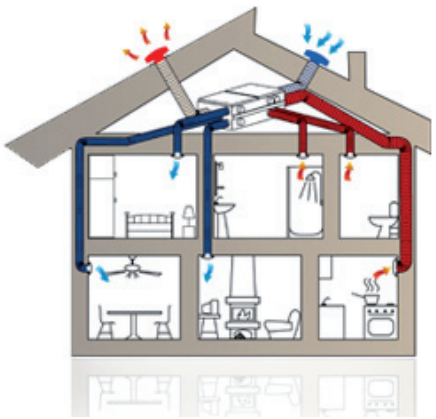
Fresh, cool and well moisturized air in your house - it is possible.



"Home" is usually associated with friendly atmosphere and comfort. The crucial factor influencing the comfort of the inhabitants is air. When we breathe it in and out everyday, it is easy to forget that it exists. Any problems with air exchange usually surface when we discover the stale odor usually associated with damp - or on the contrary, when the air is too dry and we can feel fatigue and dry eyes or throat.

Rising prices of energy and heating solutions force persons who plan building or refurbishing a house to seek for savings wherever possible. To this end, we use increasingly better materials with regards to their air-tightness and insulation parameters. In effect, the buildings become tighter, which does not allow for proper air exchange.

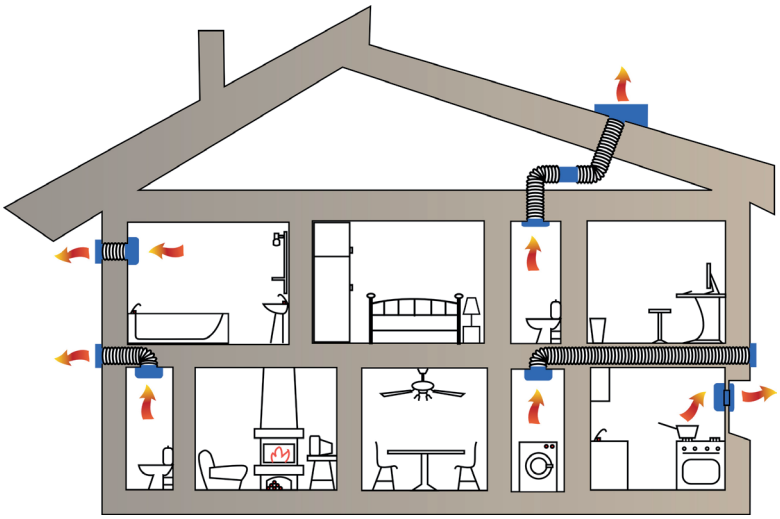
The air in the rooms collects various impurities, such as carbon dioxide, dust, pollen or steam. Excess water condenses on the walls causing dampness, which leads to the development of mold and fungus.

To ensure proper air exchange, a ventilation system is needed. The decision to install a ventilation system is to be made at the design stage for the planned house or refurbishment.

Ventilation systems can be divided into mechanical, natural and hybrid - which combine the two former types.

Natural ventilation

Usually, house ventilation utilizes natural convection - lighter, warmer air on the inside is forced away by the cooler, damper air from the outside. The exchange happens via the grilles and ventilation holes in doors and windows installed in kitchens or bathrooms. Using air-tight windows disrupts the natural air exchange process.



Ilus. nr 1
Natural ventilation

Problems may arise in winter when temperature difference may be too high, which may cool the interiors down too much, or in summer, when the temperatures inside and outside are similar, virtually halting the air exchange. This issue may be solved by opening the windows frequently, although it may not be enough to maintain the desired level of humidity.

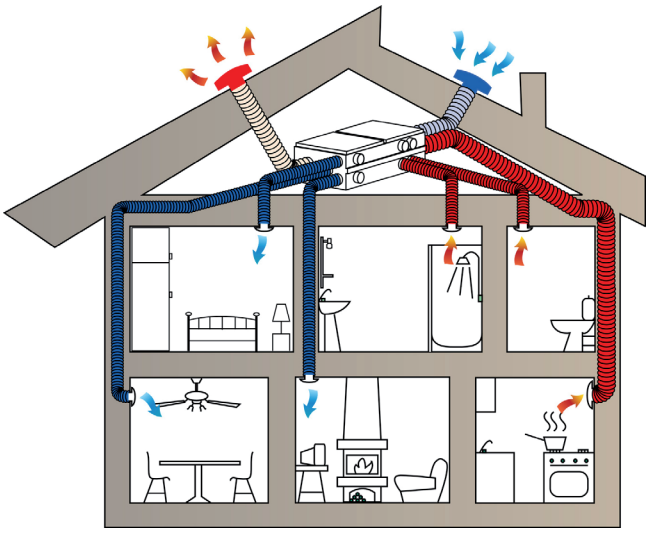
Ilus. nr 2
Chrome-Nickel Wall-Mounted Air IntakeExhaust Air Ejector UVLA

Ilus. nr 3
Chrome-Nickel Ventilation Cap Supply and Roof Valve KCN

Mechanical ventilation

To facilitate more effective air exchange, intake and intake-offtake mechanical ventilation systems are used.

