

Lo-Carbon MVDC & SENTINEL MULTIVENT RANGE

VENTILATION SYSTEMS

Installation and Wiring Instructions



Stock Ref. N°

MVDC-MS	437634C
MVDC-MSH	443298B
SMV-H	445655B
SMV-HX	495360
SMV-HX CO ²	495361
SMV PLUS-H	407849A
SMV PLUS-HX	495362
SMV PLUS-HX CO ²	495363

220-240V~50Hz

Vent-Axia®

PLEASE READ INSTRUCTIONS IN CONJUNCTION WITH THE ILLUSTRATIONS.
PLEASE SAVE THESE INSTRUCTIONS

ORIGINAL ENGLISH INSTRUCTIONS

IPX2

CE
UK
CA

Installation and Wiring Instructions for the Multivent Multi-Speed Extract Fans.



IMPORTANT: READ THESE INSTRUCTIONS BEFORE COMMENCING THE INSTALLATION

- Do not install this product in areas where the following may be present or occur:
 - Excessive oil or a grease laden atmosphere.
 - Corrosive or flammable gases, liquids or vapours.
 - Subject to direct water spray from hoses.
 - Ambient temperatures higher than 40°C and lower than -20°C.
 - Possible obstructions that may hinder access to or removal of the unit.
 - All wiring must be in accordance with the current IEE wiring regulations BS7671, or appropriate standards of your country. Installation should be inspected and tested by a suitably qualified person after completion.
 - Ensure the mains supply (voltage, frequency and phase) complies with the rating label.
 - The unit should be provided with a local double pole fused spur fitted with a 3A fuse having a contact separation of at least 3mm.
 - This appliance incorporates an earth connection for functional purposes only
 - Precautions must be taken to avoid the back-flow of gases into the building from the open flue of gas or other fuel-burning appliances.
 - This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
 - Young children should be supervised to ensure that they do not play with the appliance.
 - Cleaning and user maintenance shall not be made by children
 - The installer is responsible for the installation and electrical connection of the unit on site. It is the responsibility of the installer to ensure that the equipment is safely and securely installed and left only when mechanically and electrically safe.
 - All regulations and requirements must be strictly followed to prevent hazards to life and property, both during and after installation, and during any subsequent servicing and maintenance.
 - Certain applications may require the installation of sound attenuation to achieve the sound levels required.
 - The unit must not be connected directly to a tumble drier.
 - The exhaust grille should be located at least 600mm away from any flue outlet.
 - This product and associated duct installation should be carried out in accordance with the Domestic Ventilation Compliance Guide.

 - This product contains FCC ID: S9NSPBTLERF
 - Bluetooth LE: -12dBm EIRP (63µW), nominal 2450MHz.
 - Bluetooth v4.1 compliant
 - The module has obtained the RED certificate: No. 0051-RED-0011 REV. 0
 - Zirconia Wireless: -14dBm EIRP nominal 868MHz.
 - Vent-Axia hereby assure that this type of Bluetooth radio and 868MHz radio equipment complies with RED Directive 2014/53 / EU
- The full text of the EU Declaration of Conformity can be found at the following URL:
<https://www.vent-axia.com/range/centralised-mechanical-extract-ventilation-mev>

INTRODUCTORY NOTES

The MVDC & Sentinel Multivent units are designed for simultaneous extract ventilation of multiple areas such as bathrooms, kitchens and toilets. The units use a highly efficient backward curved centrifugal motor impeller set and are designed for continuous 24-hour use.

Depending on the model, they feature either 3 or 4 settable speeds and can be configured to change speed based on a wide range of sensor or control inputs as depicted below

Model	MVDC-MS	MVDC-MS H	SMV H	SMV HX	SMV HX Co2	SMV Plus H	SMV Plus HX	SMV Plus HX Co2
Speeds	3	3	4	4	4	4	4	4
Max airflow m3/hr (0Pa)	430	430	463	463	463	573	573	573
Switched Live Input (LS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RS485 Connectivity	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Analogue Input 0-10V	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digital Input	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Humidity Sensor	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CO2 Sensor	No	No	No	No	Yes	No	No	Yes
Wireless Receiver	No	No	No	Yes	Yes	No	Yes	Yes

The units can be precisely programmed to determine how they respond to changes in sensor values or the status of the various signal inputs. The units will run at a Normal flowrate until a sensor or input change causes it to change speed. In the case of the Switched Live and Digital inputs the units will perform a step change in speed to the appropriate new level. In the case of the Analogue inputs, Humidity Sensor and CO2 sensor the unit can be programmed to give a proportional response to the change in conditions.

INSTALLATION

Position the unit, taking into consideration the position of the rooms to be ventilated, the exhaust position and the electrical services. Ensure there is adequate access for installation and maintenance.

If the unit is sited in the heated void of the dwelling a condensate drain should not be necessary. When sited in a cold loft, consideration should be given to fitment of a condensate drain. Alternatively the unit and ducting can be externally insulated to minimize condensation within the units housing.

