



# Geothermal Comfort Systems



## The Bryant® Geothermal Advantage

Throughout Bryant's historic 100-year legacy, the company has provided millions of homeowners with the finest comfort systems available. Offering a wide variety of state-of-the-art furnaces, air conditioners and heat pumps, Bryant dealers are trusted professionals when it comes to customized home comfort systems. But it doesn't end there. Bryant also offers a complete line of exceptional geothermal comfort systems for your home.

Bryant geothermal systems provide several good options for efficient indoor heating and cooling by tapping into the earth to capture its renewable energy.

Here's how it works: The earth absorbs energy from the sun and stores it in the ground. A geothermal system extracts that energy for home heating during the winter. For cooling, the system removes heat from the home and places it into the cooler earth. This transfer of heat energy is done through a series of pipes either buried in the ground, sunk in a pond, or by using well water.

## Why Choose Geothermal?

Geothermal systems can provide homeowners with a wide range of benefits.

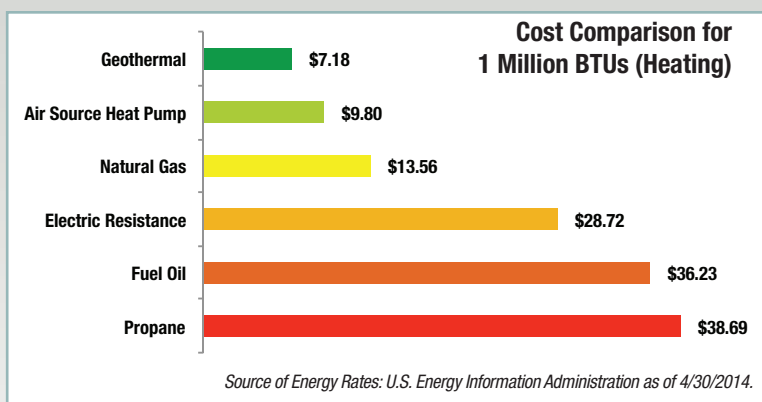
- **Savings:** Geothermal systems can offer lower operating costs compared to traditional forced air heating and cooling systems. Those savings can be as high as 79% in heating costs.<sup>1</sup>
- **Comfort:** These systems can provide even temperatures throughout the home year round, with excellent dehumidification during cooling.
- **Environmental Impact:** Geothermal is a renewable technology that can reduce your carbon footprint now and for future generations.
- **Reliability:** Geothermal units are known for durability and can operate for years with little maintenance.
- **Quiet Operation:** Unlike ordinary air conditioners and heat pumps, no outdoor unit is required. Bryant® geothermal units use heavy-duty, fully-insulated cabinets for quiet operation. Quiet, soft starting variable-speed blowers are used in many models.
- **Flexibility:** Geothermal comfort systems can provide heating, cooling and supplemental water heating from a single unit with a wide variety of models and options to fit most applications.
- **Hot Water:** Excess heat from system operation can be used to supplement the home's water heater.
- **Reduce Energy Dependence:** Geothermal systems can reduce our need to import fuel.

## The Energy Efficiency Story

One of the main reasons many homeowners choose geothermal is the benefit of lower operating costs. The cost for heating, cooling and hot water can combine for up to 75% of a home's total utility costs. Therefore, the biggest opportunity to save on utility costs is to improve those systems. That's where geothermal can help in a big way.

For every one unit of energy purchased, a geothermal system can deliver up to four units of energy because it uses energy from the earth. In many scenarios, a geothermal system is significantly less expensive to operate than traditional forced air heating and cooling systems. Geothermal systems can save up to 79% in heating costs<sup>1</sup> and 24% in cooling costs<sup>2</sup>. And, they can save energy on domestic hot water costs.

One way to compare heating efficiency is to calculate the cost for 1 million BTUs of heat transfer. Using a standard formula, an "apples to apples" comparison can be made based on local fuel rates and equipment efficiency. The table at right demonstrates a typical savings opportunity with geothermal. To get the full picture for your home, contact your Bryant geothermal dealer.



