heat from this same unit the evaporator and condenser must essentially switch places. That is, heat must be moved from the outside air to the indoor coil for discharge. This is accomplished by reversing the flow of refrigerant through a device found in heat pumps knows as a "reversing valve." This valve is automatically controlled through the thermostat when switched to heat.

Yes, there is usable heat in outdoor air at temperatures as low as 17 degrees Fahrenheit. As the temperature of the outdoor air decreases, however, the heating capacity of the heat pump diminishes proportionately, resulting in lower discharge air temperatures at the air registers, and gradual cooling of your home. To supplement the heating

capacity of the heat pump, electric resistance heating elements are used and automatically engage via the thermostat when this condition occurs.