

# Ecovent<sup>®</sup>

## Hybrid

- f Meets BB101 and FOS overheat requirements, through mechanical ventilation mode
- f Designed to meet BB93 requirements
- f Utilises natural ventilation and has low specific fan power in mechanical mode
- f Accurate CO<sub>2</sub> and thermal comfort control, varying fresh air and utilising free heating/cooling recovery
- f Simple user interface with indication of operating mode
- f Manual override to control CO<sub>2</sub> levels and summer overheating
- f Slimline, lightweight construction, saving space and easing installation
- f Single wall or facade location negating the need for ventilation stacks or ducts, reducing installation time and cost
- f BIM files available



**DUTIES UP TO**  
**0.95 m<sup>3</sup>/s**  
**(950 l/s)**



*Natural ventilation enhanced by a low power fan*

### Ecovent<sup>®</sup> Hybrid

*part of a complete range of innovative, flexible products  
from the HVAC experts*

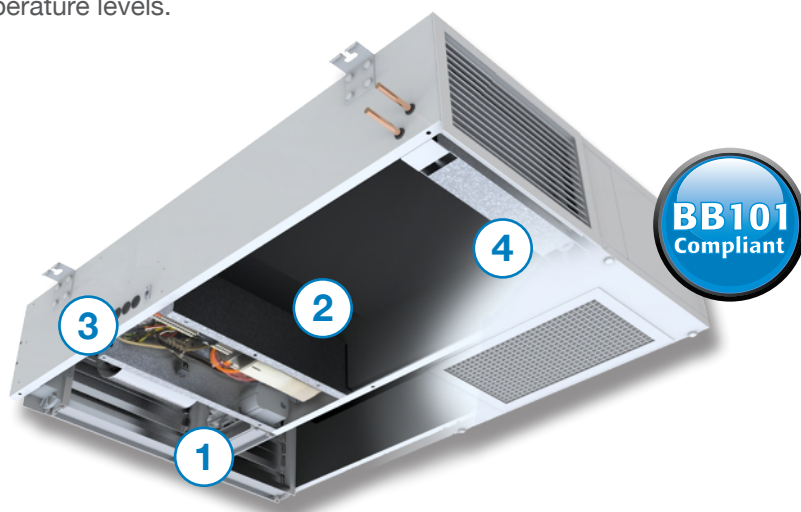
# Ecovent<sup>®</sup> Hybrid

## Ecovent<sup>®</sup> Hybrid

In the UK, all new school designs must comply with standard building regulations. Additional school design specifications and guidelines are also in place to ensure best practice.

VES products and services enable compliance with these guidelines, in all spaces throughout the school building, regardless of size or function. Our schools project portfolio extends through both the public and private sectors. Working with VES ensures occupant comfort and low operating costs over the lifetime of the ventilation system.

The Hybrid ventilation system uses a combination of automatic mechanical ventilation and manually operated windows to achieve classroom comfort conditions. These conditions are maintained by supplying a variable volume of fresh air to manage room CO<sub>2</sub> and temperature levels.



## Ecovent<sup>®</sup> Hybrid Features and Benefits

### Performance

Meet regulations,  
minimise noise and  
maximise performance

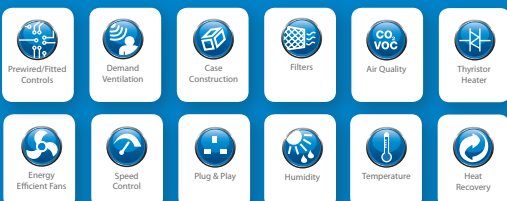
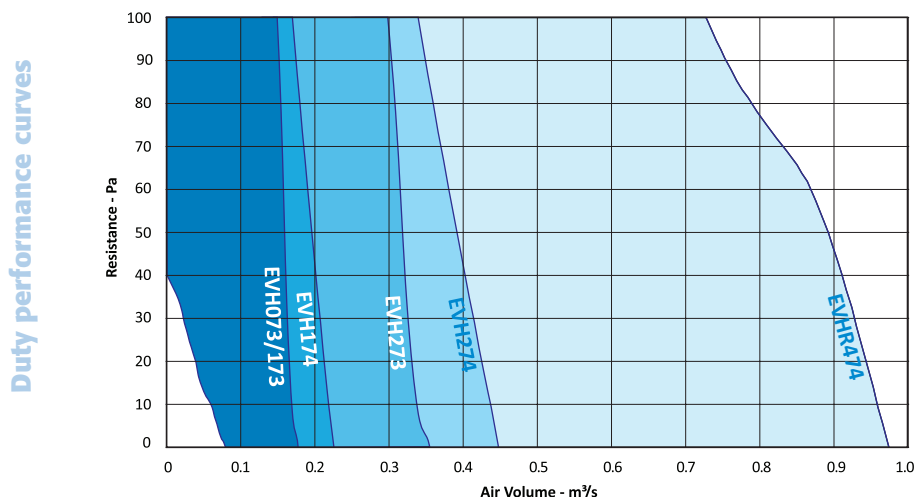
### Control

Energy saving packages  
combining intelligent  
controls technology,  
products and services

### Configuration

Simple operation,  
combining automatic  
mechanical ventilation  
and manually operated  
windows for optimised  
comfort and control

## Ecovent<sup>®</sup> Hybrid Performance



## Energy Saving

Intelligent controls enhance  
performance whilst saving  
energy and money.

# FAN ENHANCED NATURAL VENTILATION



## Energy Efficiency

Energy efficient units with low SFP to help achieve L2 Building Regulations. Fully tested to BS EN ISO 5801:2017.



## High Performance EC Fans

EC fans offering maximum energy efficiency and minimum energy consumption. Fully controllable and ErP Lot 11 compliant.



## Noise Reduction

The premium acoustic insulation helps ensure the requirements of BB93 and FOS are met. The range has been independently tested at the University of Southampton's Institute of Sound and Vibration Research (ISVR) to BS EN ISO 3744:2010, BS EN ISO 3741:2010 and BS EN ISO 10140-2:2010.