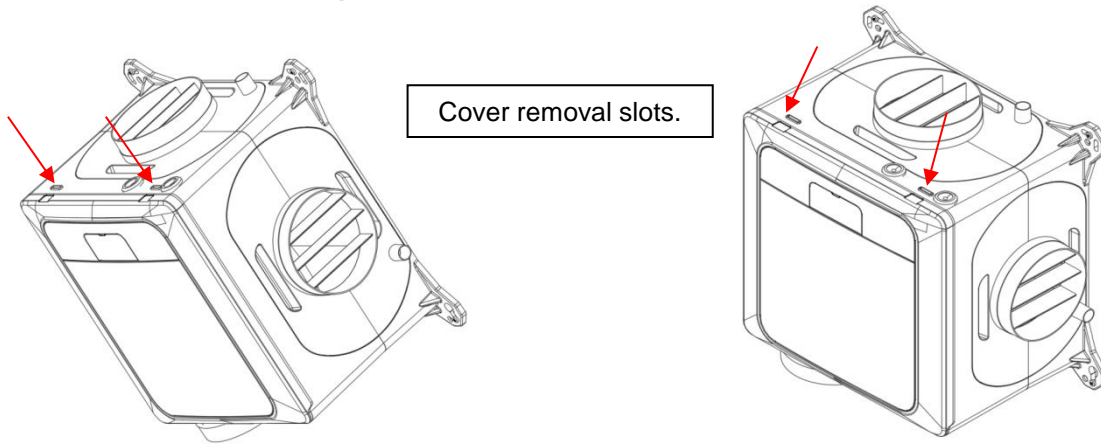
To reduce the system resistance in your duct system, and therefore lower the speed, power consumption and noise of the fan, follow these guidelines:

- 1.1. Keep the length of duct runs to a minimum, particularly the exhaust duct run.
- 1.2. If you need to use flexible ducting, make sure that it is fully extended and not crushed, sagging or torn.
- 1.3. Try to minimize the use of diffusers/valves by having similar length duct runs to the inlets.
- 1.4. The bend radius (measured to the inside of the bend), should be at least 1x the duct diameter.
- 1.5. Avoid having any bends, filters or other obstructions within 250mm of the fan inlets and outlet.

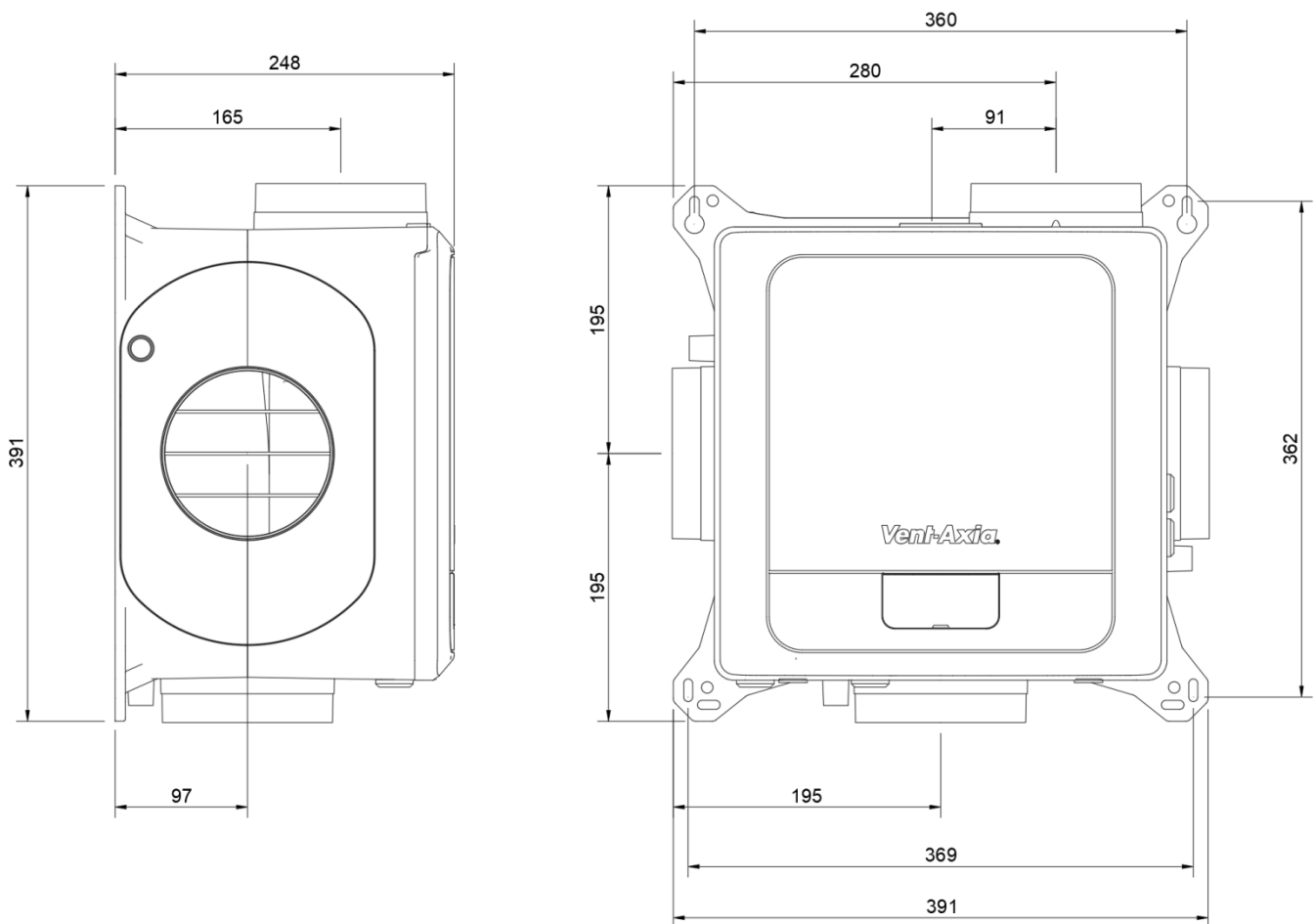
Securely mount the unit through the mounting holes on the casing using appropriate fixings for the mounting substrate. Anti-vibration mounts; acoustic mat or rubber bushes can also be used.

