



ClimateMaster Building Spotlight

Geothermal Heat Pumps from ClimateMaster Provide Education and Energy Savings at ASHRAE Headquarters Building



In July of 2008, completion of a \$7.65 million renovation at the 33,570 sq. ft. headquarters facility of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) in Atlanta, Ga. marked the advent of a new “living laboratory” for research in sustainable design and construction. One of only six buildings in the state to secure a LEED® (Leadership in Energy & Environmental Design) Platinum certification from the U.S. Green Building Council (USGBC), the ASHRAE headquarters received several upgrades that would make it a model for enhanced energy efficiency and integration of renewable energy sources. In addition, a learning and meeting center was constructed inside the building to provide a space for connecting ASHRAE members to research and ongoing performance data collection from all HVAC systems in the building.

Central to improved HVAC efficiency, a geothermal system supplied by water source and geothermal heat pump manufacturer ClimateMaster was installed to condition the headquarters building's 15,290-sq. ft. second floor. The 23-ton geothermal system includes a 14-zone heating and cooling design with 12 ClimateMaster Tranquility® 27 (TT) Series horizontal two-stage water-source heat pumps and 2 Tranquility® High Efficiency (TRC) Series console water-source heat pumps with R410A refrigerant. Additionally, a closed vertical loop geexchange field installed adjacent to the east side of the building consists of twelve 400-ft boreholes with 1¼-in. HDPE pipe and thermally enhanced grout.

“ASHRAE thanks ClimateMaster for its donation of the geothermal heat pump system that provides high-efficiency heating and cooling for 14 individual zones on the second level of the building,” said ASHRAE president Tom Watson. “The system is of great interest to visitors to the Headquarters as they tour our facility.”

“With buildings accounting for nearly 40 percent of all U.S. energy consumption, there is no doubt that ASHRAE members will play a crucial role in reshaping our energy future,” said Daniel Ellis, president of ClimateMaster Inc. “We are pleased that we were able to assist ASHRAE in demonstrating its leadership by making its headquarters a model of energy efficiency and environmental stewardship.”

Data collected since the completion of the renovation in 2008 includes a performance comparison between the ClimateMaster geothermal heat pump system and a 38-ton multi-split Variable Refrigerant Flow (VRF) fan coil unit-driven system with zoned inverter-driven-outrsource heat pumps that was installed on the 18,510 sq. ft. first floor. The system's 28 tons of heat recovery was designed with a 121-percent diversity factor to effectively handle 34 tons of fan coil capacity. It also works in concert with conditioned ventilation air from the building's DOAS units.

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— Tony Landers, Commercial Marketing Manager for ClimateMaster

Based on data collection in 2010 and 2011, the ClimateMaster geothermal heat pump system performed notably more efficiently than the VRF system during the heating season, while cooling performance was ultimately comparable. Data specifically exemplified more than a 50-percent energy savings from the geothermal heat pump system when comparing the average heating/cooling performance of both systems since their installation.

“Using the data collected by ASHRAE, the VRF system used 57 percent more energy than the geothermal heat pump system in 2010, and 84 percent more energy in 2011,” said Tony Landers, Commercial Marketing Manager for ClimateMaster. The performance data collected from 2010 showed an annual energy usage of 2.1 kWh/sq. ft. for the geothermal heat pump system while the VRF system operated at 3.3 kWh/sq. ft. “Needless to say, we are very pleased with the performance of the geothermal system and look forward to more in-depth studies of the two systems.”

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