Geothermal – 4.0 COP\*, \$0.098/kWh

Propane – 90% AFUE, \$3.18/gallon

Air Source Heat Pump – 10 HSPF\*\*\*, \$0.098/kWh

Fuel Oil – 80% AFUE, \$4.02/gallon

Natural Gas – 90% AFUE\*\*, \$1.22/ccf

Electric Resistance – 100%, \$0.098/kWh

\* COP–Coefficient of Performance \*\*AFUE–Annual Fuel Utilization Efficiency \*\*\*Heating Seasonal Performance Factor

<sup>1</sup> According to LoopLink® software based on a comparison of a 6.0 ton Bryant model GT geothermal heat pump to an 80,000 BTU, 78% AFUE propane furnace in St. Louis, MO with electricity costs of \$0.098/kWh and propane fuel costs of \$3.18/gallon as of 4/30/14.

<sup>2</sup> According to LoopLink® software based on a comparison of a 6.0 ton Bryant model GT geothermal heat pump to a 3.5 ton, 13 SEER air source air conditioner in St. Louis, MO with electricity costs of \$0.098/kWh as of 4/30/14.



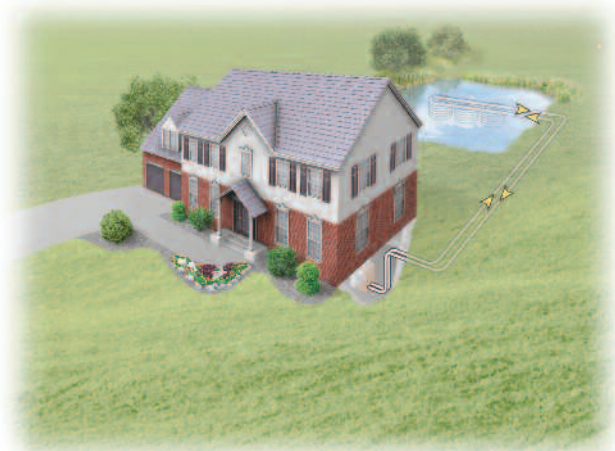
## Renewable Energy From the Earth

Geothermal systems can be installed with a variety of loop system configurations. "Closed loops" use re-circulated fluid in a series of pipes installed vertically, horizontally, or in a pond. "Open loops" use well water. Your dealer will determine which design works best for your home.

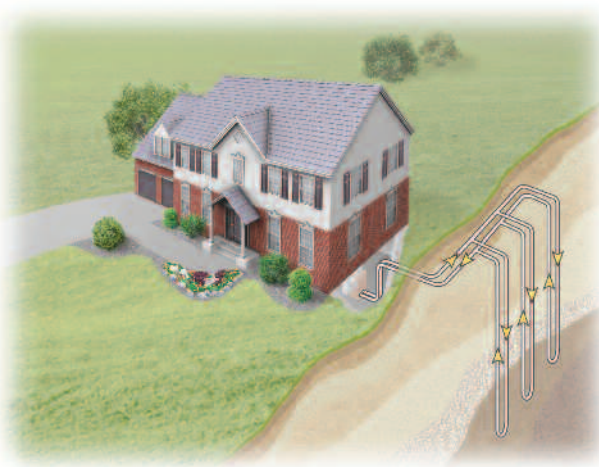
Geothermal systems use renewable energy from the earth, so the technology is one that can reduce your carbon footprint. On a grander scale, imagine the impact of the reduced emissions resulting from every current geothermal comfort system installation today. The collective result would be a dramatic reduction in carbon footprint.



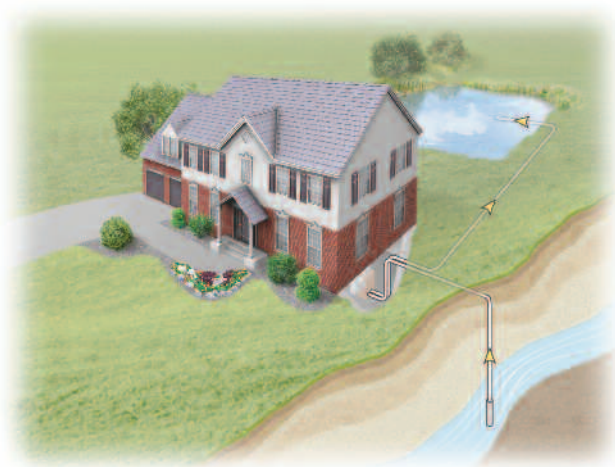
**Horizontal Loops:** Used on larger lots. Installed using a backhoe or trencher.



