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## Fully Automatic, Decentralised Ventilation System with Heat Recovery

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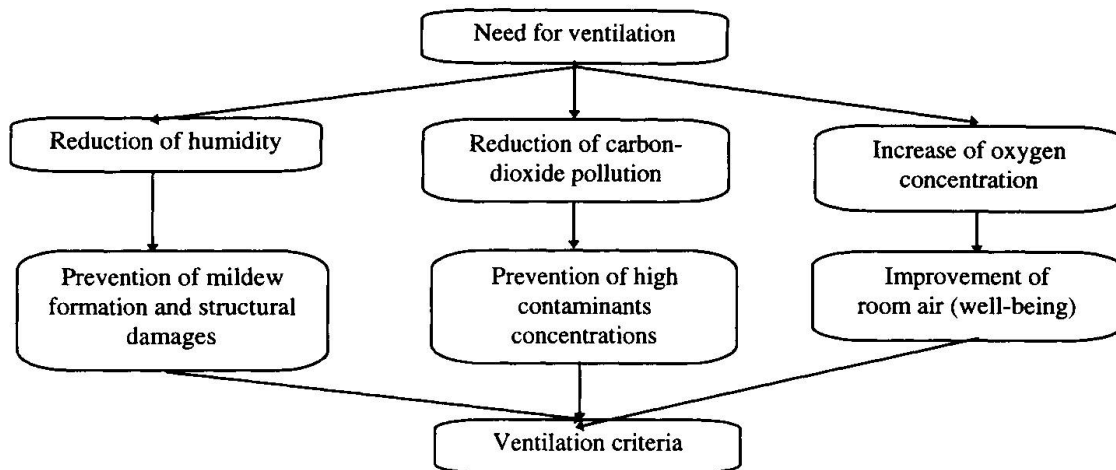
### 1. Need for Ventilation

Almost all flats in the Federal Republic of Germany are ventilated by opening the windows. Free ventilation can only hardly fulfil the demand for sufficient air quality as well as for energy-saving ventilation. No air exchange corresponding to the demand can be reached with free ventilation. In some cases, there is too much ventilation (e.g. windows that are permanently in the bottom-hung position). On the other hand, there are cases in which ventilation is too low. The damages arising therefrom are defrost water scale and mildew formation. Apart from the visible damages an enrichment of unhealthy contaminants takes place from building materials and from chemicals being used at home (e.g. detergents and cosmetics, glues).

Each kind of free ventilation is uncontrollable, because the air exchange depends on wind and thermic drive conditions.

In the Federal Republic of Germany, roughly a third of the whole energy consumption is applied on heating private households.

Due to the growing heat insulation standard, the losses of ventilation heat are very much increasing in relation to the transmission heat losses (see chart: comparison of heat losses). These energy losses can be reduced considerably in case of being constantly used today with the market of available equipment. In the demand for ventilation heat there is a remarkable potential for saving energy in the future. If there will be a building with good thermal insulation, the **demand of ventilation heat** can amount **up to 50 per cent** of the whole heat demand.



## 2. Health

Today, the subject matters 'outdoor air', 'room air' and 'health' belong inseparably together. Thus the number of people suffering from allergies is growing from year to year in an alarming manner. Numerous environmental influences cause for many people partly grave health troubles. But here, in particular, many dangers are looming up.

Due to the continuous air exchange of the system THERMO-AIR the allergens are reliably removed through special filters and - depending on the individual requirements - both from the existing air and the fresh air which is delivered from outside. In a clean condition the air is taken to the room. And the system works in a decentralised manner. Thus the corresponding rooms can be equipped with THERMO-AIR individually and according to one's own requirements.

## 3. Structural Defects

Not only the ventilation of old buildings, above all, the mode how to deal with ventilation and heating of modern buildings, rises increasingly bigger problems for room hygiene. Caused are these complications by too small an air exchange often prevailing in such rooms. The untightness of doors and windows felt to be a defect in former years, however, had a decisive advantage: it provided a continuous forced-air ventilation of the rooms. Waste air and the resulting air humidity were steadily removed to outside. This type of forced-air ventilation is practically not existent any longer, because modern door and window systems are employed. In inner rooms more air humidity is coming up as, for instance, by human breathing, by water vapour from bathroom and kitchen, by plants, etc. This humidity, however, cannot be taken off to the outdoor air sufficiently owing to the low air exchange. The moisture precipitates on exterior walls and ceilings. Damages caused by moisture, mildew and mould are coming up. The result is a considerable demand for rehabilitation in most cases. The system here ensures a permanent air exchange, thus creating a healthy room climate. It is indeed a reliable protection against moisture-conditioned damages and fungal invasion. Moreover, modern systems have to fully guarantee sound control.