MECHANICAL HEAT RECOVERY & VENTILATION SYSTEMS

TX 112

timoleon

INTRODUCING HIGH QUALITY ENERGY EFFICIENT VENTILATION SYSTEMS FROM TIMÓLEON.

WHAT IS MVHR?

Mechanical Ventilation and Heat Recovery (MVHR) systems consist of a central Heat Recovery Unit (HRU) located in the loft or in a cupboard with duct running between the HRU and the rooms in the house. The HRU has two fans, one to extract the damp, warm air from bathrooms and kitchens and one to bring in fresh air from outside. The HRU has a heat exchanger that transfers the energy from the outgoing air into the incoming air without cross contamination. This process recovers a lot of the energy that would be lost outside if using a conventional ventilation extract system. The duct from the HRU can be rigid duct or semi-rigid.

Conventional whole house ventilation systems use rigid duct to move air around the building. A radial duct system uses semi-rigid duct to distribute air through the house. As it is smaller and more flexible it is an easier, faster installation.

Suitable for use in new build or refurbishment projects this system ensures a simple, quick and hassle free installation which saves time and money. By having less fittings and easy push fit joints air leakage is reduced and the single duct run to each room results in significantly less cross talk noise for the homeowner.

CODE FOR SUSTAINABLE HOMES

The CSH aims to reduce carbon emissions for new domestic buildings by setting target levels.

- Code level 1 requires energy consumption in line with 2006 Building Regulations and Level 6 requires homes to be Zero Carbon
- Code levels rise to Code 6 in 2016
- Code level 3 is currently mandatory for private new homes and requires a 25% energy saving on homes built to 2006 regs
- Code level 4 requires a 44% energy saving and is currently EST recommended for social housing

SAP & APPENDIX Q

SAP is the Government Standard Assessment Procedure for the energy rating of dwellings. This enables performance of new technologies including MVHR to be used in SAP calculations. EST set higher standards for performance.

Polypipe HR01 MVHR appliances are >92% efficient and easily satisfy the requirements of SAP Appendix Q and the EST higher requirements of ≤1W/l/s and 85% heat recovery efficiency.

To achieve the highest CSH level, a SAP heat loss parameter (HLP) of 0.8W/m2K is required. According to work carried out by Fontenergy.com, these efficient houses will not be possible without MVHR.

HOW DOES MVHR WORK?

FRESH AIR

A high level of building air-tightness is an important method of minimising energy loss and reducing running cost. However introducing fresh air into a house and extracting the stale air is still very important to maintain comfort levels, to alleviate the potential build-up of contaminants and to reduce humidity in bathrooms and kitchens.

Part F of the building regulations makes it mandatory for new homes to be properly ventilated. Mechanical extracts are usually installed to remove stale and humid air from bathrooms and kitchens. However the energy present in the warm air is lost when extracted outside, the heating system is then needed to re-heat the incoming air.

HEAT RECOVERY

A Mechanical Ventilation and Heat Recovery (MVHR) system extracts the stale humid air from bathrooms and kitchens in the same way as conventional mechanical ventilation but instead of dumping the warm air outside the air is moved through internal ducting to a central Heat Recovery Unit (HRU) located in the loft or cupboard. The HRU passes the outgoing air through the heat exchanger whilst simaultaneously drawing fresh air from outside in the opposite direction.

The two air streams are isolated from each other as they pass through the heat exchanger with the warm stale air transferring energy to the cooler incoming fresh air which is then supplied to bedrooms and living areas.

SAVING ENERGY

The transfer of energy from the outgoing stale humid air to the incoming fresh air minimises the need for the heating system to re-heat the air. This saves energy and reduces the running costs of the heating system. It is important that the HRU used is efficient, the units supplied by Timoleon have contra flow heat exchangers that are more efficient than cross flow heat exchangers and are SAP Appendix Q approved.