## Integrated Controls

Master units include a fully integrated controls package, reducing onsite wiring requirements. Further secondary 'Slave' units can be connected in series to fulfil the environmental requirement. The unit settings can be accessed locally by plugging in a handheld HMI into the RJ45 socket supplied on the unit and the controls can interface to a BMS via BACnet MSTP as standard (other BMS protocols are available).



## Local Control

The boost/off override function can be enabled via a room mounted teacher's switch. This switch also gives a clear indication to allow windows to be opened when conditions permit.



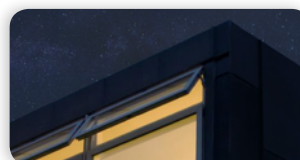
## BlueSense Complete Ventilation Package

VES offers the expertise, products and services to provide a complete ventilation package including heat recovery unit, integrated controls and site assistance, providing peace of mind through reliable products and expert knowledge.



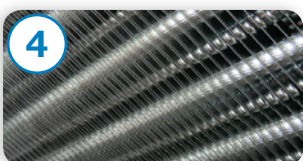
## Operation

The Hybrid unit operates by regulating fresh and recirculated air, controlling the CO<sub>2</sub> and temperature, balancing comfort and air quality. A controls philosophy detailing the full operation is available.



## Free Cooling

A purge function can provide free cooling of the room fabric on summer nights. When enabled, the system will run in boost mode provided the correct conditions are met.



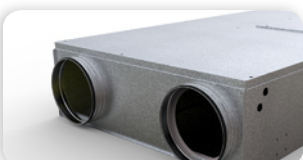
## Heating

LPHW coils ensure that the supply air temperature is no lower than 5°C below the room temperature setpoint, meaning that air quality can be maintained through colder periods whilst eliminating the potential for cold draughts.



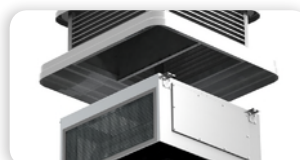
## Unit Configuration

Room units are available in 3 sizes. Any of these units can be combined to achieve the required duty. This enables ideal room placement to give the best ventilation coverage.



## Form and Function

Options for the units can include: alternative spigot connections, bespoke casework colours (standard is RAL9010 pure white), non-painted galvanised finish and internally mounted valve and actuator kits.



## Roof Unit

For larger spaces, such as gymnasiums, a roof mounted unit is also available. The two part EVHR474 features a weatherproof external turret and a room-side fan section. Mode of operation is the same as the room mounted unit.

## BlueSense Energy Saving Package



Ecovent Hybrid with integrated controls



EC fan with full control

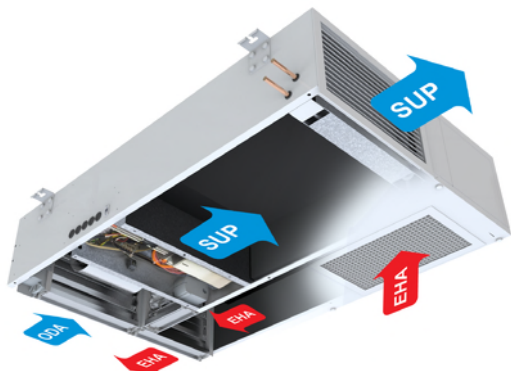


Sensor options



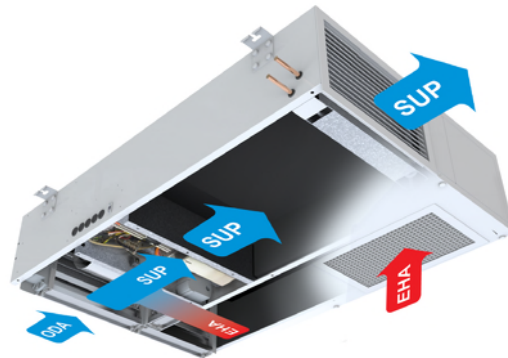
The sign of energy saving products, services and expertise

## Operating Modes



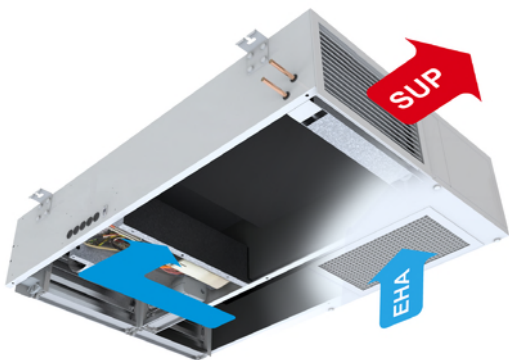
### Full Fresh Air Mode

- ▶f To reduce higher CO<sub>2</sub> and hotter temperature levels
- ▶f Mixing damper is closed; allowing no recirculation
- ▶f Exhaust air is forced to atmosphere through the introduction of fresh air



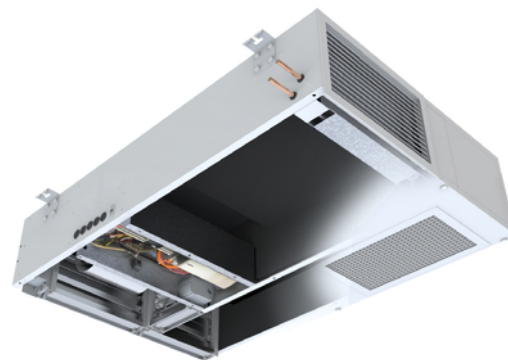
### Fresh Air Mixing Mode

- ▶f For higher CO<sub>2</sub> levels
- ▶f Cooler outdoor air is mixed with recirculated air, where the ratio of fresh air is modulated to control temperature and CO<sub>2</sub>



### Full Recirculation Mode

- ▶f With fan running for colder conditions
- ▶f Mixing damper is fully open, allowing air to be extracted from the space and passed over an LPHW coil for heating



### Full Natural Mode

- ▶f Using windows only
- ▶f Unit shuts down, with windows open, allowing for natural ventilation

## Facilities Output Specification (FOS) Compliance

The normal condition for a ventilation system is operating to limit the daily average carbon dioxide concentration to no more than 1,000ppm, with the maximum concentration not exceeding 1500ppm for more than 20 consecutive minutes on any day during normal school operating hours.

