As an ENERGY STAR® partner, Carrier Corporation has determined that the Geothermal Comfort System meets ENERGY STAR guidelines for energy efficiency.
The Carrier® Geothermal Advantage

Throughout Carrier's historic 100-year legacy, the company has provided millions of homeowners with the finest comfort systems available. Using state-of-the-art furnaces, air conditioners and heat pumps, Carrier dealers are experts when it comes to customized home comfort systems. But it doesn't end there. Carrier also offers a complete line of exceptional geothermal comfort systems for your home. According to the U.S. Environmental Protection Agency, geothermal systems are "the most energy-efficient, environmentally clean, and cost effective space conditioning systems available today. They're because a geothermal system taps into the earth to capture free, renewable energy.

Why Choose Geothermal?

Geothermal Systems provide homeowners with a wide range of benefits.

- **Savings:** Generally, no other heating and cooling system offers lower operating costs, with savings up to 60% compared to ordinary systems.
- **Comfort:** These systems provide even temperatures throughout the home year-round, with excellent dehumidification during cooling.
- **Environmentally Sound:** Geothermal is a clean, green, and renewable technology to reduce your carbon footprint now and for future generations.
- **Reliable:** Geothermal units last longer than ordinary air conditioners and heat pumps. Since the units contain few moving parts, they operate for years with little maintenance.
- **Quiet Operation:** Unlike ordinary air conditioners and heat pumps, no outdoor unit is required. Carrier geothermal units use heavy-duty, fully-insulated cabinets for quiet operation. Quiet, soft starting variable-speed blowers are used in many models.
- **Flexibility:** Heating, cooling and supplemental water heating from a single unit. And a wide variety of models and options to fit most any application.
- **Free Hot Water:** During unit operation, free excess heat is used to supplement the home’s water heater.
- **Energy Independence:** Geothermal systems reduce our need to import fuel.
- **Safe and Clean:** No flame, no flue, no odors.

The Energy Efficiency Story

One of the main reasons many homeowners choose geothermal is the benefit of lower operating costs. In most homes, the cost for heating, cooling and hot water combine for about 70% of the total utility costs. Therefore, the biggest opportunity to save a substantial amount in utility costs is to improve those systems. That’s where geothermal can help in a big way.

For every one unit of energy purchased to operate a geothermal unit, it delivers four to five units of energy because the energy from the earth is free. In many scenarios, a geothermal system is significantly less expensive to operate than ordinary heating and cooling systems. Geothermal systems can save up to 70% in heating costs, up to 50% in cooling costs, and around 30-50% in hot water costs.

One way to compare 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 Carrier geothermal dealer.

---

### Cost Comparison for 1 Million BTUs

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Efficiency</th>
<th>Cost/1 Million BTUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Efficiency Natural Gas</td>
<td>95% AFUE</td>
<td>$14.79</td>
</tr>
<tr>
<td>Standard-Efficiency Natural Gas</td>
<td>80% AFUE</td>
<td>$17.75</td>
</tr>
<tr>
<td>High-Efficiency Propane</td>
<td>95% AFUE</td>
<td>$30.65</td>
</tr>
<tr>
<td>Standard-Efficiency Propane</td>
<td>80% AFUE</td>
<td>$36.40</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>81% AFUE</td>
<td>$34.17</td>
</tr>
<tr>
<td>Electric Resistance</td>
<td>1.0 COP</td>
<td>$35.16</td>
</tr>
<tr>
<td>Heat Pump</td>
<td>2.0 COP</td>
<td>$39.50</td>
</tr>
<tr>
<td>Air Source Heat Pump</td>
<td>2.0 COP</td>
<td>$40.00</td>
</tr>
<tr>
<td>Geothermal – 4.0 COP*, $0.12/kwh</td>
<td>2.0 COP</td>
<td>$40.75</td>
</tr>
<tr>
<td>Heat Pump</td>
<td>2.0 COP</td>
<td>$41.00</td>
</tr>
</tbody>
</table>