**Pond Loops:** Coils of pipe are connected and sunk to the bottom of the pond.



**Vertical Loops:** Used where land area is limited or soil conditions prohibit horizontal loops. Installed using a drilling rig.



**Open Loop:** Well water from an existing well can be used, then discharged into a drainage ditch or pond.

## Geothermal Product Selection Guide



Features	Package Units Vertical Upflow, Vertical Downflow, Horizontal	
	GT	GP
<b>Applications</b>	<b>Ultimate luxury</b> "Best" overall Exceptional comfort and performance	<b>Upscale</b> Great choice for excellent performance and reliability
<b>Sizes</b>	2, 3, 4, 5, 6	2, 3, 4, 5, 6
<b>AHRI Ratings (13256-1)</b>	3.8 - 4.7 COP	3.5 - 4.0 COP
<b>Closed Loop (GLHP)</b>	18.5 - 32.0 EER	15.5 - 24.5 EER
<b>Ground Water (GWHP)</b>	4.5 - 5.2 COP	4.0 - 4.6 COP
	23.1 - 37.0 EER	19.6 - 30.0 EER
<b>Refrigerant</b>	Puron® refrigerant	Puron® refrigerant
<b>Compressor</b>	Two stage unloading scroll	Two stage unloading scroll
<b>Blower</b>	Variable-Speed ECM Constant CFM	Variable-Speed ECM Constant CFM
<b>Cabinet Configurations</b>	Vertical upflow Vertical downflow Horizontal	Vertical upflow Vertical downflow Horizontal
<b>Stages (* with aux.)</b>	3 stages heating* 2 stages cooling	3 stages heating* 2 stages cooling
<b>Control</b>	Microprocessor control Unit mounted display	Microprocessor control
<b>Air Coil</b>	Tin-plated copper tubing	Tin-plated copper tubing
<b>Air Filter</b>	MERV 13, 2"	MERV 8, 2"
<b>Cabinet Insulation</b>	Closed cell foam	Closed cell foam
<b>Compressor Blanket</b>	Yes	Yes
<b>Desuperheater</b>	Optional Internal mount pump	Optional Internal mount pump
<b>Auxiliary Heat</b>	Optional Internal mount on vertical units	Optional Internal mount on vertical units
<b>Comfort Alert</b>	Yes	No
<b>Smart Start</b>	Yes	Optional (field installed)
<b>Zone Control</b>	Optional	Optional
<b>ENERGY STAR® Qualified</b>	All sizes	All sizes
<b>Dealer Notes</b>		

\*\*GS072 meets Energy Star requirement only for closed loop with matching evaporator coil. Does not meet Energy Star requirement when used with a fan coil.

