

Why you breathe better in a Passivhaus home: the heat-recovery ventilation that renews the air 24 hours a day

The clean, stable air of a Passivhaus home is no accident: it comes from a mechanical ventilation system with heat recovery that works quietly and continuously.

Walking into a Passivhaus home with every window closed and still sensing fresh, clean air surprises almost everyone. That impression owes nothing to chance or to an air freshener. It is the result of a ventilation system that renews the indoor air continuously, without the occupants having to intervene. At PAPIK Group this installation is standard in every Eskimohaus home, and it explains much of the comfort described by the people who live in them.

The real problem: the air inside your home

Many homes have new windows and upgraded insulation yet still hold indoor air of poor quality. According to the World Health Organization, the air inside a home can be two to five times more polluted than the air outside. This means CO₂, formaldehydes and suspended particles breathed in every day without being noticed.

The figure carries more weight when you consider that people spend around 90% of their time in enclosed spaces, much of it at home, often asleep, precisely when the body needs to renew itself. Air quality stops being a technical detail and becomes a matter of health, comfort and well-being. This is where mechanical ventilation with heat recovery and air filtration comes in.

Passivhaus ventilation: renewing the air without losing energy

A Passivhaus home is not merely an efficient home; it is a home designed to protect the health of its occupants. The ventilation system we install renews the air 24 hours a day with no action required from those who live there.

This may seem at odds with airtightness, one of the five Passivhaus principles. Introducing air continuously appears incompatible with a sealed envelope, yet the mechanism holds no mystery: it follows a simple, controlled physical principle.

How it works

— Stale air leaves, carrying CO₂, odours and excess humidity.

- Clean air enters, filtered and free of dust and particles.
- As this happens, the system uses the temperature of the outgoing air to condition the incoming air. Both flows pass through a membrane exchanger where they transfer their temperature without mixing, so the indoor thermal energy is not lost.

The result is equivalent to opening the windows every hour without giving up warmth in winter or coolness in summer.

What sets this equipment apart

Among the units we recommend and install regularly are those from the Zehnder brand, such as the Zehnder Q350, one of the most efficient machines on the market. Its main features are:

- Heat recovery efficiency of up to 96%.
- Ultra-quiet operation, imperceptible in everyday use.
- Sensors that adjust the airflow to the real needs of each moment.
- F7 filters that retain pollen, fine particles and dust, particularly useful for people with allergies.

The system can be controlled from an app or programmed to run on its own, like automatic breathing for the home.

Benefits you notice from day one

Better health

A well-ventilated home reduces the risk of respiratory complaints, allergies and headaches. CO₂ does not build up. The heaviness and fatigue felt at the end of a large family gathering often comes precisely from CO₂ accumulation and the lack of oxygen in an enclosed space.

Greater comfort

With no draughts, no abrupt temperature swings and no condensation or mould, the environment stays stable and balanced. Dust build-up and the condensation common in damp areas such as the shower are also reduced.

More savings

Because the incoming air does not need to be fully reheated, energy use for heating and cooling drops noticeably. It is a home without an energy mortgage.

Greater peace of mind

There is no need to remember to open windows. You can go to work, sleep or spend a weekend away knowing the indoor air stays healthy.

What if you want to open the windows?

A Passivhaus home does not stop you from opening the windows. They can be opened whenever you like. What changes is that ventilation no longer depends on it: there is no need to open them every morning to air the home, nor to worry about the cold or heat coming in.

If one day it feels right to open the windows to hear the birds or let in the fresh morning air, you can do so freely. And when it is cold, raining, or pollen is high, no sacrifice is required: the home already ventilates on its own.

Planning to save

The system involves the cost of the installation and of the equipment, but the benefits in health and energy savings turn that outlay into a worthwhile investment. The key is to plan for it during the architectural design stage: space must be reserved for the unit, which takes up slightly less room than a washing machine, and the routing of the air ducts must be planned.

At the project stage this preparation is straightforward; adding it later to a home that was not designed for it becomes a complex intervention. That is why the [Eskimohaus homes we build at PAPIK Group](#) already include this installation as standard, and the same criterion applies when we undertake a full [energy retrofit](#).

A home that renews its own air is not a technical luxury: it is the quietest way to look after the health of those who live in it.