

21st century ventilation options

Your refurb, your choice!

Mechanical Ventilation with Heat Recovery (MVHR)

What is MVHR?

Mechanical Ventilation with Heat Recovery (MVHR) systems, are used to remove stale air and bring in fresh air which can also heat or cool the home.

This will ensure residents well-being is optimised and provides a total system which works together with the improved thermal performance of the envelope

The heat recovery is an air heating system that can be powered by solar power. It works with the ventilation system and is user controlled to provide heating and cooling as required by the resident

Health and comfort

- Removal/dilution of pollutants such as odour, smoke, VOCs, radon etc
- Avoidance of humidity problems and protection of the building structure
- Prevention of mould growth
- Filtration of the outside air as protection against outdoor pollutants/pollen etc.
- Generally provide more uniform distribution of fresh air
- Balanced ventilation/optimum humidity

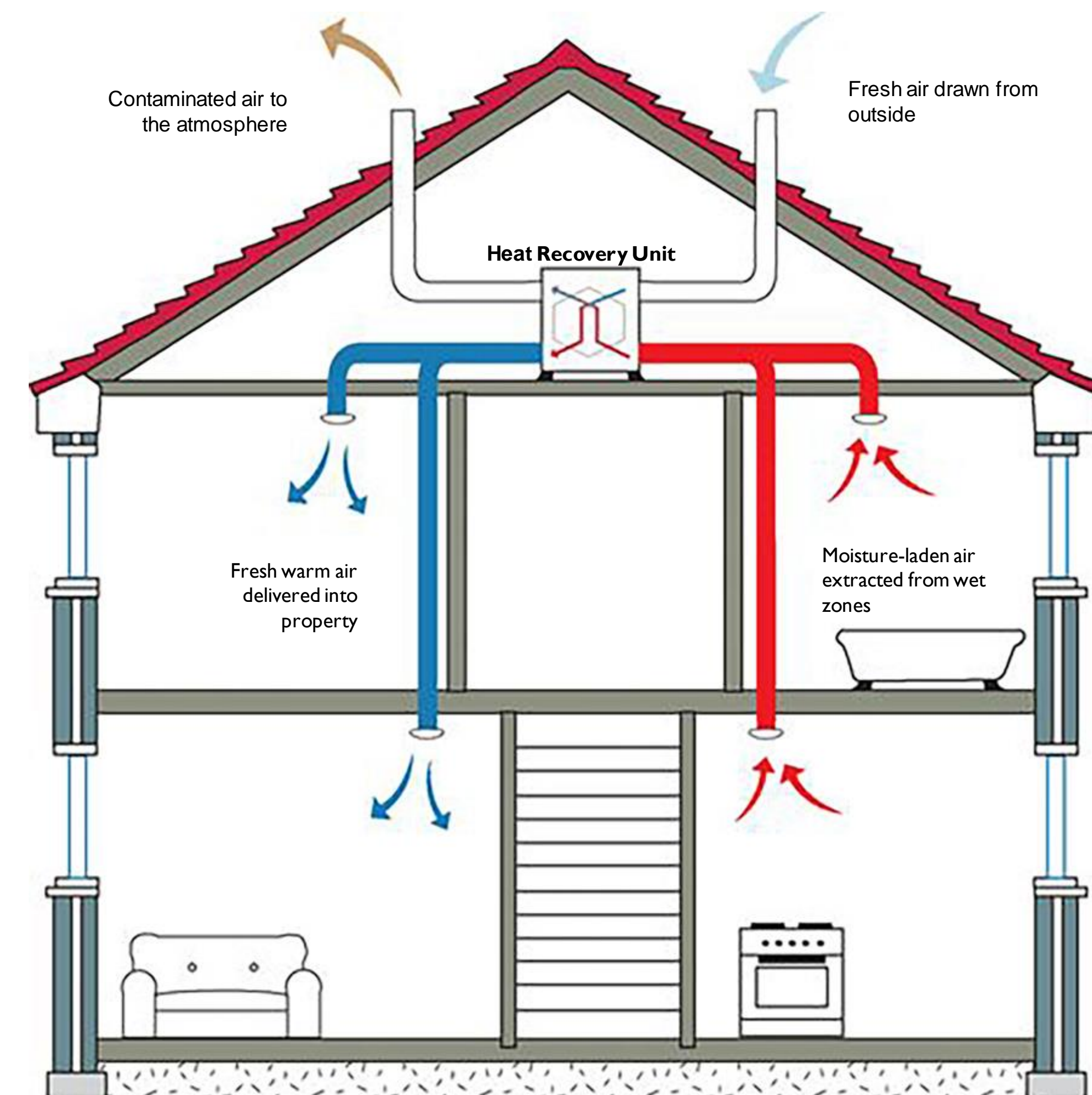
MVHR Filters:

