

Guide to Purchasing a Residential Heating or Cooling System

DEFINITIONS:

Heat Pump – Heat pumps use electricity to move heat from one space to another. Because the system is reversible, they have the ability to both heat and cool a building. Because heat pumps move heat rather than generate it, they save substantial amounts of energy. One common heat pump is the air-source heat pump. These units move heat between the outside air and your house. Ground-source heat pumps are another increasingly popular variety of heat pump. These units utilize the relatively constant ground temperature to provide your house with heating and cooling.

EER – The efficiency of heat pumps and other cooling units are rated by their Energy Efficiency Ratio (EER). This rating describes the equipment's efficiency at a specific outdoor temperature. The higher a unit's EER, the more energy efficient it is.

SEER – The seasonal efficiency of heat pumps and other cooling equipment is rated by its Seasonal Energy Efficiency Ratio (SEER). The higher a cooling unit's SEER rating, the more energy efficient it is. However, unlike the EER, the SEER takes into account the load of a typical cooling season. A unit's SEER is always higher than its EER.

HSPF – The Heating Seasonal Performance Factor (HSPF) is commonly used to measure the heating efficiency of a heat pump. The higher the HSPF, the higher the energy efficiency of the unit.

ECM – An Electronically Commutated Motor (ECM) is a brushless DC motor that contains all of its speed and torque controls. This means that the motor has the ability to adjust its speed to ensure optimal airflow at all times. As a result, ECMs use a significantly less amount of energy than a typical motor.

WHAT TO ASK YOUR CONTRACTOR

When purchasing a residential HVAC system, it is especially important to match your indoor coil and outdoor unit to ensure optimal performance from your system. Your contractor can help you choose the correct components for your situation. Additionally, your contractor should provide a heat load sizing calculation to be sure your system will handle required heating and cooling loads. Additional topics to discuss with your HVAC professional are:

EFFICIENCY LEVELS

In order for heating and cooling equipment to qualify for an energy incentive from the Minnkota/NMPA Residential Prescriptive Program, certain qualifications must be met. These qualifications depend on the type of equipment being installed. The following table summarizes these requirements.

EQUIPMENT TYPE	SPECIFICATIONS
Furnace with ECM	Furnace must have an ECM
Air-Source Heat Pump	14.0 SEER, 8.2 HSPF
Air-Source Heat Pump with indoor unit ECM	14.0 SEER, 8.2 HSPF, indoor unit must have ECM
Mini Split/Ductless Air-Source Heat Pump	15 SEER
Ground-Source Heat Pump - Open Loop <135,000 BTUH @59 degrees F	16.2 EER
Ground-Source Heat Pump - Closed Loop <135,000 BTUH @ 77 degrees F	14.1 EER

MATCHING EQUIPMENT

When replacing an air-source heat pump or central air conditioner, it is important that both the indoor coil and outdoor unit be replaced as a set, rather than a single component. This allows for the energy efficiency of the entire unit to be considered to qualify for an incentive. It also ensures that the unit is performing at its optimum efficiency.

For instance, if the indoor coil is performing at a lower efficiency than the outdoor unit, the efficiency of the entire system is lowered, thus wasting energy.

Minnkota/NMPA requires that all systems qualifying for an incentive have matching components.

SIZING

It is important for your contractor to properly size your heating and cooling equipment to the requirements of your home. This ensures that the equipment will perform properly under all conditions. It is especially important for air source and ground source heat pumps to be properly sized as they will switch to an alternative backup fuel (e.g. electric resistance heating) under extremely cold conditions.

Operating on the usually less efficient backup fuel starts to erode the cost savings and energy efficiency gains that are obtained by using a high efficiency air source or ground source heat pump. However, if the unit is properly sized for these conditions, the backup fuel source will be used more infrequently.

It is also important to consider the sizing of the ductwork. Ask your contractor about special sizing needed for ground source heat pumps, which usually require larger ductwork because the delivery temperatures are lower than those of more conventional HVAC equipment (e.g. forced air propane or natural gas furnaces). Inadequate ductwork will cause fans to work harder than necessary, waste energy and potentially not deliver the volume of air needed for a comfortable environment.

INCENTIVES

When applying for an energy incentive from the Minnkota/NMPA Residential Prescriptive Program, the following items must be completed and submitted to your local participating utility:

- Incentive application – All applicable areas of the form must be completed and signed.
- Receipt – An itemized invoice or receipt indicating the date of purchase, size, type, make, model and total project cost need to be included.
- Manufacturer specification sheets – Specification sheets indicating the size, type, make, model and energy efficiency ratings of installed equipment are required.
- AHRI Certificate – AHRI is an organization that provides ratings and certifications for HVAC equipment on the market. An AHRI certificate for the product being installed must be included.
- Sizing Calculation (Ground source heat pumps only) – Ground source heat pumps require a heat load sizing calculation to qualify. This is to ensure that the units installed can properly handle the loads they are expected to encounter. These calculations are typically performed by your contractor.
- To receive an incentive from Minnkota/NMPA, ground source heat pumps equipped with electric resistance heating must be on the local utility's load control or demand billing program.

Federal tax credits may also be available based on the type of unit you choose to install. For a full list of product criteria, please visit www.irs.gov.

BENEFITS

- Increased quality – Better components and improved technologies can result in longer equipment life and longer warranties.
- Lower utility bills – Together with other efficiency techniques in the home, a 10-20 percent reduction or more in heating cost is possible.
- Higher resale value – All of the above can mean a higher resale value of the home.