- This would equate to a ventilation rate of approximately 8 l/s per person.
- Having 32 people within a classroom, this would mean it requires 256 l/s of ventilation in total.

Units have been tested independently at the University of Southampton's Institute of Sound and Vibration Research, in accordance to BS EN ISO 3741:2010, to determine the sound levels emitted by the mechanical noise of the unit. These values describe the unit operating in isolation, while fitted to a wall (simulating the building fabric of a classroom).

There are infinite ways for configuring a classroom, which can then affect the resultant indoor ambient noise levels (IANLs) and how the Hybrid unit's mechanical noise interacts within it. The information provided by these tests allow for trained acousticians to estimate the room's IANLs when the Hybrid unit is included.

When operating at a total of 256 l/s:

- 2 x EVH173 (both running at 60%) will have approximately 25 dB(A) at 1 metre.
- 1 x EVH273 (running at 65%) will have approximately 31 dB(A) at 1 metre.

A Primary and Secondary School classroom or general teaching area has an upper limit of 35  $L_{Aeq,30mins}$  dB for a new build, 40  $L_{Aeq,30mins}$  dB for refurbished.

Hybrid ventilation systems for normal teaching and learning activities must achieve the above values, where this includes the mechanical noise of the unit and excluding external noise break in. The total noise level, including external noise ingress, may be the above levels +5dB (i.e. 40  $L_{Aeq,30mins}$  dB and 45  $L_{Aeq,30mins}$  dB respectively).

Rooms which have higher air flow requirements in practical spaces for science, art, food technology and design and technology, can use an increased number of Hybrid units within the room to provide the required air flow. These units can also linked and control a separate boost extract unit or fume cabinets. Within these rooms, units will also have intermittent boost, under local control of teacher for dilution of fumes during practical activities.

- There is an added +5 dB allowance to the room's upper limit (up to a maximum of 45  $L_{Aeq,30mins}$  dB )

The design brief describes temperatures should normally be 20°C, measured at 1 metre from the floor in the centre of the classroom. The air supplied by the Hybrid ventilation unit, at 1.4 metre above, into the classroom should not be below 15°C. By having a Hybrid unit fitted with Low Pressure Hot Water Coils (LPHW) as standard (which have been selected based on an external temperature of -5°C) along with the ability to use the mixing box to preheat incoming air, enables the unit to work in all the required temperature ranges.

**Coil Performance Data**

| Unit    | Air Volume<br>m <sup>3</sup> /s | Maximum<br>Leaving Air<br>Temp °C | Maximum<br>kW<br>Output | Water Flow<br>Rate<br>l/s | Water<br>Pressure<br>Drop kPa | Coil<br>Connection                              |
|---------|---------------------------------|-----------------------------------|-------------------------|---------------------------|-------------------------------|-------------------------------------------------|
| EVH073  | 0.060                           | 29.0                              | 2.47                    | 0.030                     | 3.0                           | Ø15mm<br>Suitable for<br>push-fit<br>connection |
| EVH173  | 0.128                           | 24.8                              | 4.62                    | 0.056                     | 3.2                           |                                                 |
| EVH273  | 0.256                           | 26.2                              | 9.67                    | 0.118                     | 17.7                          |                                                 |
| EVHR474 | 0.500                           | 32.4                              | 22.68                   | 0.277                     | 6                             |                                                 |

Note: Details above are based on flow/return of 80/60°C and air on temperature of -5°C 100% fresh air.

# Ecovent<sup>®</sup> Hybrid

## Selection Data

### Ecovent Hybrid EVH073

## Performance

$$\text{SFP} = \frac{\text{Electrical input power (Watts)}}{\text{Air volume flow rate (litres/second)}}$$

Note: SFP figures quoted at voltages tested in accordance with BS EN ISO 5801:2017

Nominal working conditions: 0.060 m³/s (60 l/s)

10 Pa approx = 6.7 W = 0.112 W/l/s

Note: values are per unit - unit EVH073 has 1 fan in total.

