

Eagle Close, Chandlers Ford Industrial Estate, Chandlers Ford, Eastleigh, Hampshire, SO53 4NF

Tel: +44 (0) 2380 46 11 50

email: info@ves.co.uk

web: www.ves.co.uk


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Original Instructions


Conventions


Important  This manual must be read in full before Installation, Operation and Maintenance of the units supplied

Please ensure that this document is passed to the end user. This manual forms an integral part of the product and should be kept for the working life of the product. Additional copies of this and supporting documents are available by contacting VES or by visiting www.ves.co.uk and following the 'Download O & M's' link.

The following symbols used within this document refer to potential dangers, advice for safe operation or important points of reference

Warning  Indicates hazards associated with electric current and high voltages

Caution  Indicates hazards that require safety advice for personnel or potential unit/property damage

Important  Indicates important information

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Introduction 1 Ecovent® EVH is a range of hybrid ventilation units with optimised duties of 0.060, 0.128 and 0.256 m³/s. All units are available as a master/slave pair. Each unit is suitable for ceiling void, plantroom or internal locations only.
As standard, each unit will have been supplied either pre-wired to a fitted control panel or prewired fitted isolator, as specified at the time of order. The standard operating temperature of these units is -20 to +35 °C.

For further technical details regarding dimensions and weights, contact VES on **023 8046 1150**, quoting the sales order (SO) number and the unit type as found on the unit nameplate, or alternatively visit www.ves.co.uk.

Nomenclature 2

Part Number Coding

Point Description	Point Variants	Details (as appropriate)
1 Product	EV	Ecovent® Acoustic Heat Recovery Units
2 Heat Recovery type	H	Hybrid Ventilation Unit
3 Unit Size	0, 1, 2	Sequential see unit outline for details
4 Fan Type	7	Centrifugal EC fan
5 Fan Size	4	Sequential
6 Phase	-1	230V 50Hz Single Phase
7 Main Heating	Null	No Heating
	-W	LPHW Coil
	-CW	Chilled Water Coil
	-E	Electric Heater Battery
8 Casework Lining	Null	Standard
	/A1	Variant (sequential)
9 Handling <small>(looking in direction of supply airflow)</small>	/LB	Left/Bottom Access
	/RB	Right/Bottom Access
10 Main Filter	Null	No filter
11 Control Panel Section	Null	No controls
	/MS01	Fitted control panel (master) V1
	/SV01	Fitted control panel (slave) V1
	/MS02	Fitted control panel (master) V2
	/SV02	Fitted control panel (slave) V2
12 Energy Monitoring	Null	No system
	/EM	Energy Monitoring
13 Gas Proving System	Null	No system
	/GF	Gas Proving System (Flamefast)
	/GM	Gas Proving System (Merlin)
14 Colour	Null	Galvanised finish
	/R9010	RAL Colour as specified
15 Finish	MT	Matt
	SG	Internal powdercoated only
	FG	Internal/External powdercoated
	FG	Leatherette
16 Special	/S	Special (non-standard) Unit

Typical Example

EVH174-1/RB/MS02/GL/R9010SG/0253

EV H 1 7 4 -1 /RB /MS02 /GL /R9010 SG /0253


① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯

Receipt of Goods and Handling

3 Immediately upon receipt of goods, check for possible damage in transit paying particular attention to fan impellers, coil connections and unit casing. Prior to installation please check to ensure alignment and smooth rotation of the impeller after transit. Also check to ensure that any ancillary items are included. These will normally be supplied fitted or, in the case of small items, taped to the unit.
In the event of any damage having occurred or if any item is found to be missing, it is essential to inform VES Andover Ltd. within **7 days** of delivery quoting sales order number and the unit type, as found on the unit nameplate. After this period, VES is unable to accept any claim for damaged or missing goods.

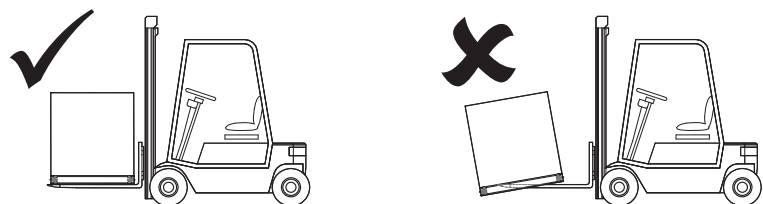
Installation


4 The entire system must be considered for safety purposes. It is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturer’s recommendations, with due regard to the current HEALTH AND SAFETY AT WORK ACT and conforms to all relevant statutory regulations.
Where a unit is installed such that component failure could result in injury to personnel, precautions should be taken to prevent such an injury. If the unit is installed where there is a reasonable possibility of persons or objects coming into contact with the impeller whilst operational, a guard should be fitted or steps taken to prevent this. It is the installer’s responsibility to ensure that access panels are not obstructed in any way. Safe working access for maintenance must be provided in accordance with Health and Safety and Building Regulations. For confirmation of required access please see the appropriate unit outline drawing.
For safe maintenance, consideration must also be given by the installer for adequate illumination of the unit location. Further consideration should be given to the unit’s position and secured into place as appropriate.

Caution  Mounting hangers, door furniture, isolators etc. extend beyond the casework, so are vulnerable to accidental damage. Take necessary precautions so as not to cause damage whilst handling the unit.

The weight of each unit/section is specified on the outline drawing and the total unit weight will be displayed on the unit inspection label. When lifting the unit using a fork lift truck ensure the whole unit is supported by the full length of the forks. It may be necessary to use fork extensions to fully support the unit. The centre of gravity may be offset from the centre of the unit; this needs to be taken into consideration when lifting the unit.

