

# Building Regulations

*The 2006 Edition of the UK Building Regulations Approved Document F1: Means of Ventilation (applicable in England and Wales) details four clearly defined systems of ventilation to dwellings. System 4 - Continuous mechanical supply and extract with heat recovery (MVHR) is complied with by the new HRU ECO 4 RF ultra-high efficiency whole house heat recovery ventilation system.*

System 4 - Continuous Mechanical Supply & Extract with Heat Recovery requires a “minimum high rate” in each wet room to be achieved (kitchen 13 l/s and both utilities and bathrooms 8 l/s (sanitary only 6 l/s)). In employing this type of system, there is no need to install background ventilators in the dwelling – an ideal solution to “noisy” sites.

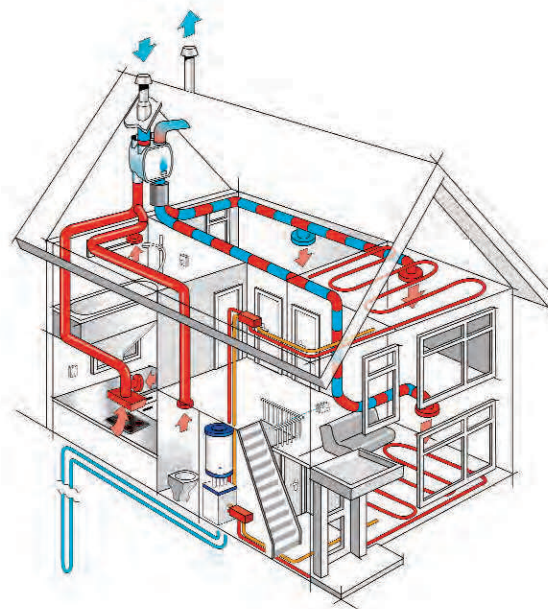
The “minimum low rate” is calculated by taking the number of bedrooms in the dwelling and applying the l/s value from Table 1.1b. In addition, the rate should be no less than 0.3 l/s per m<sup>2</sup> of internal floor area (all storeys) plus, for each additional occupant over and above the anticipated two for the first bedroom and one for each of the others, a further 4 l/s must be added to the extract rate. Also, there is an addition of an allowance to be calculated for air infiltration.

The system provides quiet, uninterrupted extract ventilation from the dwelling, removing warm stale air via all of the “wet” rooms, creating a permanent air path through the property from the “dry” habitable rooms.

Air, drawn into the property by the fan, is routed through an integral high efficiency synthetic heat exchanger where warmth from the extracted air is transferred to the incoming fresh air, before it is supplied to the habitable rooms.



# Building Regulations - System 4



## CONTINUOUS MECHANICAL SUPPLY & EXTRACT VENTILATION WITH HEAT RECOVERY

A continuous balanced mechanical central supply and extract system to be positioned in loft or cupboard space. An integral heat exchanger recovers a large percentage of heat energy that would have otherwise been lost. In employing this type of system, there is no need to install background ventilators in the dwelling.

### CONTINUOUS SUPPLY AND EXTRACT

1. Determine the whole building ventilation rate from Table 1.1B. Allow for infiltration by subtracting for multi-

storey dwellings:  $0.04 \times$  gross internal volume of dwelling heated space ( $m^3$ )  
 for single storey dwellings:  $0.06 \times$  gross internal volume of dwelling heated space ( $m^3$ ).

2. Calculate the whole dwelling extract rate at maximum operation by adding the individual room rates for 'minimum high rate' from Table 1.1A.

3. The required air flow rates are as follows: Maximum Extract Rate (boost)

is the greater step of 1 and 2 above. The minimum individual room extract rates should be at least those given in Table 1.1A for minimum high rate. Minimum air supply rate should be at least the whole building ventilation rate in 1 above.

