

ENERGY AND ENVIRONMENTAL DESIGN TRENDS

Application Note

Whether you call it 'Green', 'Sustainable', or 'Energy Efficient', all the trends in building design, construction and management point toward much reduced energy usage. Modern buildings will use dramatically less energy and water than their predecessors.

Making buildings more energy efficient does lead to some complications. Modern buildings are much more airtight than older ones. Environmental control systems are more complex than ever before. Both considerations mean that sensors are required for safe and efficient operation.

Making buildings more airtight reduces heating costs, but it must be done carefully. If not enough fresh air is provided, CO_2 levels increase as people breathe. There is a body of research which reports that increased CO_2 levels decrease intellectual performance well before any other health issues are seen. Extremely high CO_2 levels can cause drowsiness and lethargy.

Anything that uses oxygen in a tightly closed building can be an issue if not enough fresh air is provided, or the system isn't properly ventilated. Gas water heaters, furnaces, and stoves all produce carbon monoxide (CO) if they are not properly vented. CO is a very dangerous gas - both poisonous and highly flammable.

The solution to many of these problems is the proper use of sensing solutions. At a minimum, buildings should have proper CO alarm systems; however, it's obviously better to avoid triggering alarms and risking occupants' health and safety.

SENSOR POTENTIAL APPLICATIONS

- CO_2 sensing in demand control and energy recovery ventilation
- Proof-of-airflow sensors in burner controls to confirm exhaust stacks are functioning properly
- CO sensors in burner systems to detect CO at levels well below hazardous
- Pressure sensors in VAV controls and other ventilation systems to ensure proper airflow
- Temperature sensors on gas pilots to shut off the flow of gas if the pilot goes out

The increasing complexity of environmental control systems means that they need an increasing number of sensors to function properly. In the past, HVAC systems might have had no more control than a simple mechanical thermostat.

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SENSOR USE THROUGHOUT MODERN BUILDING CONTROL SYSTEMS

- Demand control ventilation systems use CO_2 sensors to control indoor air quality
- Energy recovery ventilation systems use temperature, humidity and pressure sensors to manage the energy transfer process while correctly ventilating a building
- Pressure and airflow sensors are used in VAV controls to balance the airflow in complex HVAC systems
- Magnetic sensors, switches and pressure sensors can all be used to detect windows and doors that have been left open, wasting energy
- Temperature and humidity sensors are used in smart thermostats to efficiently manage the HVAC system while improving occupant comfort
- Gas sensors are used both to control burner systems and to detect hazardous materials in industrial environments
- Heavy-duty pressure sensors control the refrigerant pressures in chillers and compressors; these sensors must be compatible with the latest environmentally-friendly refrigerant gases characteristics

FOR MORE INFORMATION

Honeywell Advanced Sensing Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit our website or call:

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008331-2-EN | 2 | 04/21
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