

MVHR ventilation



mechanical ventilation with heat recovery for Passivhaus and low energy buildings

What is MVHR ?

Mechanical Ventilation with Heat Recovery (MVHR) is an essential part of **Passivhaus** and low energy building design. It allows for sufficient and comfortable ventilation to all areas of the house, whilst minimising the loss of indoor heat. This is achieved by use of a heat exchanger driven by two low energy fans. The incoming air passes the outgoing air through the heat exchanger (without being mixed together) so that energy is extracted from the outgoing air and is put into the incoming air.

Can MVHR work in any building?

Essential for MVHR to run efficiently is the building's airtightness. Although MVHR can be installed in any building, as a rule of thumb its use is best justified – in terms of energy conservation – when the airtightness of the thermal envelope is **less than 3 m³/m².h @ 50 Pa**.

The comfort zone

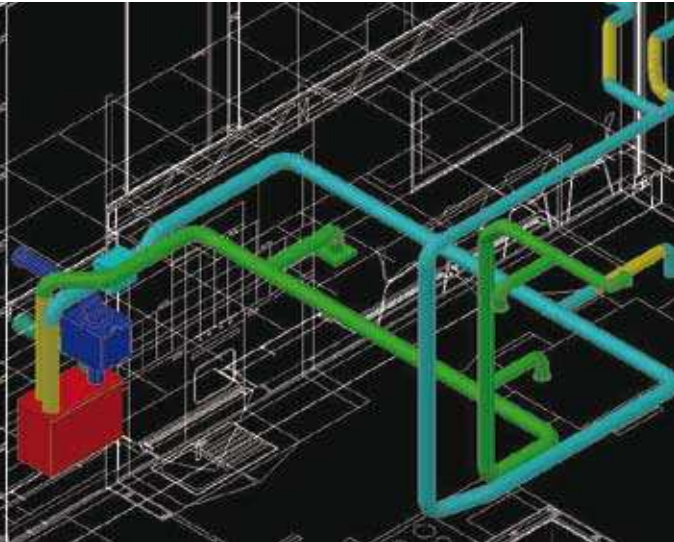
Well designed and correctly installed, a **comfort ventilation system** (MVHR) should be practically **imperceptible** to the inhabitants while ensuring **good air quality** throughout the building.

*There's a pleasant warmth in the air – it's not hot, it's just comfortable. There's also a serenity about a **Passivhaus**, thanks to all the insulation and triple glazing. As for the **MVHR** system – myths about which abound – you would actually have to make a supreme effort to hear it at all. Most importantly we have found that in the extreme conditions of the winter the system has been really tested and has performed very well.*

Geoff Tunstall
owner Denby Dale Passivhaus

Denby Dale Passivhaus, West Yorkshire
Photo: Morgan O'Driscoll

MVHR design service



MVHR is a relatively new technology in the UK and for complete peace of mind we recommend our specialist MVHR design service, to avoid costly and inconvenient changes later on.



Larch House, Ebbw Vale (bere:architects)

Good MVHR design:

- Optimises the efficiency of the heat recovery
- Prevents noise, mechanical vibration and internal turbulence problems
- Maximises energy efficiency of the MVHR unit

- Comprehensive design and support service – from initial plans to commissioning
- Specialists in Passivhaus and low energy buildings
- High performance MVHR units
- High quality rigid steel spiral wound ducting system



Mayville Community Centre (bere:architects)

Green Building Store works with us to carefully design the heat recovery ventilation ducting system to ensure that the system performs at its optimum.
Justin Bere, bere:architects



Lancaster CoHousing Passivhaus development (Eco Arc Architects)

We have had very positive feedback about the MVHR systems from our clients. In fact, the only complaints we have had are that people are worried that they're not on, because the systems are so silent in operation.
Andrew Yeats, Eco Arc Architects



Steel Farm Passivhaus (LEAP: Low Energy Architectural Practice)

Green Building Store is far and away ahead of everyone else in terms of knowledge and expertise in designing and supplying MVHR systems for low energy and Passivhaus projects.
Mark Sidall, LEAP: Low Energy Architectural Practice



Green Base, St Helens (Simmonds Mills Architects)



Retrofit for the Future project, Balham (Prewett Bizley Ltd)

Projects we have designed MVHR systems for:

