



MVHR ventilation

MECHANICAL VENTILATION WITH HEAT RECOVERY

For Passivhaus & low energy buildings

MVHR

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.



GOLCAR PASSIVHAUS

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.

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.

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.



DENBY DALE PASSIVHAUS

“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.

Quality MVHR units

We offer a wide range of units from manufacturers including Zehnder and UBBINK, 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.

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.

Preventing condensation

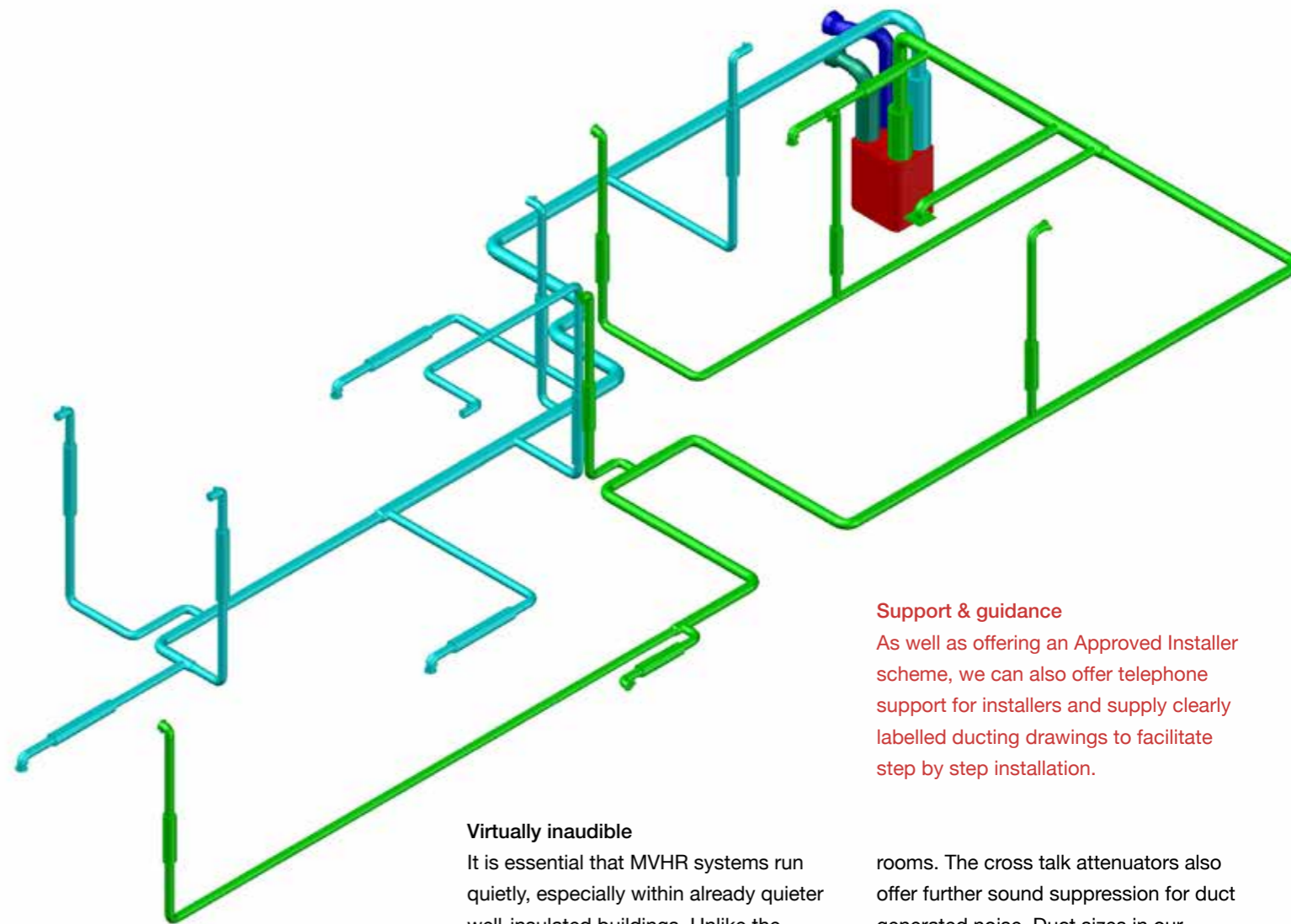
Condensation within an MVHR system could cause damage to ductwork, the unit or the building fabric. We design out potential problems by paying attention to the ductwork detailing and insulation requirements where temperature and humidity differences will cause condensation either inside or outside the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

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 & 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.



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.