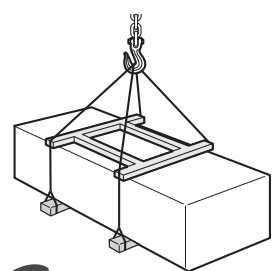
Fork Lifting Detail
Fig. 1



Caution  Handle with care. Failure to fully support the unit during lifting may result in damage to the unit casework

Lifting Detail
Fig. 2

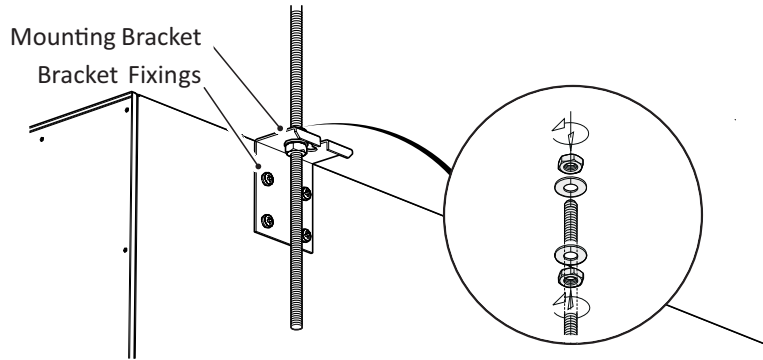
Units are to be rigged and lifted using spreaders, taking into account the weight of the unit. Lifting gear should be arranged so as not to bear on the casework, see right.



Installation 4 Continued

Ecovent® EVH units are supplied with hangers suitable for drop-rod or ceiling-void mounting, in bottom access orientation, with airflow in the horizontal plane. For alternative mounting please consult your outline drawing as supplied with the unit, or refer to VES Customer Services for further information.

Secure drop rods/unit with the appropriate fixings as shown below 3.



Unit mounting detail
Fig. 3

Important



When hanging units from drop-rods, ensure that the load is evenly spread and that **ALL** brackets are used within the support. Ensure that the drop rod/fixing used is selected appropriately to accommodate the load of the unit.

Ecovent® EVH units are intended to be connected to a wall or window-mounted louvre. This can be a direct connection (from unit to louvre) or via a specific transition duct.

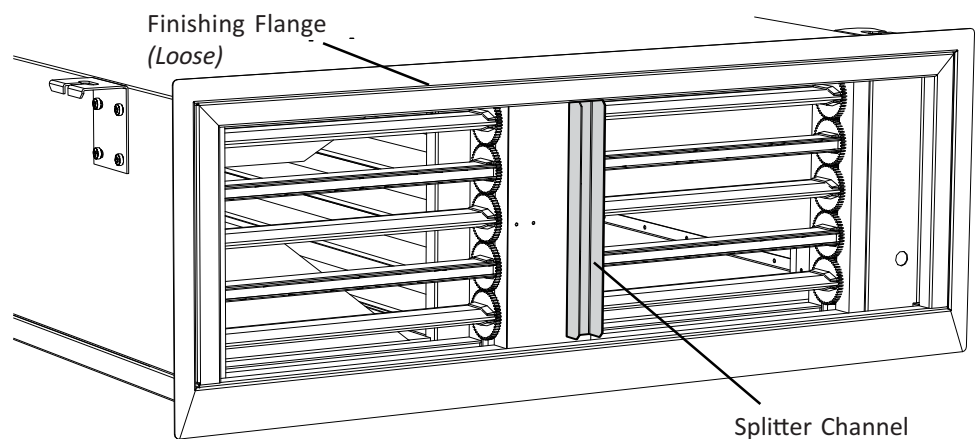
Important



In situations where access to the outside grille for cleaning is limited, provision should be made for suitable access from inside the building. This is particularly relevant for installations with long transitions where it would be difficult to reach the grille from inside the hybrid unit.

To ensure the opposing supply and exhaust airflows are separate, a site-specific splitter **MUST** be incorporated into the installation (supplied by others). This can be incorporated into the wall cavity, transition duct or external louvre, depending upon the exact site requirements. A 30mm wide splitter channel positioned centrally on the unit has been incorporated into the unit to assist with alignment. This is removable if not required.

For units mounted flush against wall openings, a finishing flange is available to assist with this. Ensure that the joint between unit and wall is sealed correctly. The flange is handed; ensure the widest part is toward the bottom of the unit see fig.

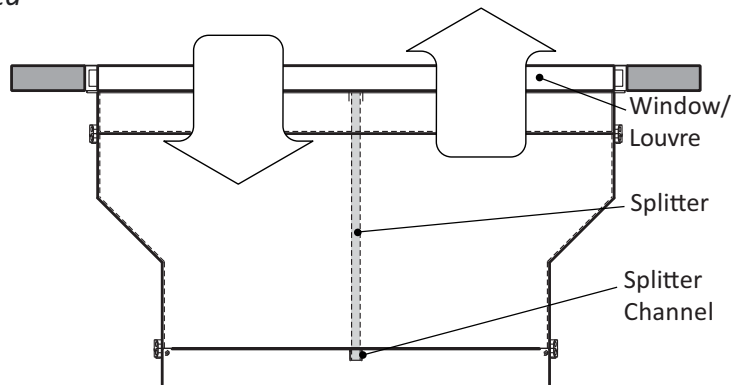


Finishing Flange &
Splitter arrangement
detail
Fig. 4

Installation 4 Continued

Typical installation detail (plan view)