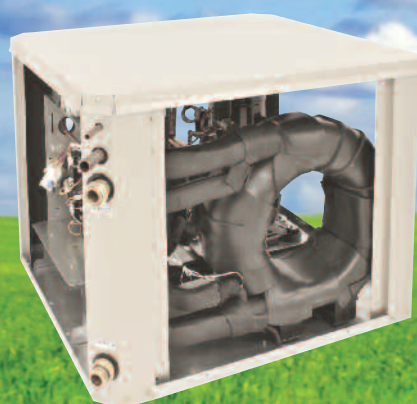


Horizontal	Split	Water-to-Water
GB	GS	GW
<b>Entry Level</b> Standard, solid performer at a base tier price	<b>Versatility</b> Great performance Used with air handler or gas furnace	<b>Hydronic</b> Heating and cooling capable for various applications
1.5, 2, 2.5, 3, 3.5, 4, 5	2, 3, 4, 5, 6	2, 3, 4, 5, 10
3.7 - 4.3 COP	3.4 - 4.5 COP	(13256-2)
18.5 - 21.7 EER	15.4 - 26.4 EER	3.0 - 3.2 COP
4.3 - 5.2 COP	3.9 - 5.1 COP	14.6 - 22.1 EER
22.7 - 28.1 EER	19.2 - 30.5 EER	3.4 - 3.8 COP
Puron® refrigerant	Puron® refrigerant	18.8 - 25.7 EER
Single stage scroll	Two stage unloading scroll	Puron® refrigerant
Multi-Speed ECM	Used with ECM	Two stage unloading scroll
Constant Torque	furnace or fan coil	Not applicable
Vertical upflow	Compact cube	Compact cube
Horizontal		
2 stages heating*	3 stages heating*	2 stage heating
1 stage cooling	2 stages cooling	2 stage cooling
Microprocessor control	Microprocessor control	Microprocessor control
Tin-plated copper tubing	Depends on air handler selected	Not applicable
Coated coil	Depends on air handler selected	Not applicable
MERV 8, 2"	Depends on air handler selected	Not applicable
Fiberglass	Closed cell foam	Fiberglass
No	Yes	Yes
Optional	Optional	Optional
Internal mount pump	Internal mount pump	Internal mount pump
Optional	Depends on air handler selected	Not applicable
Internal mount on vertical units	Hybrid Heat® System option	Not applicable
No	Yes	No
Optional (field installed)	Yes	Optional (field installed)
Optional	Optional	Not applicable
All sizes	All sizes (except 6 ton**)	All sizes



Bryant offers a wide range of model options and configurations to fit a variety of applications. Our most popular models include the following product features and benefits.

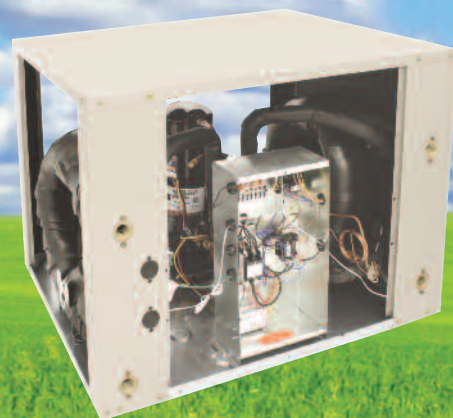
Main Product Features	Benefits
● Copeland Ultra-Tech™ two-stage unloading scroll compressor (single-stage scroll compressor on GB)	▶ Energy savings, comfort, dehumidification, reliability, quiet operation
● Variable-speed ECM fan (GT, GP models)	▶ Energy savings, comfort, dehumidification, quiet operation
● Tin-plated copper tubing in air coil	▶ Durability, long life
● Fully insulated cabinet	▶ Quiet operation
● Filter frame with two-inch MERV 13 filter (GT) (two-inch MERV 8 on GP, GB)	▶ Improved indoor air quality, keeps coil clean for energy savings and comfort
● Stainless steel drain pan	▶ Durability, long life
● Microprocessor control	▶ Precise sequencing for optimum performance, ease of service
● Dual level compressor isolation	▶ Quiet operation
● Heavy gauge steel cabinet	▶ Attractive and durable, quiet operation
● Comfort Alert™ and Smart Start (GT, GS)	▶ Easy diagnostics, prevents dimming of lights when compressor engages
● Unit mounted display (GT)	▶ Displays operating status and faults



Model GS



Model GT



Model GW

Note: Some features above are included in water-to-water and split units not shown.

## Frequently Asked Questions

**Q: How efficient are geothermal heat pump systems?**

**A:** Actual efficiencies will depend on a number of factors but, generally speaking, a geothermal heat pump can be between 2 to 5 times more efficient at producing heat than a gas, propane or oil furnace (based on the amount of energy consumed to produce a given amount of heat). For cooling, a geothermal system (30 EER) can be up to 3 times more efficient than an air source air conditioner (10 EER).

**Q: Why are geothermal heat pumps so efficient?**

**A:** Geothermal heat pumps use the ground temperature as a “source” for heat energy to help warm your home, and use the ground as a heat “sink” during cooling. The earth acts as a giant energy battery, providing an endless, renewable source for heating and cooling comfort. Standard heat pumps use outdoor air for heating and cooling. Because the ground temperature is much more moderate and stable than air temperatures, geothermal system operation is much more energy efficient, especially at extreme outdoor temperatures.