- Ebbw Vale Passivhaus (bere: architects)
- Retrofit for the Future project, Balham (Prewett Bizley Ltd)
- Gentoo Racecourse project (Devereux Architects)
- Centre for Disability Studies (Simmonds Mills Architects)
- Camden Passivhaus (bere: architects)
- Mayville Community Centre (bere: architects)
- Denby Dale Passivhaus (Green Building Company)
- Grove Cottage, Hereford – first certified UK EnerPHit refurbishment (Simmonds Mills Architects)
- Nottingham Passivhaus Retrofit (Gil Schalom Design)
- Green Base, St Helens (Simmonds Mills Architects)
- Sampson Close (Orbit Housing)
- Lancaster CoHousing Passivhaus development (Eco Arc Architects)
- Steel Farm Passivhaus (LEAP: Low Energy Architectural Practice)

Optional on-site commissioning service

Our technical team are available to fully commission and balance the **MVHR** system for optimum performance.

MVHR design service

Our design service includes:

Specialist knowledge
of Passivhaus and low energy construction

Advice on the right MVHR system
for your specific needs and budget

Noise minimisation
through careful design of attenuation

Careful positioning of ducting
modelling for pressure loss and sound attenuation

Air flow calculations
provided for building control

2D and 3D plans
fully labelled products and parts list for ease of installation

Technical support
including telephone support to installers

MVHR: getting it right

As a result of our expertise in supplying **MVHR** systems to meet **Passivhaus** requirements, our technical team is now regularly asked to investigate problems with systems that have not been designed or installed properly. Typical issues we are called upon to troubleshoot are: noise, leaking condensation, poor air circulation and over-consumption of electricity.

Use our **MVHR design service** to avoid these problems from the outset.

Design service charges

To design an **MVHR** and **ducting system**, using specialist CAD-based software, standard charges start from £400* for a standard house of up to 150m².
* Excluding VAT



examples of MVHR units



Novus 300/450



Focus 200



Santos 570 Cool



Climos F 200



ComfoAir 160 Luxe



ComfoAir 200 Luxe

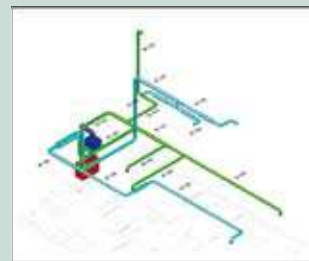


Green Building Store is committed to supplying the most **advanced, high performance** MVHR ventilation systems, suitable for Passivhaus and low energy buildings.

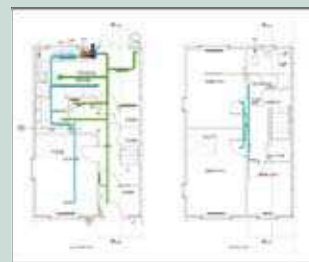
We offer a wide selection of ranges to ensure we can provide MVHR solutions for every situation. Our **technical team** is here to advise on the best system for your situation.

- MVHR units with **up to 94%** heat recovery
- Range of capacities to **suit all building sizes**
- Flexible mounting/installation options for **ease of installation**
- Different **price options** to suit a wide range of project budgets
- Mechanical/electronic **summer bypass** options
- Integrated/external **frost protection** units
- Optional enthalpy **humidity recovery** heat exchanger
- Additional **cooling capacity** options

We can also design and supply MVHR systems for larger buildings, including schools, offices and community centres.



Isometric



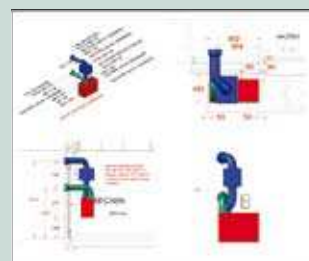
Plan view



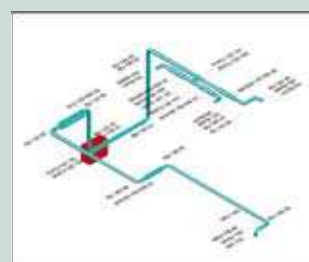
Section views



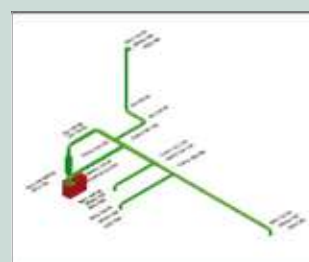
Air transfer diagram



Unit layout



Supply duct



Extract duct

Typical insulation drawings



ducting

A well-designed **high quality** ducting system is critical to the efficiency of an MVHR system and comfort for the occupants.

