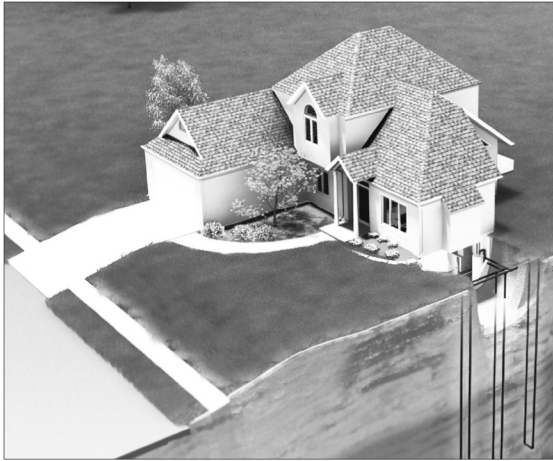


Geothermal Heat Pumps Offer Comfort Advantages



This alternative ground loop system involves drilling several 150-foot-deep holes for the loop to extract heat from the ground.

Source: WaterFurnace

Q: *I have an inefficient propane furnace and central air conditioner. I was thinking of replacing them with a geothermal heat pump. Does this sound like a good idea? What types are best?*

A: With all of the problems last winter with propane shortages and the price uncertainty of natural gas, many people are considering geothermal heat pumps. I just installed a variable-speed WaterFurnace 7-Series geothermal heat pump in my home.

In addition to extremely efficient and comfortable heating, a geothermal heat pump is the most efficient central air conditioning system available. In summer, when in the cooling mode, it provides free water heating for additional savings.

Even though the overall installed geothermal heat pump cost is higher than other heat pump systems because of the ground loop, it will pay back its higher cost in savings. If one is installed by 2016, there is a 30 percent federal tax credit on the total cost.

The difference between a standard and a geothermal heat pump is the geothermal unit uses liquid-filled (water/

antifreeze mix) piping in the ground instead of the outdoor condenser unit. Since the ground temperature stays fairly constant, it is efficient year-round. Most people install deep vertical loops, but in a large backyard, a five-foot-deep horizontal loop may work best.

The big advantage in winter is the heating output of a geothermal system does not drop as it gets colder outdoors. This is when your house needs the most heat. For this reason, the expensive backup electric-resistance heating seldom comes on with a geothermal heat pump.

The WaterFurnace model has a variable-speed compressor and the highest heating and cooling efficiencies. The

heating coefficient of performance is 5.3. Using free heat from underground, it produces more than \$5 worth of heat for each \$1 on my bill.

When cooling in summer, the energy efficiency ratio is as high as 41—more than twice as efficient as the best new standard heat pumps and central air conditioners. Instead of heat from the house being exhausted outdoors and wasted, it goes into the water heater for free heat.

For extra savings, you may want to install an optional hot water assist unit. In winter, excess heat produced by the geothermal heat pump goes into the standard electric water heater. This heats the water using just one-fifth as much electricity as the water heater elements.

The variable-speed compressor in a 7-Series model is connected to its matching thermostat to fine tune its heating and cooling output to the instantaneous needs of my house. This provides excellent comfort and maintains even room temperatures and lower noise levels.

By varying output, it runs in more efficient, slower, quieter and longer cycles. That is coupled with a variable-speed blower that matches the air flow from the registers to the compressor output—the reason why the comfort level is so good.

Another significant advantage of the variable-speed compressor is summer humidity control. Set the desired humidity on the thermostat. When it is humid, but not very hot outdoors, the blower slows down and the compressor runs fast to provide more dehumidification with less cooling. This compressor provides a 120 percent instant supercool mode.

The next step down in comfort and efficiency is a model with a two-stage compressor. Most of the time, it runs at lower output speed. When it can't heat or cool your house to the thermostat setting, it automatically switches to higher speed for more output, with an EER up to 30.

The simplest design is a single-stage compressor that is either on or off. It still provides better comfort and savings compared with a standard heat pump. ■



To ask a question, write to **James Dulley**, Energy Report, 6906 Royalgreen Dr., Cincinnati, Ohio 45244, or check his Web page, www.dulley.com.

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