Fig. 5

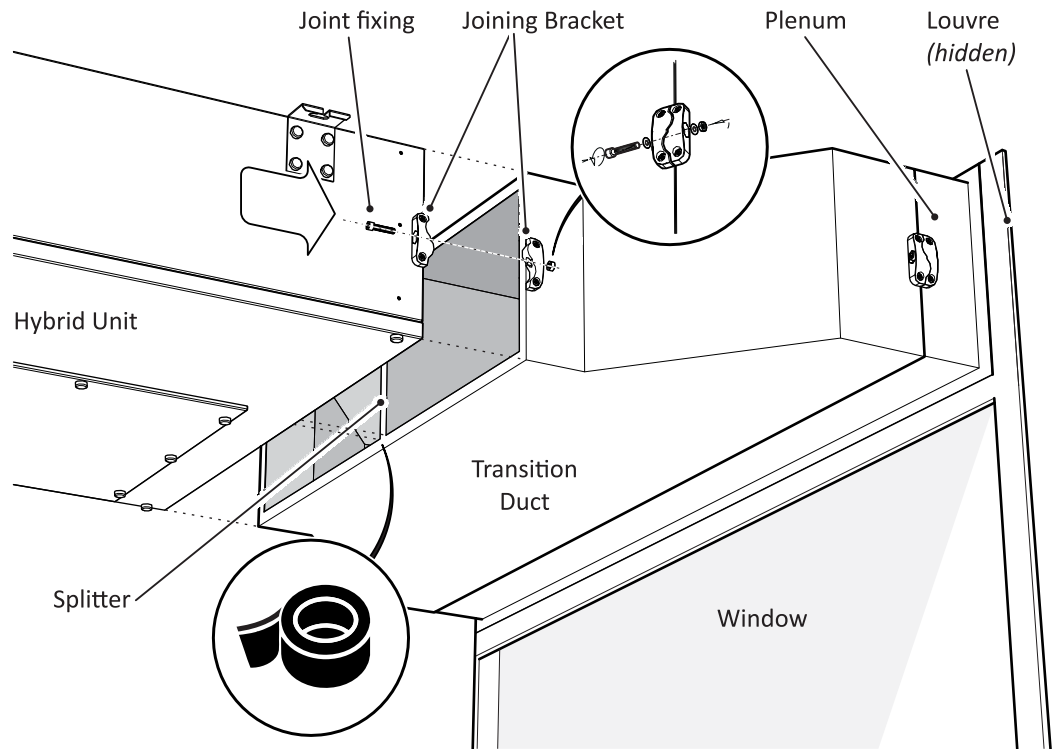


Duct transitions and plenum boxes allow for resizing and/or realignment as required and should be sized to match both unit and louvre connections. A pair of joining brackets per section (one each side) are provided to assist with the duct connection.

The example shown in fig. 6 below depicts a two-part transition/plenum, each section having its own set of joining brackets.

Typical transition assembly detail

Fig. 6



Fix the bracket parts to both sides of unit and transition as shown using the M6 fixings provided. Tape the joint using self-adhesive rubber tape prior to assembly to prevent air leakage.

To finish the assembly, bring the sections together and install the M8 joint fixings through both parts of each joining bracket and tighten using a 6mm hex key, drawing the sections together evenly, ensuring no visible gaps.

Important



The nut is loose but held within the bracket body. Take care not to dislodge when fixing.

Caution



Flange connections and channels are **NOT** structural and are included as part of the unit sealing only. When moving assembled units ensure that **ALL** sections are fully supported.

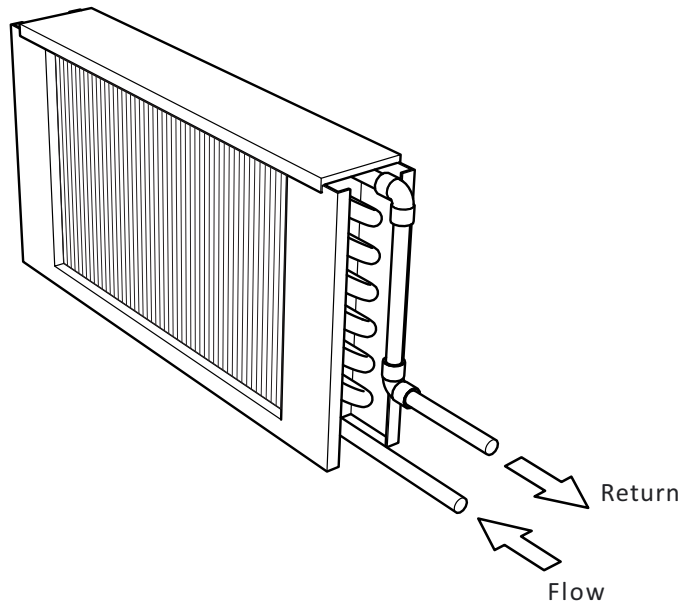
Installation 4 Continued

Coils should be piped according to any relevant local codes of practice. As standard EVH coils are supplied with a Ø15mm plain stub suitable for push-fit connections. All external piping is to be supported independently from the coil. The flow connection is nearest the bottom of the unit (see below)



It is important that coils are protected against damage from extreme weather conditions during the winter season. If the water is allowed to freeze in the coil system, damage may occur potentially bursting pipes and resulting in emergency problems. EVH LPHW units are fitted with a coil temperature sensor as standard, ensuring that boilers run continuously in low ambient temperatures can help to prevent damage.

On Ecovent® **EVH/ -W** units, a Low Pressure Hot Water (LPHW) coil will be installed. The coils are normally suitable for low pressure hot water with a range of between 80 ~ 40 °C flow and between 70 ~ 30 °C return temperature. The coil should be regularly vented so as to avoid potential air locks, resulting in a fall off of duty.



Typical LPHW Coil
Fig. 7

It is recommended that a check be made as to whether any treatment is required to the water supply for prevention of corrosion and scaling of the equipment. Information regarding the necessary action to be taken can be obtained from the relevant Local Water Supply Authority. The unit will have been supplied with connections either left or right-hand side looking in direction of airflow. Please see order acknowledgement for confirmation of this handing. Should you need to alter this please consult VES as unit adjustment may invalidate your warranty.

Installation 4 Continued

Unit that are configured for cooling feature condensate drainpans and peristaltic pumps as standard.

A pump sensor features as part of the drainpan and this is connected to a small pump mounted next to the fan in the fan section.