Fixings (not supplied) to be capable of securing 4 x the weight of the unit. Unit weight: 4.1kg

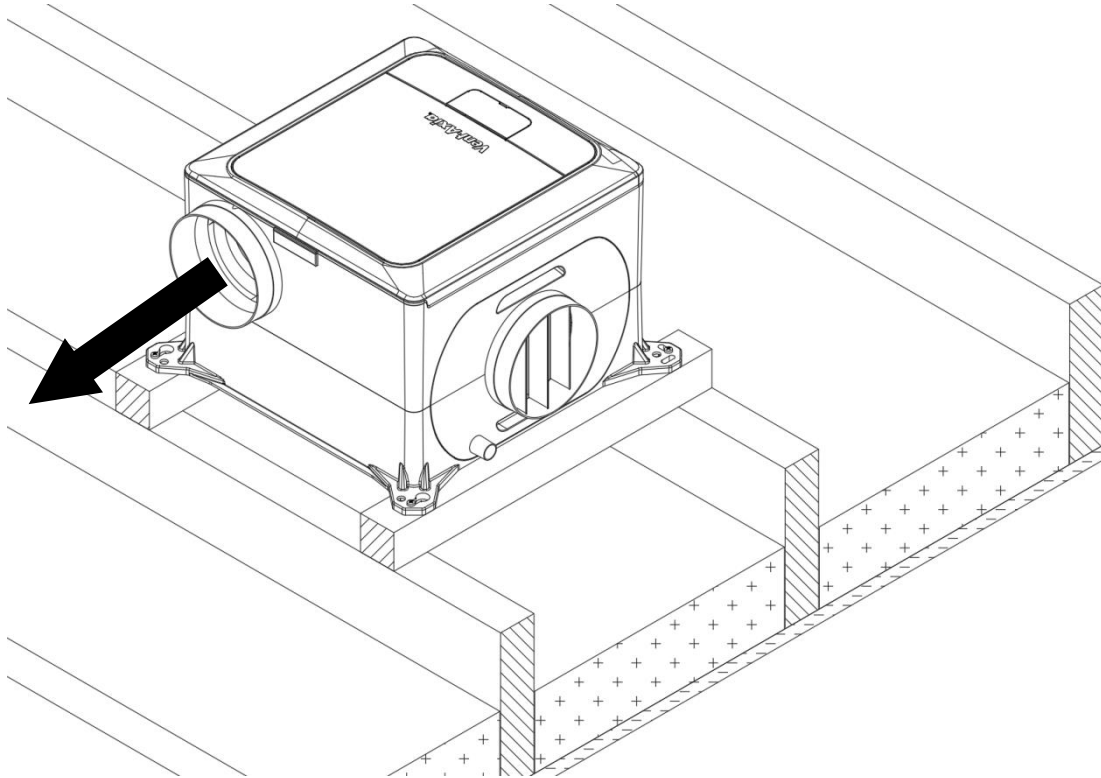
To maintain the IPx2 rating of the unit, the unit must not be mounted with the cover removal slots facing upwards, or at an angle where they are visible from above. All other orientations are acceptable.



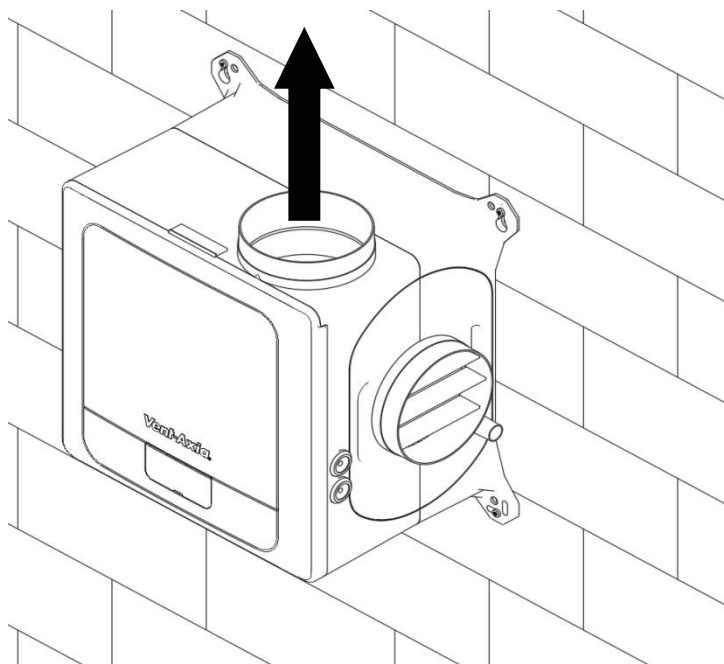
See the dimensional details below for the mounting hole positions.
-Spigot diameters are 125mm



