

*NuAire's new Smart Sqrbo system offers many fully automatic supply and extract options for ventilating smaller rooms.*

## Practical application of demand ventilation

# High Indoor Air Quality with Minimum Energy Costs

A random pattern of occupancy makes ventilation more difficult: the control system must be able to detect when ventilation is needed and to what extent. To ensure a cost-effective supply of fresh air, NuAire fitted its Smart Sqrbo system with Vaisala's CARBOCAP<sup>®</sup> carbon dioxide transmitters.



*When the air starts to get stuffy, Vaisala's GM20 carbon dioxide transmitter and occupancy sensor alert the ventilation system.*



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**T**he current vogue for large open plan offices has created a need for many other smaller rooms for activities such as meetings, briefings, appraisals, training sessions, etc. These areas are notoriously difficult to ventilate effectively because of their random pattern of occupancy. The time that the room is occupied and the number of occupants can vary significantly. How then can we design a ventilation system to cope with fluctuating demand?

### **A simple solution... and one that is even better**

One simple method is to rely on a manual on/off switch and a speed control to alter the ventilation rate. The problem with such systems is the difficulty of matching the fan speed with the conditions and the number of occupants. These systems, moreover, are often left running in an empty room. The result is usually one of two extremes: unhealthy stuffy conditions or too much ventilation, which is a waste of expensively heated or cooled air.

The best solution is to fit a ventilation control system that will turn itself on and off and automatically adjust the speed to match the level of occupancy. Efficient fan and motor combinations are important, but it is much more sensible and effective to switch off the fan or reduce the ventilation rate to match demand. Turning the fan down to half speed, for example, can cut the motor's power consumption by up to 87 per cent. Add to this the savings that result from heating or cooling half the amount of make-up air, and the results can be staggering.

### **NuAire's Smart Sqrbo system**

NuAire's Smart Sqrbo demand ventilation system incorporates a temperature sensor, an occupancy sensor and Vaisala's GMD20 carbon dioxide transmitter. All these sensors are used to determine the level of ventilation necessary to keep the air fresh.

Vaisala carbon dioxide transmitters were selected because of their stability and long life.





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The NuAire Group produces one of the world's widest ranges of ventilation fans and equipment, from domestic bathroom and toilet extract fans to large commercial/industrial units. The company is also a market leader in condensation control equipment for public housing, and has developed an industry leading range of ventilation controls for the commercial sector. NuAire currently has customers in over 25 countries worldwide. Located in Caerphilly, South Wales, United Kingdom, NuAire has about 300 employees.

Stability minimizes the need for calibration and maintenance, helping to reduce the total operating costs of the system.

The fan action is directly controlled by the sensors. When the occupancy sensor detects people in the room and the carbon dioxide level starts rising, the fan switches on, supplying the right amount of fresh air to the room. This prevents the rooms from becoming stuffy and provides healthier conditions for the occupants. Since the fan is used only when needed, this eliminates excess energy consumption.

NuAire's experiences with Vaisala instruments have been good. So far, we have installed ten systems with Vaisala sensors, and they have measured up to our expectations. All the transmitters are working fine. ■



The Ski Tunnel has attracted skiers from all over the world.

## Never-Ending Winter

In the Huurre Ski Tunnel in Finland, optimal conditions are always guaranteed. Vaisala transmitters play an important role at this indoor ski track, continuously measuring the prevailing humidity, temperature and carbon dioxide levels.



The housing of HMP140 transmitters provides IP65 protection from dust and sprayed water, so these are suitable instruments for humid spaces and outdoor installations.

**T**he Vuokatti Ski Training Center is located in central Finland. Skiers from all over the world come here to train – even in the summer time. The main attraction is the 1.2 km Ski Tunnel, which has a 2.4 km natural snow surface ski track. With curving trails and hills, the conditions are similar to natural outdoor ski trails in every respect.

### Winter conditions guaranteed

The winter weather conditions in the tunnel are optimal – there is snow and fresh air, but it is not too cold. Because the conditions are stable, weather-related risks and inconveniences are not a factor. An advanced ventilation system provides humidity control and good air quality. Humidity, temperature and carbon dioxide levels are measured with