Is it worth it? Definitely yes. The possibility to control the intensity of interior airing depending on what we do or how many people are present in the room considerably improves the comfort of the inhabitants and guests. The intake air flow should be balanced with the amount of offtake air from the interior. Mechanical ventilation systems allow to adjust these parameters.



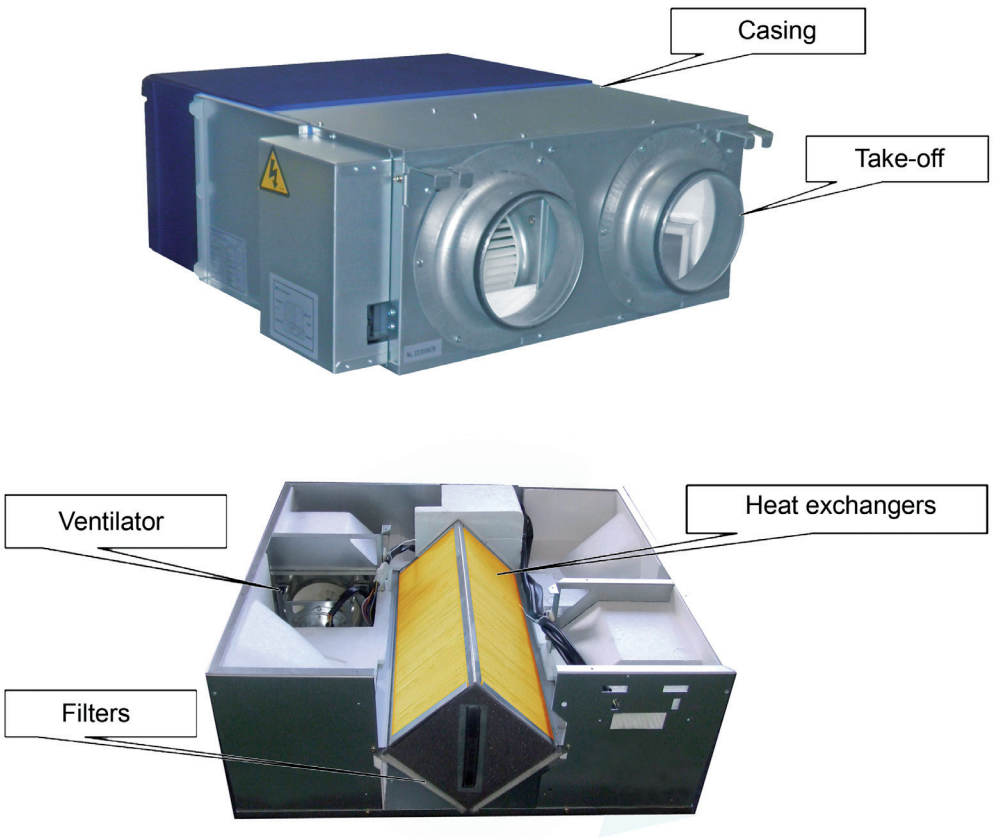
Ilus. nr 4
Mechanical ventilation

This solution has many advantages. Air movement is caused by the ventilator fan. Intake air may be filtered to limit the amount of pollen and other impurities. Due to the fact that tight windows are used, it is possible to fully muffle the sounds coming from the outside. The ventilation system itself causes no noise indoors - special silencers and acoustic insulation fully muffle any sound which may have been caused by the flowing air. The heart of the entire ventilation system in this case is the recuperator unit - contrary to the now obsolete, obstructed chimneys, this modern device allows to maintain a comfortable climate indoors.

Recuperator unit ensures comfortable climate and savings

Recuperator unit is where the intake and offtake air flows connect, but do not mix. Due to the heat exchanger inside the recuperator unit, expelled air gives off its heat and moisture to the supplied air. This is particularly useful in winter, as heat exchangers cut down the required amount of energy to keep the air warm, it also is more moist despite being dried by the heating system.

Outside the heating season, mechanical ventilation may be assisted by opening the windows frequently. This causes the ventilator units to engage less frequently, which saves energy.