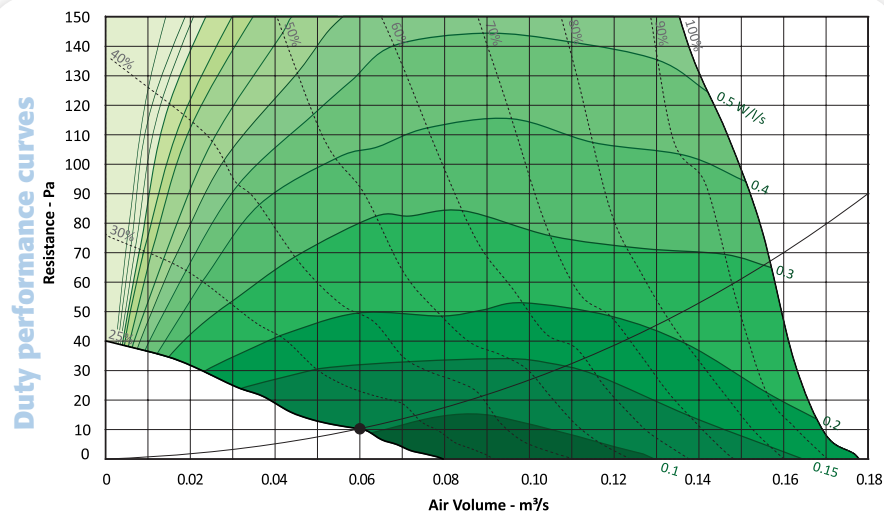
Motor power: 0.15kW

Voltage: 230 VAC

Full fan speed: 3450 rpm

Motor full load: 1.45 A

Speed control: EC



## Acoustic Data

| Fan<br>Voltage | Sound Spectrum dB re 10 <sup>-12</sup> W PWL Centre Frequency (Hz) |     |     |     |    |    |    |    | Casing Radiated |       |        |        |
|----------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|-----------------|-------|--------|--------|
|                | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | NR@1m           | NR@3m | dBA@1m | dBA@3m |
| 100%           | 59                                                                 | 56  | 56  | 48  | 45 | 38 | 37 | 33 | 33              | 25    | 38     | 30     |
| 90%            | 58                                                                 | 55  | 56  | 47  | 43 | 37 | 36 | 31 | 33              | 25    | 37     | 29     |
| 80%            | 56                                                                 | 53  | 53  | 45  | 41 | 34 | 33 | 28 | 29              | 21    | 34     | 27     |
| 70%            | 53                                                                 | 51  | 50  | 44  | 38 | 31 | 30 | 26 | 27              | 19    | 32     | 24     |
| 60%            | 49                                                                 | 48  | 46  | 40  | 34 | 26 | 24 | 23 | 23              | 15    | 28     | 21     |
| 50%            | 45                                                                 | 43  | 44  | 37  | 29 | 20 | 19 | 23 | 20              | 12    | 25     | 17     |
| 40%            | 39                                                                 | 42  | 39  | 32  | 21 | 13 | 16 | 22 | 17              | 9     | 20     | 12     |
| 30%            | 41                                                                 | 46  | 38  | 24  | 13 | 9  | 16 | 22 | 17              | 9     | 20     | 12     |
| 25%            | 41                                                                 | 31  | 33  | 22  | 12 | 10 | 16 | 22 | 16              | 9     | 14     | 7      |

Units are independently tested at ISVR in accordance with BS EN ISO 3741:2010.

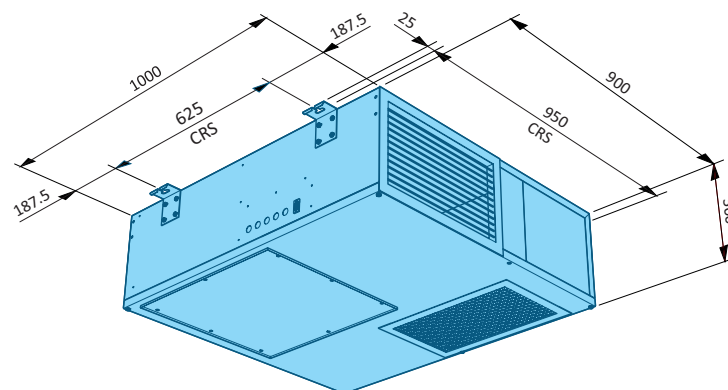
### Weighted Sound Reduction

$$R_w = 27$$

Units are independently tested at ISVR in accordance with BS EN ISO 10140-2:2010. Single number rating in accordance with BS EN ISO 717-1:2013

## Unit Dimensions

### Dimensions



Weight: 65 kg

**Note:** Data for design guidance only. Detailed information is available upon request.

## Selection Data

### Ecovent Hybrid EVH173

## Performance

$$\text{SFP} = \frac{\text{Electrical input power (Watts)}}{\text{Air volume flow rate (litres/second)}}$$

Note: SFP figures quoted at voltages tested in accordance with BS EN ISO 5801:2017

Nominal working conditions: 0.128 m³/s (128 l/s)

10 Pa approx = 15.2 W = 0.118 W/l/s

Note: values are per unit - unit EVH173 has 1 fan in total.

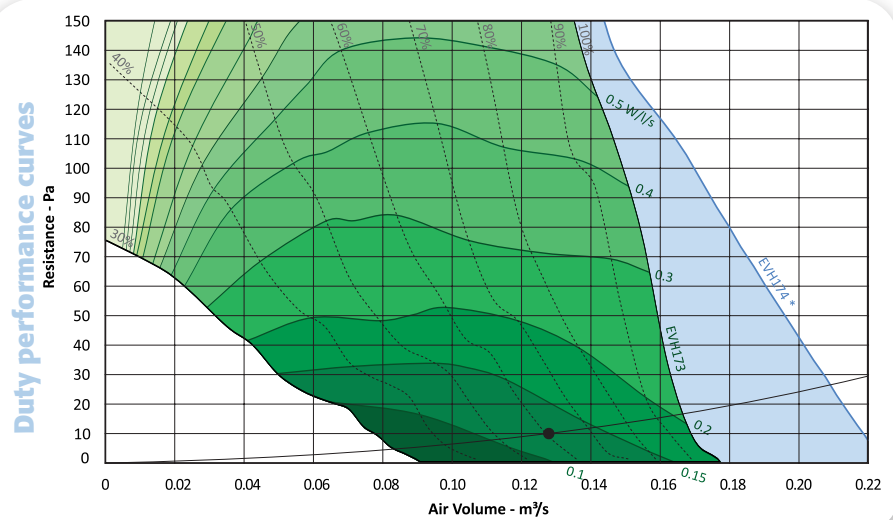
Motor power: 0.15kW

Voltage: 230 VAC

Full fan speed: 3450 rpm

Motor full load: 1.45 A

Speed control: EC



\* Units with extended boost capacity available. Contact VES for further details.

## Acoustic Data

| Fan<br>Voltage | Sound Spectrum dB re 10 <sup>-12</sup> W PWL Centre Frequency (Hz) |           |           |           |           |           |           |           | Casing Radiated |           |           |           |
|----------------|--------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------|-----------|-----------|-----------|
|                | 63                                                                 | 125       | 250       | 500       | 1k        | 2k        | 4k        | 8k        | NR@1m           | NR@3m     | dBA@1m    | dBA@3m    |
| 100%           | 57                                                                 | 50        | 50        | 41        | 37        | 30        | 23        | 24        | 27              | 19        | 31        | 23        |
| 90%            | 55                                                                 | 49        | 51        | 40        | 36        | 29        | 22        | 23        | 27              | 19        | 30        | 23        |
| 80%            | 53                                                                 | 48        | 47        | 38        | 33        | 25        | 19        | 23        | 23              | 15        | 27        | 20        |
| 70%            | 50                                                                 | 46        | 45        | 37        | 30        | 22        | 17        | 23        | 21              | 13        | 25        | 18        |
| <b>60%</b>     | <b>47</b>                                                          | <b>43</b> | <b>44</b> | <b>34</b> | <b>25</b> | <b>17</b> | <b>16</b> | <b>22</b> | <b>19</b>       | <b>11</b> | <b>23</b> | <b>16</b> |
| 50%            | 43                                                                 | 41        | 41        | 31        | 21        | 15        | 16        | 23        | 18              | 9         | 21        | 14        |
| 40%            | 37                                                                 | 38        | 38        | 22        | 13        | 12        | 16        | 23        | 16              | 8         | 18        | 10        |
| 30%            | 35                                                                 | 38        | 38        | 16        | 10        | 12        | 16        | 22        | 16              | 9         | 17        | 9         |

Units are independently tested at ISVR in accordance with BS EN ISO 3741:2010.