* COP – Coefficient of Performance  † AFUE – Annual Fuel Utilization Efficiency
Free 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 Product Selection Guide

<table>
<thead>
<tr>
<th>Feature</th>
<th>GT-PX</th>
<th>GT-PG</th>
<th>GT-PX Indoor Split</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHRI Ratings (13256-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed Loop (GLHP)</td>
<td>3.6 - 4.6 COP</td>
<td>3.6 - 4.2 COP</td>
<td>3.6 - 4.2 COP</td>
</tr>
<tr>
<td>Ground Water (GWHP)</td>
<td>4.3 - 5.1 COP</td>
<td>4.3 - 5.1 COP</td>
<td>4.3 - 4.7 COP</td>
</tr>
<tr>
<td>Refrigerant</td>
<td>Puron®</td>
<td>Puron®</td>
<td>Puron®</td>
</tr>
<tr>
<td>Compressor</td>
<td>Two-stage</td>
<td>Single-stage scroll</td>
<td>Two-stage unloading scroll</td>
</tr>
<tr>
<td>Blower</td>
<td>Variable Speed ECM</td>
<td>Variable Speed ECM</td>
<td>Used with ECM or PSC furnace</td>
</tr>
<tr>
<td>Cabinet Configurations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical Loops (used where land area is limited or soil conditions prohibit horizontal loops)</td>
<td>Installed using a drilling rig</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal Loops (used on larger lots)</td>
<td>Installed using a backhoe or trencher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Loops (well water from an existing well can be used, then discharged into a drainage ditch or pond)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Model Availability
- **Models**: 50YD (V,H,D) 50YE (V,H,D) 50YDS
- **Sizes**: 2, 3, 4, 5, 6 (for GLHP), 1.5, 2, 2.5, 3, 3.5, 4, 5, 6 (for GWHP)
- **HSPF Ratings**: 16.2 - 27.0 (for GLHP), 19.9 - 31.5 (for GWHP)
- **EER Ratings**: 16.6 - 20.2 (for GLHP), 21.6 - 28.1 (for GWHP)
- **Compressor**: Two-stage or Single-stage scroll
- **Blower**: Variable Speed ECM or Used with ECM or PSC furnace
- **Cabinet Configurations**: Vertical upflow, Vertical downflow, Horizontal
- **Stages**: 3 stages heating*, 2 stages cooling
- **Control**: CXM solid state module, On-board diagnostics
- **Air Coil**: Tin-plated, Depends on air handler selected
- **Desuperheater**: Optional, Internal mount pump
- **Auxiliary Heat**: Optional, Depends on vertical units
- **Zone Control**: Optional, HYBRID HEAT® option
- **ENERGY STAR® rated**: All sizes

* with aux.

## Notes
- **Dealer Notes**
- **Geothermal Product Selection Guide**
- **Free Energy From The Earth**

---

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

**Closed Loop (GLHP)**

**Ground Water (GWHP)**

**Pond Loops**: Coils of pipe are fabricated and sunk to the bottom of the pond.
Go Green: Reduce Your Carbon Footprint

Geothermal systems use the free, renewable energy from the earth, so the technology is one that can have a positive effect on your carbon footprint. In fact, according to the Geothermal Heat Pump Consortium, installing a geothermal system instead of an ordinary system is the environmental equivalent (in emission reduction) of taking two cars off the road or planting an acre of trees. And because of improved electrical energy efficiency, geothermal systems reduce the need to build additional costly fossil fuel burning power plants. It’s clean technology — geothermal units produce no on-site emissions.

There are over 1 million geothermal installations today, resulting in the avoidance of more than 5.6 million metric tons of carbon dioxide and more than 18 million metric tons of carbon equivalent annually. In addition, existing geothermal installations are the environmental equivalent (in emission reduction) of taking 1.2 million cars off the road, or planting more than 385 million trees.