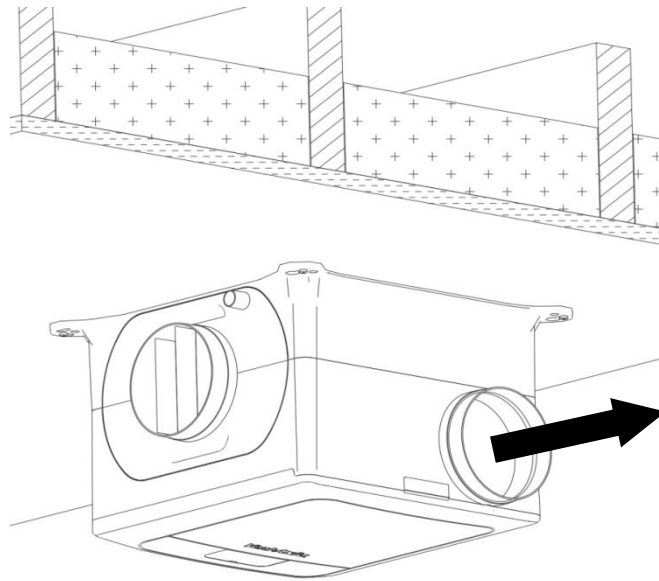
- i. **Base mounted Installation** with ducting radiating out horizontally.



- ii. **Vertically mounted Installation** with the exhaust spigot at top. The electrical connections must come out of the bottom of the unit in order to maintain the water ingress protection.



iii. **Ceiling mounted Installation** with ducting radiating out horizontally.



WIRING

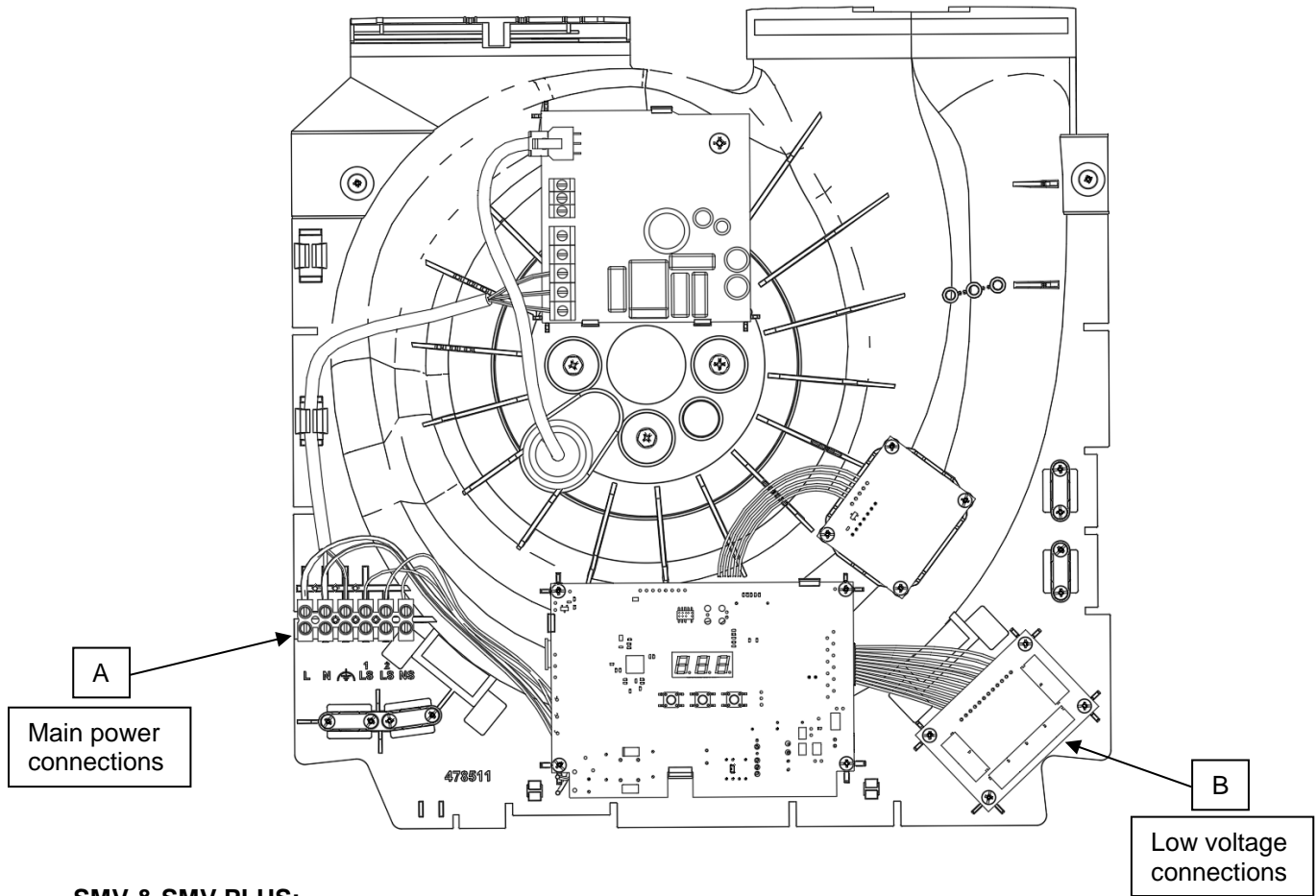


WARNING:
THE UNIT AND ANCILLARY CONTROL EQUIPMENT MUST BE ISOLATED FROM THE POWER SUPPLY DURING THE INSTALLATION / OR MAINTENANCE. THIS UNIT MUST BE EARTHED.