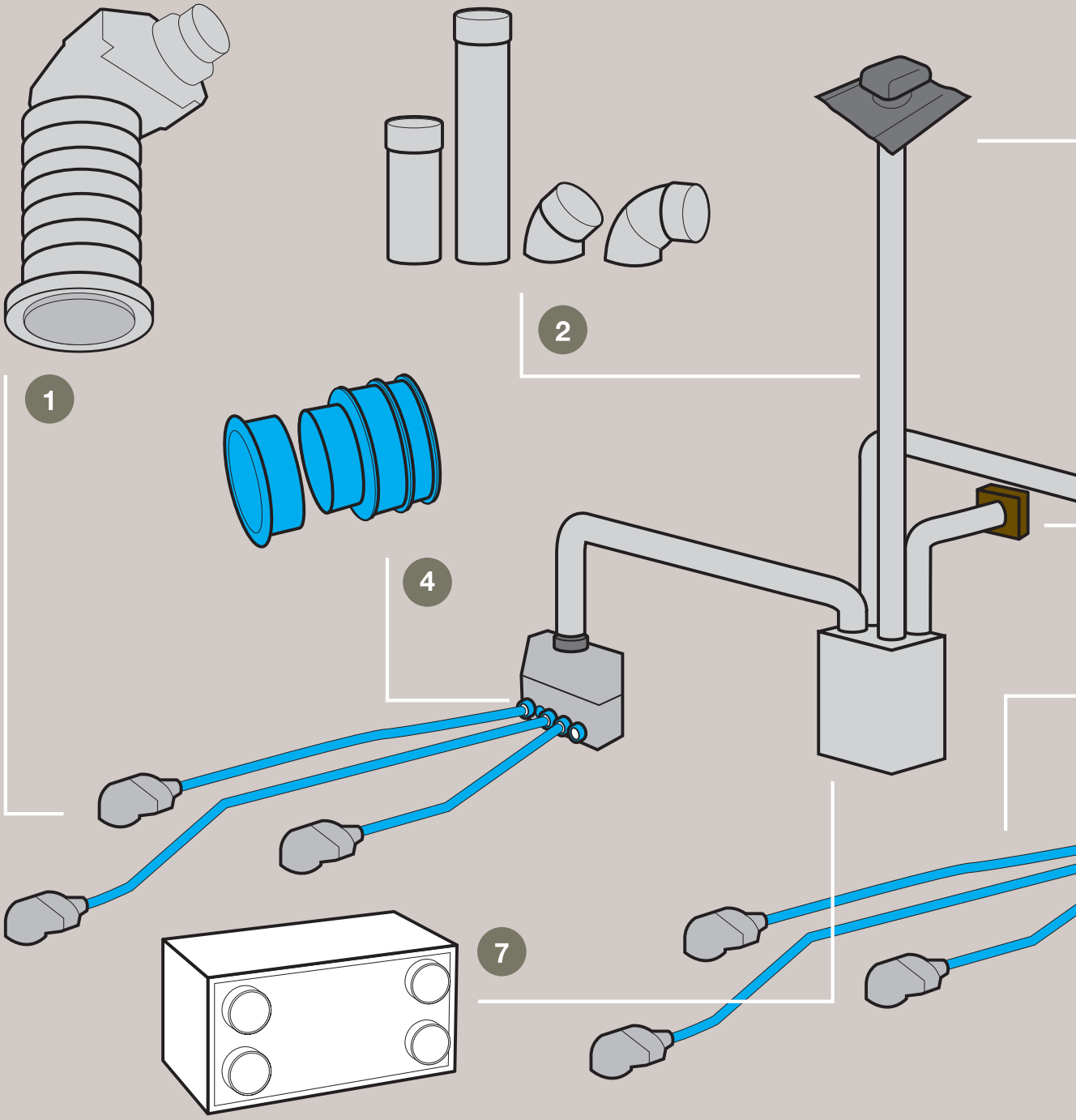
EXISTING HOUSING, NEW-BUILD & PASSIVHAUS

Heat from ventilation loss is the single biggest component of energy loss in a well insulated building especially in Passivhaus design. This is because, no matter how air tight the building is, fresh air is always required and this needs to be heated. This supply of fresh air is conventionally provided by extracting stale air using mechanical ventilation from bathrooms and kitchens with fresh air coming from window vents in other rooms.

The heat loss from mechanical ventilation can be significantly reduced by using MVHR to control and recover the energy that would otherwise be lost. In existing housing the air tightness of older buildings needs to be improved to meet our national targets for energy and carbon reduction as well as saving money on running costs. It is only when existing buildings become more airtight that the energy saved by MVHR becomes significant compared to the overall heating costs. However controlled whole house ventilation for improving indoor air quality and extracting damp stale air is applicable for any construction.

BENEFITS OF USING MVHR SYSTEMS:

- Moisture that causes mould growth is removed. Mould growth and other pollutants lead to a poor indoor air quality.
- Little condensation on windows
- Provides a better overall climate control
- A controlled supply of fresh air
- The Heat Recovery Unit is sited discretely in the loft, cupboard or wall
- Windows do not need to be left open eliminating noise, pollution, control and security issues
- Eliminates noise from extract fans located in within bathrooms
- Low maintenance
- Less dust



THE SYSTEM

1. OUTLET PLENUM & VALVE

This duct to room outlet adaptor moves the air from the ø75mm duct through 90° to a standard air valve connector. This reduces air speed on room entry, eliminating draughts and noise.