Key Features

Carrier offers a wide range of model options and configurations to fit a variety of applications. Our popular GT-PX Series includes the following features:

1. Copeland Ultra-Tech™ two-stage unloading scroll compressor for exceptional performance, efficiency and reliability
2. Variable speed blower motor for comfort and quiet operation
3. Tin-plated air coil for corrosion resistance
4. Foil faced insulation in blower section for easy cleaning. Insulated compressor section for quiet operation
5. Filter rack with two-inch MERV 11 filter for indoor air quality
6. Stainless steel drain pan for corrosion resistance
7. Unit Performance Sentinel microprocessor control precisely sequences and monitors component operation for improved performance and serviceability
8. Double spring and grommet compressor isolation for quiet operation
9. Heavy-duty cabinet, epoxy powder coated for aesthetics and long life

Note: Features on other models may vary.

Go Green: Reduce Your Carbon Footprint

Geothermal systems use the free, renewable energy from the earth, so the technology is one that can have a positive effect on your carbon footprint. In fact, according to the Geothermal Heat Pump Consortium, installing a geothermal system instead of an ordinary system is the environmental equivalent (in emission reduction) of taking two cars off the road or planting an acre of trees. And because of improved electrical energy efficiency, geothermal systems reduce the need to build additional costly fossil fuel burning power plants. It’s clean technology — geothermal units produce no on-site emissions.

There are over 1 million geothermal installations today, resulting in the avoidance of more than 5.6 million metric tons of carbon dioxide and more than 18 million metric tons of carbon equivalent annually. In addition, existing geothermal installations are the environmental equivalent (in emission reduction) of taking 1.2 million cars off the road, or planting more than 385 million trees.

Key Features

Carrier offers a wide range of model options and configurations to fit a variety of applications. Our popular GT-PX Series includes the following features:

1. Copeland Ultra-Tech™ two-stage unloading scroll compressor for exceptional performance, efficiency and reliability
2. Variable speed blower motor for comfort and quiet operation
3. Tin-plated air coil for corrosion resistance
4. Foil faced insulation in blower section for easy cleaning. Insulated compressor section for quiet operation
5. Filter rack with two-inch MERV 11 filter for indoor air quality
6. Stainless steel drain pan for corrosion resistance
7. Unit Performance Sentinel microprocessor control precisely sequences and monitors component operation for improved performance and serviceability
8. Double spring and grommet compressor isolation for quiet operation
9. Heavy-duty cabinet, epoxy powder coated for aesthetics and long life

Note: Features on other models may vary.

Go Green: Reduce Your Carbon Footprint

Geothermal systems use the free, renewable energy from the earth, so the technology is one that can have a positive effect on your carbon footprint. In fact, according to the Geothermal Heat Pump Consortium, installing a geothermal system instead of an ordinary system is the environmental equivalent (in emission reduction) of taking two cars off the road or planting an acre of trees. And because of improved electrical energy efficiency, geothermal systems reduce the need to build additional costly fossil fuel burning power plants. It’s clean technology — geothermal units produce no on-site emissions.

There are over 1 million geothermal installations today, resulting in the avoidance of more than 5.6 million metric tons of carbon dioxide and more than 18 million metric tons of carbon equivalent annually. In addition, existing geothermal installations are the environmental equivalent (in emission reduction) of taking 1.2 million cars off the road, or planting more than 385 million trees.

Key Features

Carrier offers a wide range of model options and configurations to fit a variety of applications. Our popular GT-PX Series includes the following features:

1. Copeland Ultra-Tech™ two-stage unloading scroll compressor for exceptional performance, efficiency and reliability
2. Variable speed blower motor for comfort and quiet operation
3. Tin-plated air coil for corrosion resistance
4. Foil faced insulation in blower section for easy cleaning. Insulated compressor section for quiet operation
5. Filter rack with two-inch MERV 11 filter for indoor air quality
6. Stainless steel drain pan for corrosion resistance
7. Unit Performance Sentinel microprocessor control precisely sequences and monitors component operation for improved performance and serviceability
8. Double spring and grommet compressor isolation for quiet operation
9. Heavy-duty cabinet, epoxy powder coated for aesthetics and long life

Note: Features on other models may vary.
Q: How efficient are geothermal heat pump systems?
A: Geothermal heat pumps use the ground temperature as a “source” for heat energy during heating, and as 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. The efficiency of a geothermal system is rated by an industry standard known as the Seasonal Performance Factor (SPF), which speciﬁes a set of conditions by which efﬁciency is determined. The higher the SPF, the more energy the system delivers for a given amount of energy consumed. For cooling, a geothermal system is generally 30-50% more efﬁcient than an air conditioner or heat pump. For most installations, the pond should have a surface area of at least a half acre and a depth of 12 feet. Bigger is better.

