

case study



Croft home benefits from heat recovery ventilation

Using a heat recovery ventilation system was a natural choice for one homeowner on the Isle of Mull when they were looking to create an efficient and comfortable renovation of a centuries old croft house.



The two storey croft, which has a coombed ceiling, had originally been in need of considerable repair and although there were certain design restrictions on the external appearance, the owners were looking to create a home with high levels of energy efficiency. In order to retain the appearance of the dry-stone wall exterior, whilst still achieving thermal performance, the decision was taken to construct a timber frame lining inside the existing structure. The Kingspan 100 thermal lining was designed to be fully independent of the single solid stone external wall.

This construction method was used because it was calculated to be the only practical method of maximising the airtightness of the building - essential for achieving energy efficiency. However, although creating a thermally efficient envelope, it would have resulted in poor indoor air quality, leading to unhealthy living conditions. This is because a typical household of four people can produce up to 18 litres of moisture per day, simply by breathing, cooking and washing! Eventually, this would have led to mould growth that can cause bronchial conditions, and proliferation of dust mites, which have been shown to exacerbate asthma and allergies.

Installing the heat recovery ventilation system (MVHR) helped address these issues by reducing relative humidity levels to below 70 per cent. This resulted in a cleaner and fresher internal environment from the continually circulated filtered air.

The heat recovery files

Client:	Tim Capper
Project:	Refurbishment of existing croft
Ventilation:	Heat recovery ventilation
Heating system:	Air source heat pump
Options:	Summer bypass to introduce an element of cooling to the system
Local conditions:	Over 3m of rain per year. Very low average winter temperatures
Construction:	Insulated timber panels on the inside of the existing external wall

"We have been delighted with the MVHR system from ADM Systems. The service provided by the company was excellent and the whole system has helped us create a super energy efficient home."

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The MVHR system works using a series of ducts that collect stale moist air from inside the croft, from areas such as the kitchen, laundry and bathroom. This stale contaminated air passes through the heat exchanger unit and is exhausted to the outside. Clean fresh air is then simultaneously drawn from the outside and, as the two air streams pass each other, the heat is transferred from the outgoing stale air to the fresh incoming air. There is no mixing of air streams. During winter, the unit is able to capture over 90 per cent of the energy from the outgoing stale air before delivering it as warm, filtered, preconditioned air into the living areas of the property through the ducting.



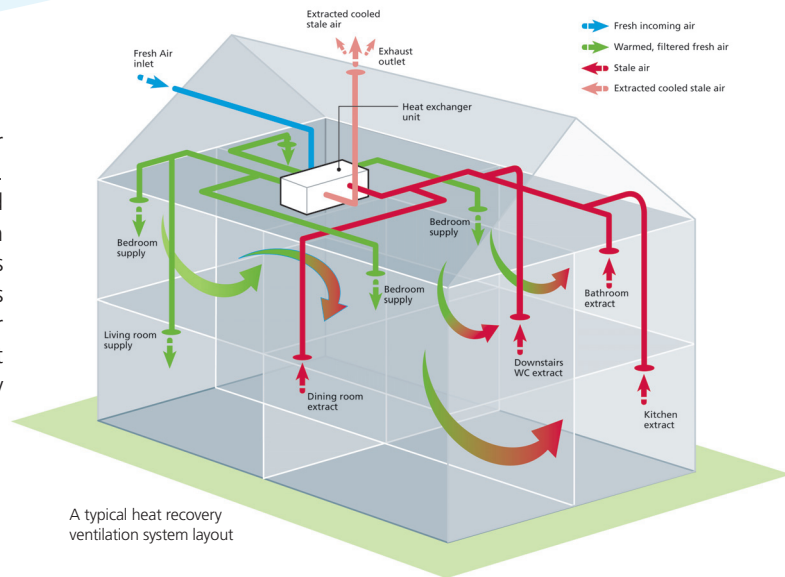
As well as achieving maximum levels of energy efficiency, local weather conditions were part of the reason why the owner of the croft chose a MVHR system. With over 3m of rain each year, they knew that simply opening the windows would not provide adequate ventilation for the property and preferred not to do this anyway because it would compromise the energy efficiency of the building.

The MVHR system also enabled the building to comply with Building Regulations in terms of providing ventilation without requiring window vents that can, again, reduce the thermal performance of the property.

"The efficiency of the MVHR system meant that it was unnecessary to fit heating appliances upstairs in the croft. This is because heating upstairs is provided by the 'recovered' heat from the MVHR system, which maximises the energy efficiency of the whole building," explained Tim Capper, owner of the property. **(ADM Systems recommends that you seek advice from a qualified independent heating specialist to determine the heating requirement for your home).**

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A typical heat recovery ventilation system layout

The MVHR system in the croft was fitted with a summer thermal bypass as it is south-facing. This means that that incoming air can be drawn into the property without transfer of heat from the heat exchanger unit. This allows the homeowner to provide comfort cooling during summer.



"The MVHR system is one of the best features of our new home as it maximises energy efficiency as well as providing an element of comfort cooling during summer. The service provided by ADM Systems was excellent and the whole system has helped us create a super energy efficient home that feels much drier and healthier," commented Tim Capper.