Important



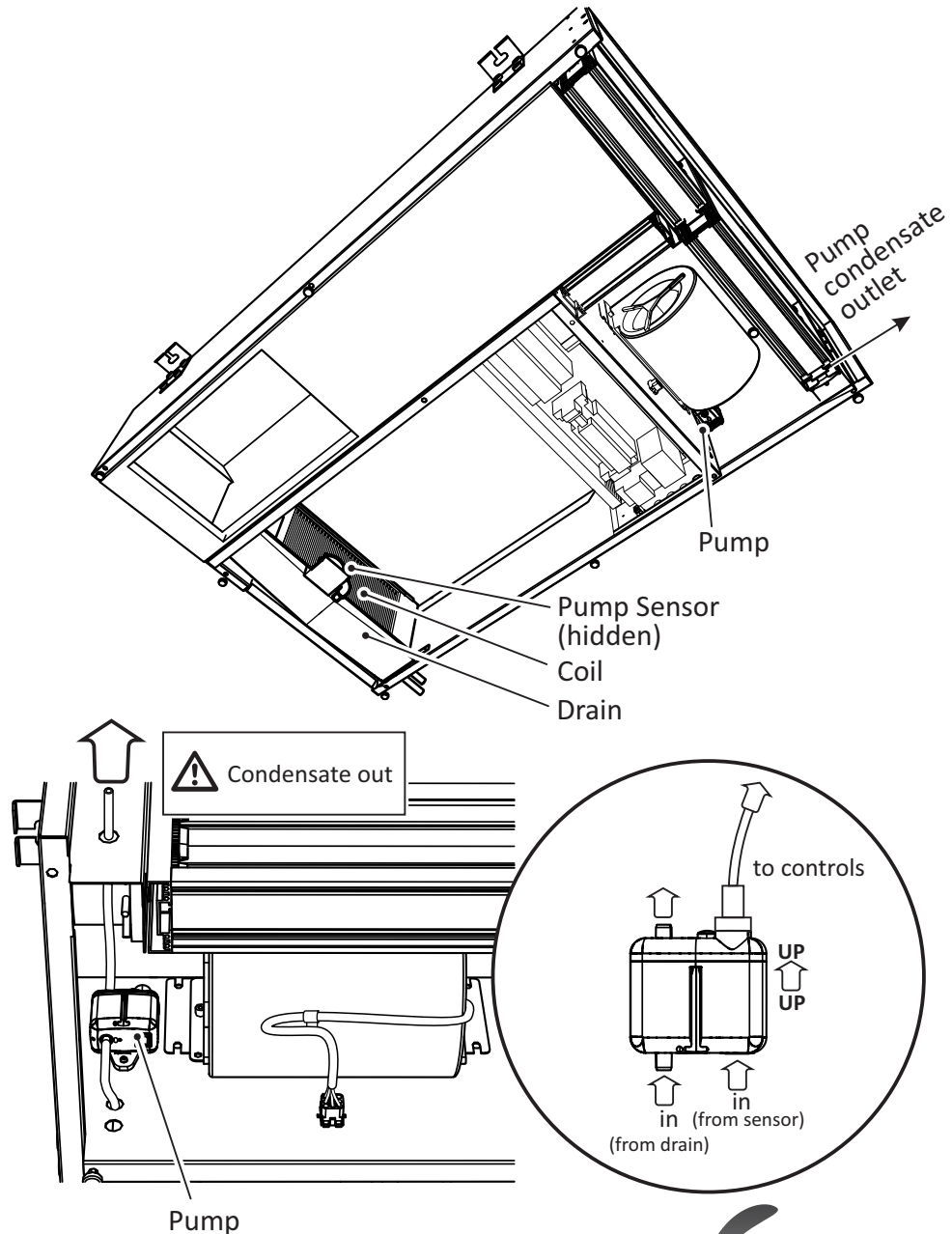
Ensure the pump is connected to a suitable waste water outlet; a length of tubing has been supplied. Depending on the discharge head, the pump can deliver up to 30 metres away. Extra hose length is available upon request.

Important





It is important that an initial drain system test be carried out to ensure correct operation. Clean the condensate tray of debris. Pour a small amount of water into the condensate tray using a squeezable bottle or similar and check that the pump unit starts and then stops as the water level decreases.

Typical CW Cooling Coil Setup
Fig. 8




Standard Wiring 5
and Fan Installation

Warning  The electrical supply **must be fully isolated** before attempting to affect any work on this unit. All electrical connections to any unit must be carried out in accordance with the current edition of the I.E.T Regulations, only competent Electricians should be allowed to affect any electrical work to our units.

Important  A cable entry point is provided at the control section. It is the responsibility of the installer to ensure that a suitable cable gland (giving adequate protection and strain relief) is fitted, and in doing so also ensure that no internal components are damaged during this installation. Make certain all swarf is removed before use.

It is the customer's responsibility to supply earth fault protection through the building installation device and a dedicated, isolated power supply with overload protection, to account for motor start up currents.

Warning  Do not connect any unit to an electrical supply voltage outside of the specification.

The following wiring diagrams are a guide to installing the standard fan and actuator options found on **Ecovent® EVH** units. If in any doubt, for units with fitted VES controls or for special versions of the units, consult the wiring diagram in your document pack or contact VES Customer Services on **023 8046 1150**, quoting the sales order (SO) number and unit type as found on the unit name plate.

For incorrect fan rotation, check with the VES Customer Services for advice, on **023 8046 1150**.

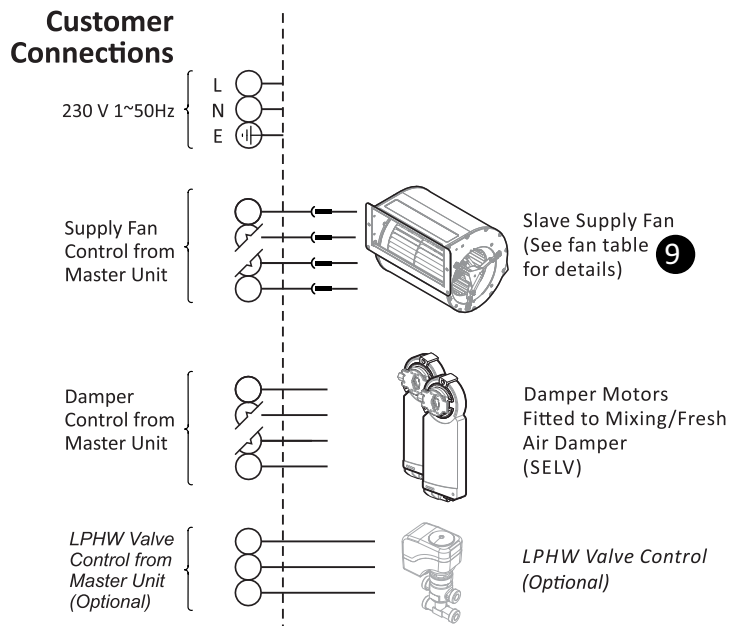
Standard Fan Details

Fig. 9

Size	Phase	Motor Size	Voltage	Fan Speed (rpm)	Full Load Current	Speed Control	Fans per unit
EVH074-1	1 Phase	0.100 kW	230 VAC	1410	0.83A	EC	1
EVH174-1	1 Phase	0.100 kW	230 VAC	1410	0.83A	EC	1
EVH274-1	1 Phase	0.100 kW	230 VAC	1410	0.83A	EC	2