Q: How big does a pond have to be for use with a geothermal system?
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 to last 50 years or more.

Q: What kind of underground loop system is best?
A: It depends on several factors. Homes on smaller 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. Horizontal loops require considerably more space. Vertical loops may require a space of only 15x15 feet, or a line of 3x45 feet, located at least 10 feet away from the house. The Carrier dual capacity units with variable speed fans precisely match the needs of the home, regardless of the loop system selected; the operating costs are all about the same.

Q: How is the unit size and loop design determined?
A: Carrier dealers use GeoDesigner software to determine the most appropriate 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, surface area and location, earth temperatures, outdoor temperatures, local fuel rates and much more. In addition, the software can demonstrate energy costs for a Carrier geothermal system vs. another type of heating and cooling system.

Q: Why are geothermal heat pumps so efficient?
A: Geothermal heat pumps use the ground temperature as a “source” for heat energy during heating, and as 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: Does comfort get compromised to get all this efﬁciency?
A: No. In fact, geothermal systems can provide exceptional comfort without the “cold blast” from an air source heat pump during heating; or short, hot blasts of air associated with standard efﬁciency gas furnaces. Geothermal units deliver air at constant temperatures that provide comfort throughout the house. The Carrier 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: How is the unit size and loop design determined?
A: Carrier dealers use GeoDesigner software to determine the most appropriate 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, surface area and location, earth temperatures, outdoor temperatures, local fuel rates and much more. In addition, the software can demonstrate energy costs for a Carrier geothermal system vs. 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 geothermal unit be combined with a gas or propane furnace?
A: Yes. Some homeowners like the benefits of both technologies in the case, a geothermal 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 switches over to furnace operation. This type of system may be a good choice for a replacement installation.

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 Carrier 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. Carrier's water-to-water geothermal units are four to five times more efficient than today's best boilers.

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 is usually recovered in a few years. 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 Carrier dealer can demonstrate the complete financial scenario for your home using the GeoDesigner software. Many homeowners find that a Carrier 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. Some homeowners may qualify for tax credits of 30% of the system cost (with no maximum). Check with your Carrier 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, Carrier geothermal units are backed with a standard 10-year limited warranty on all internal components. An optional extended warranty provides labor allowances for 10 years on all parts. Ask your Carrier dealer for details on both coverage plans.

www.carrier.com 1-800-CARRIER

© Carrier Corporation 2010 01-811-20311-25
Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice or without incurring obligations.

Frequently Asked Questions (con't)

Factoids
● With over 1 million geothermal installations, the total estimated annual energy savings is 8 billion kWh of electricity and 40 billion BTUs of fossil fuels. It reduces our reliance on imported fuels by 23.5 million barrels of crude oil per year.
● Homeowners with geothermal systems installed are saving a combined estimated $750 million over 20 years.
● Surveys by utilities have shown that more than 95% of geothermal system owners would recommend the technology to others.
● The amount of the earth's energy absorbed by the earth is more than 300 times the energy required for all of mankind every year.
● Geothermal systems installed in schools are saving over $20 million in energy costs annually, saving more money for books, equipment and teachers.

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. Some homeowners may qualify for tax credits of 30% of the system cost (with no maximum). Check with your Carrier 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, Carrier geothermal units are backed with a standard 10-year limited warranty on all internal components. An optional extended warranty provides labor allowances for 10 years on all parts. Ask your Carrier dealer for details on both coverage plans.

Traffic is based on usage (July 2003).