Only as much as necessary, not as much as possible

DCV solution for demand-based ventilation

BELIMO AUTOMATION AG The DCV technology (Demand Controlled Ventilation) measures the conditions in a room and calculates the amount of air actually required. It is applied to regulate the fans according to the demand. Devices used are sensors and control devices for CO_2, VOC, temperature and so on. The required air volume is supplied to the room by precise volumetric flow controllers.

Performance adjustment of the fans via the ventilation system's actual demand

Efficient fan control is a vital part of a DCV system. Next to variable speed drive-controlled fans, EC fans are increasingly being implemented. To adapt the fan power made available to the ventilation system, the DCV system must gauge the ventilation system's requirements and set a suitable setpoint.

In a pressure feedback Fan Optimiser system, only as much pressure as required is produced to transport the current volume through the air duct system. The goal is to operate the system with the least pressure loss.

The Fan Optimiser function permanently monitors the damper positions of each VAV box. If the dampers eliminate the surplus of supply pressure, this pressure will be lowered – in contrast to the pressure-controlled systems where the supply pressure corresponds to the full load operation and thus not as much as possible.

System design of a pressure feedback Fan Optimiser system

If the system is configured as a bus system, or if a bus system is already installed, then there are basically no additional hardware costs. The volumetric flow controllers VAV-Compact KNX are integrated via KNX TP and the damper blade positions are evaluated by the Fan Optimiser application. The optimisation is calculated separately for supply and extract air and requires an opening angle of 80–90 %.

Bus-capable volumetric flow controller VAV-Compact

Potential savings – Case study

For a comparison in an office building the Fan Optimiser application was programmed into a DDC controller. The VAV controllers are connected to the DDC controller by bus communication. In addition to the Fan Optimiser, the system also has a conventional duct pressure control for taking comparative measurements. Either control function can be selected in order to compare the two strategies under identical operating conditions.

The measured current difference on the chosen day was an impressive saving of 64 %. Over the course of a year the savings would probably lie between 20 % and 50 %, depending on the system and the partial load conditions.

Fields of application

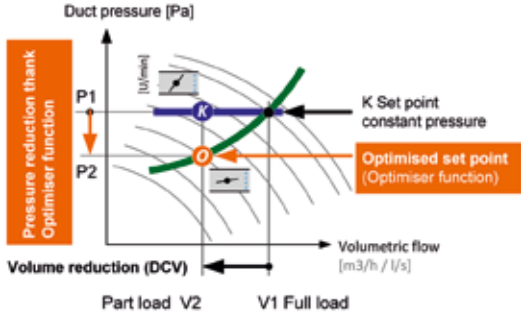
- VAV system in office buildings, hotels, hospitals, etc.
- Variable volume systems for controlled residential ventilation

Benefits of a Fan Optimiser system

- Compliant with EN 15232, Class A
- No reduction in comfort
- Compensates for design errors
- Easy commissioning, finds its own operating point automatically
- Energy-optimised, minimal pressure loss
- Reduced noise, thanks to lower duct pressure
- Short payback time, low operating costs

Contact: www.belimo.eu

Operating points on the fan characteristics



Design of a Fan Optimiser application