HEAT RECOVERY VENTILATION UNIT GUIDE
03  **AN INTRODUCTION TO HRVU'S**

04  What Does a HRVU Do?
    How Does It Work?

05  HRVU Components

06  What Are the Benefits?
    Why Choose Mechanical Ventilation?

07  Less Energy Consumption Than You May Think
    What Units Are Available?

08  **HRVU INSTALLATION GUIDE**

09  The Importance of Correct Installation

10  Where Is It Best to Install HRVU's?
    Planning

11  System Configuration

12  Layout and Sizing

13  Wiring
    Ducting

14  Measuring and Balancing Air Flows

15  **CONTACT US**
AN INTRODUCTION TO HRVU’S
The purpose of a HRVU is two-fold:

1. To manage the impact of moisture on the building fabric and improve energy efficiency.
2. To improve the air quality in the property.

A HRVU will keep your building well ventilated throughout the year. By moderating and balancing temperature, HRVU’s help to spread warm air evenly throughout a property while also extracting any moist air.

**WHAT DOES A HRVU DO?**

**HOW DOES IT WORK?**

**IT EXCHANGES**
It effectively and reliably exchanges stale air with fresh air.

To do this, a fan is used to push stale air out of the building whilst a 2nd fan draws fresh air back in.

**IT DISTRIBUTES**
It distributes ventilated air to multiple rooms.

Air ducts will run between the supply air fan and each room that is served.

**IT CIRCULATES**
It circulates clean air throughout the entire space.

Circulation is achieved by careful placement of the supply & extract air diffusers to create a slow and continuous movement of air either on a room by room basis or over the entire property.

**IT RECOVERS**
Heat is recovered through the heat exchangers and transferred to the incoming fresh air.

By extracting warm and moist air from rooms such as kitchens and bathrooms, the unit passes heat to fresh air from outside, through a heat exchanger, rather than simply expelling it outwards.
HRVU’s typically consist of the following components:

- An airtight insulated case
- Supply and exhaust fans
- Outdoor air inlet from outside (with insulated duct connected)
- Outdoor supply air outlet (with duct connected)
- Exhaust air inlet (with duct connected)
- Exhaust air outlet to outside (with insulated duct connected)
- Heat exchanger
- Condensation drain pan connecting to a drain
- Sensors and controls
- Removable / cleanable filters
WHAT ARE THE BENEFITS?

As well as reducing moisture and spreading temperatures more evenly throughout your building, HRVU’s have exceptionally low noise levels and reduce heat loss with up to 90% heat recovery. **As well as being easy to manage, HRVU’s also offer the following benefits:**

- **Runs quietly** (unlike extractor fans)
- **Makes environments healthier**
- **Energy-efficient to run**
- **Makes temperatures more predictable**
- **Makes environments more comfortable**

Installing a HRVU supports a healthy indoor living and working environment.

WHY CHOOSE MECHANICAL VENTILATION?

Mechanical ventilation actually has many benefits over natural ventilation. Natural ventilation can cause drafts, comfort problems, and generate higher costs. Plus, natural ventilation can be unpredictable and not always available when or where it is needed. **As housing has become better insulated and more airtight in an effort to conserve energy and reduce utility bills, mechanical ventilation has definitely become the preferred ventilation strategy for most buildings.**
HRVU’s supply and exhaust equal quantities of air simultaneously, both to and from a building, while transferring heat between the two air streams. This reduces the energy consumption associated with heating or cooling and keeps the ventilation system balanced.

HRVU’s save energy by recovering heat from the exhaust airstream and pre-heating the incoming air in the winter. This process is then reversed in the summer.

LESS ENERGY CONSUMPTION THAN YOU MAY THINK

WHAT UNITS ARE AVAILABLE?

We offer a range units with varying capacities (to match the size of your building) that are well suited for both domestic and commercial use.

Most of our units also have three different operating speeds, to ensure that you get the best flow of air for your needs.

Speak to one of our experts by calling 01636 639 900 to determine which type of system and model is best for you.

There are three types of model to choose from:

**STANDARD**
Recover heat while exchanging stale air for fresh air.

**PRE HEATER**
Heats the cool air taken in from outside, in addition to the heat exchanged from the internal air.

**AUTO BYPASS**
The heat exchanger can be bypassed, meaning the heat energy is not transferred to the incoming air.
A feature of modern buildings, designed to be thermally efficient, is that opportunities for natural ventilation are virtually removed.

A carefully planned and installed MVHR enables your property to breathe effectively, whilst also reducing the risk of condensation and mould by removing humid air from your home.

This guide is designed to provide you with an understanding of how to gain the most from the installation of your MVHR system and enjoy the benefits that a well-ventilated home provides, both in terms of health and energy conservation.

**THE IMPORTANCE OF CORRECT INSTALLATION**

**DIAGRAM OF A STANDARD HRVU INSTALLATION**

This is an example of an installation with one inlet or outlet per room. With this setup, you would extract from your wet rooms (kitchen / bathrooms) and push into your dry rooms (living rooms / bedrooms).
WHERE IS IT BEST TO INSTALL HRVU’S?

HRVU’s are best situated in the following three locations:

1. In a well-insulated loft (with adequate space left around the unit).
2. Mounted on joists or the floor.
3. Raised on a plinth (usually fitted on an anti-vibration mount).

It’s important to choose a space that:

- Has easy access to electricity.
- Is within close proximity to an external wall.
- Can become a central hub for pipes, ducts and cables.
- Is in a position that minimises the amount of ducting required to reach your rooms.