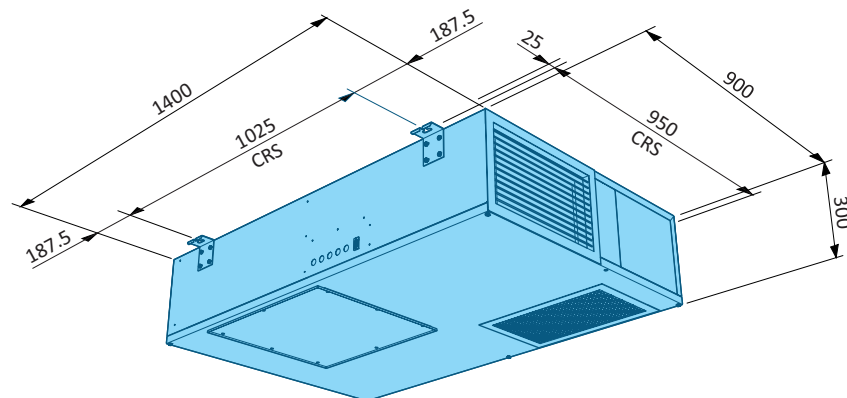
### Weighted Sound Reduction

$R_w = 31$

Units are independently tested at ISVR in accordance with BS EN ISO 10140-2:2010. Single number rating in accordance with BS EN ISO 717-1:2013

## Unit Dimensions

### Dimensions



Weight: 75 kg

**Note:** Data for design guidance only. Detailed information is available upon request.

# Ecovent<sup>®</sup> Hybrid

## Selection Data

### Ecovent Hybrid EVH273

## Performance

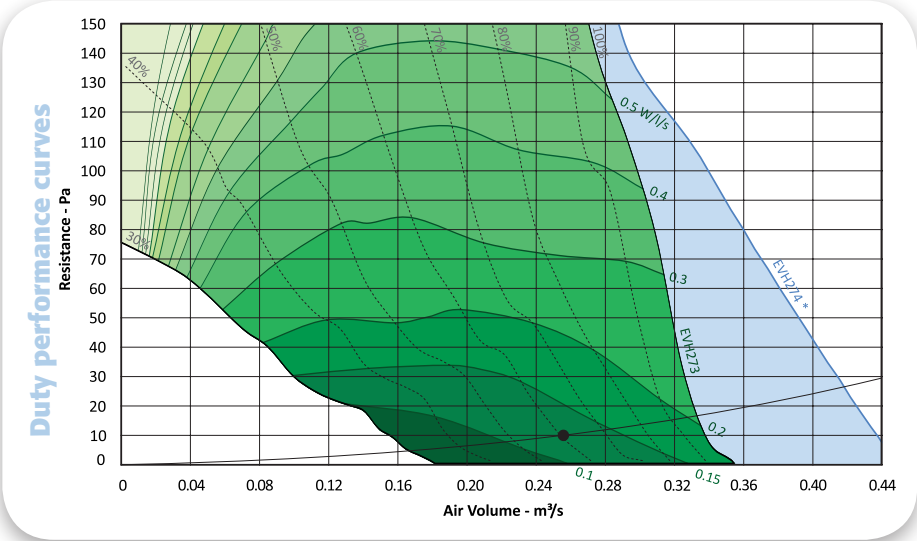
SFP

$$\frac{\text{Watts/litres/second}}{\text{second}} = \frac{\text{Electrical input power (Watts)}}{\text{Air volume flow rate (litres/second)}}$$

Note: SFP figures quoted at voltages tested in accordance with BS EN ISO 5801:2017

Nominal working conditions: 0.256 m³/s (256 l/s)  
10 Pa approx = 30.4 W = 0.118 W/l/s  
Note: values are per unit - unit EVH273 has 2 fans in total.

Motor power: 0.15kW  
Voltage: 230 VAC  
Full fan speed: 3450 rpm  
Motor full load: 1.45 A  
Speed control: EC



\* Units with extended boost capacity available. Contact VES for further details.