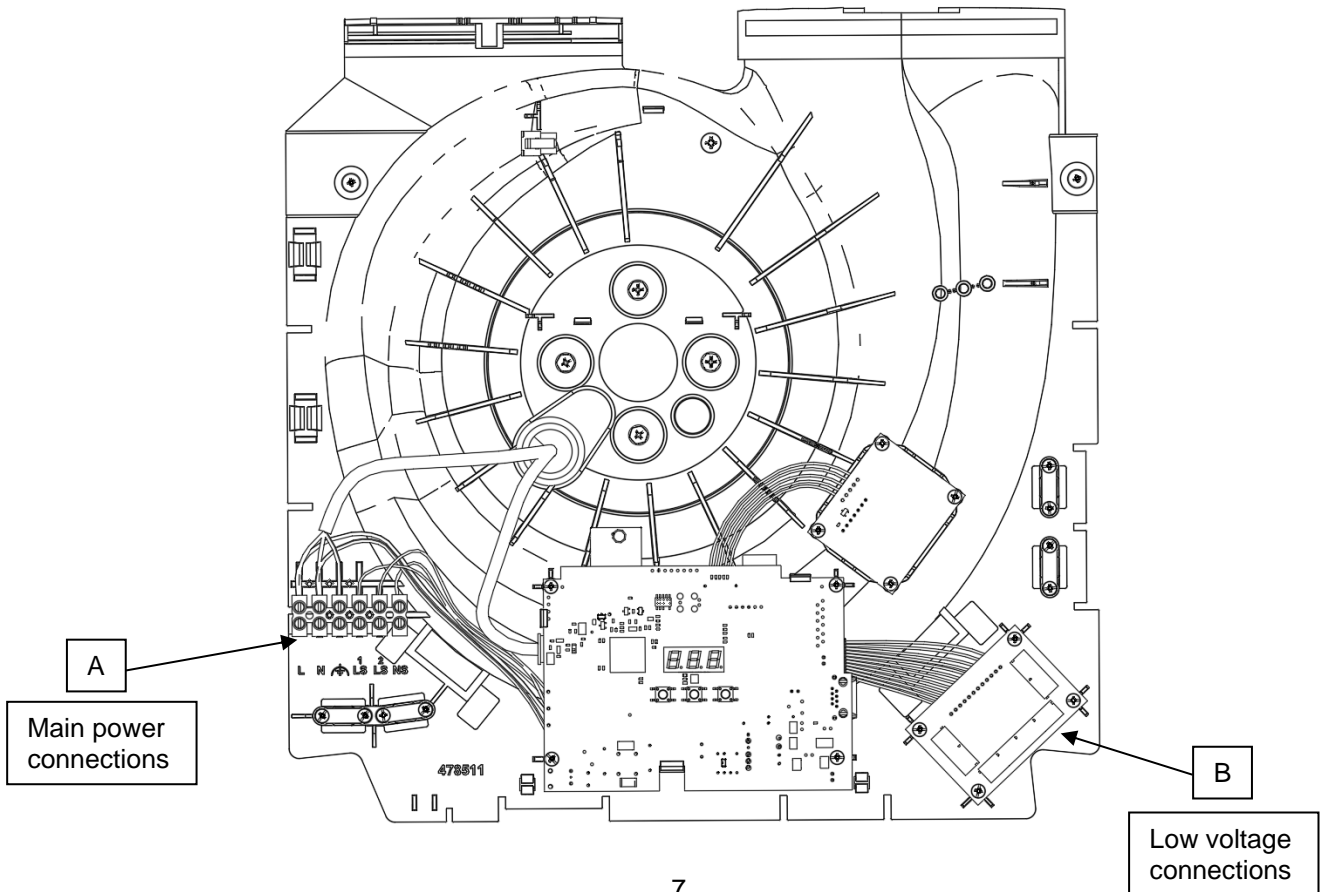
1. To remove the cover, use a coin or similar; depress the retaining tabs via the slots in the side of the unit.
2. With the power off, connect a suitable mains power cable from a switched, fused spur to the screw terminal block. Use the cable clamps and clip provided to secure the lead.
3. Two mains voltage Live Switched (LS1 and LS2) connections are provided, and can be used to trigger a change in speed. Common inputs would be from a bathroom lighting circuit. When commissioning the unit, a delay on timer and an overrun timer can be selected and adjusted in the software using the buttons and screen. See Commissioning section on page 7 of this document for details.
4. The switched live output (230Vac) from any other switch or controller, (such as a simple latching pull cord or push button switch, humidistat or PIR detector) can be connected to the LS terminal instead of connecting to a lighting circuit.
5. Important: Use 4-core, low voltage, twisted pair, telecoms type cable for accessories (Vent-Axia part number 459931). Accessories are connected via the IO (Input Output) PCB; see the Low Voltage Connections diagram. Use the cable clamp and grommet provided.
6. There are no delay on or overrun timers with the volt-free connection as the controller should determine when the fan is running at Boost or Normal speeds. Use the LS connection described above if you want a timer.
7. If a humidity sensor is fitted, the unit uses Ambient Response technology to adjust the fan speed proportionally depending on the temperature and relative humidity levels in the extracted air. The unit does not just look for relative humidity levels above a set point, which can be unreliable in products that extract from multiple rooms, but it also looks for rapid increase in relative humidity typically generated by such activities as showering or cooking. The sensor control also avoids nuisance tripping at night time when temperatures drop and relative humidity naturally rises.

