VORT NRG

Heat recovery solutions
for the commercial
and tertiary sectors

VORT NRG FLAT

VORT NRG FLAT EVO

VORT NRG FLAT EVO V

VORT NRG MEGA

VORT NRG MEGA-R

VORTICE S.p.A. is now part of a multinational group, **the VORTICE GROUP**, which operates through its own companies or local distributors in over 90 countries worldwide and has a rich product portfolio that guarantees air quality and climate comfort. The headquarters of VORTICE S.p.A are in Tribiano (Milan).

The VORTICE GROUP also includes:

[1]
VORTICE UK Ltd, English branch of VORTICE S.p.A established in 1977 and based in Burton on Trent.

[2]
VORTICE INDUSTRIAL, born from the acquisition in 2010 of Loran srl, based in Isola della Scala (VR).

[3]
VORTICE Ventilation System, a company inaugurated in 2013 with headquarters in Changzhou, China.

[4]
VORTICE Latam, based in Alajuela in Costa Rica, established in 2012.

[5]
CASALS VENTILACIÓN AIR INDUSTRIAL S.L,
a historic Spanish brand, based in Sant Joan de les Abadesses, Girona, was acquired in 2019.

CONTROLLED MECHANICAL VENTILATION

The sick building syndrome is a disease recognised by the World Health Organization that presents a series of symptoms caused by the presence of toxic elements in closed environments. The main sources of pollution originate both from factors inside and outside the building. An adequate air exchange rate, achieved without wasting energy, is the solution to the problem. The installation of adequately sized and correctly designed Controlled Mechanical Ventilation (CMV) systems guarantees the correct exchange and filtering of the air.

The heat recuperators provide for the exchange of air by minimising the dissipation of the thermal energy of the extracted air, which is largely transferred to the fresh air at practically no cost. Therefore, the air introduced — adequately filtered to retain any impurities that may be present in it — is pre-heated in winter or pre-cooled in summer, thus favouring the adoption of smaller-sized thermo-technical systems, with significant savings both during purchase and operation.

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VORT NRG series - Certifications

Electric Safety Regulations:
EN 60204
EN 12100
EN ISO 13857
EN ISO 12499
EN 60335-1
EN 60335-2-80
EN 60529
EN 62233

Aeraulic Performances Regulations:
EN 308
EN 13141-7

Electromagnetic Compatibility Standards:
- EN 55014–1
- EN 55014-2
- EN 61000-3-2
- EN 61000-3-3

European Directives for CE Marking
- Machinery Directive (2006/42/EC)
- Electromagnetic Compatibility Directive (2004/108/EC)
- Ecodesign Directive (2009/125/EC)
- Regulation 327/2011/EU
- Regulation 1253/2014/EU
- Regulation 1254/2014/EU

DEDICATED SELECTION SOFTWARE

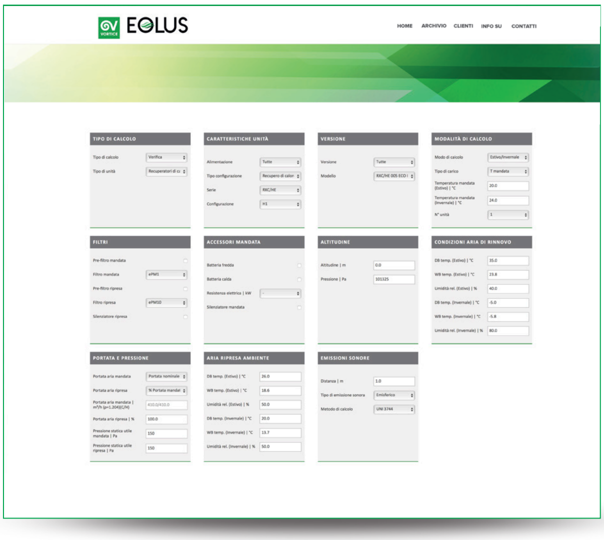
EOLUS

Eolus is an online selection software dedicated to VORTICE customers who want to select a heat recuperator that meets their needs.

If you did not find a product suitable for you among the proposals in the list, you can configure it deciding which features it should have.