Ilus. nr 6
Schematics of HRU-ECCO recuperator unit

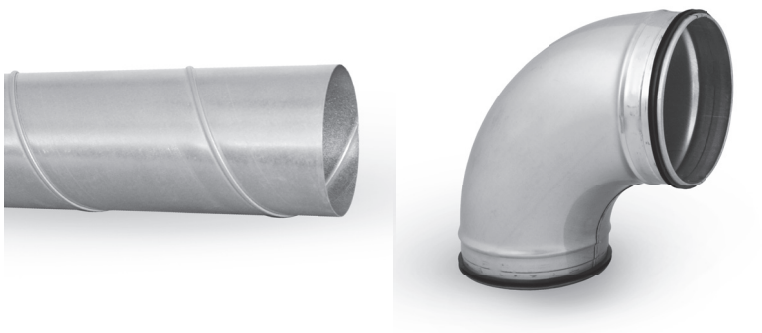
Hybrid ventilation

Hybrid ventilation joins the features of natural (gravitational) and mechanical ventilation systems. This is usually achieved by installing a special chimney cap with a ventilator fan fitted inside. When there is a sufficient air flow, the ventilation operates following the gravitational principle, when the air flow gets weaker, the ventilator fan is turned on to force the air current.

Ilus. nr 7
Chimney cowl

The best solution

The best solution to optimize the air exchange is to lead separate intake and offtake ducts to each room in the house. Grilles or intake and outtake valves may be located close to each other. This allows to facilitate proper air flow to each room, accounting for their size, intended use and the number of people present.



Ilus. nr 8
Typical ventilation components - round ventilation duct SPR and pressed bend BPL-90

This solution may be problematic, due to the large number of air ducts which are to be distributed along the house. This calls for a special installation, fitted with all the required piping, elbows, shapes, grilles, air intakes and roof fittings The recuperator unit completes the set.

There are many other possible solutions - for example, cascade ventilation, or using only outtake ducts - from kitchens and bathrooms, with no air intakes. However, neither of the alternatives offers the same amount of comfort as fresh air supply and foul air outtake directly to each room.

Ventilation system maintenance

To ensure that the ventilation system operates properly, it is required to tend to its hygiene.

For natural ventilation systems, it is required to install cleaning holes at the bottom of the ducts as well as the access hole to clean the chimneys.

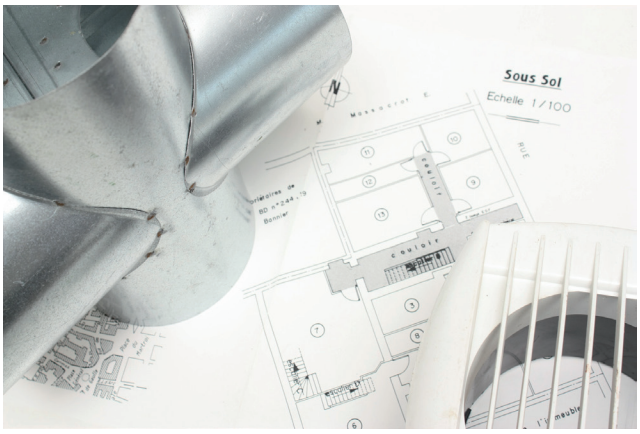
Ilus. nr 9
Access door IPR for round ventilation ducts

For mechanical installations, it is required to ensure proper access for cleaning robots. Special access hatches and other accessories - clamps, elbows, flanges can be mounted to facilitate this. Ducts should be checked no less frequently than once per year and cleaned when necessary.

Ventilation systems, is it worth to install them?

Ventilation system allows constant supply of fresh air to the interior. This shouldn't be underestimated, as good ventilation has an effect on our mood and health. Despite the fact that fitting the building with a mechanical ventilation system is an expense, let's not forget that it is an investment to improve the health and comfort of the building inhabitants.

If the installation is well made and properly cleaned, it will last for a long time. Utilizing the recuperator unit allows to reduce heating costs, which means the investment pays off in the long term.



Ilus. nr 10

The requirements for ventilation are specified in docement: PN-83/B-03430 Ventilation in collective residential buildings and public buildings. Requirements. Changes: PN-83/B-03430/Az3: 2000

As per the Building Law Act, the minimum amount of air removed from the room required is as follows:

- 70 m^3/h – kitchen with gas cooker,
- 50 m^3/h – kitchen with electric cooker,
- 50 m^3/h – bathroom,
- 15 m^3/h – rooms without windows,
- 30 m^3/h – living areas away from the kitchen or bathroom.

It is required to ensure fresh air supply to take place of the removed air. The figures above constitute an impassable minimum value.

By means of a ventilation system, it is possible to achieve the desired values and match the air exchange frequency to one's individual requirements.