CONNECTION DIAGRAM

MVDC-MS & MVDC-MSH:

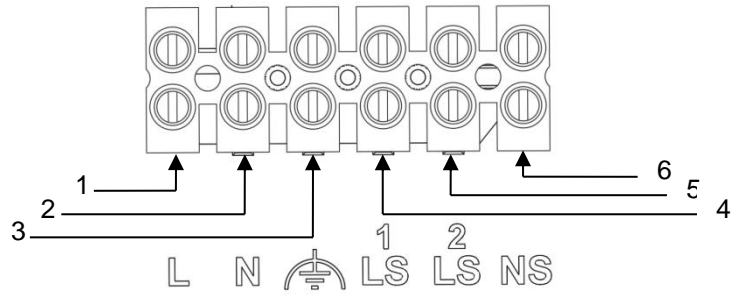


SMV & SMV PLUS:



A: Main power connections

The LS1, LS2 and NS terminals are electrically isolated. If the LS connections are used, a connection must be made with the NS terminal. This can be via a jumper or dedicated neutral connection.

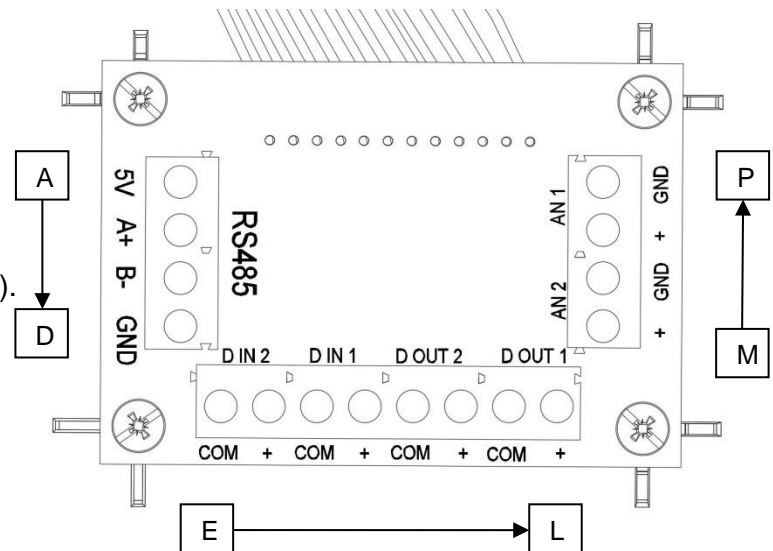


This appliance incorporates an earth connection for functional purposes only.

Connection	Description
1	L Live (220-240Vac)
2	N Neutral
3	Functional Earth
4	LS1 Live Switched 1, (220-240Vac), isolated
5	LS2 Live Switched 2 (220-240Vac), isolated
6	NS Neutral Switched, isolated

B: Low voltage connections

For best performance use 4-core, low voltage, twisted pair, telecoms type cable for accessories (available from Vent-Axia part number 459931).



Position	Label	Description	Action
A	RS485	5V	RS485 communication to wired accessories. Data connection is only available for SMV/SMV Plus units. The 5V and Ground connections are available on all units.
B		A+	
C		B-	
D		GND	
E	D IN 2	COM	Go to Boost speed (Min.1V, max. 6V). The 5V output from the RS485 connection can be used as a power supply
F		+	
G	D IN 1	COM	Go to Low speed (Min.1V, max. 6V). The 5V output from the RS485 connection can be used as a power supply
H		+	
I	D OUT 2	COM	Unpowered Boost indicator Switch (switching 6V 50mA max)
J		+	
K	D OUT 1	COM	Unpowered LED fault indicator switch (switching 6V 50mA max)
L		+	
M	AN 2	+	0-10V analogue input. Two user settable voltage thresholds with two user settable actions. The unit will run at Normal when supplied voltage is between the two thresholds.
N		GND	
O	AN 1	+	
P		GND	

COMMISSIONING

Advanced feature descriptions

If compatible, the unit can be controlled via the Bluetooth linked App. This is only available on **X** units.

Comfort mode

If Comfort mode is enabled the unit will behave as follows to all LS inputs:

Trigger	Action
LS input active less than 5 minutes	No action
LS input active more than 5 minutes but less than 20 minutes	Once LS input is removed, fan will run at user selected speed for the length of time LS was present plus the set over-run time (if over run is enabled).
LS input active more the 20 minutes	Unit will Boost after 20mins. Once LS input is removed, fan will run at user selected speed for 20 minutes plus the set over-run time (if over run is enabled).

The above applies to all LS inputs. The times are not adjustable by the user.

Humidity – Rapid rise

Rapid Rise humidity response functions to detect rapid rises in humidity when the ambient %RH is under the threshold setting. If a rapid rise is detected the fan will boost until the humidity lowers again.