## Acoustic Data

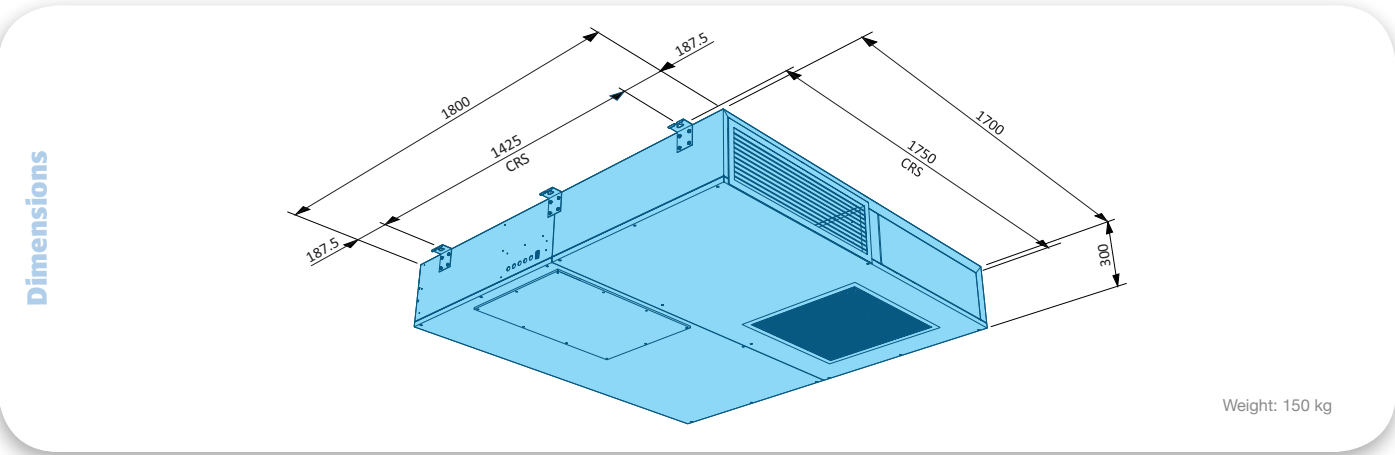
| Fan Voltage | Sound Spectrum dB re 10 <sup>-12</sup> W PWL Centre Frequency (Hz) |     |     |     |    |    |    |    | Casing Radiated |       |        |        |
|-------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|-----------------|-------|--------|--------|
|             | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | NR@1m           | NR@3m | dBA@1m | dBA@3m |
| 100%        | 63                                                                 | 64  | 59  | 49  | 43 | 36 | 32 | 30 | 35              | 27    | 38     | 32     |
| 90%         | 62                                                                 | 62  | 57  | 47  | 41 | 34 | 30 | 29 | 32              | 25    | 36     | 30     |
| 80%         | 60                                                                 | 59  | 54  | 45  | 37 | 30 | 28 | 27 | 29              | 22    | 34     | 27     |
| 70%         | 58                                                                 | 57  | 52  | 44  | 35 | 27 | 27 | 27 | 27              | 20    | 32     | 25     |
| 65%         | 57                                                                 | 56  | 51  | 43  | 34 | 27 | 26 | 27 | 26              | 19    | 31     | 24     |
| 60%         | 56                                                                 | 56  | 50  | 42  | 33 | 26 | 26 | 27 | 24              | 17    | 30     | 23     |
| 50%         | 52                                                                 | 53  | 46  | 39  | 30 | 25 | 26 | 26 | 21              | 14    | 27     | 20     |
| 40%         | 50                                                                 | 52  | 46  | 38  | 28 | 24 | 26 | 26 | 21              | 13    | 26     | 20     |
| 30%         | 46                                                                 | 50  | 43  | 32  | 23 | 24 | 26 | 26 | 19              | 12    | 23     | 17     |

Units are independently tested at ISVR in accordance with BS EN ISO 3741:2010.

|                          |            |
|--------------------------|------------|
| Weighted Sound Reduction | $R_w = 32$ |
|--------------------------|------------|

Units are independently tested at ISVR in accordance with BS EN ISO 10140-2:2010. Single number rating in accordance with BS EN ISO 717-1:2013

## Unit Dimensions



Note: Unit can be delivered in 2 sections.

**Note:** Data for design guidance only. Detailed information is available upon request.

## Selection Data

### Ecovent Hybrid EVHR474

## Performance

$$\text{SFP} = \frac{\text{Electrical input power (Watts)}}{\text{Air volume flow rate (litres/second)}}$$

Note: SFP figures quoted at voltages tested in accordance with BS EN ISO 5801:2017

Nominal working conditions: 0.500 m³/s (500 l/s)

25 Pa approx = 93.5 W = 0.187 W/l/s

Note: values are per unit - unit EVHR474 has 4 fans in total.

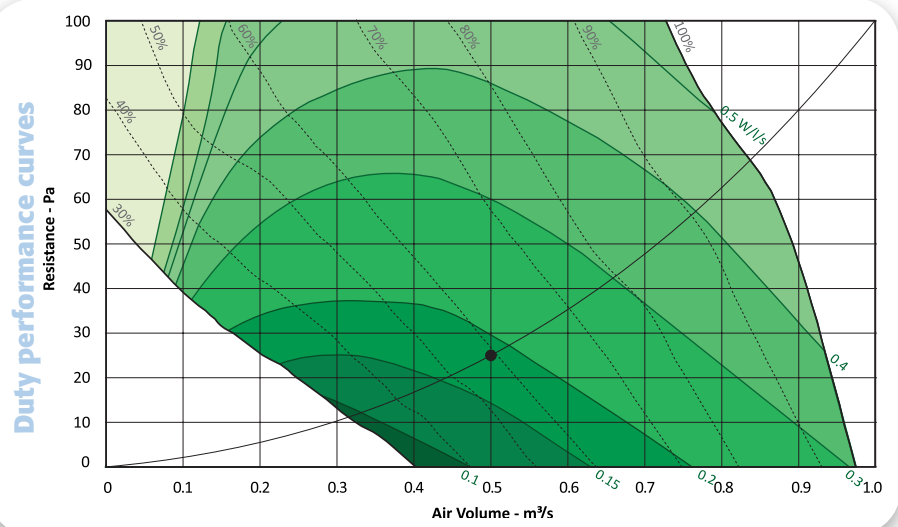
Motor power: 0.10kW

Voltage: 230 VAC

Full fan speed: 1410 rpm

Motor full load: 0.83 A

Speed control: EC



## Acoustic Data

| Fan<br>Voltage | Sound Spectrum dB re 10 <sup>-12</sup> W PWL Centre Frequency (Hz) |     |     |     |    |    |    |    | Casing Radiated |       |        |        |
|----------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|-----------------|-------|--------|--------|
|                | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | NR@1m           | NR@3m | dBA@1m | dBA@3m |
| 100%           | 67                                                                 | 70  | 71  | 71  | 70 | 70 | 65 | 60 | 59              | 51    | 61     | 54     |
| 90%            | 65                                                                 | 68  | 68  | 68  | 67 | 67 | 62 | 56 | 56              | 49    | 59     | 51     |
| 80%            | 63                                                                 | 65  | 65  | 65  | 64 | 64 | 58 | 52 | 53              | 46    | 55     | 48     |
| 70%            | 61                                                                 | 63  | 62  | 63  | 62 | 62 | 54 | 47 | 51              | 43    | 53     | 45     |
| 60%            | 58                                                                 | 59  | 59  | 59  | 58 | 58 | 49 | 41 | 47              | 40    | 49     | 41     |
| 50%            | 56                                                                 | 57  | 56  | 57  | 55 | 55 | 45 | 36 | 44              | 37    | 46     | 39     |
| 40%            | 53                                                                 | 52  | 52  | 54  | 51 | 51 | 38 | 29 | 40              | 33    | 42     | 35     |
| 30%            | 49                                                                 | 48  | 49  | 50  | 46 | 46 | 31 | 24 | 35              | 28    | 38     | 30     |

Units are independently tested at ISVR in accordance with BS EN ISO 3741:2010.

