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Energy-efficient control strategy

Air quality based demand-controlled ventilation

In rooms which are not fully occupied, the outside air flow rate needs to be reduced to make more rational use of energy. Demand-controlled ventilation is the right energy-efficient solution to achieve this.

What is a demand-controlled ventilation system?

Fixed ventilation systems provide constantly sufficient fresh air for full occupancy. The provided volume of heated or cooled air therefore does not always match the actual required one. Scheduled ventilation can provide fresh air at the correct rates at the right time but runs the risk of under or over ventilation if schedule changes are not made at the appropriate times. On the other hand a demand-controlled ventilation system controls the amount of outside air brought into the building. It provides just the amount of outside air the occupants actually need.

Demand-controlled ventilation with CO₂/VOC* sensors

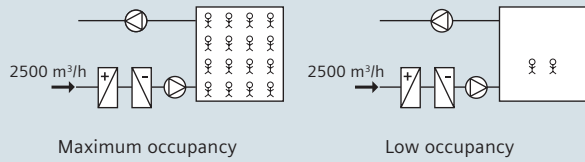
Demand-controlled ventilation can be achieved by various means, the most effective of which is by determining indoor air quality by the amount of CO₂. Further, there may be additional sources of odors. New furniture, carpeting, paint, office equipment, smoke, or other processes may add contaminants that overwhelm the designed ventilation or occupants' perceptions. VOC sensors will likely detect these unusual odors.

* VOC: Volatile Organic Compound (mixed gas)

Answers for infrastructure.

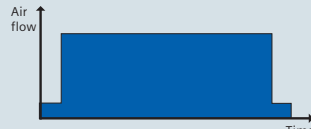
The principle of demand-controlled ventilation

Without demand-controlled ventilation



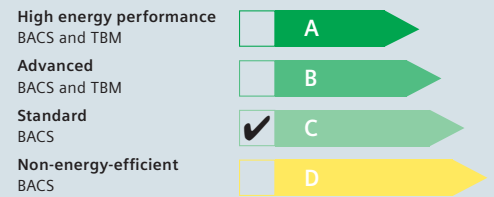
Energy consumption

Without demand-controlled ventilation

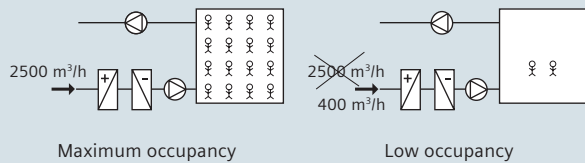


BACS efficiency classes – EN 15232

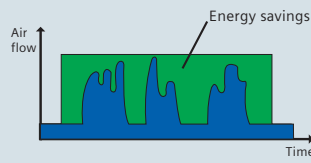
Without demand-controlled ventilation



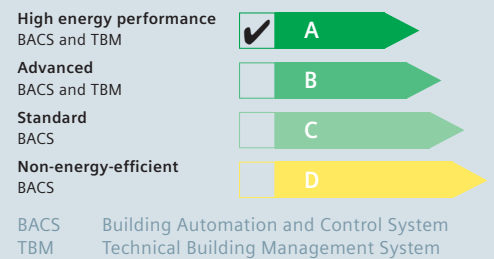
With demand-controlled ventilation



With demand-controlled ventilation



With demand-controlled ventilation



Buildings suitable for demand-controlled ventilation applications with most energy saving potential

Demand-controlled ventilation has the most energy saving potential in buildings where occupancy fluctuates during a 24-hour period, is unpredictable, and peaks at a high level.

Examples are:

- Movie theaters, entertainment and night clubs
- Auditoriums, schools and sport halls
- Restaurants, canteens and cafeterias
- Office buildings, government facilities
- Hotels and convention centers
- Retail stores and shopping malls

Benefits of demand-controlled ventilation

- Cost savings through energy savings
- Improved comfort and healthy indoor environment: Demand-controlled ventilation prevents under ventilation that results in poor indoor air quality
- Cost-efficient solution thanks to retrofit ability in installed base: Demand-controlled ventilation can be used on existing, fully operational electric HVAC systems

Highlights

- Energy savings due to lower power consumption of the fan and reduced heat losses of the ventilation system
- Enhanced room comfort owing to optimum fresh air supply and lower fan noise levels
- Cost-efficient solution thanks to retrofit ability in installed base