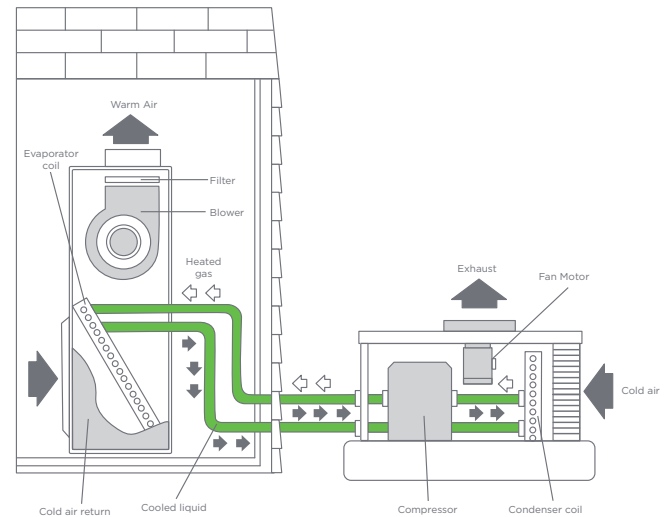


# Using and Maintaining Your Heat Pump

If you've recently installed a heat pump, or have moved into a house with a heat pump, this guide will help you learn how it works and how to maintain it to keep it as efficient as possible.

## How They Work

Heat pumps act much like a refrigerator in reverse, transferring heat from one place to another. While a fridge transfers heat from inside the fridge to outside (to cool the inside space), a heat pump uses a small amount of energy to move heat that exists outside the house, to the inside. Even on cold days there is heat available from the outside, which can be used to heat your home. This means that instead of generating heat like electric baseboards, they can use electricity to give more heat for less cost. The two components of a heat pump – an inside unit and an outside unit – work together as a system to transfer and distribute the heat to the home.



## Types of Heat Pumps

Heat pumps need a source of heat, which is traditionally the outside air, the ground, or a large body of water. Systems that transfer heat from the outside air are called **air source heat pumps** and systems that transfer heat from the ground or water are called **geothermal heat pumps**. Most heat pumps installed in Nova Scotia today are air source, as geothermal heat pumps require deep drilling, large land lots, or permitted access to a body of water.

In addition to different heat sources, heat pumps come in two possible configurations. Central systems require ductwork or piping to distribute heat from one central location (like a furnace or boiler). In contrast, ductless mini-splits are usually installed on a wall and act as a local heat source (like a wood stove).

## Efficiency Ratings

Manufacturers rate the efficiency of heat pumps in three ways: HSPF, SEER, and EER. These numbers are an inherent part of the system and cannot be changed or improved; however, it may be useful to know what they are and how they impact your system's performance. The numbers below are the minimum requirements for a system to qualify for ENERGY STAR® in Nova Scotia (region V).

Remember, there are two components to your heat pump system – the inside unit and the outside unit; each have separate efficiency ratios that combine to meet ENERGY STAR® requirements.

	Measure	Description	ENERGY STAR®
HSPF	Heating Seasonal Performance Factor	Heating efficiency	7.1 (central) 8.0 (mini-split)
SEER	Seasonal Energy Efficiency Ratio	Cooling efficiency	14.5
EER	Energy Efficiency Ratio	Overall efficiency	12

## Setting The Temperature: Change It or Leave It?

Lowering the heat a few degrees overnight or when the home is vacant for at least four hours can save energy. Some programmable thermostats on heat pumps are specially designed with an adaptive-recovery or “ramping” feature, allowing the thermostat to anticipate and plan ahead for a heating increase without relying on the more expensive supplemental backup heating. The microprocessor unit considers the temperature requirement and the outside air temperature, and begins the heat recovery process earlier and over a longer period of time. This allows the heat pump alone to provide the heat and minimizes the use of a potentially more costly backup heat.

If you reduce the temperature, it's always best to set the temperature of your backup system at least 5°C lower than the setting on your heat pump. For example, if your heat pump is normally set to 20°C and you turn it down to 15°C overnight, make sure your backup is set no higher than 10°C.