Humidity – Ambient response

When ambient response is enabled the threshold set point is modified based on the ambient temperature. This helps to prevent nuisance boosting of the unit as temperatures changes during the day.

Analogue inputs

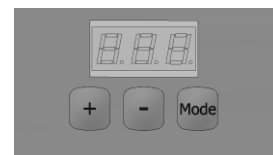
Both analogue inputs have adjustable low and high trigger voltages within the 0-10V range.

The response to being above or below either of the threshold voltages is user settable.

The display doesn't show a decimal point, for example at threshold voltage of 5.2V, is displayed as "52" on the unit.

Unit adjustment

1. Commissioning and configuration on all products is supported by the 3 digit user interface and associated push buttons.
2. When powered on, the unit will display the firmware revision number, after a few seconds the unit will display the first option in the menu structure (see below).
3. Changes to the settings can be made via the **+** and **-** buttons, the Menu button will accept changes and move onto the next menu option.
4. When setting the speeds, there is an internal logic: low<Normal<Boost<Purge. I.e., Boost is always higher than Normal.
5. The actions for each of the Live Switched (LS), inputs are selectable. The setting for delays and over run timers are applicable to all inputs.



User Configurable Parameters

Display text	Function	Selections	Default
Lxx	Low speed	1 to 97% motor speed	10%
nxx	Normal speed	2 to 98% motor speed	35%
bxx	Boost speed	3 to 99% motor speed	70%
Pxx	Purge Speed	4 to 100% motor speed	100%
LS1	Live switch 1	Low, Boost or Purge speed	Low
LS2	Live switch 2	Low, Boost or Purge speed	Boost
LS3	Live switch 1&2	Low, Boost or Purge speed	Purge
c-n	Comfort mode	Comfort mode - yes or no	No
d-n	Delay On	Delay on - yes or no	No
dxx	Delay On time	Delay to boost duration 1 to 60 minutes	10m
o-n	Overrun	Overrun - yes or no	No
oxx	Overrun time	Overrun duration 1 to 60 minutes	10m
r-n	Humidity – Rapid Rise	Rapid rise - yes or no	Yes
A-n	Humidity – Ambient Response	Ambient response - yes or no	No
hxx	Humidity threshold	Ambient response threshold 40 to 80% RH	70%
C2b	CO2 threshold boost	Boost threshold 1000 – 1500 PPM in increments of 100	1000
C2P	CO2 threshold purge	Purge threshold 1400 – 1800 PPM in increments of 100	1500
A1LA	Analogue 1 - low action	Low, Normal, Boost or Purge speed	Low
A1HA	Analogue 1 - high action	Low, Normal, Boost or Purge speed	Purge
A1tL	Analogue 1 - low threshold	Analogue Input Threshold Low 1 - 99	15
A1tH	Analogue 1 - high threshold	Analogue Input Threshold High 1 - 99	75
A2LA	Analogue 2 - low action	Low, Normal, Boost or Purge speeds	Low
A2HA	Analogue 2 - high action	Low, Normal, Boost or Purge speeds	Purge
A2tL	Analogue 2 - low threshold	Analogue Input Threshold Low 1 - 99	15
A2tH	Analogue 2 - high threshold	Analogue Input Threshold High 1 - 99	75
D1	Digital input 1 Action	Low, Boost or Purge speeds	Low
D2	Digital input 2 Action	Low, Boost or Purge speeds	Purge
unl	Unlock code	Turn on/off the menu lock	- - -
Pln	Display Pin	3 characters A to 9	LoC
dtxx	Display time	Adjust how long the display is illuminated	30 s
rot	Rotate display	Invert the display	rot
hu	Humidity	Show the current internal humidity	%
tu	temperature	Show the current internal temperature	°C
CO2	CO2	Show the current CO2 level	PPM
end	end	End of menu (loop to start)	

If the unit being commissioned is not fitted with the relevant hardware, the associated menu options will not be available.

Control via Bluetooth

If compatible, the unit can be controlled via the Bluetooth linked App. This is only available on units the X designation.

Download the Vent-Axia iOS or Android App and follow the pairing instruction in the App to connect to your device.

The App allows the user to set all of the units parameters and monitor the status of the unit. It also supports updating of the units firmware should new features become available. .



SERVICING & MAINTENANCE



WARNING: THE FAN AND ANCILLARY CONTROL EQUIPMENT MUST BE ISOLATED FROM THE POWER SUPPLY DURING MAINTENANCE.

1. At intervals appropriate to the installation, the fan should be inspected and cleaned to ensure there is no significant buildup of dirt or other deposits.
2. To inspect the inside of the product isolate the power, use a coin or similar to depress the cover retention clips.
3. Remove the cover; remove the scroll assembly by unscrewing the two screws and unclipping the clips in the two corners and pulling away. If necessary, vacuum the inside of the Sentinel Multivent.
4. The fan has sealed for life bearings, which do not require lubrication. Expected service life is at least 45,000 hours continuous running.
5. Check all fixings are tight and secure

FAULT CODES

If the MEV unit detects a fault it will display an error message on the HMI display:

Fault Code	Description
F01	Control fault – Unit failed startup check
F02	Motor Fault – No RPM
F03	Humidity/Temp sensor Fault – No value
F04	Co2 sensor Fault – No value