Standard Isolator (Slave) arrangement

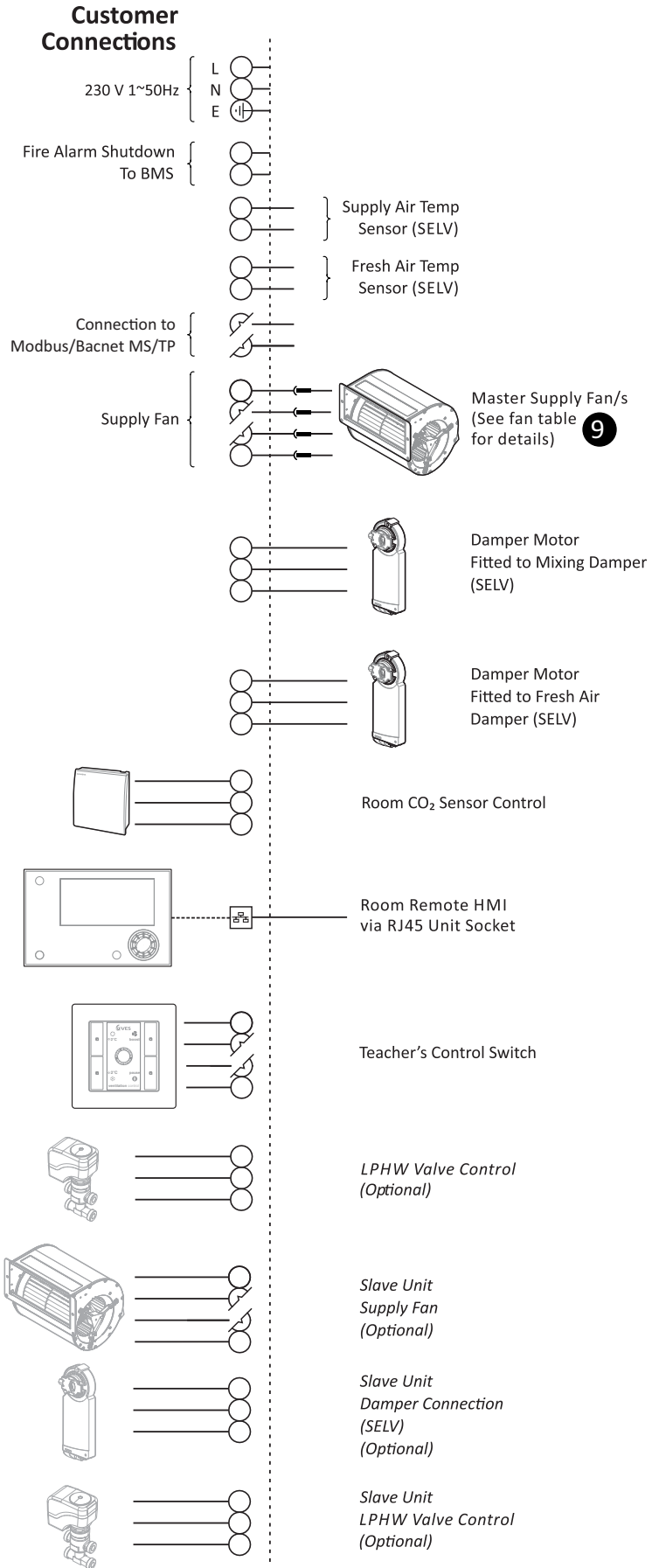
Fig. 10



**Standard Wiring
& Fan Installation**

**Standard Controls
(Master)
arrangement
Fig. 11**

5 *Continued*



Standard Wiring & Fan Installation 5 *Continued*

Important



The following gives an overview of the current and previous versions of Room override panel. For details regarding its full operation and the full controls philosophy, please contact VES Controls Department on **08448 15 60 60** for further information

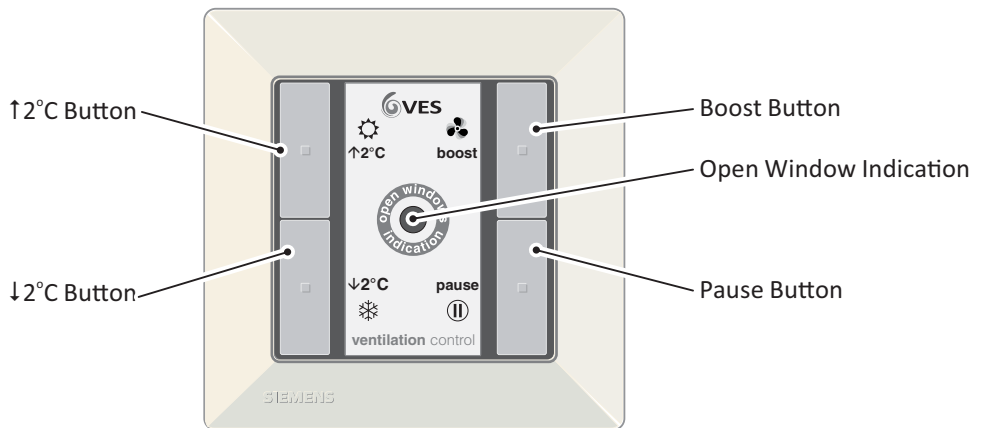
Controls arrangement 2022

For each room an information and override panel is provided to allow the user to override the automatic controls.

The panel comprises:

- Fresh Air Boost switch
- Pause switch
- Temperature Adjustment switches $\uparrow 2^{\circ}\text{C}/\downarrow 2^{\circ}\text{C}$
- Open windows indication

Override Panel Fig. 12



EPEL3001
Override Panel

Temperature Adjustment Switches

When the $\uparrow 2^{\circ}\text{C}$ button is momentarily pressed the set point will be increased by 2°C . Pressing the $\downarrow 2^{\circ}\text{C}$ button will cancel this action.

Likewise, when the $\downarrow 2^{\circ}\text{C}$ button is momentarily pressed the set point will be decreased by 2°C . If the unit is in heating mode, when the $\uparrow 2^{\circ}\text{C}$ button is pressed for 3 seconds the unit will go into Heating Boost.