4. No background ventilators are required with System 4.

Table 1.1 A

Room	Minimum Intermittent Extract Rate	Continuous Rate	
		Minimum high rate	Minimum low rate
Kitchen	30 l/s (adjacent to hob); or 60 l/s elsewhere	13 l/s	Total extract rate must be at least the whole building ventilation rate in table 1.1B
Utility Room	30 l/s	8 l/s	
Bathroom	15 l/s	8 l/s	
Sanitary Accommodation	6 l/s		

Table 1.1 B

Whole Building Ventilation Rate (l/s)	Number of bedrooms in dwelling				
	1	2	3	4	5
	13	17	21	25	29
Minimum value in any dwelling of 0.3 l/s per $m^2$ floor area.					

In addition, the minimum ventilation rate should not be less than 0.3 l/s per  $m^2$  internal floor area (this includes each floor, e.g. for a two-storey building, add the ground and first floor areas).

This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected, then add 4 l/s per occupant.

# SAP Appendix Q Eligible

*The HRU ECO 4 is SAP Appendix Q Eligible proving it to be one of the most energy efficient MVHR units available.*

Designed to calculate the energy performance of Dwellings, the Standard Assessment Procedure (SAP) Appendix Q website: [www.sap-appendixq.org.uk](http://www.sap-appendixq.org.uk) is a UK based Government led initiative used to demonstrate compliance with building regulations within the following areas - Part L (England and Wales), Section 6 (Scotland) and Part F (Northern Ireland), providing energy ratings for dwellings that can be compared nationally. Here are the relevant independent BRE test results for the HRU ECO 4:

As featured in the Energy Saving Trusts' 'Demonstrating Compliance - Best Practice', in order to meet reduced CO2 emission targets, MVHR units have been set certain standards and must have a specific fan power (SFP) of 1.0 W/L/s or less and a heat recovery efficiency of 85% or above. These figures have been both reached and exceeded by the HRU

ECO 4, a credit to Itho's continued technological advancements.

The Energy Saving Trust's 'Best Practice' standards, along with The Code for Sustainable Homes, both offer valuable guidance toward sustainable home building and offer the industry the chance to exceed Government targets

and to aspire to go that extra mile.

Following years of experience in having to meet continually tightening demands, Itho always aims to stay one step ahead and continues to offer ventilation solutions that exceed current expectations.

Test report – SAP Appendix Q – MVHR

Test report Number 244-174  
Test report issued 02/04/08

## Standard Assessment Procedure 2005 – Appendix Q MVHR Product Data

Product tested **HRU ECO 4**

### Results for Appendix Q at minimum flow rate condition

This product has only been tested with rigid ductwork and it is not applicable for SAP Appendix Q if installed with flexible ductwork.

Table Q2 – Systems with rigid ductwork only

Exhaust terminal configuration	Fan speed setting	Total flow supply rate (l/s)	Total exhaust flow rate (l/s)	Specific fan power (W/l/s)	Heat recovery efficiency (%)	Energy Saving Trust Best Practice Performance Compliant
Kitchen + 1 additional wet room	Supply & Extract – 100% variable	15.0	15.0	0.46	91	Yes
Kitchen + 2 additional wet rooms	Supply & Extract – 100% variable	21.0	21.0	0.46	90	Yes
Kitchen + 3 additional wet rooms	Supply & Extract – 100% variable	27.0	27.0	0.50	88	Yes
Kitchen + 4 additional wet rooms	Supply & Extract – 100% variable	33.0	33.0	0.56	88	Yes
Kitchen + 5 additional wet rooms	Supply & Extract – 100% variable	39.0	39.0	0.65	87	Yes
Kitchen + 6 additional wet rooms	Supply & Extract – 100% variable	45.0	45.0	0.75	87	Yes
Kitchen + 7 additional wet rooms	Supply & Extract – 100% variable	51.0	51.0	0.87	87	Yes

These figures must NOT be entered directly into the SAP worksheet or any software. They must be entered into the SAP Q Calculation Spreadsheet.

bre