2. Ø 150mm DUCTING

The ø150mm duct runs from the Heat Recovery unit to the manifold. Its insulated properties prevent condensation and limit the escape of heat and noise, reducing the requirement for silencers. The bends complement the ø150mm ducting and the connector provides an easy push fit joint.

3. ROOF COWL

Used for passing ductwork through a roof.

4. MANIFOLD CONNECTOR

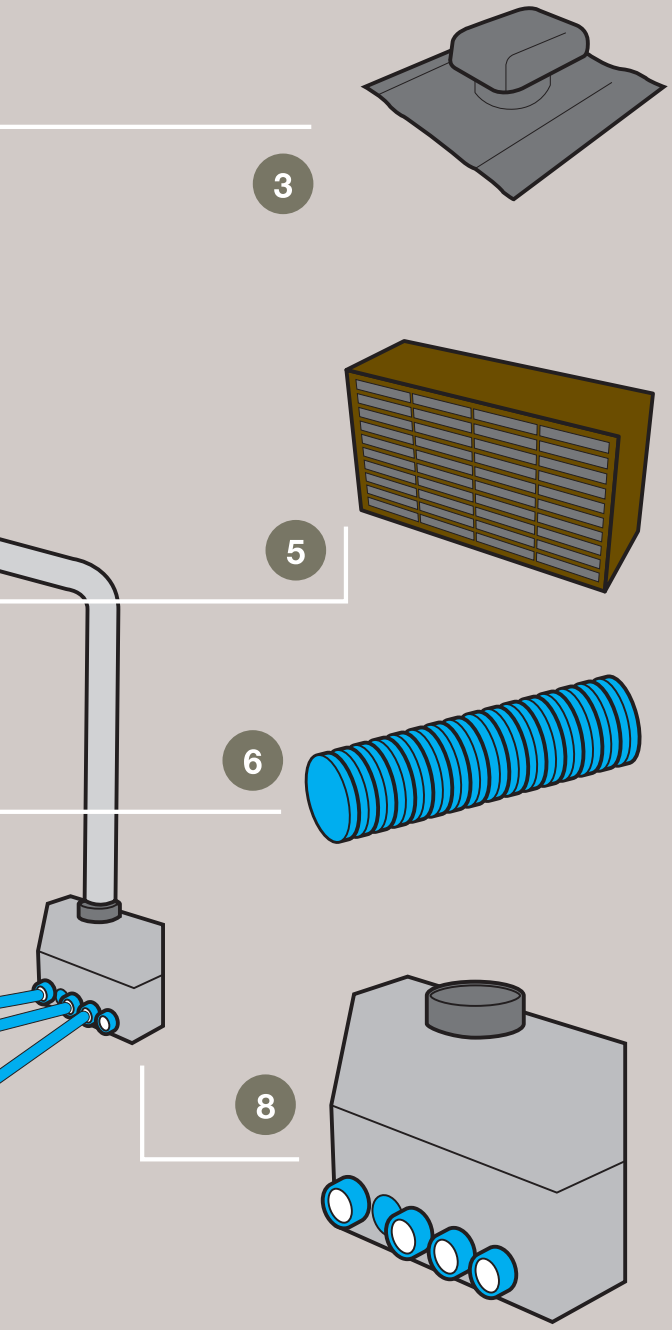
The manifold connector provides an air tight seal for the 75mmm semi-rigid duct as it is connected to the manifold. This reduces the need for traditional sealing methods such as mastic. Overall this improves the system performance by reducing air leakage.

5. DOUBLE AIRBRICK & ADAPTOR

Used for passing ductwork through an external wall.

6. Ø 75mm SEMI-RIGID DUCTING

Supplied in neatly coiled 50m lengths it's easy to handle, store and transport. Its smooth inner lining and strengthened corrugated outer layer are made from Low Density Polyethylene (LDPE) which makes it flexible in its application but hard wearing on site. It can be easily manipulated to changes in direction reducing the need for connectors and T-pieces and saving time on installation, however where sharper bends are required, there is a 90° bend connector available. Should there be a requirement to connect two pieces of semi-rigid duct, a connecting piece is available with an airtight fixing.



7. HEAT RECOVERY UNIT

The heat recovery unit uses fans to extract air from inside the building and also introduce air from outside. The two air flows pass through a high efficiency heat exchanger. Each heat recovery unit has a summer bypass fitted.