OPTIONAL ACCESSORIES

	MVDC-MS / H	SMV H SMV PLUS H		SMV HX / CO2 SMV PLUS HX / CO2	
Sensor/Controller Name / Function	Wired 0-10V	Wired 0-10V	Wired RS485	Wired RS485	Wireless RF868
Temp/RH	496428 (240V)	496428 (240V)	496429 (240V)	496429 (240V)	496429 (240V) 496431 (Battery)
CO2 (+RH) 0-10V	496432 (240V)	496432 (240V)	496433 (240V)	496433 (240V)	496433 (240V)
PIR	-	-	496438 (240V)	496438 (240V)	496438 (240V)
AIM (Alarm interface module)	-	-	-	-	496441 (240V)
External Temp/RH battery powered	-	-	-	-	496442 (Battery)
MEV Controller RH RS485 & RF868	-	-	496442 (240V)	496442 (240V)	496442 (240V)
Speed Switch-R 4 way	-	-	496621 (240V)	496621 (240V)	496620 (240V) 496437 (Battery)

All units	
Sensor/Controller Name	Part Number
4 way analogue speed switch	496622
Timespan controller	563519
Air Quality Sensor	563506
Ambient response Humidity sensor	563550
Ecotronic Humidity sensor	563532
ThermoSwitch	563502
7 Day timer switch	563515
Visionex PIR	459623
3-pole Isolator switch	563518
Remote delay timer	457986
Isolator relay	442030
Normal/boost switch	455213
Normal/boost/purge switch	5108454
2-way switch with neon	459746
3 speed controller switch	563533
Normal / boost switch stainless	437320
Normal / boost switch with Neon	449060
LED Fault indicator	448356

SPARE PARTS

Scroll assembly - Please contact:
Vent-Axia Technical support
+44 (0)344 856 0594
Email: tech@vent-axia.com

Product Fiche

Name:	Vent-Axia							
Model ID (Stock Ref.) :	437634C	443298B	445655B	495360	495361	407849A	495362	495363
SEC Class	B		B			B		
SEC Value ('Average')	-27.2		-27			-26.9		
SEC Value ('Warm')	-11.7		-11.5			-11.4		
SEC Value ('Cold')	-54.3		-54.1			-54.0		
Label Required? (Yes/No=Out of scope)	Yes							
Declared as: RVU or NRUVU/UVU or BVU	RVU/UVU							
Speed Drive	Multi Speed							
Type HRS (Recuperative, Regenerative, None)	None							
Thermal Eff: [(%), NA(if none)]	N/A							
Max. Flow Rate (m3/h)	338.8		400			505.1		
Max. Power Input (W): (@Max.Flow Rate)	43		52			85		
LWA: Sound Power Level dB)	46.4		50.7			52.2		
Ref. Flow Rate (m3/s)	0.066		0.078			0.098		
Ref. Pressure Diff. (Pa)	201		203			206		
SPI [W/(m3/h)]	0.07		0.08			0.09		
Control Factor & Control Typology: (CTRL/ Typology)								
Control Factor; CTRL	0.65							
Control Typology	Local Demand Control							
Declared: -Max Internal & External Leakage Rates(%) for BVUs or carry over (for regenerative heat exchangers only), Ext. Leakage Rates (%) for Ducted UVUs;	<5% Internal, <5% External							
Mixing Rate of Non-Ducted BVUs not intended to be equipped with one duct connection on either supply or extract air side;	N/A							
Position and description of visual filter warning for RVUs intended for use with filters, including text pointing out the importance of regular filter changes for performance and energy efficiency of the unit	N/A							
For UVUs (Instructions Install Regulated Supply/Extract Grilles Façade)	In F&W							
Internet Address (for Disassembly Instructions)	www.vent-axia.com							
Sensitivity p. Variation@+20/-20 Pa: (for Non-Ducted VUs)	N/A							
Air Tightness-ID/OD-(m3/h) (for Non-Ducted VUs)	N/A							
Annual Electricity Consumption: AEC (kWh/a)	0.4		0.5			0.6		
Annual Heating Saved: AHS (kWh/a)								
AHS: Average	28.3		28.3			28.3		
AHS: Warm	12.8		12.8			12.8		
AHS: Cold	55.4		55.4			55.4		

Disposal

This product should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority for recycling advice.



The **Vent-Axia** Guarantee

Applicable only to products installed and used in the United Kingdom. For details of guarantee outside the United Kingdom contact your local supplier.

Vent-Axia guarantees its products for two years from date of purchase against faulty material or workmanship. In the event of any part being found to be defective, the product will be repaired, or at the Company's option replaced, without charge, provided that the product:-

- Has been installed and used in accordance with the instructions given with each unit.
- Has not been connected to an unsuitable electricity supply. (The correct electricity supply voltage is shown on the product rating label attached to the unit).
- Has not been subjected to misuse, neglect or damage.
- Has not been modified or repaired by any person not authorised by the company.

IF CLAIMING UNDER TERMS OF GUARANTEE

Please return the complete product, carriage paid to your original supplier or nearest Vent-Axia Centre, by post or personal visit. Please ensure that it is adequately packed and accompanied by a letter clearly marked "Guarantee Claim" stating the nature of the fault and providing evidence of date and source of purchase.

The guarantee is offered to you as an extra benefit, and does not affect your legal rights

Vent-Axia

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As part of the policy of continuous product improvement Vent-Axia reserves the right to alter specifications without notice.