Advanced rooftop unit controls

DESCRIPTION

Packaged rooftop units (RTUs) are used to heat and cool nearly half of all the commercial buildings in the United States. These units tend to use single-speed fans and compressors resulting in inefficient operation when buildings are not fully occupied. Advanced controls—demand control ventilation, economizer diagnostics, and variable speed fans—can significantly reduce the energy use of these units.

Demand control ventilation (DCV) uses sensors to reduce ventilation during unoccupied periods; properly functioning economizers allow outdoor air to be used for cooling when ambient temperatures are favorable; and variable speed fans circulate only the amount of air necessary to maintain room temperature.

DEMONSTRATING THE TECHNOLOGY

Advanced rooftop unit controls are suitable for commercial, low rise buildings and multifamily buildings that use RTUs. The commercial sector includes a variety of business types from office to retail; education to food service; public assembly to warehouses. Suitable multifamily applications would include the RTUs serving common areas or make-up air units serving ventilation.

Testing and demonstration sites could be recruited through programs targeting HVAC equipment maintenance and/or replacement or new construction programs.

CRITERIA	VALUE
Electricity savings	1.55 kWh/ft²
Gas savings	0.14 therm/ft²
Cost savings	$0.24/ft²
Measure life	25 years
2017 simple payback	3 years
Carbon emissions avoided	2.0E-03 MT equivalent CO_2
How it saves energy	DCV reduces the amount of outside air brought into the building based on need; properly functioning economizers use cool outside air to reduce cooling load; variable speed fans adjust fan speed to maintain room temperature
Non-energy benefits	quieter; early detection of issues can save costly repairs; improved ventilation
Barriers to adoption	first cost; contractor training; more cost effective on larger RTUs (>8 tons); existing blower must be able to be equipped with VFD without overheating; may violate warranty

FOR MORE INFORMATION

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