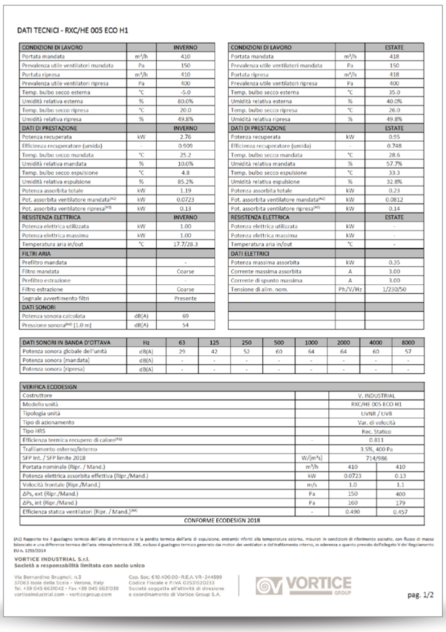
IT IS POSSIBLE TO SELECT:

- **Type of heat exchanger:** you can choose among plate and rotating exchangers;
- **Air flow rates up to 4000 m³/h (NRG FLAT Series) or 8000 m³/h (NRG MEGA Series);**
- **Type of installation:** horizontal or vertical;



- **Type of panel:** it is possible to choose the thickness of the casing panel according to the room temperatures in which the installation will occur.
- **Different levels of filtration:** grease filters, pre-filters, medium or high efficiency filters.
- **Different configurations of supply and return air flows;**
- **Available models: operating at constant pressure, at constant flow rate and with control of the CO_2 level;**
- **Possibility to combine the selected machine with accessories** such as: post-treatment coils (electric, hydronic, direct expansion), silencers, manual or power-operated dampers, defrosting systems.

From the software home page, that is available via WEB application and does not require installation, it is possible to access the recuperators selection.
The software automatically calculates the machine performance in summer or winter mode - as temperature and relative humidity values of indoor and external air, altitudes and possible limits of noise emission change.
You will obtain a complete quotation and a specific technical data sheet for the selected product, complete with data such as technical description and data, energy indices and technical drawing.
The quotation and technical data sheet can be downloaded and printed in various formats.


DATI TECNICI - RXC/HE 005 ECO H1

VORTICE INDUSTRIAL S.r.l.

VORTICE

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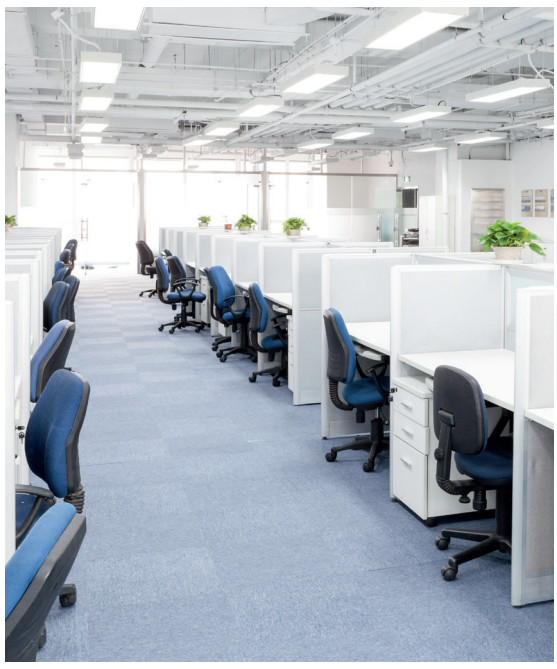
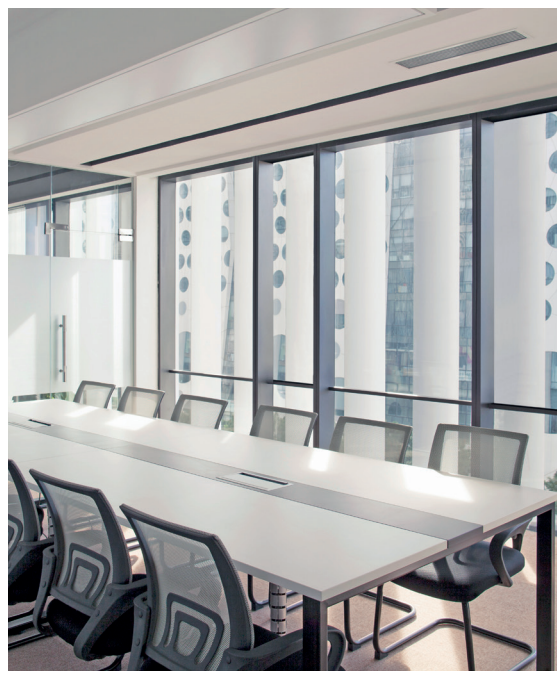
VORT NRG FLAT

