

Basic knowledge

Ventilation systems and their components

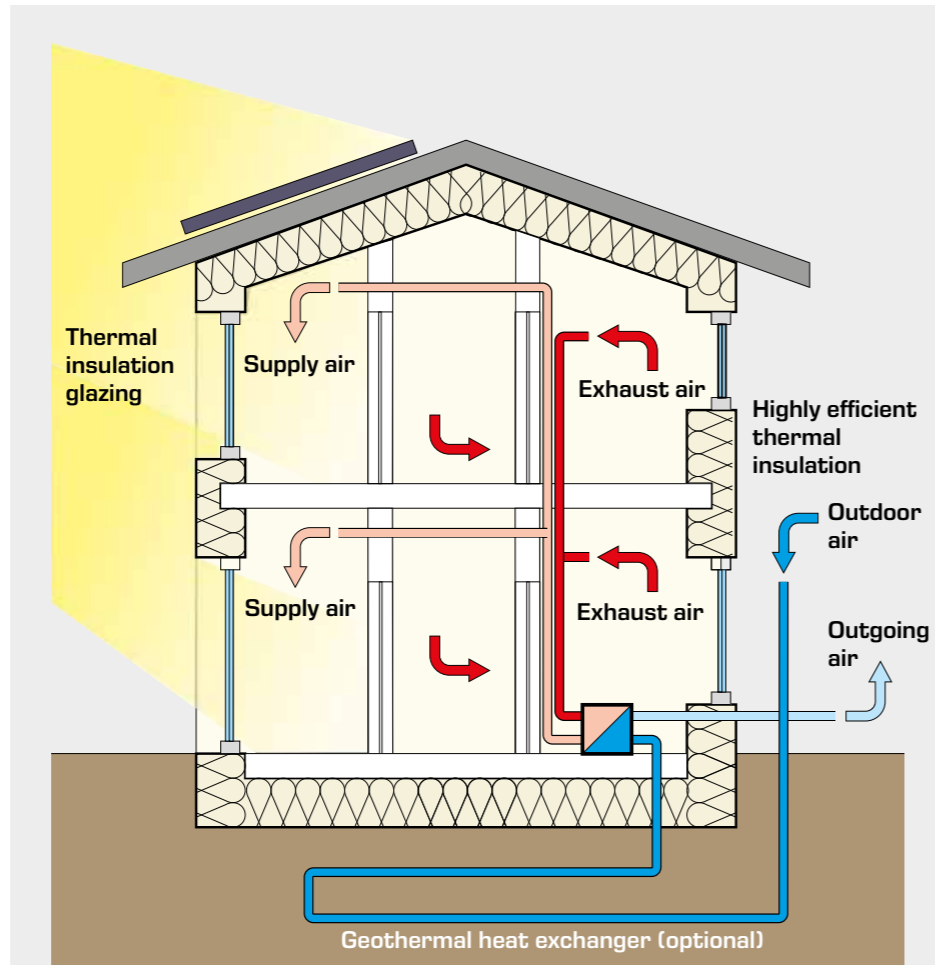
Ventilation systems ensure the change of air in residential, office and equipment rooms.

Ventilation systems are not only concerned with air supply and exhaust, but also with the consideration of **thermal energy**: sophisticated ventilation systems can transfer the heat of the outflowing air to the incoming air, so that hardly any thermal energy leaves the system.

There are basically three types of system:

1. exhaust air system: the "used" air from the building is expelled to the outside (outgoing air)
2. ventilation system: in addition to the exhaust air system, a supply system supplies fresh air to the living areas
3. different techniques that target the saving of heating energy, e.g. via heat recovery or geothermal heat exchangers

These systems are grouped together under the term controlled residential ventilation. Non-controlled ventilation of living space, on the other hand, is the free ventilation of living space by means of window ventilation, joint ventilation or shaft ventilation.



Ventilation with heat recovery

- **outside air:** air drawn in from the environment,
- **outgoing air:** air released into the environment,
- **supply air:** air entering a room or facility after it has been treated, e.g. by filtering or heating
- **exhaust air:** air leaving a room



The design of ventilation systems requires knowledge of fluid mechanics, e.g. the characteristic variables of fans and the pressure losses of pipe elements. GUNT's **product area 4 Fluid mechanics** deals with these aspects.

Heat recovery ventilation

Processes in which the residual heat of a mass flow is used after its primary use are referred to as heat recovery. The heat gained in this way would otherwise be wasted without heat recovery. Heat recovery can be used to reduce the primary energy consumption for heating buildings.

Ventilation systems with heat recovery are state-of-the-art today. For heat recovery, heat exchangers are built into the supply and exhaust air ducts of the ventilation system. They utilise the temperature difference between exhaust air and fresh air and can be operated according to demand. The thermal energy of the outgoing air is used to heat up outside air in winter and cool it in summer.



Ventilation system: in addition to the exhaust air system, a supply system supplies fresh air to the living areas.