PLANNING

When planning where the ducts or pipes should go, remember that it is optimal for the room vents to be situated as far from the door to the room as possible.

It is also essential to make sure there is an adequate gap between the exhaust vents and the incoming vents, to maximise the effectiveness.
You can select the configuration best suited to your property. At the new-build stage you can plan ducting runs and vent locations with your builder as you progress. Retro-fitting to an existing property is not as difficult as you think and with ducting available in a number of different profiles, you can easily reach all areas of the property.

Develop your plan by identifying those areas that create heat and moisture; kitchens, bathrooms, utilities and WC’s are major areas for the extraction of stale, warm, moist air that, when not dealt with, will track through the property to find cold spots. These cold spots are then prime sites for the development of condensation and mould growth.

You will then need to locate areas to return the fresh, drier air that has retrieved heat from the unit’s heat exchangers. Rooms such as living areas, bedrooms and playrooms are ideal for this, as they are the rooms that are most lived-in.

Connect the areas to the unit (situated in a convenient location) to provide the shortest ducting runs in one of two ways:

01 By the use of a single ‘backbone’ duct linking all the extract points to the HRV unit extract connection; you would ‘T’ off this backbone to connect to the vents located in each room identified as an extract location.

You would connect the return air rooms in exactly the same way using a backbone and ‘T’s to link to the fresh air supply from the unit.

02 You may find it easier to run a duct back from each location to a central point where you create a manifold or Plenum that will then connect to the unit; an individual plenum box for the extract and supply will be required.

If the rooms that you are servicing are large rooms it may be advisable to install more than one extract or return vent.
Understandably, the size of the building and the number of rooms will greatly affect the size and layout of your system.

If in doubt, consult a professional to ensure that you get the most out of the ventilation system.

**Planning the layout and sizing can be done using the following steps:**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Choose the appropriate locations for the HRVU equipment, including all indoor supply diffusers and return grilles, and outdoor air intakes and exhaust(s).</td>
</tr>
<tr>
<td>02</td>
<td>Choose a location for the HRVU, close to a wall and easily accessible for maintenance.</td>
</tr>
<tr>
<td>03</td>
<td>Choose locations for the interior supply diffusers so that outdoor air is well circulated in each room. Diffusers should be mounted in the ceiling or in linear grilles that can be located high up in partition walls within 300mm of the ceiling, so that the supply air sweeps across the entire room before it exits under the door.</td>
</tr>
<tr>
<td>04</td>
<td>Choose locations for exhaust grilles in bathrooms, kitchens, laundry rooms and walk-in closets: in the ceiling or high in a partition wall within 300mm of the ceiling, and away from entry doors so that air moves under the door and across the entire room.</td>
</tr>
<tr>
<td>05</td>
<td>The outdoor air intake hood is recommended to be placed at a minimum of 1.8m from the exhaust outlet hood, at least 900mm from all pollution sources, at least 450mm above grade, or above the highest snow level, and so that it is accessible for cleaning (i.e., not located under decks).</td>
</tr>
<tr>
<td>06</td>
<td>Lay out the ductwork. The ductwork should be sized and laid out to minimize the airflow resistance or friction.</td>
</tr>
<tr>
<td>07</td>
<td>Size the ductwork. The size of the ductwork required will depend on the layout and the volume of air that flows through each duct and the external static pressure rating of the fan motor set.</td>
</tr>
<tr>
<td>08</td>
<td>Confirm that the HRVU fan capacity is adequate. Once the duct layout and sizing is complete, the capacity of the fans within the HRVU must be checked to ensure they can overcome the total static pressure of the ventilation system.</td>
</tr>
</tbody>
</table>
The HRVU system needs access to the mains power to run. Pre-planning this wiring run & placement of the unit will make this a much easier process.

The HRVU controls (either manual or LCD) should be placed in a location with convenient access and requires direct wiring to the unit. It may be necessary to run cables down the walls or roof, and that knowledge will be useful when installing.

Take a look at our Control Guide for information on how to operate the controls of your system.

Ducting provides a connection from the HRVU system to the outside world. Capped with external grilles, these ducts pass air both into and out of the building.

Internally, the HRVU system will need two loops, one to provide rooms with fresh air and the other to extract the stale air that has circulated. Both loops will run around the top layer of the building, using Tees to connect the circuit down to each room.

Each fitting should be easy to connect, simply plan the ducting runs and then cut them to size.

What if the ducting doesn’t fit to the HRVU?

Depending on the size of the ducting, reducers or spigots can be attached to the unit to help the ducting fit more securely.
Balancing the ventilation system will help to ensure that:

01 The amount of air entering the building is the same as the amount of air leaving the building.

02 The appropriate outdoor supply airflow reaches each space.

03 An appropriate amount of exhaust/moisture in the air is drawn from kitchens and bathrooms.

Airflows should be measured through major ducts, using a flow measuring station, as that is the most accurate way to measure the performance. In addition, the airflow from each supply grille and diffuser and to each exhaust grille or diffuser must be verified, for example by using a smoke pencil. The HRVU contractor will read the outdoor air supply and exhaust airflows and balance them at the desired setting.

Once all checks have been completed, results can be compared to the charts given in the manufacturer’s measurement checklist and altered if necessary.
If you have any questions or queries regarding the **Heat Recovery Ventilation Unit** systems we have to offer, or about the installation process, simply contact a member of our team on **01636 639 900** and we’ll be happy to help.

**BHF Unlimited**
Black Horse Farm, Norwell, Nottinghamshire NG23 6JN

**01636 639 900**

**admin@boulderdevelopments.com**

**www.bhfunlimited.co.uk**