

Bells, Whistles for Geothermal Heat Pumps

Manufacturers Introduce Features to Improve Comfort, Efficiency, Serviceability

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The 30 percent residential renewable-energy federal tax credit has helped drive sales of geothermal heat pumps (GHPs) to an all-time high, with homeowners racing to install these energy-efficient systems before the program is scheduled to end in 2016. With just three years left to encourage homeowners to invest in geothermal advances, manufacturers are pulling out all the stops by introducing new features on their GHPs, such as variable-speed technology and sophisticated controls, which they say will provide homeowners with better comfort, as well as lower energy consumption and operating costs.

New Offerings

GHPs are expensive to install, so homeowners want to make sure their investment results in greater comfort and lower energy bills than what they would experience with



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1 WaterFurnace incorporated variable-capacity technology into its new 7 Series geothermal products. 2 ClimateMaster developed iGate, which is a two-way communicating platform that signals system performance, as well as conditions at the time of a fault. 3 Two-capacity compressors and variable-speed high-efficiency motors are the new features offered on Bosch's Greensource CDI Series. 4 A Geofinity water-to-water geothermal system is installed in a home. Every unit comes standard with the Orb, a fully integrated equipment control system. (Courtesy of Modine Mfg. Co.)

a traditional HVAC system. For these reasons, WaterFurnace Intl. Inc. incorporated variable-capacity technology into its new 7 Series geothermal products, said Tim Litton, director of marketing. "This technology is unique, because rather than running at the one or two speeds of normal compressors, it adjusts its speed to precisely match the heating or cooling load of a building. Imag-

ine if your car had only two settings: 30 mph and 70 mph. It would be very strenuous to drive, and it probably wouldn't get very good gas mileage. As we all know, gentle acceleration and maintaining constant speeds increases efficiency."

The 7 Series units operate over a wide capacity range — from 20-130 percent of full speed — which means the needs of just about every home

can be covered with only three sizes. To manage and optimize the variable-capacity technology, WaterFurnace engineered a new platform of controls called Aurora, which offers full two-way communication between components and provides support for instantaneous and recorded energy monitoring that is visible from the thermostat. Incorporating the upcoming Aurora Web Link (AWL)

module will also extend communication protocols to include the Internet, smart grids, home automation networks, and more, said Litton.

Keeping the homeowner and contractor in mind, Modine Mfg. Co. recently incorporated the Orb controller into its Geofinity™ product line. As Jesse Robbennolt, EIT, product manager, explained, the Orb is a fully integrated equipment

control system that comes standard on every Geofinity GHP. It offers complete operating, monitoring, control, and diagnostics capabilities, as well as total system management along with a reporting platform that provides real-time data trending and analysis, whether on-site or online. Standard onboard zoning capabilities for up to four zones are also included on the Orb.

“The Orb gives homeowners an avenue to ensure the best possible performance from their system, along with the ability to view real-time estimates of energy consumption,” said Robbennolt. “For contractors, it gives them the ability to track the unit’s performance and to call end users to notify them of service requirements before they even know there is a problem. It also allows for easier start-up, commissioning, and troubleshooting at the push of a button.”

The need to provide the ability to monitor, control, and diagnose a system in plain English is what led ClimateMaster Inc. to develop iGate™, which is a two-way communicating platform that signals system performance, as well as conditions at the time of a fault. The company also introduced vFlow™ variable-water flow components, which reduce installation labor and time and ensure operation at optimal capacity, said Raj Hiremath, director of marketing.

Two-capacity compressors and variable-speed high-efficiency motors are the new features offered on Bosch Thermotechnology Corp.’s Greensource CDi Series, said Craig Kersten, product manager of residential geothermal products. “Variable-speed fan watt usage is as low as a 60-watt light bulb, and when combined with a quality filter, improves IAQ at a very low cost. In addition, the two-capacity compressor operating in low capacity 80 percent of the time helps remove moisture during the hot summer months. With this technology, owners will experience improved IAQ and whisper-quiet operation.”

Contractors will appreciate the LCD display on the Greensource CDi Series units, said Kersten, which communicates unit operation without requiring the removal of any doors. “Alerts from the unit can be easily relayed to contractors, so they can be prepared for the service call, which saves time and money.”

The American Standard EnviroWise™ VS Series geothermal heat pump features variable-speed compressor technology, a fully communicating control package, and a variable-speed loop pump, providing high efficiency and quiet comfort for homeowners. All Platinum ZV heat pumps include service, performance, and energy-monitoring sensor kits, which communicate system efficiency and diagnostic troubleshooting through the dedicated thermostat or a handheld AID tool. All of these units are attractive options for homeowners in search of fingertip functionality.

On The Horizon

While manufacturers have been very busy rolling out their latest

products, there is definitely more to look forward to over the next few years. According to Hiremath, the next significant technology that will impact GHPs will be information exchange. “This will require adding smart components inside the units and on accessories and making critical information available on the Web.”

Litton agrees, noting that energy management integrated into home

automation will be a big area of growth in residential HVAC. “Consumers really like the idea of being able to monitor and control their comfort levels from wherever they’re sitting — whether that’s on the couch or on the flight home. The public is realizing that thermostats don’t have to be mounted to the wall if they’re accessible from an app on a mobile device or tablet. This will become increasingly

important, given the time-of-day rates and critical-peak pricing that are becoming a reality at electric utilities around the country.”

The next generation of GHPs will most likely include improved monitoring capabilities for the homeowner and the contractor, said Robbennolt, as well as advanced controls systems that provide text-based notifications instead of traditional dip switches

and LED flash codes. “In addition, higher-efficiency coaxial and aluminum microchannel air coils, which are highly durable and proven technologies, will soon be incorporated into GHPs.”

As can be seen, there is a lot of technological innovation going on right now in the world of GHPs, and the industry is eagerly waiting to see what manufacturers plan to introduce next. **N**

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