Fresh Air Boost Switch

Operation of the boost switch will start the system (if off) in fresh air boost mode and the boost LED will illuminate. The fans will run at “Boost Switch Supply Speed”. The mixing box position will be limited to force fresh air intake as shown in Section 7. The system will revert to automatic operation after a pre-set period “Boost Switch Duration” or if the switch is pressed again. A short time delay will prevent rapid mode switching by unauthorised operatives.

Operation of the Boost switch will run the unit to maximum set speed and modulate the dampers to allow maximum amount of fresh air possible without affecting room temperature. If the unit is off, operation of the Boost switch will start the system in boost mode. The system will revert to automatic operation after a preset period or if the switch is operated again. A time delay will prevent rapid mode switching by unauthorised operatives.

Standard Wiring & Fan Installation

5 Continued

Pause Switch

Operation of the Pause switch will pause the system. The system will revert to automatic operation after a preset period or if the switch is operated again. A time delay will prevent rapid mode switching by unauthorised operatives.

Open Windows Indication

The open windows indication shall illuminate when the external temperature reaches a suitable level to encourage manual window opening. The centre LED will illuminate if the external temperature exceeds “Window Open Minimum External Temperature” (default maximum 5°C between the room setpoint and external air temperature).

Alternatively, the LED will illuminate if the room CO₂ level exceeds the CO₂ Setpoint” to encourage manual opening of the windows to assist the unit in achieving target conditions.

Diagnostic Mode

Diagnostic mode is used to give a simple indication of any alarms that may be present in the system. Further examination can be made via connections with the BMS or through a handheld HMI.

If the **Boost and Pause switches are pressed together** and held down for three seconds the teachers panel will temporarily enter a diagnostic mode. All the LEDs on the teacher panel will flash up together to show that the panel has entered diagnostic mode. 10 seconds later all the LEDs on the teacher panel will again flash up together to show that the panel has exited diagnostic mode. In diagnostic mode specific alarms are indicated by the following LED sequences:

Diagnostic Mode Fig. 13

LED	Solid On / Flashing	Alarm
↑2°C	On	1x Supply Fan Trip
↑2°C	Flashing	More than 1x Supply Fan Trip
↓2°C	On	Peristaltic Pump Trip
Boost	On	Slave / Extract Fan Trip
Open Windows	On	Frost Hazard
Open Windows	Flashing	No Hot Water Alarm

Important



When in diagnostic mode if the Boost switch is pressed, all present alarms will be acknowledged.

Standard Wiring & Fan Installation

Controls arrangement Pre 2022

5 Continued

For each room an information and override panel is provided to allow the user to override the automatic controls.

The panel comprises:

- Boost/Pause switch
- Boost/System Healthy active indication
- Open windows indication
- *Optional +/- 2 °C Temperature trim switch*

Operation of the Boost switch will run the unit to maximum set speed and modulate the dampers to allow maximum amount of fresh air possible without affecting room temperature. If the unit is off, operation of the Boost switch will start the system in boost mode. The system will revert to automatic operation after a preset period or if the switch is operated again. A time delay will prevent rapid mode switching by unauthorised operatives. The Boost/System Healthy indication will illuminate with an asymmetric pulse.

Operation of the Pause switch will pause the system. The system will revert to automatic operation after a preset period or if the switch is operated again. A time delay will prevent rapid mode switching by unauthorised operatives. The Boost/System Healthy indication will stop illuminating until the unit resumes normal operation.

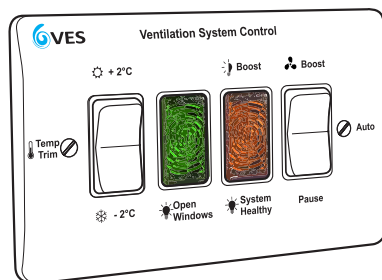
The Open windows indication shall illuminate when the external temperature reaches a suitable level to encourage manual window opening. The preset temperature for indication shall be set through the BMS at 15° C such that should the windows be opened, there will never be a temperature differential of more than 5° C between room design temperature and incoming fresh air.

An optional secondary condition can be activated to enable the window open indication if the CO₂ level in the classroom reaches 1500 ppm. In this case, the window open indication will be illuminated.

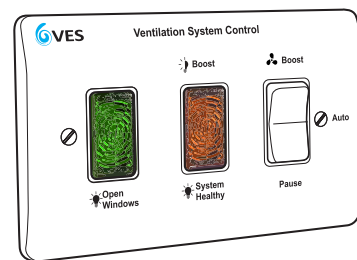
EPEL2008 has the same functionality and characteristics as the above with the addition of the +/-2°C Temperature trim switch, which provides user override of room design temperature by +2°C or -2°C. This is limited to 2°C either side of the setpoint, the system will revert to automatic operation after a preset period.

For details regarding older switchplate designs or special versions please contact VES Customer Services on **023 8046 1150** for further information.

Override Panels Fig. 14



EPEL2008
Override Panel c/w temperature trim



EPEL2009
Override Panel (no trim)

Important



The system healthy indicator will illuminate when the unit is operational. In the event of a system failure, the indicator will be off and the buttons will be unresponsive e.g pressing the boost button results in no boost indication. Should this situation arise the system should be checked for a possible fault.

Maintenance 6

Important



Before attempting to carry out any work on VES units, all accompanying documentation including warning labels on the unit must be referenced. Should it be necessary to remove any component, ensure they are secured into position once reinstalled. It is critical that after any maintenance work has been conducted that all components removed/replaced be refitted correctly by a competent engineer.

Warning



Before attempting to carry out any maintenance work, investigative or repair work on our units, the unit **MUST BE COMPLETELY ISOLATED** from its electrical supply. Ensure a minimum of two minutes after electrical disconnection before removing access panels. This will allow any moving parts to come to a complete standstill. Care should also be taken when accessing external units as the wind and elements may cause moving parts to 'windmill'.

In general, this series of units require little maintenance. In the unlikely event of component failure, spares are available from stock at VES Andover Ltd.