Heat recovery units with plate recuperator

The heat recovery units of the VORT NRG FLAT series are available in 7 sizes, with nominal air flow rates from 400 to 4000 m^3/h. The units have been designed for false ceiling (**H**) or ground (**V**) installations, and are available in the **ECO, PLUS, TOP** versions.





CONSTRUCTION FEATURES

01 CONSTRUCTION

Self-supporting structure in sandwich panels with internal insulation made of high-density polyurethane foam (40 kg/m³). The panels are 25 mm thick and consist of steel sheets with a thickness of 6/10". The outer side is pre-painted RAL 9010, the inner side is hot-dip galvanised Z140. The structure is made according to the EN1886 standard, class D1 of mechanical resistance. The airtightness is guaranteed by a particularly adaptable and resilient neoprene gasket, the tightening of the extendable panels is carried out by means of screws that ensure an adequate and constant pressure on the sealing gaskets. In all areas subject to condensation there is a condensate collection basin inclined internally and in compliance with the EN1.4301 standard. All internal components are accessible from below through removable panels in order to ensure proper routine and extraordinary maintenance.

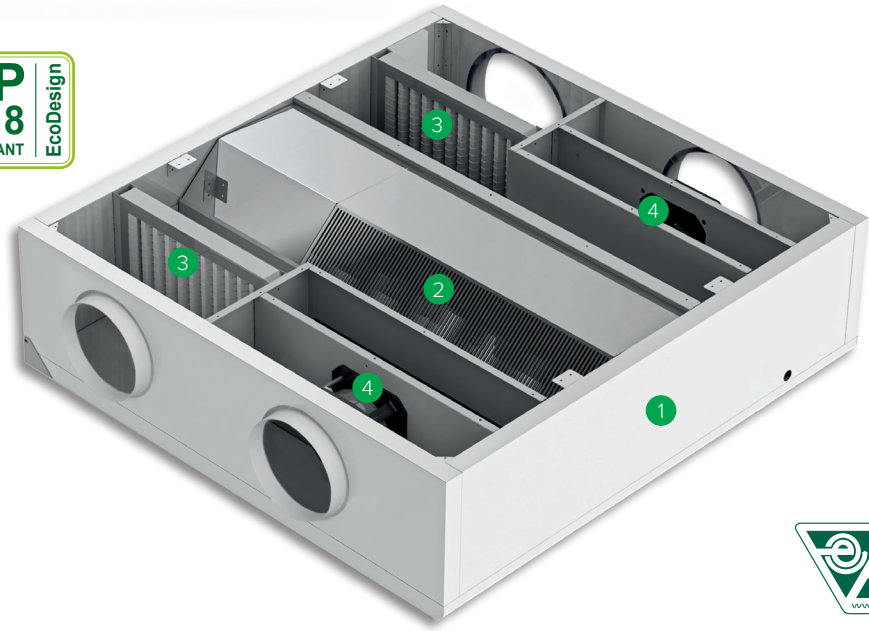
03 FILTERS

ePM10 60% (M5) filters for stale air extraction and filtration and PM1 55% (F7) filters for fresh air intake. Both types of filters are mounted on guides equipped with gaskets to ensure effective sealing.
Their position, upstream of the internal components, also guarantees their protection.

04 FANS

Independently controllable, they consist of centrifugal impellers with backward blades with an aerodynamic profile, made in galvanised steel, statically and dynamically balanced. The impellers are directly coupled to EC brushless motors, with internal rotor, operating via a modulating 0-10V signal.