**Q: Are these systems reliable?**

**A:** Yes. Geothermal units are not subject to some of the same forces that cause wear and tear on other types of systems. And, earth loops are installed using a special grade of polyethylene pipe with heat-fused fittings designed for durability and long life.

**Q: What kind of underground loop system is best?**

**A:** It depends on several factors. Homes on larger lots usually have horizontal loops installed. Smaller lots may require a vertical loop. A nearby pond can also be used. If you have a well water system, that may be an option. Your Bryant® dealer is trained to determine which loop design is most appropriate for your home. Regardless of the loop system selected, the operating costs are all about the same.

**Q: How much space is needed for a closed loop system?**

**A:** The smallest closed loop design, the vertical loop, may require a space of only 15x15 feet, or a line of 3x45 feet, located at least 10 feet away from the home, and 10 feet from property lines. Horizontal loops require considerably more space.

**Q: How is the unit size and loop design determined?**

**A:** Bryant dealers use geothermal system design software to determine the most appropriately sized unit and loop for your home. The software takes many factors into consideration including: the heating and cooling requirements of the home, loop type, depth, soil conditions, earth temperatures, outdoor air temperature extremes, local fuel rates and much more. In addition, the software can demonstrate energy costs for a Bryant geothermal system versus another type of heating and cooling system.

**Q: Will the fluid in the loops freeze during a long, cold winter?**

**A:** No. Antifreeze in the loop fluid eliminates any concerns about freezing.

**Q: Can a well be used instead of an earth loop?**

**A:** Yes. Prior to using a well for a geothermal installation, the water quality must be checked. Sufficient water volume is needed for the unit, usually about four to nine gallons per minute during unit operation. A discharge location like a pond or drainage ditch is also required.

**Q: How big does a pond have to be for use with a geothermal system?**

**A:** For most installations, the pond should have a surface area of at least half an acre and a minimum depth of 10 feet. Bigger is better.

**Q: What is the actual efficiency of a geothermal system?**

**A:** The energy efficiency of a geothermal system is rated by an industry standard known as ARI/ISO 13256-1, which specifies a set of conditions by which efficiency is determined. The rating for heating is Coefficient of Performance (COP). It's a ratio of the amount of energy used to operate the unit compared to the amount of energy output. Bryant's highest efficiency geothermal units have a COP in excess of 4.5 (that's 450% efficient), compared to a high-efficiency air source heat pump with an average seasonal COP around 1.8. The rating for cooling is called Energy Efficiency Ratio (EER). It's calculated by dividing BTUs per hour output into the watts used. Bryant's highest efficiency geothermal units have EERs around 20-32. That's about 2-3 times better than many air conditioners and heat pumps. But because geothermal units are not rated according to the same industry standard as furnaces, air conditioners, and heat pumps, it is difficult to compare, for example, an AFUE and HSPF to COP, or SEER to EER. To get the full energy efficiency story, compare the dollars. Your Bryant dealer can calculate operating cost estimates using Bryant's geothermal system design software.

**Q: Is comfort compromised to get all this efficiency?**

**A:** No. In fact, geothermal systems can provide exceptional comfort without the “cold blow” from standard air source heat pumps during heating; or short, hot blasts of air associated with some standard efficiency gas furnaces. Geothermal units deliver air at temperatures that provide comfort throughout the house. The Bryant dual capacity units with variable-speed fans precisely match the needs of the home to deliver comfort no matter what the outdoor air temperature is.

**Q: Can the existing duct work and electrical service be used?**

**A:** Generally, the existing duct work can be used with a geothermal unit without extensive modification. Variable-speed blowers used in many of the Bryant® geothermal units can compensate for a less-than-optimum duct system. For the electrical supply, a 200-amp service for the home is recommended.

**Q: What about radiant floor heating?**

**A:** A geothermal system can be designed to provide warm water for radiant floor applications. Bryant's water-to-water geothermal units are much more efficient than today's best boilers.