Particles to be filtered/ Filterclass

The more stars, the higher the percentage of the filtered particles

	Sand, coarse dust, insects, hair	Spores, pollen, mould	House dust mite, mould, spores, skin flakes, animal dander	Bacteria, smog, tobacco smoke	Fine dust, viruses, exhaust fumes, carbon black
G3	★★★★★☆☆	★★★☆☆☆☆	★☆☆☆☆☆☆	☆☆☆☆☆☆☆☆	☆☆☆☆☆☆☆☆
G4	★★★★★★☆☆	★★★★☆☆☆☆	★★★☆☆☆☆☆	☆☆☆☆☆☆☆☆	☆☆☆☆☆☆☆☆
M5	★★★★★★★☆☆	★★★★★☆☆☆	★★★★☆☆☆☆	★☆☆☆☆☆☆☆	☆☆☆☆☆☆☆☆
M6	★★★★★★★☆☆	★★★★★☆☆☆	★★★★☆☆☆☆	★☆☆☆☆☆☆☆	★☆☆☆☆☆☆☆
F7	★★★★★★★☆☆	★★★★★☆☆☆	★★★★☆☆☆☆	★☆☆☆☆☆☆☆	★☆☆☆☆☆☆☆

How it works?



1. Supply of fresh air:

Fresh air is fed into the system via an external wall vent. The fresh outside air can optionally flow through sub-soil heat exchanger beforehand which uses geothermal energy to pre-temper the outside air





2. Ventilation unit:

Up to 96% of the heat is recovered from the extract air and transferred to the fresh air. This can be humidified, dehumidified, heated and cooled using optional components

3. Air distribution:

The air distribution system channels fresh air at the right temperature to individual rooms as needed and vents the extract air to the outside. The air volume can be individually adjusted for each room

Mechanical Ventilation with Heat Recovery units (MVHR)

	Zehnder	Zehnder	Brink	Brink
Image				
Model	Comfoair Q350	Comfoair 160	Renovent sky 150 & 200	Flair 325
Pros	<p>PASSIVHAUS CERTIFIED LH & RH RANGE OF CONTROL OPTIONS</p> <p>INTEGRAL HUMIDISTAT</p> <p>100% FULL AND FILTERED MODULATING SUMMER BYPASS</p>	<p>PASSIVHAUS CERTIFIED, LH & RH. WIRELESS CONTROL OPTION.</p> <p>THIS UNIT CAN BE USED IN THE HORIZONATAL AND VERTICAL SO CAN BE STANDRADISED ACROSS THE SITE IN THE SMALLER FLATS</p>	<p>PASSIVHAUS CERTIFIED, LH & RH. WIRELESS CONTROL OPTION.</p> <p>INTEGRAL HUMIDISTAT</p> <p>THIS UNIT CAN BE USED IN THE HORIZONATAL AND VERTICAL SO CAN BE STANDRADISED ACROSS THE SITE IN THE SMALLER FLATS</p>	<p>PASSIVHAUS CERTIFIED, LH & RH. WIRELESS CONTROL OPTION.</p> <p>INTEGRAL HUMIDISTAT</p> <p>THIS UNIT CAN BE USED IN THE HORIZONATAL AND VERTICAL SO CAN BE STANDRADISED ACROSS THE SITE IN THE SMALLER FLATS</p>
Cons/Comments	G4 with F7 FILTER	<p>HORIZONTAL & VERTICAL – G4 WITH F7 FILTER</p> <p>DOES NOT HAVE AN INTEGRAL HUMIDISTAT - ADDITIONAL REMOTE HUMIDITY SENSOR</p>	HORIZONTAL & VERTICAL – G4 WITH F7 FILTER	HORIZONTAL & VERTICAL – G4 WITH F7 FILTER

