

GEOTHERMAL SYSTEMS



Mutual Boiler Re®

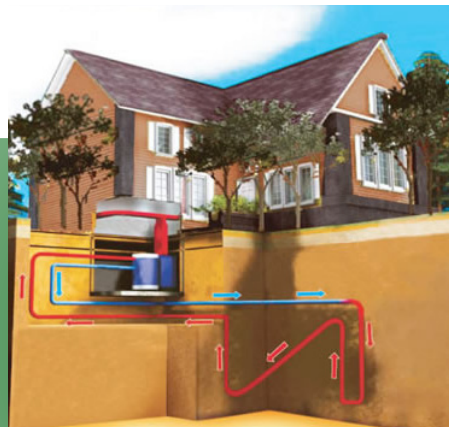
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OVERVIEW OF GEOTHERMAL SYSTEMS

The word Geothermal is derived from the Greek words Geo, meaning Earth and Therme, meaning heat. Geothermal heating and cooling (GHC) systems technology was developed in the early 20th century and has been in residential use since the 1940s. During the past decade, GHC systems have become more widespread as an alternative source for producing heating and cooling for comfort. Geothermal heating and cooling systems are considered renewable energy technology because of their use of an inexhaustible supply of energy from the earth's ground temperature. Unlike solar panels and wind turbines, geothermal heating and cooling systems used in a home do not generate electricity for electrical power needs on site. Instead, they focus on energy efficiency associated with heating and cooling.

HOW DOES THE SYSTEM WORK?

At the heart of a geothermal heating and cooling system is a heat pump that operates in one of two modes: heating or cooling. Unlike traditional heat pumps that use outdoor air, geothermal heat pumps use a common heat exchange liquid inside a buried piping system to absorb heat from the ground during the winter, and cooling from the ground during the summer. In this way, a GHC system simply collects warmth and cooling from the ground and transfers it to an area where it is used inside the home, which greatly increases the energy efficiency and lowers fuel costs.



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LOSS EXPERIENCE

Mechanical breakdown is by far the most common type of loss which occurs at these locations. Equipment such as compressors, fans and pumps are most often damaged. Since most GHC systems operate year round, this equipment is important for maintaining a constant indoor air temperature for personal comfort.

Electrical damage can also occur, and most often affects electrical and electronic equipment due to power surges and electrical arcing. Dust accumulation, temperature extremes and humidity affect the reliability of electric motors, service panels and electronic controls increasing the chance of equipment damage.

TYPICAL LOSSES

A 5 ton geothermal heat pump compressor experienced extensive damage from overheating. The compressor had to be replaced, old refrigerant had to be disposed and new refrigerant was recharged into the system.

Property Damage: \$5,750

A 4 ton geothermal heat pump compressor experienced extensive damage from a cracked rod. The entire geothermal heating and cooling system was 16 years old, and replacement parts were no longer available. As a result, the entire GHC mechanical system had to be replaced.

Property Damage: \$13,450

An electrical power surge entered the home and damaged the controls for the compressor inside the 4 ton GHC System. A replacement compressor was found to replace the damaged compressor.

Property Damage: \$4,850

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