

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 transferred into the incoming air.

The best MVHR system is the one you don't know is there

Well designed and correctly installed a heat recovery ventilation system should be practically **imperceptible** to the inhabitants while ensuring **good air quality** throughout the building.

Mechanical ventilation with heat recovery is a relatively new technology in the UK and problems can arise if it is poorly designed or installed. For complete **peace of mind** come to the **experts on MVHR for Passivhaus and low energy projects**, for quiet, efficient and robust heat recovery ventilation.

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

www.greenbuildingstore.co.uk



Lancaster CoHousing Passivhaus Development
Eco Arc Architects

Steel Farm Passivhaus
LEAP: Low Energy Architectural Practice



MVHR design service

Why we're different

Green Building Store is nationally recognised for its **expertise** in designing, supplying and commissioning MVHR systems for **Passivhaus and low energy** projects. Our design service is **qualitatively different** to most other MVHR providers. As well as designing a system to physically fit in a building, we model the system in 3D software to **check performance** of the system in terms of noise, pressure, balance and airflows.



Image: © Alena Ozerova

Why good design matters

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

Solving problems at the design stage

Through our detailed design process, we can ensure that we've designed **the quietest, most efficient system possible** for your building. Any potential problems are solved at the design stage, **avoiding costly and inconvenient alterations** later on.

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 Siddall, LEAP: Low Energy Architectural Practice

What makes our MVHR systems different?

Robust ducting

MVHR ductwork is embedded into the fabric of the building and would be very disruptive to have to replace, so it is worth investing in a high quality system from the outset. We recommend galvanised steel spiral wound rigid ducting for our systems, designed to last the lifetime of the building.

Constant air flows

We carefully calculate air flow rates of our systems to each room and look to select MVHR units that have constant volume flow fans. Ductwork airtightness is important to ensure that the designed air flow is delivered to the rooms. Air leakage is designed out through use of rigid steel round ducting systems with airtight joints. By minimising air leakage we reduce air speeds within the system, helping ensure lower energy consumption and noise levels.

Quality MVHR units

We offer a wide range of units from manufacturers including PAUL, Zehnder and Brink, to suit all projects and specifications. We help you choose a quality MVHR unit to suit the ventilation demands of the building and to achieve optimal heat recovery efficiency.

Preventing condensation

Condensation within an MVHR system could cause damage to ductwork, the unit or the building fabric. We design out potential problems by paying attention to the ductwork detailing and insulation requirements where temperature and humidity differences will cause condensation either inside or outside the duct.

Virtually inaudible

It is essential that MVHR systems run quietly, especially within already quieter well-insulated buildings. Unlike the majority of our competitors, we model the acoustics of our systems so that we choose the right size of sound silencer for each duct run. We specify primary attenuators (silencers), to reduce noise generated by the MVHR unit fans, and secondary 'cross talk' attenuators, to reduce voice transmission between rooms. The cross talk attenuators also offer further sound suppression for duct generated noise. Duct sizes in our designs are typically larger than those specified by other companies, helping to keep air speeds low, thus minimising duct generated noise. As a result, we design our MVHR systems to have noise levels of no more than 30 dB(A) at the extract valves and no more than 25 dB(A) at the supply valves.