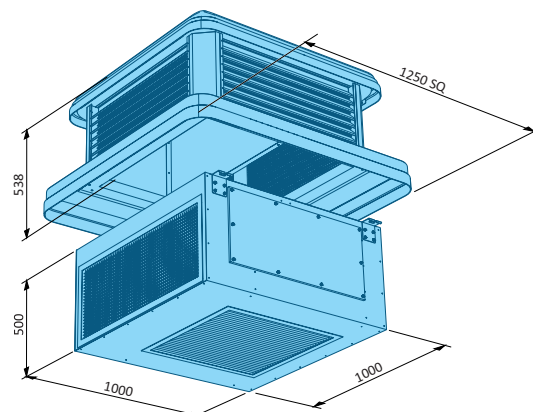
### Weighted Sound Reduction

$R_w = 13$

Units are independently tested at ISVR in accordance with BS EN ISO 10140-2:2010. Single number rating in accordance with BS EN ISO 717-1:2013

## Unit Dimensions

### Dimensions

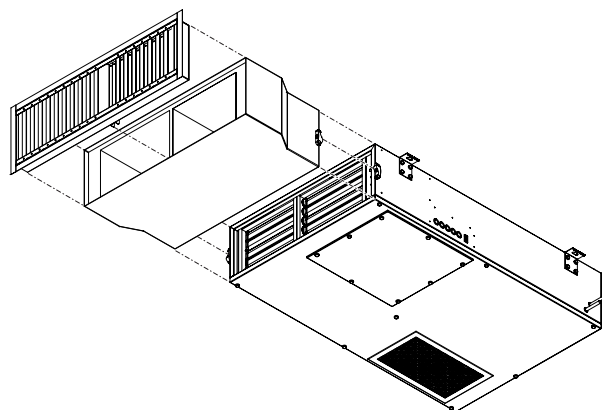


Weight  
Fan Section: 78 kg  
Turret: 75 kg

Note: Fan section and turret delivered separately. No-heat unit shown: for EVHR474-1-W with LPHW please contact VES for further details.

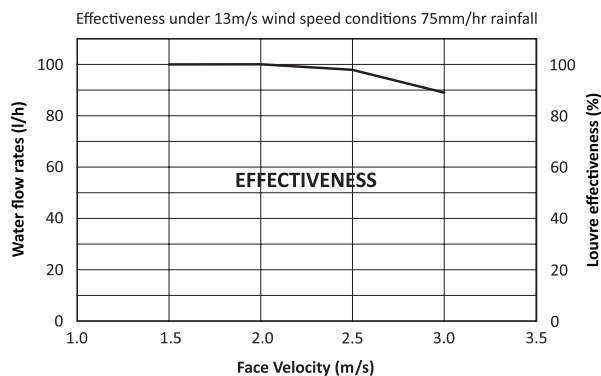
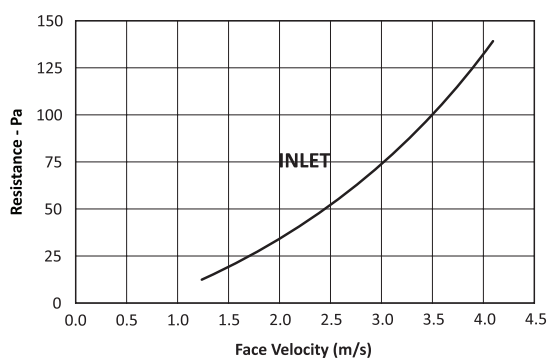
**Note:** Data for design guidance only. Detailed information is available upon request.

## Louvre Details

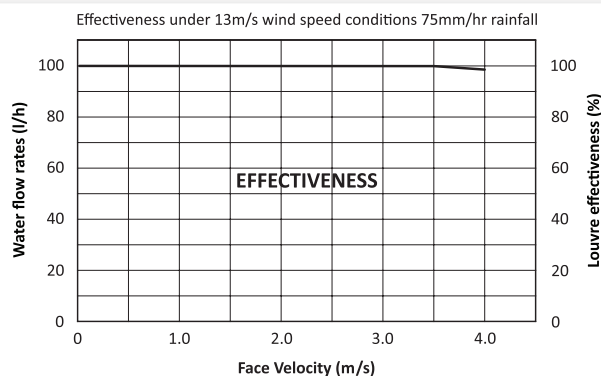
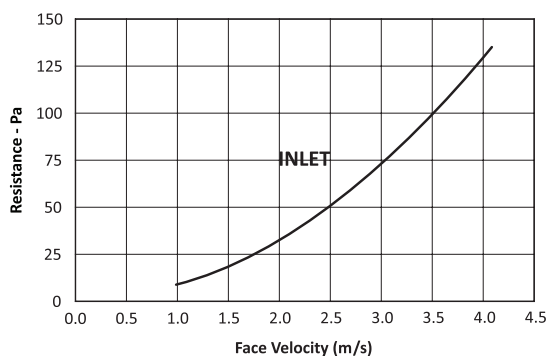


Third party testing verifies that vertically oriented blades have better weather performance and reduce the likelihood of cross contamination, when compared to horizontal blades. However, we understand the importance of building aesthetics and so are able to offer both vertical and horizontal blade configurations. Louvres can be sized to fit the glazing requirements on site and Hybrid units can be fitted to all types of louvre (subject to transitions and plenum boxes).