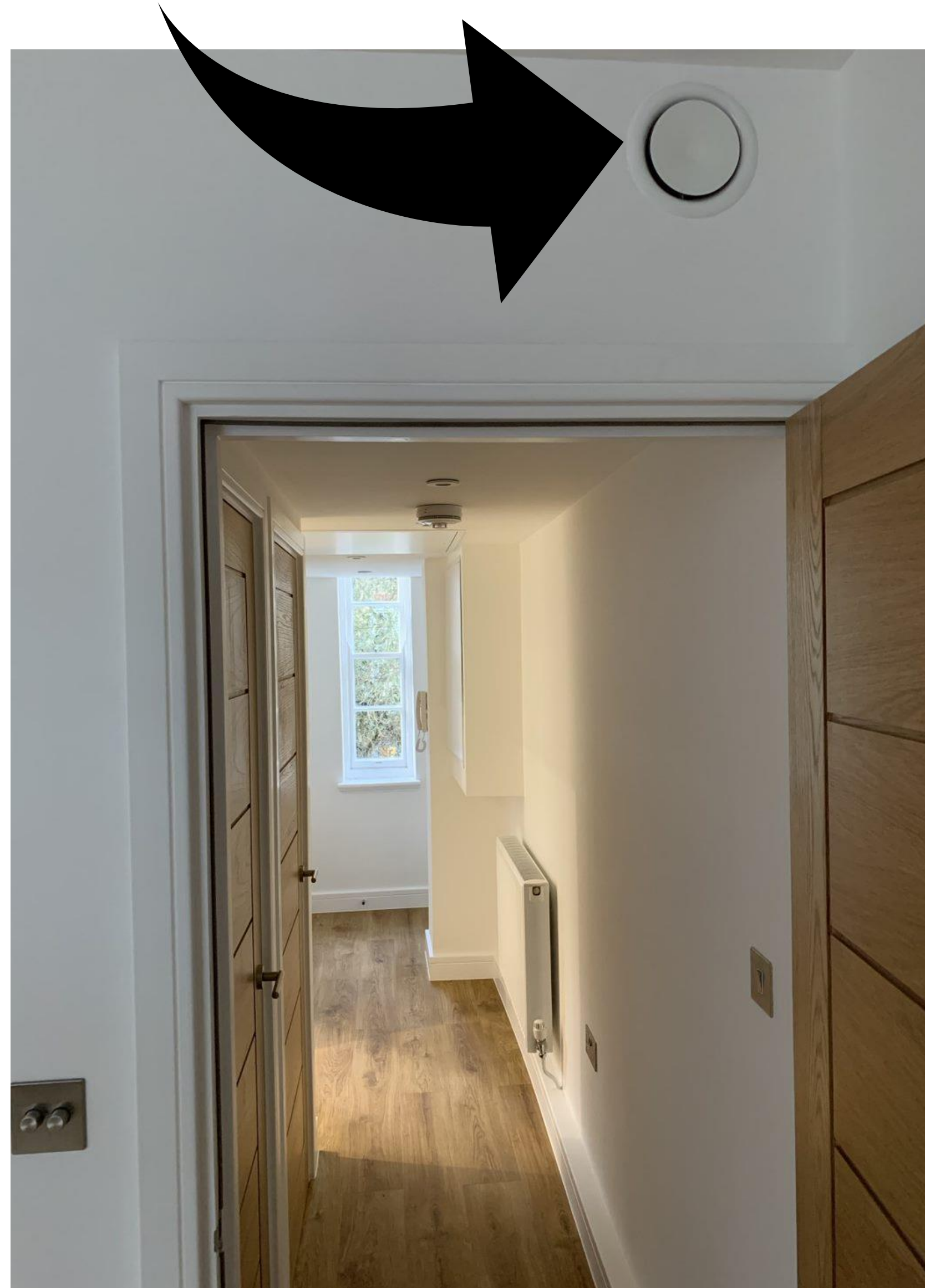
Above are some heat recovery ventilation units that we are considering for homes on the estate. Here we present some pros and cons

Ceiling mounted MVHR installation

The MVHR unit is placed in the lowered ceiling



The MVHR ventilation unit is located in the ceiling in the hallway. This has meant that ceiling reduction has been limited to the hallway area only



Above the door, close to the ceiling, we have an MVHR extractor fan pulling fresh air into the living room and removing the stale air. A similar inlet will be installed in each room.



