

# A healthy indoor climate in a noisy environment



## The issue

This 10-year old detached two story house suffered from stale inside air and moisture problems. Opening windows was not an option due to traffic noise and heat losses.

## The solution

A permanent ventilation system with heat recovery was the perfect solution in this case. Heat recovery units provide fresh air and improved climate control, while also saving energy by reducing the heating (or cooling) requirements.

They work like this:

Stale and moist air is sucked out of bathrooms and kitchens. This air enters the heat recovery unit on one side. Cold external air is sucked into the other side of the unit. The external air is warmed by the heat exchanger using the warmth of the outgoing air before being blown into the living spaces of the house.

This means that the house benefits from a constant supply of pre- heated fresh air without the need to open windows.

The benefits of the system include:

- Reduced heating requirements, because 90% of the heat is transferred from outgoing air to incoming air.
- Elimination of condensation
- Improved air quality for asthma and hay fever sufferers as air is filtered
- No need for noisy bathroom ventilators
- Reduction in external noise, for example from traffic
- Increased security against burglars because windows stay shut.

## The proposal

The proposal included a recommendation for an eco-fan heat recovery module and recommendations for ducting and control, all of which would comply with the proposed building regulations part F1.

## Heat recovery unit

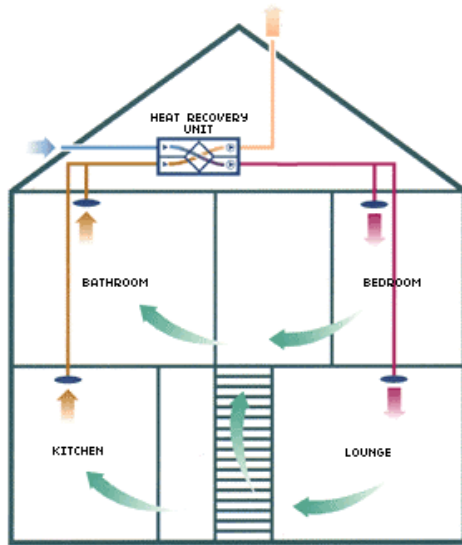
There are three factors key factors determining the suitability of a heat recovery unit:

- Air exchange rate: A good heat recovery unit provides the air exchange rate as stated in the building regulations part F1.
- Performance – A good heat recovery unit extracts the maximum possible heat out of the stale air without using too much electricity. Good heat recovery units have an efficiency of well over 90% and use less electricity than a light bulb to run.
- Control - At least three settings should be available: to keep noise levels down during the night, to provide a suitable airflow during day time and to provide the possibility to increase the airflow during showers, toilet use and/or cooking. A by-pass of the heat exchanger is useful to remove excess heat from the property in the midst of summer without opening windows.

The HRU ECO-fan 3 S B H, which is manufactured by ITHO, was recommended for this house. In night mode an extraction rate of approx. 75 m<sup>3</sup> can be achieved, in day mode 150 m<sup>3</sup> and in extract mode 275 m<sup>3</sup>.

## Ducting

Heat recovery units are usually located in the loft. This diagram shows a typical installation:



Occupied rooms produce stale and moist air, especially the kitchen and bathrooms. These rooms need extract ducts fitting, which connect to the heat recovery unit. Rooms such as the lounge and the master bedroom are fitted with ducts through which the unit blows pre-heated fresh air.

Two connections need to be made from the heat recovery unit to external air; one to let outside air in and one to extract stale air. It is important to prevent water ingress and insects from entering the ventilation system.

The proposal included a plan of the house showing where ducts would be placed. Sizes and numbers of ducts were recommended for maximum performance and minimum noise levels, and drains where needed. The recommendations also took into account minimum visual intrusion from the system.

## Control

A heat recovery unit automatically switches between day and night modes. The extract mode is needed at times when moisture levels are highest, for example during showering or cooking.

It was proposed to use the Silvercrest Home automation system to automatically switch to extract mode for 20 minutes as soon as the light in the bathroom/toilet or on the cooker hood was switched on.