ErP 2018 COMPLIANT EcoDesign



EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

02 HEAT EXCHANGER

The units are equipped with a counter-current heat recuperator in aluminium used to transfer heat from the expelled air to the incoming external air.
The spacing between the fins is optimised in order to reduce the loss of air-side load and the electric consumption of the fan. The heat recuperator is equipped with an additional by-pass damper for the management of the free-cooling and free-heating modes as required by the ErP regulation.
By-pass damper 100% of air flow rate.
The exchanger participates in the **Eurovent Certification** programme and is sized in accordance with the **ECO Design directive**.

ADDITIONALS COILS
(optional + external module)

External module that can accommodate heating and/or cooling coils with a high number of rows.

DEFROSTING SYSTEM
(optional)

The automatic defrosting system can be carried out either electrically (consisting of a self-regulating electric coil installed on the room air return), or with unbalanced air flows (consisting of a specific device and a software that avoids an excessive drop in the temperature of the expelled air).

Technical data

MODEL		400	600	1000	1500	2000	3000	4000
Type of ventilation unit		UVNR-B (Non Residential Ventilation Units - Bidirectional)						
Type of drive installed		Analog signal on EC fan (0-10 Vdc)						
Type of fans	type/n°	EC/2	EC/2	EC/4	EC/2	EC/2	EC/2	EC/2
Type of heat recovery system (HRS)	type/n°	Static with counter-current flows / 1						
Winter Thermal Efficiency (ηt_nrvu) [1]	%	77.4	78.6	77.5	77.7	78.2	78.3	77.8
Winter Thermal Efficiency [2]	%	84.5	85.6	84.6	85.7	86.1	86.9	86.6
Nominal air flow rate (at 150 Pa)	m³/h	410	650	1000	1620	2150	3040	3980
Electric power consumption	kW	0.24	0.33	0.60	0.95	1.33	1.47	1.84
Installed electric power	kW	0.36	0.36	0.72	1.45	1.50	2.06	2.06
SFP_{int}	W/(m³/h)	1121	907	1171	1159	1151	881	1032
SFP_{lim} 2018	W/(m³/h)	1215	1252	1194	1174	1166	1132	1078
Front speed at design flow rate	m/s	2.18	1.61	2.03	2.14	1.93	2.21	2.41
External nominal pressure $\Delta p_{s,\ ext}$ [3]	Pa	150	150	150	150	150	150	150
Internal pressure drop $\Delta p_{s,\ int}$ Ret./Sup.	Pa	161/171	110/122	165/185	178/194	169/190	186/207	228/259
Fans static efficiency (UE) no. 327/2011	%	29.1	27.6	29.1	31.2	30.7	43.0	45.0
Max. external/internal leakage percentage	%	max 3.5% at -400 Pa I max 5.0% at +250 Pa						
Filter energy classification		ePM1 55% (F7) I ePM10 60% (M5)						
Filter pressure switch		present						
Sound power level [4]	dB(A)	73.3	75.1	77.3	79.9	82.0	82.3	82.8
Sound pressure level [5]	dB(A)	57.8	59.6	61.8	64.4	66.5	66.8	67.3
Power supply	V/ph/Hz	230/1/50					400/3/50	

[1] Ratio between the thermal gain of the inlet air (0 °C) and the thermal loss of the expulsion air (20 °C), both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of Annex V of EU Regulation No. 1253/2014.