- Increases the energy efficiency of the MVHR unit and reduces energy losses from the system itself
- Ensures MVHR systems are practically imperceptible to the inhabitants, while ensuring good air quality throughout the building
- Allows the MVHR system to continue to perform well for the lifetime of the building

Left: Centre for Disability Studies
(Simmonds Mills Architects)



Lindab safe ducting system

Rigid galvanised steel spiral wound system for exceptional durability and longevity. Robust push-fit system with twin rubber seals for the highest level of airtightness (Type D approval). Lifetime system airtightness, requiring no tapes or mastics.



Sound attenuators (silencers)

Specialist range of off-the-shelf and custom-made sound attenuators, including rigid and semi-rigid attenuators. Designed to work within the parameters of domestic installation.

peripherals

We are also able to supply the following products and can advise you on their **suitability** for your project.

supply air heaters

Device used to heat supply air, offering a neat and compact heating solution for up to approximately 10 W/m² of building floor area, reducing the need for other heating sources. NB If used as only means of heating, it is important that Passivhaus levels of performance are achieved.



Supply air heater – electric-heated



Supply air heater – water-heated

Frost protection

MVHR systems require **frost protection** to ensure that the condensation in the heat exchanger does not freeze. MVHR systems for Passivhaus require **active** frost protection and we can advise on the best system for your project.

frost protection/pre-heating & pre-cooling units

Electrical resistance frost protection unit
With ultra safe self-modulating ceramic element.



Ground pipe systems

Offering frost protection and pre-heating/pre-cooling supply air by means of underground pipes.



Ground source heat collector

Form of frost protection offering moderate pre-heating/pre-cooling of intake air using a glycol solution as a passive heat transfer medium. This is not an active heat pump but a passive temperature exchange. The maximum cooling effect of these types of system is approximately 650 W/ 100m³ of ventilation.



duct insulation

Closed-cell sheet insulation
For primary ducts within the thermal envelope.

Foil-backed mineral wool insulation
For ducting where supply air heating is used.



air valves supply

We also offers a comprehensive range of **air valves** to complement our MVHR systems.



options

Wall throw directional air valve. Designed to exploit 'coanda effect'*. Powder coated pressed steel. VVTK



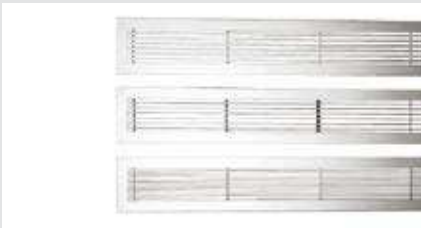
Ceiling mounted directional air valve. Designed to exploit the 'coanda effect'*. Powder coated pressed steel. VTTB



Supply air valve – internal baffle plate allows some directional control of air movement (but not as much as the VVTK or VVTB models). KIR



Linear bar grilles are a standard part of commercial building design.



options

High performance extract air valve, with minimal noise impact. Powder coated pressed steel. KSU



Filter extract valves

Recommended for kitchens. White powder coated valve ceiling or wall mounted and flush or surface. Supplied either with a replaceable fleece filter or an aluminium wire filter that can be put through a dishwasher to clean.



Stainless steel valve available as surface mount only.



filters



Green Building Store stocks a wide range of MVHR filters to ensure the smooth running of its MVHR systems. Filters are required for the MVHR units, frost protection units and kitchen extract valves and should be replaced 2-4 times a year (depending on local air quality factors etc). It is important to change filters regularly to optimise energy efficiency and comfort levels.

air valves extract



Other ducting air terminals are available. Please contact the MVHR department for more information

* The coanda effect enables an air valve to be located at ceiling height on one side of a room, but extract air from the other, utilising air flow characteristics. This helps to minimize ducting requirements and simplifies silent delivery.

Passivhaus & low energy experts

call our
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department
on
01484 461705

email us at:
mvhr@greenbuildingstore.co.uk

FREE Passivhaus resources

Technical films, blogs and briefings showing how to undertake newbuild and retrofit Passivhaus projects:
www.greenbuildingstore.co.uk



other environmental construction products from Green Building Store

Passivhaus products & services

- High performance windows & doors
- MVHR systems & design
- Airtightness membranes & tapes
- Wall ties
- Insulation for window & door detailing
- Building services
- Design guidance
- Training

water-saving products

- Low flush siphon WCs (including Doc M pack)
- Airflush waterless urinals
- Water saving taps and washroom range

FREE CPDs for building professionals
Passivhaus principles & specification
Tel: 01484 461705

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