80% for half the cost

Aereco Demand Controlled Mechanical Extract Ventilation system

nearly the same performance as an 80% heat recovery system[1] **for half the cost**[2]


Fraunhofer Institut Bauphysik

IBP-Bericht RKB-12-2008

Berechnung des Primärenergiebedarfs einer Zu- und Abluftanlage mit Wärmerückgewinnung im Vergleich zu einer bedarfsgeführten (feuchtegeführten) Abluftanlage

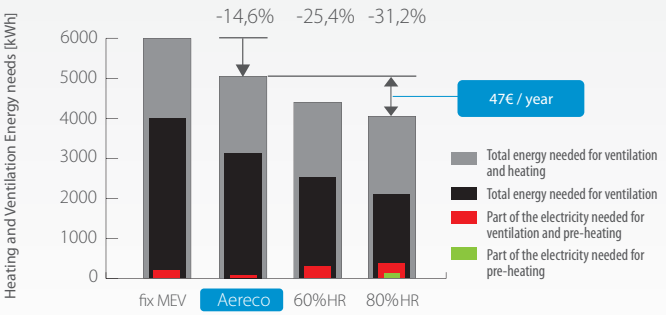
Durchgeführt im Auftrag
Aereco GmbH

[1] According to a study realised by the Fraunhofer Institut Bauphysik in Germany (reference IBP-Bericht RKB-12-2008 : «**Calculation of the needs in primary energy of a supply and extract fan with heat recovery in comparison to a demand controlled mechanical extract fan (based on humidity sensors).**»

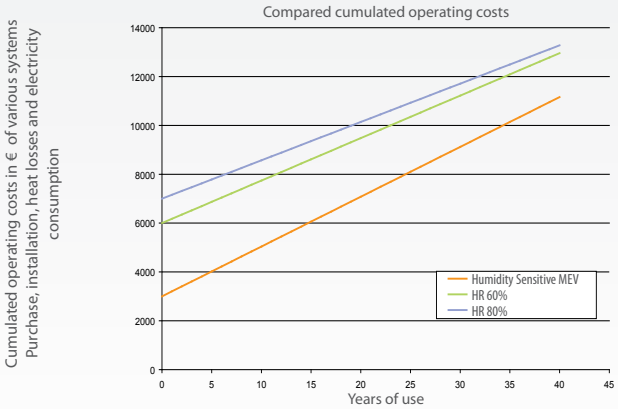
Detailed study available on request.

A clear saving

A study conducted in 2008 by the Fraunhofer Institut Bauphysik[3] has shown that the Aereco Demand Controlled MEV system was generating only 1070 kWh extra consumption per heating period than an 80% heat recovery system -equivalent to only 47 €-, in the conditions of the study[4]. This represents much less than the cost of the annual filters change which is compulsory on the HR units to maintain their level of performance (graph n.1).
In the long run, the initial extra cost of the Heat Recovery (supply and fit) in comparison with the Demand Controlled MEV is never paid back even without taking the required annual filters change into account (graph n.2):



graph n.1 – **Total energy consumption of various ventilation systems**
Assumption: 1 kWh electricity = 0.19 € ; 1 kWh Fuel or Gas = 0,07 €



graph n.2 – **Operating costs and R.O.I. of various ventilation systems**
Assumption: 1 kWh = 0.10 € +VAT

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

[3] Located in Germany, the Fraunhofer Institute for Building Physics IBP deals with research, development, testing, demonstration and consulting in all fields of building physics. These include energy saving measures, problems of indoor climate, emissions of building materials, moisture and weathering protection and preservation of buildings and historical monuments. The Institute is responsible for the development of new building materials, components and systems. The Institute is an officially licensed authority for the approval of new building materials and types of construction in Germany and all over Europe.