## Using Your Heat Pump for Cooling

One of the common attractions to heat pumps is its cooling ability. The cooling cycle reverses the heating process to transfer heat out of your home. The heat pump also acts as a dehumidifier during the cooling cycle.

It's important to remember that cooling your home uses the same amount of energy as heating, so be careful not to overuse this feature and decrease the energy savings you were expecting. If your home does not require air conditioning, simply shut off your heat pump. As heat pumps still use electricity, use it only when needed for cooling and try other ways to keep your home cool (closing windows and curtains during the hottest parts of the day, or planting leafy trees in front of windows, for example). Central systems can be switched to a low-energy “Circulate Only” mode which simply moves cool air from the basement to other warmer areas of the home. Remember that overheating in the summer can be a sign of inadequate insulation so consider having a Home Energy Assessment to save on both cooling and heating.

## Final Thoughts

Given proper maintenance and the right environment, heat pumps are a very energy efficient way to keep your home comfortable and should keep your home comfortable for 15 to 30 years. If you still have questions, please contact an Energy Solutions Advisor at **1 877 999 6035** or at **info@efficiencyns.ca**.

Keep this table as a reference guide and a reminder of maintenance tasks and when they should be completed.

Dirty filters, coils, and fans can all reduce airflow through the system, decreasing performance and negatively affecting your system's compressor and efficiency.

On the reverse you'll find additional information on annual servicing and trouble-shooting.

Manufacturer:			
Model No.	Inside:		Outside:
Year Purchased:			
Installed By:			

Frequency	Task	Date
Monthly or bimonthly	Clean filters and coils	
	Dust heads or registers	
Annually	Have whole system serviced (see over)	
Seasonally	Keep coils on back of outside unit free of obstructions i.e. leaves, bushes, snow, etc.	
	Turn off power to fan and clean it	
Summer	Check that drain on outside unit is free from blockage or obstruction	
Ongoing	Keep registers free of obstruction by furniture, curtains, dust, etc.	
NOTES:		

## Annual Service

Once a year, be sure to have a qualified technician inspect your heat pump. Here are some of the things the technician will do; keep track of any issues or questions you may have for this visit.

- Check system's operation to determine its condition
- Inspect ducts, filters, blower, and indoor coil for dirt and other obstructions
- Diagnose and seal duct leakage
- Verify adequate airflow and correct refrigerant charge by measurement
- Check for refrigerant leaks
- Inspect electric terminals, and, if necessary, clean and tighten connections
- Lubricate motors, and inspect belts for tightness and wear
- Verify thermostat operation and electric control (i.e., heating disabled during cooling mode, etc.)
- Check and clean the condensate drainage system

## Not seeing the expected energy savings?

One of the most important and often overlooked factors in the efficient function of a heating system is the home's building envelope. Ensure your home has adequate insulation in your attic, walls and basement to minimize heat loss. In fact, it's better to insulate and draft-proof your home first, as that might reduce the size you need for a heat pump, saving you even more money. If your system components do not meet the minimum efficiency ratings above, it is likely not ENERGY STAR® rated and may not perform as efficiently as other models. Keep this mind for future purchases. If you are adjusting your temperature, check out the section on temperature control.

When your heat pump was sized and installed, a balance point was calculated based on the size of the heat pump and the optimum temperature required. If you have moved into a house with an existing heat pump, you may wish to contact a heating contractor to adjust the balance point to your own comfort level for your home.

## Problems with Your Heat Pump?

1. If the unit isn't working, check that you haven't blown a fuse or tripped the breaker.
2. Check the thermostat to make sure it's running properly.
3. Check the filter, fans, and coils, and change if dirty.
4. Rattles may be fixed by tightening loose parts.
5. If you hear squeaking inside the unit, you may need to replace or adjust the fan belt connecting the motor to the fan, which your technician can do.
6. A grinding noise may indicate that the bearings on the motor are worn out, which your technician will be able to fix.
7. Check to see if the outside condenser is running, if it is not, call your technician
8. Humming or buzzing are normal noises for the outside unit.
9. The unit should be running intermittently and not constantly. If it is, call your technician.