Support & guidance

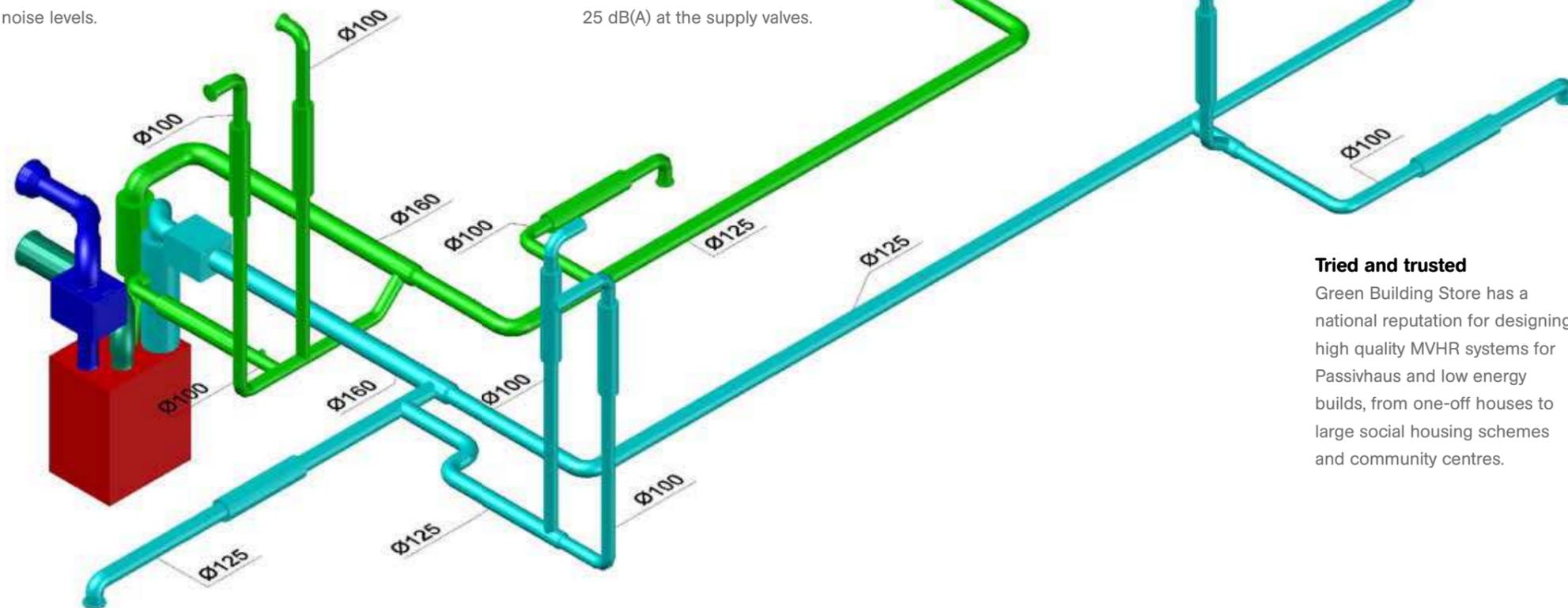
As well as offering an Approved Installer scheme, we can also offer telephone support for installers and supply clearly labelled ducting drawings to facilitate step by step installation.

Commissioning

It is critical that the system is correctly commissioned in order to maximise comfort and energy efficiency. Green Building Store's optional commissioning service also offers a valuable check on the installation process and functioning of the MVHR system.

Tried and trusted

Green Building Store has a national reputation for designing high quality MVHR systems for Passivhaus and low energy builds, from one-off houses to large social housing schemes and community centres.



Lansdowne Drive Passivhaus, Tectonics Architects

I was initially concerned about the noise of the system but that proved not to be an issue at all. It is very quiet, we can't hear it at all. The MVHR system is also very easy to operate and maintain and the air quality is fantastic.

Bernard Tulkens, Tectonics Architects



Mildmay Community Centre, bere:architects

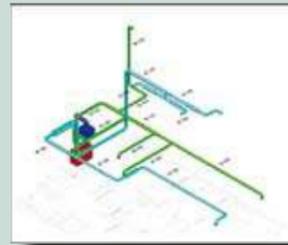
Green Building Store works with us to carefully design the heat recovery ventilation ducting system to ensure that the system performs at its optimum.