Caution



When accessing the unit ensure the access panels are handled/opened in a controlled manner so as to avoid damage to the unit or injury to personnel. This is particularly important with bottom access units. Ensure the AHU has come to a complete stop before attempting any work on the unit

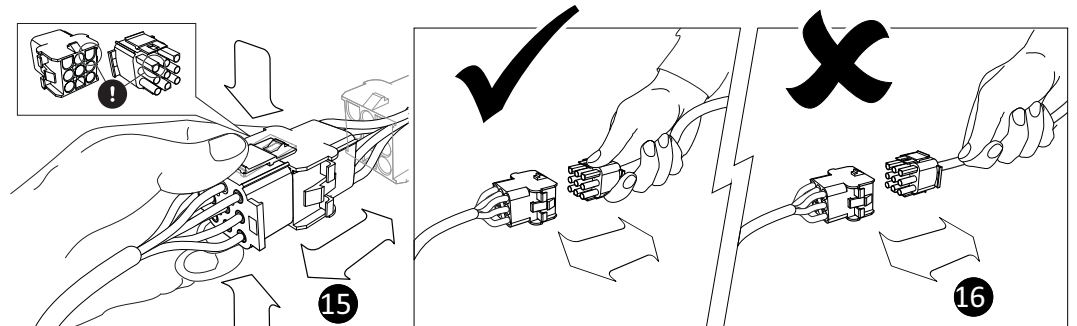
Important



Ecovent® EVH units feature plug & socket connections to allow easy removal/replacement of key components. Separate the plug connection by hand (tools not required) by pressing the top/bottom clasp mechanism to open 15 and pulling the plug/socket apart . **DO NOT** pull the cables to separate the assembly 16 .

Plug & socket operation

Fig. 15 16



On reconnection, the assembly features a locating lug to ensure correct orientation. Once rejoined, lock the connection together again using the corresponding system as shown. Note the plugs are handed and forcing an incorrect connection may result in damage to the plug.

Caution



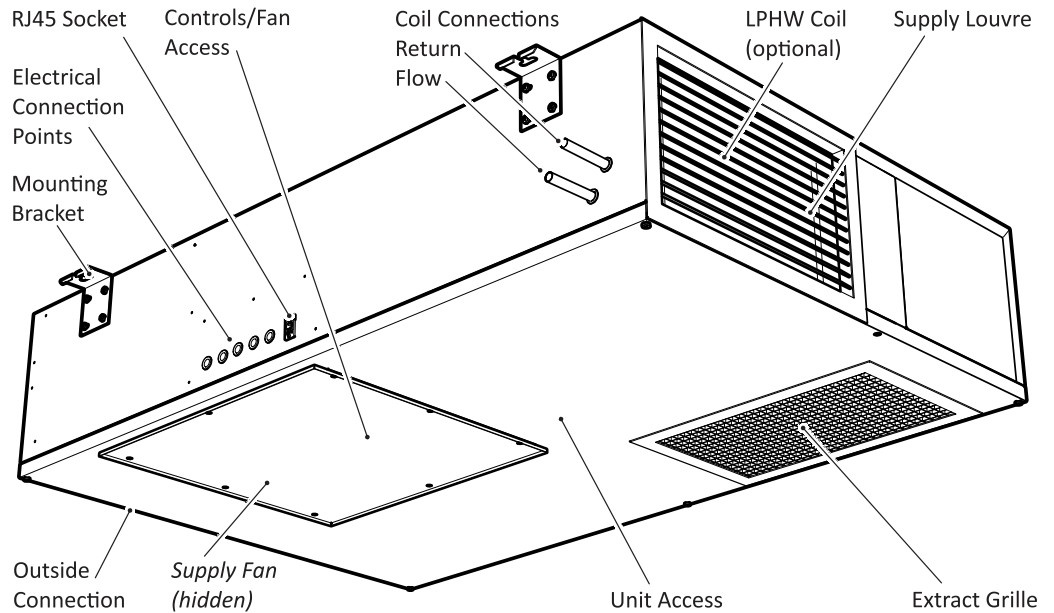
To separate the assembly, hold the plugs to pull them apart. **DO NOT** pull the cables.

Important



Ecovent® EVH units feature bulkhead-mounted fan plate assemblies. Ensure that special care is taken when removing/replacing components/assemblies from bottom-access units. Larger access panels may require the use of two or more persons. **THE CONTROL ACCESS COVER MUST BE REMOVED BEFORE THE UNIT ACCESS COVER** to gain safe access to the unit. Ensure all panels are safely replaced after access.

EVH1
Key components
Fig. 17



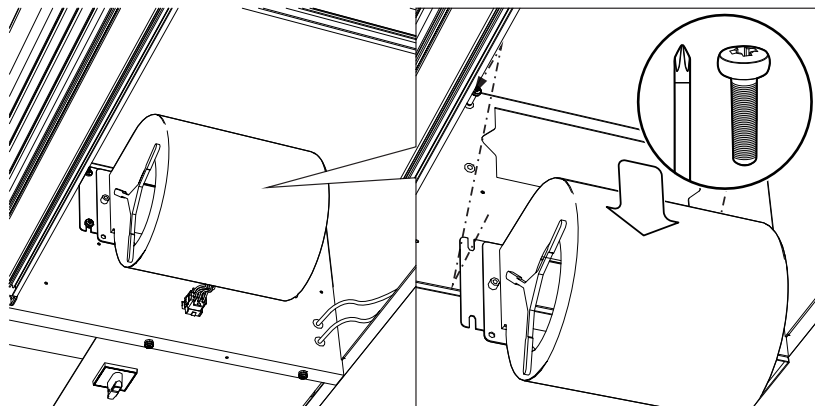
Important



The fan mounting plates are slotted to aid plate alignment. It is important to keep the fan assembly supported at all times; the fan assembly should not be considered supported until all fixings are securely tightened.

Ecovent® EVH units feature double inlet centrifugal fans mounted on an adapter plate. The supply fans are clearly visible beneath the main access panel. To remove/replace, unplug as per Fig. 15 16, undo the fixing screws and carefully remove the fan/adapter plate assembly, retaining all fixings.

Supply Fan assembly
removal/installation
Fig. 18



To replace the fan assembly, secure one fixing leaving enough of a gap to allow the adapter plate to slide into place. Fit the remaining fixing and tighten both. Ensure the impeller is free running. Reconnect the supply plugs as in Fig. 15 16; if more than one plug is used, ensure the correct plugs are reconnected as marked.

