

Exceeding Standard 62.1 Requirements

Variable Air Volume System Heat Recovery Economizer

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Outdoor air–return air–exhaust air economizer systems on VAV air-handling units (AHU) have sometimes created IAQ problems as the supply fan air volume decreases (during cold ambient conditions) to match the building cooling requirements. The minimum outdoor air fraction prescribed by ASHRAE Standard 62.1-2016 drops below acceptable levels without reheat at the AHU. Often, indoor zone air change rates (ach) are kept high because of a mistaken perception that high ach will yield better IAQ. The result is wasted reheat energy at the interior zone VAV terminals and increased fan energy at the supply fan.

A 2015 study reports that a reduction from 6 to 2 ach would reduce California hospital HVAC reheat and fan energy costs by nearly 70% during ambient conditions when airside economizers are used.¹

ASHRAE Research Project RP-1515 confirms that VAV terminals with reheat may be set as low as 10% of maximum flow without compromising room occupant comfort or the VAV boxes' ability to control cfm. The research shows that there is 10% to 30% savings in HVAC energy possible by reducing flow at the zone terminal. Surprisingly, the buildings' test also showed a reduction in over-cooling complaints, which have become endemic for VAV designs.^{2,3}

Recent studies have identified low room relative

humidity (RH) and/or absolute humidity (AH) as factors contributing to the buoyancy, viability and spread of some airborne pathogens within the human breathing zone.^{4,5} When indoor RH drops below 40%, the probability of airborne infection between susceptible hosts increases. Some airborne pathogens show an increase in infection rate above 60% RH.⁶ Therefore, controlling indoor conditioned spaces between 40% to 60% RH⁷ at comfortable room air temperatures between 70°F to 75°F (21°C to 24°C) and maintaining AH levels between 50°F (10°C) dew point (DP) and 55°F (13°C) DP would seem to offer the best protection from the spread of flu and other airborne viruses within the breathing zone. Hospital critical areas are often

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