Justin Bere, bere:architects

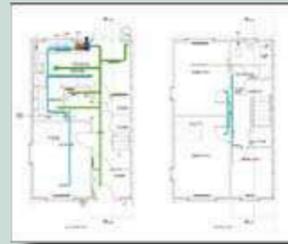
MVHR design service



Typical installation drawings



Isometric



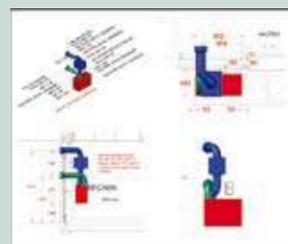
Plan view



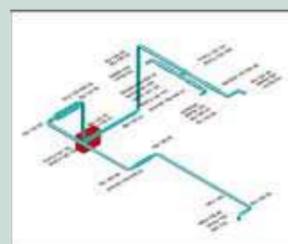
Section views



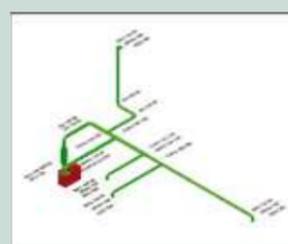
Air transfer diagram



Unit layout



Supply duct



Extract duct

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

Optional on-site commissioning service

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

Approved MVHR Installers

Green Building Store now has a list of tried and tested installers to ensure that our MVHR systems are installed correctly to achieve optimum performance.



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



Lime Tree Passivhaus, Parsons + Whitley Architects

With Green Building Store we know we have probably the country's most knowledgeable and experienced MVHR suppliers and designers so we can be sure that this aspect of the design has been properly considered. At the Lime Tree Passivhaus we also used a Green Building Store accredited installer so that we could be sure the whole process delivered the designed performance.

Dan Higginbotham, Parsons + Whitley Architects



Focus 200
H x W x D (mm): 542 x 752 x 355.



Novus 300
H x W x D (mm): 978 x 792 x 601



ComfoAir 160
H x W x D (mm): 770 x 670 x 268



ComfoAir Q
H x W x D (mm): 850 x 725 x 570



Brink Renovent Sky 150
L x W x D (mm): 1000 x 660 x 200



Brink Renovent Excellent 300
H x W x D (mm): 765 x 677 x 564

examples of MVHR units



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 units, from PAUL, Zehnder and Brink, 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 93%** 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

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



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

peripherals

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



Lansdowne Drive
Passivhaus, Tectonics
Architects

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 units

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



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.

Iso pipe

Insulated ductwork for intake and exhaust pipes.



Rigid 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.

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 VTTB models). KIR



Wall mounted diffuser for supply air. SHH



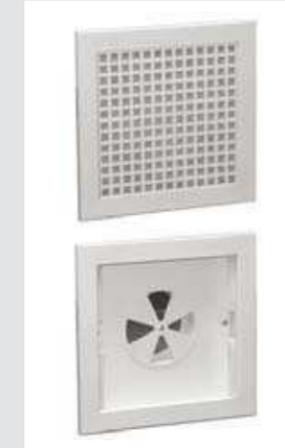
options

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

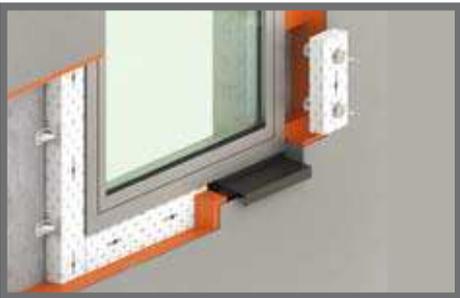
* The coanda effect enables an air valve to be located at ceiling height on one side of a room, but extract air from the other, utilising air flow characteristics. This helps to minimize ducting requirements and simplifies silent delivery.

Passivhaus & low energy experts



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

- Triple glazed timber windows & doors
- MVHR systems & design
- Airtightness membranes & tapes
- Insulation for window & door detailing
- Building services
- Design guidance
- Training

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



Heath House Mill, Heath House Lane, Golcar, Huddersfield HD7 4JW
telephone 01484 461705 • fax 01484 653765

email info@greenbuildingstore.co.uk • web www.greenbuildingstore.co.uk

A trading division of Environmental Construction Products Ltd

www.greenbuildingstore.co.uk