## Frequently Asked Questions (cont'd)

**Q: Can a geothermal unit be combined with a gas or propane furnace?**

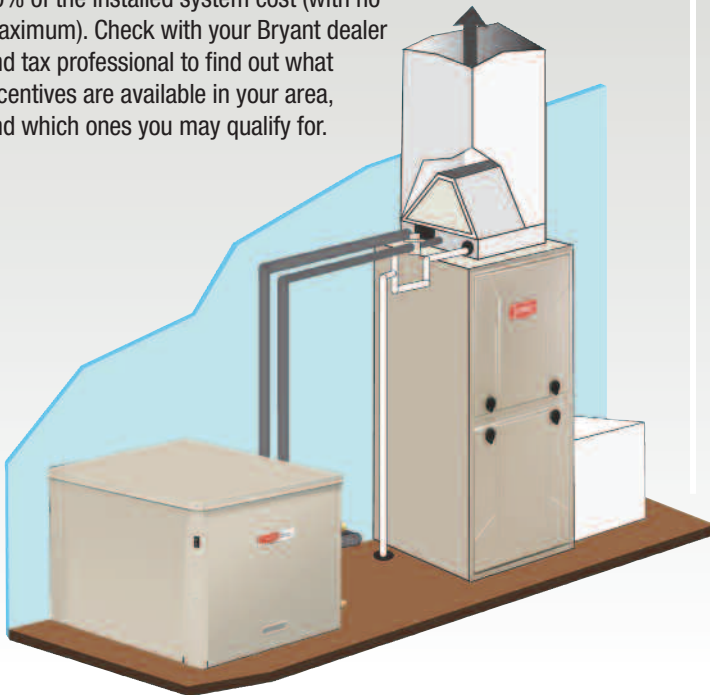
**A:** Yes. Some homeowners like the benefits of both technologies. In this case, a geothermal “split” unit (compressor only) is connected to a furnace and cooling coil. The geothermal unit will perform all the cooling and some of the heating. During the coldest days, the system can switch over to furnace operation to provide the warmest air temperatures and maximum capacity. The most cost effective “balance point” can be pre-determined by the dealer to maximize efficiency and comfort. This Hybrid Heat® system may be a good choice for a replacement installation or a new home.

**Q: Are geothermal systems more expensive to install, and how long does it take for the extra expense to pay for itself?**

**A:** Geothermal systems are generally more expensive to install than ordinary systems. For replacement installations, the added cost can be recovered faster than you think, due to the high energy efficiency of geothermal. In a new home where the added cost of the system is included in the mortgage, the monthly energy savings may be greater than the added cost, providing the homeowner with a positive cash flow from day one. Because every situation is somewhat unique, your Bryant dealer can demonstrate the complete financial scenario for your home using the geothermal system design software. Many homeowners find that a Bryant geothermal system is a great investment.

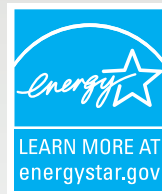
## Incentives, Rebates and Tax Credits

Because geothermal systems can be part of the solution for national energy policy, and for efficiency programs of various utilities, many incentives are available throughout the U.S. and Canada. Qualified homeowners in the U.S. may be eligible for a tax credit of 30% of the installed system cost (with no maximum). Check with your Bryant dealer and tax professional to find out what incentives are available in your area, and which ones you may qualify for.



## Limited Warranty

As part of our commitment to quality, all GT, GP, GS, and GW model geothermal units are backed with a 10-year parts and labor limited warranty upon timely product registration (10-year parts and 5-year labor without timely registration). All GB model geothermal units are backed with a 10-year parts and 5-year labor limited warranty upon timely product registration (5-year parts and 5-year labor without registration). Ask your Bryant dealer for details.



As an ENERGY STAR® Partner, Bryant Heating & Cooling Systems has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.



Heating & Cooling Systems

A Member of the United Technologies Corporation Family.  
Stock Symbol UTX.

01-8110-1200-25

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Visit our website at [www.bryant.com](http://www.bryant.com)

Before purchasing this appliance, please read the important energy cost and efficiency information available from your dealer.

Manufacturer reserves the right to discontinue, or change, at any time, specifications or designs without notice and without incurring obligations.



Visit the geothermal section of our website.