

Geothermal Heating and Cooling Overview

Why should I consider it?



GEOHERMAL - A major source of energy is right under your feet

The idea behind geothermal energy is simple.

- The earth stores a vast reservoir of thermal energy (which is constantly re-supplied by the sun), typically 10 times that required over an entire heating season.
- A geothermal system simply transfers heat from the earth to the home in the winter and from the home back to the earth in the summer.
- The earth stays at a more constant temperature than widely varying air temperatures. And because heat energy is being moved, and not created, geothermal systems operate at higher efficiencies than ordinary heating and cooling systems.

GEOHERMAL – Types of systems



GEO THERMAL – How does it work?

Geothermal Systems provide heating, cooling and dehumidification and can provide virtually free hot water when supplied with our optional heat recovery system. FHP Geothermal Systems work by removing heat from your home and rejecting it into the earth or in the reverse cycle mode absorbing the heat from the earth and supplying it back to the space.

Heating Mode:

In the heating mode, heat is extracted from the fluid in the earth loop or well water by the heat pump and distributed to your home through the air ducts. The air from your home is heated by the unit with the energy absorbed from the earth and the compressor heat of the heat pump.

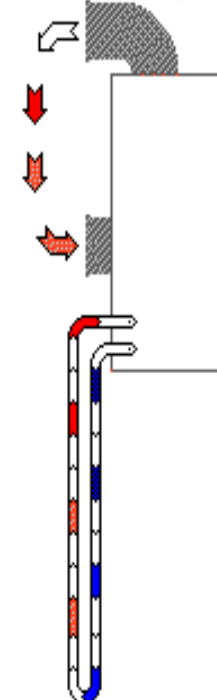
The fluid is constantly re-circulated through the heat pump so it can continue to absorb the needed heat from the earth.

Cooling Mode:

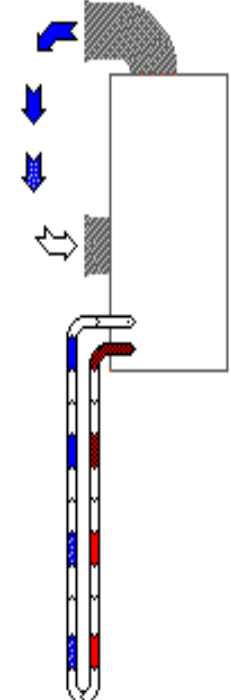
The cooling mode works similar to the heating mode except the process is reversed. The heat pump absorbs the heat from your home and rejects it into the fluid that transfers it back into the earth.

HOW GEOTHERMAL SYSTEMS WORK

HEATING MODE



COOLING MODE



GEOHERMAL – It's a better environmental option

Geothermal technology is environmentally advantageous.

- These systems can help curb environmental concerns such as acid rain, global warming and ozone depletion (which are directly linked to fossil fuel burning) by using natural energy removed from the earth instead of energy that must be artificially produced, generated and transported.
- Geothermal systems do not contain any chlorofluorocarbons (CFCs) in the loop solution (which are suspected to be a major cause of ozone depletion), use far less refrigerant in the unit than ordinary heat pumps or air conditioners, and are factory-sealed to prevent leakage.

GEOHERMAL – Earth-saving facts




According to the US Environmental Protection Agency

- Geothermal heat pumps are the most cost-effective, energy-efficient and environmentally clean heating and cooling system available in the United States.
- The average house contributes more greenhouse gas emissions than the average car.
- Replacing an HVAC system with a geothermal system will reduce pollution equivalent to not driving your car 140,000 miles.
- Replacing an ordinary HVAC system with a geothermal system is the equivalent of planting 750 trees, or three-quarters of an acre of rain forest.

GEOHERMAL – And it's a better economic option

- Geothermal heating and cooling systems are at least three times more efficient than fossil fuel systems. In energy consumption, WaterFurnace systems use on average:
 - 75% less primary energy than oil
 - 48% less primary energy than natural gas
 - 33% less primary energy than air-source heat pumps
 - 33% of the refrigerant required by air-source heat pumps and central air conditioning
- At \$4.40 a gallon, the cost of heating a 2,000-square-foot home this winter at roughly \$7,920. With the geothermal system, the cost is \$1,833 in electricity, an energy savings of \$6,087.
- For the average-size home converting to a geothermal system it will take between 6 and 12 years to pay off, or about 4 years if it's new construction.

GEOHERMAL – Customer satisfaction for current users

- Surveys of geothermal users was conducted by the Department of Energy and utility companies nationwide
- Indicates a higher level of consumer satisfaction for geothermal heat pumps than for ordinary systems
- Survey says!
 -  99% would recommend the system to family and friends
 -  95% said overall operation met or exceeded their expectations
 -  94% said they would buy a geothermal system again

SUMMARY – Top reasons for selecting Geothermal

- ✓ **Cost effective** - savings on monthly bills of 30-70% in heating mode and 20-50% in the cooling mode
- ✓ **Comfortable** - constant, even comfort with no hot or cold spots
- ✓ **Safe and clean** - no flame, no flue, no odors; just safe, reliable operation year after year
- ✓ **Quiet** - no noisy outdoor compressor
- ✓ **Versatile** - compatible with nearly any home or business
- ✓ **Environmentally friendly** - emits no CO₂, a major contributor to indoor and outdoor air pollution.
- ✓ **Elimination of outdoor or rooftop units** means the system is not exposed to temperature extremes, dirt, pollution or vandalism
- ✓ **Lower life-cycle cost** than ordinary systems, and long equipment life (20 years and more)