### Horizontal Blades



### Vertical Blades



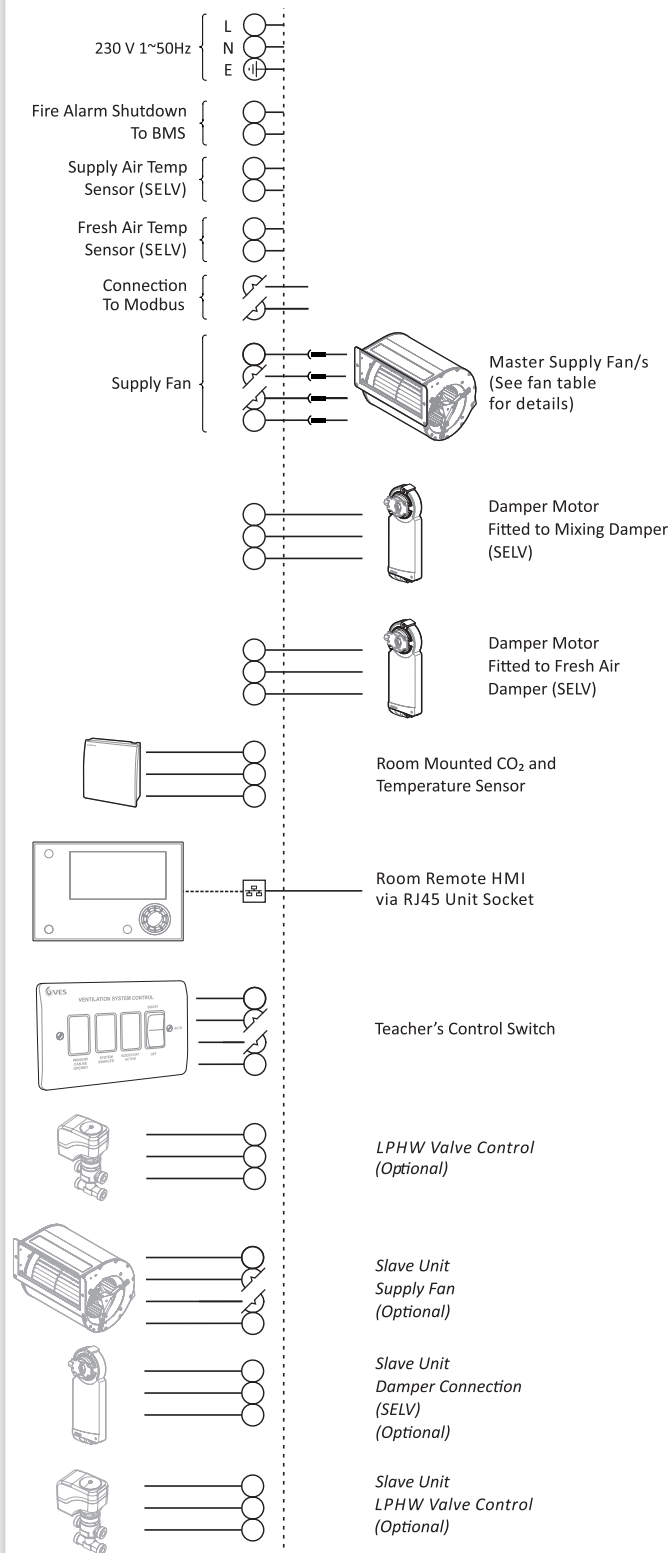
| Louvre     | Face Velocity (m/s) |      |      |      |      |       |       |       |       | CV    |
|------------|---------------------|------|------|------|------|-------|-------|-------|-------|-------|
|            | 0.0                 | 0.5  | 1.0  | 1.5  | 2.0  | 2.5   | 3.0   | 3.5   | 3.75  | Class |
| Horizontal | A                   | A    | A    | A    | A    | A     | A     | b     | -     | 0.253 |
|            | 100%                | 100% | 100% | 100% | 100% | 99.9% | 99.3% | 95.8% | -     | 3     |
| Vertical   | A                   | A    | A    | A    | A    | A     | A     | A     | A     | 0.287 |
|            | 100%                | 100% | 100% | 100% | 100% | 100%  | 100%  | 100%  | 99.9% | 3     |

Ratings in accordance with BS EN 13030:2001

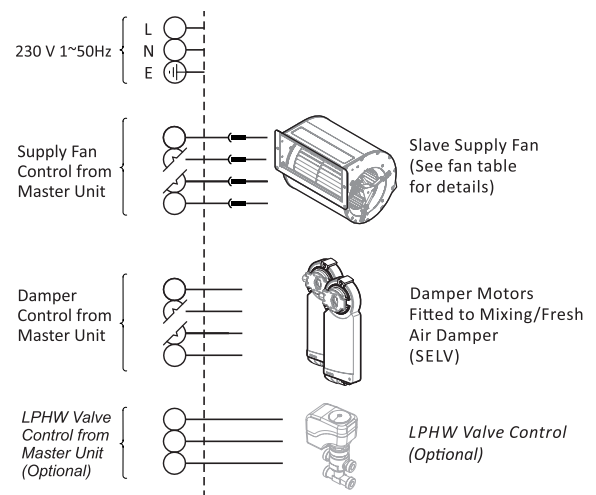
**Note:** Data for design guidance only. Detailed information is available upon request.

## Connection Details

### Customer Connections (Master)



### Customer Connections (Slave)



## Packages

- ▶f EVH173 standalone or multiples (master and slaves)
- ▶f EVH273 standalone or multiples (master and slaves)
- ▶f EVHR474 standalone or multiples (master and slaves)
- ▶f Package includes sensors and switches
- ▶f Standard colour RAL9010

## Options

- ▶f Heating (LPHW) - up to 26 kW
- ▶f BACnet MSTP as standard. Full range of BMS options available\*
- ▶f Room mounted temperature control
- ▶f Data logging facility\*\*
- ▶f Wide choice of casework colours
- ▶f Mechanical and electrical installation
- ▶f Round or rectangular spigots
- ▶f Pre-fitted internal valve and actuator kit

## Accessories

- ▶f Louvres
- ▶f Transition pieces
- ▶f Valves and actuators
- ▶f Attenuators

\* Minimum system requirements apply

\*\*SD Card required



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VES reserves the right to amend product specifications and details without notice.