[4] Study realised on a 75 m² apartment occupied by 3 persons. Indoor temperature = 21°C; U-Value = 0.25 W/m².K

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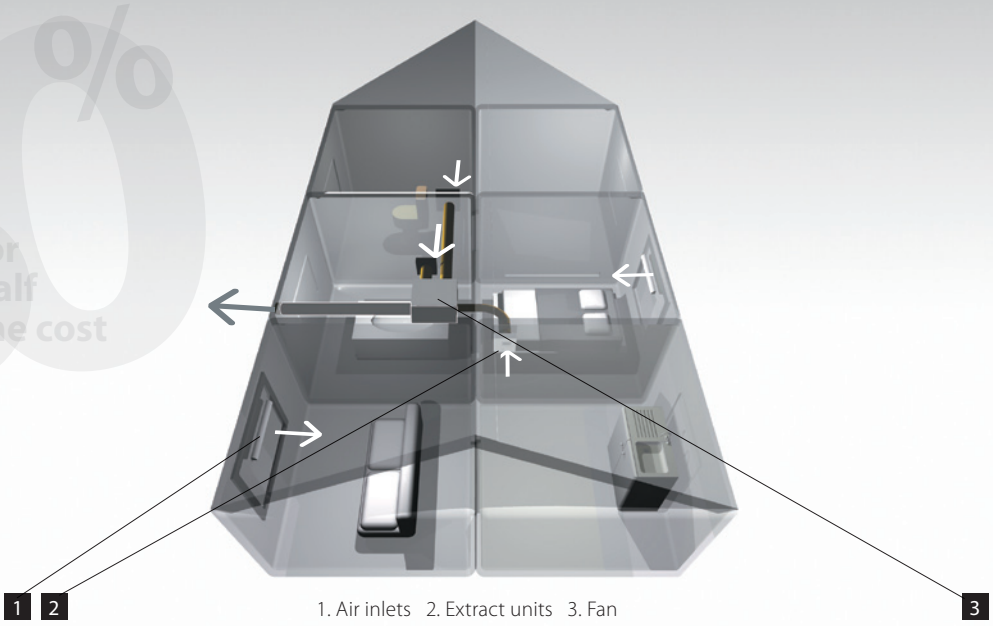


1. Air inlets 2. Extract units 3. Fan

Working of the Demand Controlled Mechanical Extract Ventilation system

The air renewal is ensured by a single fan (which can be placed in a cupboard or a ceiling void to enable easier maintenance). Connected to the fan, the extract units located in the wet rooms determine the air renewal of the whole dwelling. Humidity sensitive air inlets control the distribution of the fresh air according to the needs of each main room.

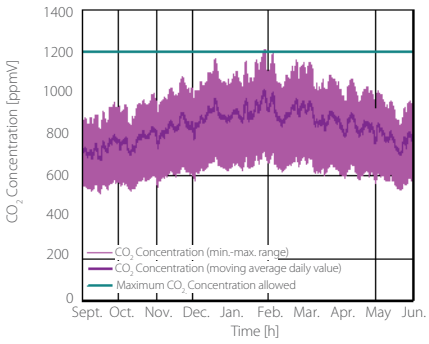
Humidity sensitive or presence detection extract units distribute the available airflow generated by the fan according to the needs of each wet room.

So rooms with high requirements in fresh air dispose of a greater pressure and airflow than the empty rooms.

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] the impact on the primary energy -then on the CO_2 emissions- is favorable to humidity controlled ventilation for the part of energy due to system consumption.

Optimal Indoor Air Quality



This study has also shown that, in real occupation conditions, Aereco Demand Controlled MEV system is an excellent way to stay below 1,200 ppm CO_2, which guarantees an optimal Indoor Air Quality in the dwelling (graph n.3).

graph n.3 – **Daily variation of CO_2 inside the dwelling.**

More savings, less constraint using the humidity sensitive ventilation

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

- **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 single flow ventilation.
- **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.
- **Existing simulation tools to assess its energy performance** for different dwelling, weather, and occupancy configurations.

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

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