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.

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

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

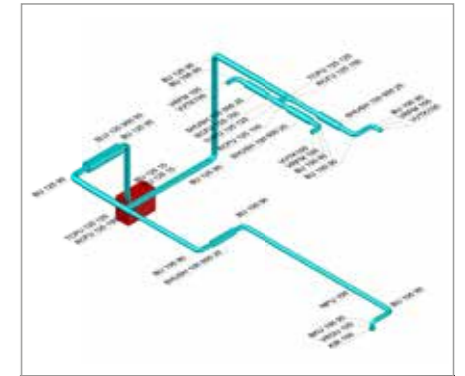
To design an MVHR and ducting system, using specialist CAD-based software, standard charges start from £400* for a standard house of up to 150m².

* Excluding VAT

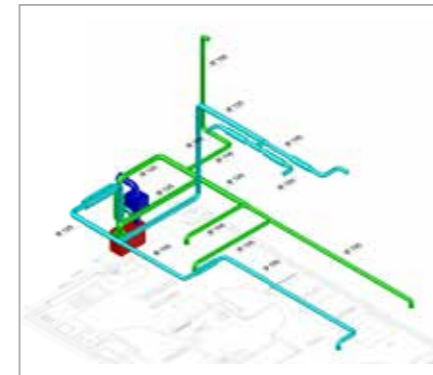
Typical installation drawings



Section views



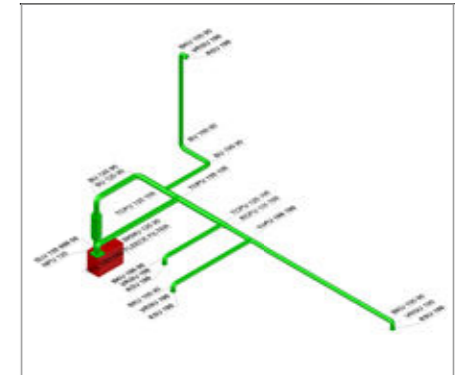
Supply duct



Isometric



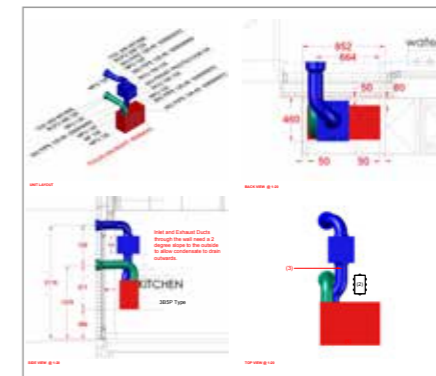
Air transfer diagram



Extract duct



Plan view



Unit layout



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 Zehnder and UBBINK, 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.



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②



④



① **ComfoAir 160**
H x W x D (mm): 770 x 670 x 268

② **ComfoAir Q**
H x W x D (mm): 850 x 725 x 570



③ **Ubiflux F150**
L x W x H (mm): 1000 x 660 x 198

④ **Ubiflux Vigor 400**
H x W x D (mm): 650 x 750 x 560

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



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.



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① External air grilles

② **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 heater – electric-heated



Supply air heater – water-heated



Frost protection units

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



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① **Closed-cell sheet insulation**
For primary ducts within the thermal envelope. Foil-backed mineral wool insulation. For ducting where supply air heating is used.

② **Iso pipe**
Insulated ductwork for intake and exhaust pipes.

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.

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.

AIR VALVES | supply options

We also offers a comprehensive range of air valves to complement our MVHR systems. Other ducting air terminals are available. Please contact the MVHR department for more information.



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above + cover: THE HEN HOUSE, SHEFFIELD



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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.

- 1 Wall throw directional air valve. Designed to exploit 'coanda effect'*. Powder coated pressed steel. VVTK
- 2 Wall or ceiling mounted directional air valve. Powder coated pressed steel in a range of different shapes and can be painted with emulsion or wall papered. AIRY

- 3 Supply air valve – internal baffle plate allows some directional control of air movement (but not as much as the VVTK or VVTB models). KIR
- 4 Wall mounted diffuser for supply air. SHH

* 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.

AIR VALVES | extract options

- 1 High performance extract air valve, with minimal noise impact. Powder coated pressed steel. KSU
- 2 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.

Please contact the MVHR
Department for more
information or to get a quote
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a trading division of
Environmental Construction Products Ltd

“We have been very happy with both the products & service from Green Building Store. I would have absolutely no hesitation in using them again. We have also 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*



LANCASTER COHOUSING PASSIVHAUS DEVELOPMENT