8. MANIFOLD

The manifold is used as a distribution system receiving air through 150mm duct from the Heat Recovery unit and distributing the air into each room using several smaller 75mm semi-rigid ducts. With inherent insulation and sound attenuation properties, this also helps prevent condensation and limit the escape of heat and noise, reducing the requirement for duct silencers.

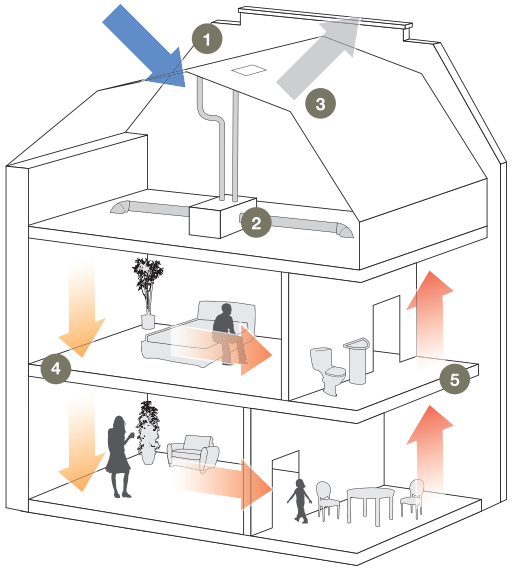
WHAT'S DIFFERENT ABOUT OUR MVHR?

Simpler and quicker installation
- ↘ Less fittings required
- ↘ More flexible, semi-rigid duct makes it easier to go around obstacles, change direction and fit through joists
- ↘ Supplied in 50m or 25m lengths
- ↘ Connection from the manifold to the room in one length

Where joints are required
- ↘ Cutting and joining is quick and easy
- ↘ The duct can be cut using a knife
- ↘ Flexibility means less accuracy required in measuring

Airtight reliable seals - no air leakage
- ↘ Uses 'lip type' Thermo Plastic Elastomer (TPE) seals
- ↘ Sealing components are manufactured to precise standards
- ↘ Securing clips grip into outer corrugations to keep joints locked together

Eliminates room to room cross talk
- ↘ No need for silencers
- ↘ Easy and quick to commission
- ↘ Straightforward airflow balancing as changes to one air valve will have less effect on the flow of air through the other outlets



THE WORKING SYSTEM

1. Outside air is drawn into the house through a roof cowl or air brick.

2. The heat recovery unit transfers the energy from the outgoing warm stale air into the incoming cold fresh air.

3. Air is extracted to the outside though a roof cowl or air brick.

4. The heat recovery unit supplies fresh air through ducting into living rooms and bedrooms through a valve in the ceiling.

5. Stale humid air is extracted by the heat recovery unit from bathrooms and kitchens through a valve in the ceiling.

THE HEAT RECOVERY UNIT

ABOUT THE “HRU”

The Heat Recovery units are among the quietest on the market and are light weight and compact for simple, easy installation in kitchen eye-level cupboards or lofts.

There are four appliances available. HR01WB is a wall mounted appliance with a summer bypass to provide night time cooling during the summer. The filters in these appliances are designed for annual servicing.

HR01LB is a loft mounted unit with a summer bypass. Filters require servicing every 5 years to keep the unit functioning efficiently. HR02LB and HR03LB are loft units designed for increased capacity.

The heat recovery appliances installed with high flow duct systems to save fuel costs and improve air quality and comfort.

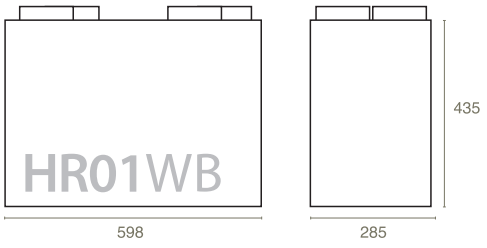
A range of tamperproof control sensors ensure the system runs optimally all year round and all appliances are offered with a three year warranty as standard.

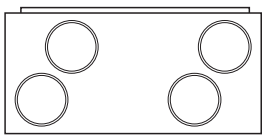
HR01 appliances have been approved as Best Practice compliant by the EST.

LESS ENERGY, MORE COMFORT.