Maintenance 6 Continued

It is common for the external louvre on the outside of the building to feature a mesh which over time can become blocked with leaves and other detritus. It will be necessary to clean the louvre periodically or the ventilation unit may perform poorly.

This maintenance can normally be carried out from the outside of the building however should it be necessary, some limited access might be possible from the inside of the hybrid unit, through the blades of the fresh air inlet damper.

Important



Ensure that special care is taken when removing/replacing components/assemblies from bottom-access units. Larger access panels may require the use of two or more persons. **THE CONTROL ACCESS COVER MUST BE REMOVED BEFORE THE UNIT ACCESS COVER** to gain safe access to the unit. Ensure all panels are safely replaced after access.

Warning



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Care should also be taken when accessing external units as the wind and elements may cause moving parts to 'windmill'.

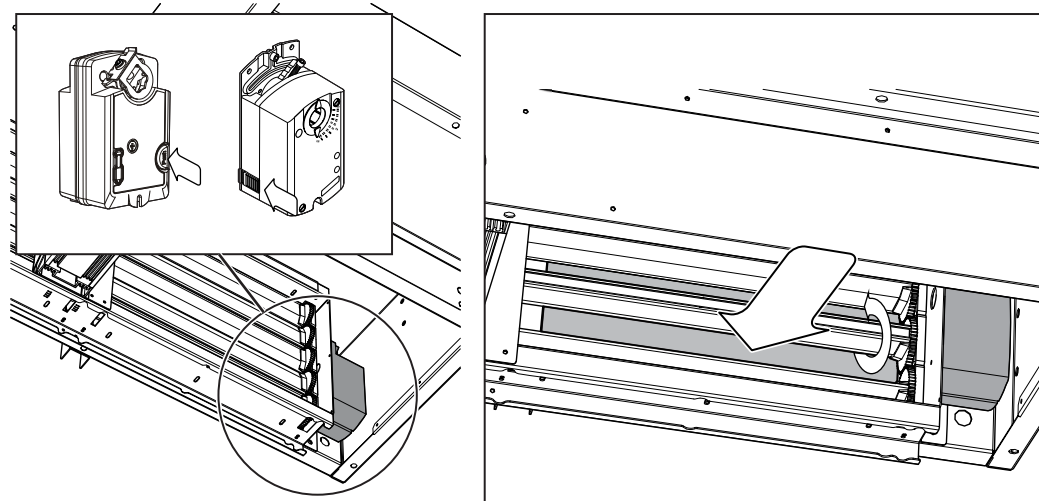
To gain access:

- Remove both the bottom and control cover.
- If required refer to page 12 for fan removal.
- The fresh air damper actuator (examples of which are shown below) features a clutch release button. Whilst engaging this button turn the damper blades by hand to the open position. **Take care whilst doing this as the button may be obscured.**

When complete it is not necessary to close the damper blades.

Manual Damper Opening

Fig. 19



Important



During any maintenance take care not to damage any of the internal components

Maintenance 6 Continued

Recommended Checks In order to keep the unit in good order the following maintenance routine is recommended:

Six Monthly Checks The fan impeller should be cleaned every 6 months. Failure to clean the fan on a regular basis could result in loss of fan performance, or cause it to fall out of balance. If a fan is stationary for long periods in a humid atmosphere, it should be switched ON for minimum of two hours every month to remove any moisture that may have condensed within the motor.

The fan motors are maintenance free due to the use of ball bearings with ‘life-long lubrication’. At the end of the grease life it may be necessary to change the fan unit. Failure to keep dampers clean could result in the damper becoming inoperative. Clean damper blades and frames and lubricate with PTFE aerosol or equivalent.

For units with integrated heating, the heating coil should be inspected for debris, dust or dirt build up. If found contaminated, foreign matter should be removed accordingly; superficial dust or debris can be removed from the surface of the heat exchange by gently brushing. Loosened debris can then be vacuumed from the surface of the coil.

Spares & Repairs When enquiring after or ordering spares contact VES Spares Department, quoting the sales order (SO) number and unit type as found on the unit nameplate.

Tel: 023 8046 1150

Spare Parts List

Part Number	Part Description
ZG0301/34/50	Fan Assembly
GSD141.1A	Damper Actuator
EVEX2200/R9010SG	Double Deflection Grille
EVEX2100/R9010SG	Eggcrate Grille
FX002401	M6 Screw Cover White
PPPS01	Condensate Pump
PSGN1030	6mm PVC Tube

WEEE Directive



At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre. Do not dispose of with normal household waste. Do not burn.



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VES is a trading name of VES Andover Ltd.
Registered in England No. 02303719.
Registered Office as above.



Eagle Close, Chandlers Ford Industrial Estate, Chandlers Ford, Eastleigh, Hampshire, SO53 4NF

Tel: +44 (0) 2380 46 11 50

email: info@ves.co.uk

web: www.ves.co.uk



UK Declaration of Conformity

This declaration is issued under the sole responsibility of the product manufacturer.

Product: Ecovent EVH Hybrid Ventilation Units
Type: EVH
Manufacturer: VES Andover Ltd.
Date: 28th November 2022

The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

2016 No. 1091	The Electromagnetic Compatibility Regulations
2008 No. 1597	The Supply of Machinery (Safety) Regulations 2008
2010 No. 2617	The ECODESIGN for Energy-Related Products Regulations 2010

We hereby declare that the product described above, to which this declaration of conformity refers to, is in conformity with the essential requirements of the following standards:

BS EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
BS EN ISO 13857:2019	Safety of machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs
BS EN IEC 61000-6-4:2019	Electromagnetic compatibility (EMC) - Generic standards
BS EN 61000-3-3:2013+A2:2021	Electromagnetic compatibility (EMC)-Limits
BS EN 61000-6-2:2005	Electromagnetic compatibility (EMC). Generic standards - Immunity for industrial environments
BS EN 60204-1:2018	Safety of machinery — Electrical equipment of machines

Name:

A. Reade

J. Atack

Signature

Position of Signatory:

Director

Head of Design



Eagle Close, Chandlers Ford Industrial Estate, Chandlers Ford, Eastleigh, Hampshire, SO53 4NF

Tel: +44 (0) 2380 46 11 50

email: info@ves.co.uk

web: www.ves.co.uk