Aereco Demand Controlled
Mechanical Exhaust Ventilation system

The same performance as an 80% heat recovery system for a very lower cost[1]

2010 study

Two ventilation systems compared

A study conducted in 2010 by the Fraunhofer Institut Bauphysik[2] has consisted in simulating two ventilation systems on a single-family house: on one hand, the Aereco demand controlled (humidity controlled) exhaust system which varies the air changes depending on the humidity room by room and, on the other hand, a standard supply and exhaust system with a constant air change rate of 0.4 ACH, an integrated heat recovery and an additional electrical preheating device. The heat recovery efficiency of this unit is of 93% (data from manufacturer). The comparative calculations has been carried out for both ventilation systems for a new built house with high insulation (according to DIN V 4108-6:2003 and DIN EN 12831-Bbl. 1) with a heated and ventilated living area of 205.6 m^2 and a ventilated volume of 534.6 m^3. The heat transfer coefficient of the outside walls is 0.25 W/m^2K, with the roof at 0.18 W/m^2K and the ground floor at 0.7 W/m^2K. The windows have a U-value of 1.1 W/m^2K. The reference chosen for the cold region in Germany is the city of Hof. The indoor temperature is 20° C.


Fraunhofer

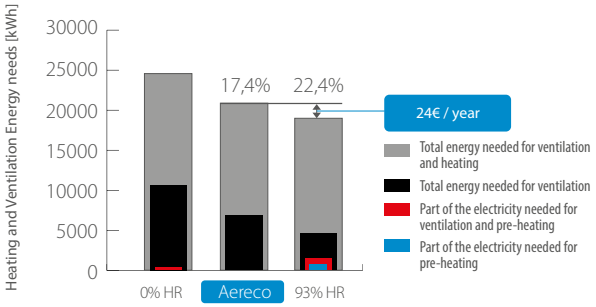
Calculation of the energy demand of a supply and exhaust system with heat recovery compared to a demand controlled (humidity controlled) exhaust system in a single-family house

Study realised by the Fraunhofer Institut Bauphysik in Germany (reference IBP-Bericht RKB-032-2010-292: **«Calculation of the energy demand of a supply and exhaust system with heat recovery compared to a demand controlled (humidity controlled) exhaust system in a single-family house.»**

Detailed study available on request.

A very low gap in energy consumption

The study has shown that the difference in total energy demand for ventilation (heat + electricity) between the two ventilation systems is about 1220 kWh per heating period, i.e. only 24 € [3]. This extra cost remains very low in comparison with the one of the annual filters change, which is compulsory on the HR units to maintain their level of performance.



Total energy consumption of several ventilation systems

[1] Price comparison based on a «standard» Aereco MEV system vs a standard heat recovery system, products + installation.

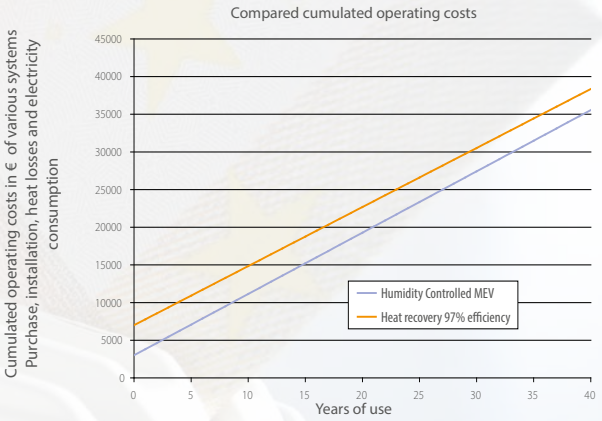
[2] Located in Germany, the Fraunhofer Institute for Building Physics IBP deals with research, development, testing, demonstration and consulting in all fields of building physics.

[3] Considering an air change of the supply and exhaust ventilation system n =0.4 ACH. The energy costs are set to 0.07 €/kWh for heating (oil and gas) and to 0.22 €/kWh for electricity.

AERECO

Aereco DCV remains the best cost efficient solution in the long run

In the long run, **the initial extra cost of the heat recovery (supply and fit) in comparison with the Aereco demand controlled MEV is never paid back even without taking the required annual filters change into account.** The very low energy cost difference (24 € per year) is negligeable in comparison with the quite important investment cost (system plus installation) for the heat recovery.



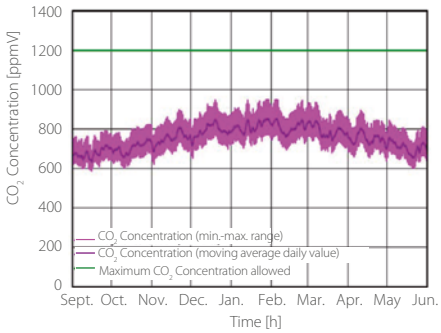
Cumulated operating costs and R.O.I. of the two compared ventilation systems
Assumption: 1 kWh = 0.04 €

More environmental benefits

The energy performance of the Aereco Demand Controlled MEV system is reinforced by the fact that its single fan consumes less electricity than the two fans with preheating of the heat recovery system.

With a PE-factor of 2.7 [5] for electricity, **the impact on the primary energy -then on the CO_2 emissions- is favorable to Aereco Demand Controlled MEV for the part of energy due to system consumption.**

Optimal Indoor Air Quality



This study has also demonstrated that, in real occupation conditions, Aereco Demand Controlled MEV system offers excellent results in terms of IAQ, as it enables to stay below the limit of 1,000 ppm CO_2.

Daily variation of CO_2 inside the dwelling.

More savings and flexibility with Demand Controlled Ventilation

Rather than recovering part of the heat from extracted air based on a high constant airflow, the demand controlled exhaust ventilation proposes to decrease the airflow when the need is low, or to increase it when the needs are more important. This principle offers numerous benefits:

- **A high level of energy savings** (up to 50% compared to a fixed single flow ventilation, at equivalent air quality).
- **Perennial energy savings** throughout the building's life. Based on a simple mechanism without electricity, it does not need special maintenance, and its performances do not decline over time.
- **A reduced dimensioning of the network,** because it can take into account the time-repartition of needs for airflows.
- **A very easy adaptation for refurbishment,** without the need to create new ducts for air supply.
- **An obvious economic viability,** because its installation cost is as low as the one of constant MEV.
- **A known, light and not critical maintenance.** Because the system is simple, it doesn't need the cleaning of components like exchanger, filter and resistance.
- **A possible combination with the widely used techniques** like passive stack, hybrid or mechanical ventilation.

(5) PE = coefficient of primary energy for electricity, value for Germany.

AERECO

62 rue de Lamirault – Collégien – 77615 MARNE LA VALLEE CEDEX 3 – FRANCE
tel. +33 1 60 06 26 63 – fax +33 1 64 80 47 26 – www.aereco.com

FLV528GB_v2