Centex, Livermore, California

The Watt Stopper Occupancy Sensors at Home in Zero Energy Residence

A "21st Century Performance Home," built in Livermore California by Centex Homes, is demonstrating several innovative energy efficient features that could become part of the American landscape in coming years. As one of these innovations, occupancy sensors from The Watt Stopper ensure that occupants receive hot water as soon as they turn on the faucet.

When builder Centex Homes and design firm Davis Energy Group assessed the needs of this "zero energy" home, they knew an innovative solution would be necessary to provide instant hot water as well as save energy. The home features a solar water heater and an instantaneous water heater that are a substantial distance from the home's bathroom and kitchen fixtures. A recirculating system became a necessity to provide hot water on demand; however, these systems typically operate almost continuously, using substantial amount of pumping energy and experiencing heat loss from piping.

"The Watt Stopper's WPIR sensors to control circulating pumps are a natural fit to ensure that hot water is delivered promptly and that water heating energy is not wasted."

– David Springer
Davis Energy Group

The Watt Stopper's WPIR occupancy sensors offered a unique ability to meet this challenge. Although typically used to control lighting based on occupancy, the sensors can also be used to control other types of electrical loads. The WPIR signals a power pack (also known as a relay) that switches the load on or off in response to the signal.

In this home, the sensors were installed in the kitchen and each of three bathrooms. The sensors detect the presence of an occupant in any of these rooms, and in response, turn on the hot water circulating pump. The sensors turn off the pump about two minutes after an occupant exits the room. A temperature sensor is also installed to turn off the pump when water in the recirculation loop reaches about 120° F.

David Springer, President of Davis Energy Group, which designed the system, says, "We selected The Watt Stopper sensors because we were familiar with their reliability and energy efficient performance. The sensors are a natural fit for this application." Centex Project Manager Trece Herder notes that when an occupant uses a fixture, such as a shower, "the hot-water pump will automatically go on, but it's not circulating constantly."

The single-story, 3,079 square foot home serves as a model for state and national energy efficiency programs, including the U.S. Department of Energy's Zero Energy Buildings program, the California Energy Commission's Public Interest Energy Research program, and Alameda County Green Building Program standards. "Green" features such as a solar electrical system, solar water heater, and a heating/cooling system that utilizes air from the outdoors, share the limelight with luxury features such as ten-foot ceilings, stone fireplaces, and Sub-Zero refrigerators.

Completed in July 2002, the home was listed for $800,000 and sold in September. Project partners continue to monitor energy performance of various building systems through the summer of 2003. Pleased with the success of the project, and the homeowner interest in "green" residences, builder Centex Homes anticipates it may build similar homes under the auspices of the Zero Energy Homes program. Features such as the occupancy-controlled hot water recirculating system could well become a standard or buyer optional feature in these homes.