Here we have refurbished the front entrance to install MVHR air intake and extract grilles above the new fire door

Mechanical Ventilation with Heat Recovery (MVHR) systems, are used to remove stale air and bring in fresh air which can also heat or cool the home. This can help improve and maintain the health and well-being of both the occupant and the building. The heat recovery aspect provides an air heating system that can be powered by solar power. It works with the ventilation system and can be controlled to provide heating and cooling as required by the user

Bulkhead approach MVHR installation

The MVHR unit is placed in a cupboard, with ductwork limited to only part of the ceilings



The recessed ceiling partly over the kitchen area contains the MVHR ducting.

Here the ceiling height has been dropped at the entry way of the room only, keeping the original ceiling height in the rest of the room untouched. This allows the space to continue to feel airy and open.



MVHR unit tucked out of sight in a storage area.

The heat recovery is an air heating system that can be powered by solar power. It works with the ventilation system and is user controlled to provide heating and cooling as required by the resident



MVHR particles that could be filtered through the system

- Sand, coarse dust, insects, hair
- Spores, pollen, mould
- Mites, skin flakes, animal dander
- Bacteria, smog, tobacco, smoke



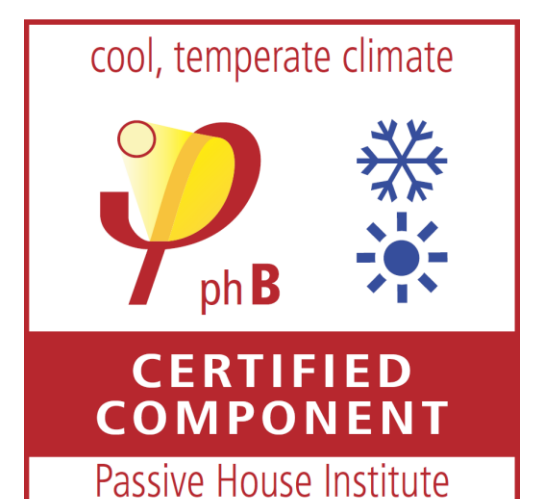
The MVHR ventilation machine will need to be located in an existing storage cupboard which means it will reduce your overall storage space within your home. The machine is approximately 75cm in width x 60cm deep and 85cm in height.

Various Control options



- **Easy display control panel** with a simple controller that is integrated directly into the ventilation unit
- **Simple downloadable app** - allowing you to control your system through your device
- **Remote control** – a remote control that allows you to control the ventilation unit via wireless communication.

Passive House is an internationally recognised standard for high quality, low energy buildings.



Tell us what you think! What's important to you?

Energy efficiency and
keeping your home
warm in winter

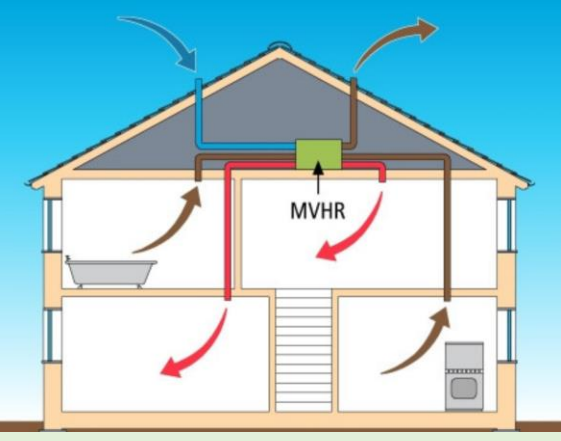
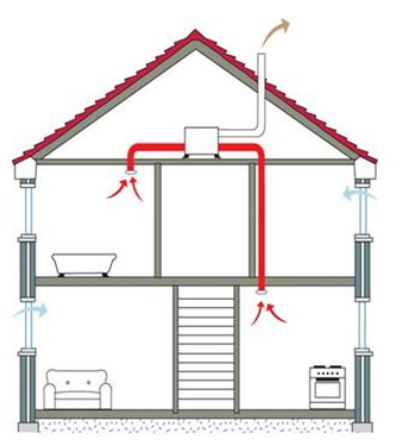
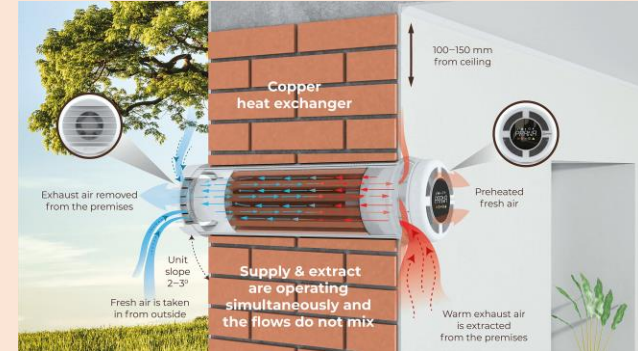