	HR01WB with Summer Bypass			HR01LB with summer Bypass			HR02LB with Summer Bypass			HR03LB with Summer Bypass		
Installation type	Wall Cupboard			Loft			Loft			Loft		
Spigot Diameter (mm)	100/125			150/125			150/125			150/125		
Fan Speed	100% variable			100% variable			100% variable			100% variable		
	SFP	Heat Exchange Efficiency	Flowrate	SFP	Heat Exchange Efficiency	Flowrate	SFP	Heat Exchange Efficiency	Flowrate	SFP	Heat Exchange Efficiency	Flowrate
	(W/l/s)	(%)	(l/s)	(W/l/s)	(%)	(l/s)	(W/l/s)	(%)	(l/s)	(W/l/s)	(%)	(l/s)
Kitchen plus 1 additional wet room	0.59	92	15	0.69	92	15	0.61	91	15	0.81	91	15
Kitchen plus 2 additional wet rooms	0.68	91	21	0.76	92	21	0.59	91	21	0.77	91	21
Kitchen plus 3 additional wet rooms	0.83	90	27	0.85	90	27	0.62	91	27	0.78	91	27
Kitchen plus 4 additional wet rooms	-	-	-	-	-	-	0.71	91	33	0.86	91	33
Kitchen plus 5 additional wet rooms	-	-	-	-	-	-	0.78	91	39	0.96	91	39
Kitchen plus 6 additional wet rooms	-	-	-	-	-	-	0.92	90	45	1.09	90	45
Kitchen plus 7 additional wet rooms	-	-	-	-	-	-	-	-	-	1.24	90	51

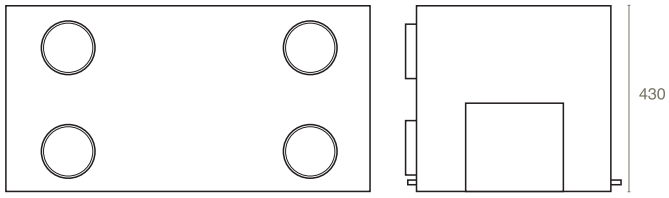
HR01WB





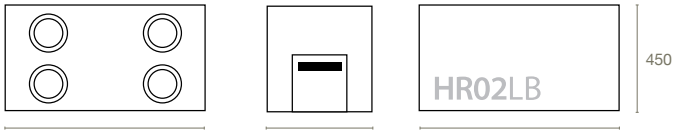
Weight 13Kg

HR01LB



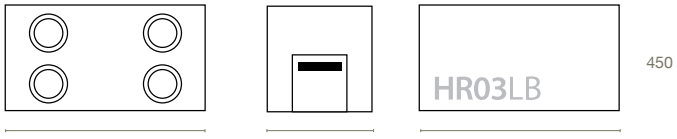
Weight 21Kg

HR02LB



Weight 21Kg

HR03LB



Weight 21Kg

All dimensions in mm

TIE

TOTAL INDOOR ENVIRONMENT

DESIGN SERVICE

We can even take the hassle out of specifying the exact components required for your project with our own in-house design service.

SYSTEM SOLUTION PACKS

We have also tailored our product offering to ensure that you get the best value for money. You can order one of our handy system solution packs or any of the items individually from the spare parts list.

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THE PERFECT INDOOR ENVIRONMENT AT THE LOWEST ENVIRONMENTAL COST

Creating the perfect working and living environment at the lowest environmental cost is an important feature of all Timoleon systems. By bringing an underfloor heating system together with whole house ventilation and heat recovery excellent comfort conditions can be obtained with low energy consumption and running costs.

Comfortable radiant underfloor heating

Underfloor heating has long been considered the most comfortable form of heating. This is because underfloor heating transfers radiant energy rather than transferring energy by convection. This method of energy transfer reduces draughts and feels generally more comfortable.

Ventilation and heat recovery to provide fresh air and maintain humidity levels

It is important that buildings are ventilated properly and that sufficient fresh air is brought into the building. Whole house ventilation can achieve this in a controlled way but it is equally important that to transfer the energy in the outgoing air into the incoming air.

Controls to ensure the system works at the right time and in the right way

Good simple to use controls are essential to any system. If the controls are difficult to use or don't control the environmental conditions as they should then users will end up feeling uncomfortable and probably be using more energy than they should.

What is Comfort?

Comfort is subjective, different people have different comfort levels. When designing a system our aim is to create and maintain a comfortable environment that most people are happy with. By using the correct controls we also provide the flexibility within the system for the user to alter the environment to their choosing.

Key factors in a comfortable environment;

- Temperature -The temperature needed is dependent on activity and clothing.
- Humidity – Too much moisture can feel humid and uncomfortable whereas too little moisture can make the eyes, skin and throat feel uncomfortably dry.
- Air movement – If the air is completely still it can feel stale and stuffy but fast moving air, such as draughts, can also cause discomfort.
- Air quality – Stuffiness and a build up of odours need to be removed to maintain a feeling of freshness.

Polypipe's
Indoor Climate Partner