Bosch Geothermal Heat Pump Residential Installation Case Study

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Greensource CDi Series
Model SM060-1VTC-TA

Project Goals:
- Energy Savings
- Eco-Friendly
- Quiet Operation
- Reliability

Background
Mr. Chris Butts is President of Perfect Temp, Inc., a heating/cooling & geothermal contractor in Loveland, CO. Chris recently installed a new Greensource CDi Series Bosch geothermal heat pump system in his own home. Chris wanted to accomplish several key goals including improving energy savings, better utilization of space, and reliable performance with an ecologically friendly heating and cooling system.

Installation Summary
The 4200 square foot home is located in a suburban area of Loveland, Colorado, which is located within the Arapahoe National Forest along the U.S. Continental Divide, at an elevation of 5100 feet (1554 meters) above sea level. Challenges of the retrofit installation included restricted space constraints in the yard and basement.

According to Chris, “Although we had challenges accessing the yard in my home’s subdivision, we successfully drilled four vertical holes 300 feet deep, using 1 inch high density polyethylene plastic pipe for the geothermal heat source.” The loops were then connected to the heat pump and fluid circulates through the loop piping, transferring thermal energy contained in the ground water to the heat pump and into the home. The Bosch Greensource geothermal heat pump is designed to be field-configured for various arrangements including air discharge (up, back or sides) or air return (left or right). The unit fits snugly into the basement utility area of Chris’s home.

Technical Specs of the Home:

Geothermal Heat Pump:
- Greensource CDi Series Model SM060-1VTC-TA
- COP: 1st stage: 4.4, 2nd stage: 3.9
- EER: 1st stage: 26.5, 2nd stage: 18.9

Economics:
- Space Heating Input (Natural Gas): 100,000 Btu/h
- Cooling Size: 42,000 Btu/h
- Projected Energy Savings: Payback Period: 5-7 years

Ecologically Friendly to Save Energy

The Bosch Greensource geothermal heat pump requires less energy to produce the equivalent heating and cooling output of other heat pumps on the market. This saves energy and reduces cost while maintaining comfort in the home. With Greensource, recognized as the most efficient heat pump system by ENERGY STAR in 2013, a typical homeowner can save up to 70% on energy bills, plus realize payback on this investment in as little as 5 to 7 years. With high-efficiency geothermal heat pumps, a strong dealer network throughout the U.S. and a commitment to producing high-quality products, Bosch Thermotechnology is taking the lead in establishing geothermal as an answer to improving America's heating and cooling energy efficiency.

Optional Accessories Improve Indoor Air Quality

This area of the country is at high elevation, and indoor air typically exhibits low relative humidity. To supplement the Greensource's performance and enhance comfort, Chris incorporated a Bosch bypass humidifier to help reduce annoying static electricity shocks, and Bosch's Photo-Catalytic Oxidizer (PCO) to convert Volatile Organic Compounds (VOCs) as well as other gases and pollutants into harmless water vapor and carbon dioxide.

Quiet Operation with Advanced Sound Package

The Greensource heat pump is equipped with an advanced sound package comprising a unique floating base pan to isolate internal components from the exterior cabinet, thereby reducing sound and vibration. Combined with high-density, closed-cell foam cabinet insulation, the Greensource is one of the quietest units on the market, with sound output as low as 52dBA, which is about as quiet as an average home refrigerator.

Benefits and Conclusion

The Greensource incorporates an optional domestic hot water heat recovery package; this uses excess heat from the compressor to pre-heat water in the domestic hot water tank. With less than 2% leakage rate, a Greensource geothermal heat pump offers a best in class rating for air-tightness and quiet operation. This unit delivers heated and cooled air into a home´s duct air distribution system - not diverted into the attic, garage, or crawl space - thus lowering operating costs. "Bosch has the highest efficiency, with a superior level of comfort," according to Chris. "My family noted that the house has never been as comfortable before, and the geothermal system runs so quietly, we hardly notice it running. We are looking forward to enjoying energy savings over a long period of time."

- **Project Name:**
  Bosch Geothermal Heat Pump
  Residential Installation
- **Wholesaler:**
  Brian Fowler / Geosource,
  Denver, Colorado
- **Installer:**
  Chris Butts, President,
  Perfect Temp Inc.
- **Model Installed:**
  Geothermal Heat Pump
  Greensource CDi Series
  Model SM060-1VTC-TA
- **Installation Location:**
  Loveland, CO
- **Installation Date:**
  Jan 16-18, 2013

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bosch-climate.us

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SM CDi SERIES | UP TO 32.0 EER Part Load | UP TO 22.0 EER Full Load

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