Improving indoor air
quality

Cost savings

Impact on space in your
home



Alternative ventilation options

	 <p>MVHR</p>	 <p>MEV</p>	 <p>Decentralised MVHR</p>	 <p>Opening Windows</p>	 <p>Smart Bricks</p>	 <p>Trickle Vents</p>
Positives	<ul style="list-style-type: none"> Controlled balanced supply and extraction of air Negates the majority of ventilation heat losses All habitable rooms have filtered outside air Saves more money than it costs to run for residents 	<ul style="list-style-type: none"> The air is extracted from kitchens and bathrooms only. This limits ductwork Low maintenance as no filters are included 	<ul style="list-style-type: none"> Ceilings may not be compromised in most cases (except internal bathrooms and kitchen) More flexible - pick and choose which rooms from a resident's perspective No cupboard spaces are required 	<ul style="list-style-type: none"> Most cost effective system Familiar use 	<ul style="list-style-type: none"> Improves air tightness Can reduce heating bills in winter months 	<ul style="list-style-type: none"> Cost effective Easily controlled
Negatives	<ul style="list-style-type: none"> Higher installation costs Requires space internal cupboards and ceiling space Regular filter maintenance needed Can be difficult for users to understand operation 	<ul style="list-style-type: none"> Trickle vents in habitable rooms are needed Air quality reduced as no filters or Insect guard of supply air 	<ul style="list-style-type: none"> You need an outside wall for each supply and extract. Where we have Internal bathrooms and kitchens this could be a technical issue as the fan may not overcome the resistance associated with the length. Volumes are low, and appear not to meet the min kitchen ventilation volumes for the Part F due to distance to external wall. There is no boost facility increase air flow volumes for cooking and overheating assistance. Will not meet EnerPHit standards 	<ul style="list-style-type: none"> Uncontrolled heat loss Cold drafts Poor Indoor air quality 	<ul style="list-style-type: none"> Would not meet Building Control Part F alone Will require windows or fans for kitchens and bathrooms Reliant on natural pressure differentials across a building or wind velocity Require a smart device 	<ul style="list-style-type: none"> Does not meet building control standards without openable windows Cannot ventilate an Internal space such as a kitchen or bathroom
Ventilation Rates- Statutory for Intermittent Extract	<ul style="list-style-type: none"> Kitchen - 30 litres/second Elsewhere In kitchen -60 litres/second Bathroom- 15 litres/second WC- 6litres / second 	<ul style="list-style-type: none"> Kitchen - 30 litres/second Elsewhere In kitchen -60 litres/second Bathroom- 15 litres/second WC- 6litres / second 	<ul style="list-style-type: none"> Kitchen - 30 litres/second Elsewhere In kitchen -60 litres/second Bathroom- 15 litres/second WC- 6litres / second 	<ul style="list-style-type: none"> Kitchen - 30 litres/second Elsewhere In kitchen -60 litres/second Bathroom- 15 litres/second WC- 6litres / second 	<ul style="list-style-type: none"> Kitchen - 30 litres/second Elsewhere In kitchen -60 litres/second Bathroom- 15 litres/second WC- 6litres / second 	<ul style="list-style-type: none"> Kitchen - 30 litres/second Elsewhere In kitchen -60 litres/second Bathroom- 15 litres/second WC- 6litres / second
Whole Dwelling Supply	<ul style="list-style-type: none"> 13 litres /second - 29 litres / second 	<ul style="list-style-type: none"> Trickle Vents Required 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Trickle Vents 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Windows
Ranking	 <p>Most effective Least effective</p>					
Reason	This meets all ventilation requirements and energy improvements.	This meets all ventilation requirements but increases energy	This meets ventilation requirements but cannot ventilate internal spaces such as bathrooms In most buildings. Will require extract fans to comply with building control.	This is uncontrolled ventilation hence cannot guarantee ventilation rates. Internal bathrooms/ Kitchen will require extract fans to comply with building control.	This is uncontrolled in terms of meeting required ventilation rates. Bathroom and Kitchens will require extract fans to comply with building control.	This will not meet any of the required ventilation criteria.