

Intelligent flow sensor for demand-controlled ventilation

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VTT Technical Research Centre of Finland and Fläkt Woods Oy have developed a flow sensor that enables ventilation to adapt to actual demand, thereby improving indoor air quality and energy efficiency. The flow control utilises a flow sensor, based on ultrasound, which is ideal for use in challenging hospital conditions and schools, for example.

Existing [ventilation](#) systems are based on estimated average occupancy rates and cannot adapt to unexpected changes. For example, the air can be poor in a meeting room due to inadequate ventilation if more than the expected number of occupants arrive; conversely, the ventilation can be humming away in an empty room, wasting energy.

Under the ULVI joint project, VTT and Fläkt Woods have developed a new flow sensor that enables reliable measurement across the entire speed range, even at low flow rates. The system does not require dirt gathering or bulky measuring devices. This maintenance-free, intelligent sensor solution does not cause pressure drops.

"Our [flow sensor](#) is based on ultrasound technology. An ultrasound pulse is transmitted in the radial direction of the air channel and is measured differentially. This measurement system enables us to eliminate several sources of error and obtain highly accurate measurements," says Anu Kärkkäinen of VTT, who is leading the research team.

"The new [flow](#) controller allows just the right volume of air to be pumped into a room, based on the current load. The overall life-cycle

costs of a property fall when the ventilation works precisely and is demand controlled," says product manager Timo Kaasalainen of Fläkt Woods. "Demand-controlled ventilation reduces energy costs by 45 to 50 percent," he says.

The product will be launched on the Finnish and Swedish markets first, in September.

"The ULVI project is a good example of the cost-effective application of technology to a new area. VTT has been developing silicon-based MEMS (Micro Electro Mechanical System) [sensors](#) since the '90s, and we now have a strong basis for meeting the measurement technology challenges faced by companies," says Kärkkäinen.

Provided by VTT Technical Research Centre of Finland

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