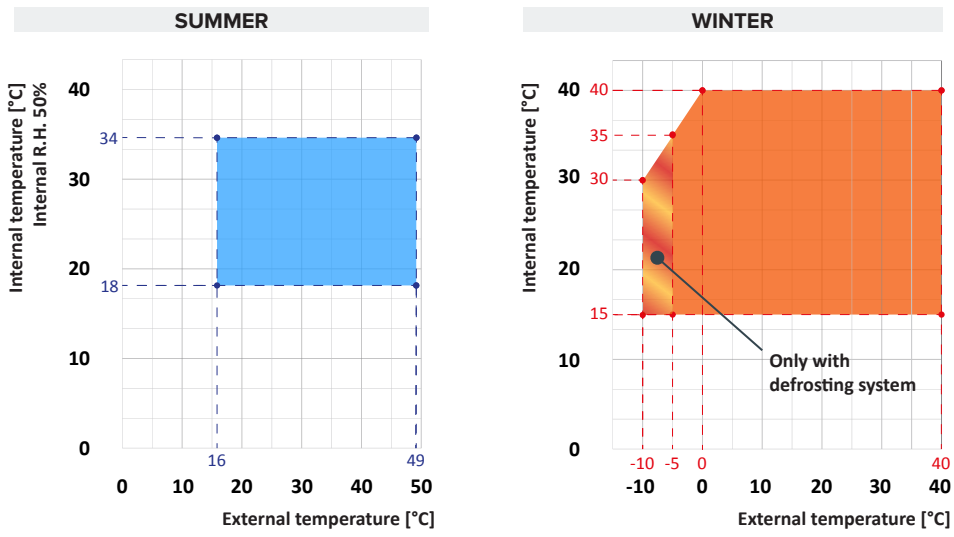
[2] External air: -5 °C / 80% RH - Internal air: 20 °C / 50% RH.

[3] Performance with clean filters.

[4] Sound power level calculated in accordance with EN 3744.

[5] Sound pressure level measured at a distance of 1m in free field, in accordance with EN 3744.

Operation limits



Adjustments

The units are supplied complete with control system and available in three versions: **ECO, PLUS** and **TOP**.

ECO: complete with air temperature probes installed on the fresh air intake and room air return. The control allows you to select, manually from the control panel, in continuous variation, the speeds of the supply and return fans and automatically manages the by-pass damper of the heat recuperator through the motorised On/Off control, the summer/winter seasonal change and the programming for daily time slots.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

PLUS: this control version is set to operate at constant pressure, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

TOP: this control version is set to operate at constant flow rate, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

GRAPHIC LCD REMOTE DISPLAY
(all versions)

Accessories

Anti-grease ISO Coarse 40% (G2) pre-filter
The filter is used in the presence of dust and large pollutants suspended in the air or in the case of oil mist filtration. The filtering material is washable and can be installed as a pre-filter in combination with the ePM10 55% (M5), ePM1 55% (F7) or ePM1 80% (F9) filters placed on the room air return side.

ePM10 50% (G4) air pre-filter
The filtering septum has low pressure drops and can be installed as a pre-filter in combination with ePM10 60% (M5), ePM1 55% (F7) or ePM1 80% (F9) filters.

ePM10 60% (M5) air filter
The filtering septum has an ePM10 60% (M5) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

ePM1 55% (F7) air filter
The filtering septum has an ePM1 55% (F7) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

ePM1 80% (F9) air filter
The filtering septum has an ePM1 80% (F9) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

Guides for additional filters
The additional filter guides are used in case a second additional filter in addition to the one used as standard is used.

Defrosting system
The automatic defrosting system consists of a self-regulating electric coil in PWM mode of the power absorbed, installed on the room air return. The system is controlled by a special temperature probe positioned on the air expulsion and guarantees a considerable reduction in the power absorbed compared to traditional systems on the market.

Unbalanced flows defrosting system
The defrosting system (optional) consists of a specific device and a software that avoids an excessive drop in the temperature of the expelled air, slowing down the flow of the supply and return air and, if necessary, the opening of the by-pass damper. This system is normally supplied in combination with the hot water coil (optional).

Post-heating electric coil (internal)
All units can be supplied complete with internal post-heating electric coil, consisting of armoured steel electric resistors, supplied complete with PWM control system, safety thermostat already wired and installed on board.

Hot water coil (external)
The hot water coil is supplied in an box to be installed directly on the air supply flow. The box has the same section and construction features of the basic unit, and it is installed through the special mounting kit supplied with the unit. The coil is made of 0.40 mm thick copper tubes and 0.11 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Upon request, it is possible to install coils with different thermal performance compared to the production standard where previously agreed with the company.

Cold water coil (external)
The coil is made of 0.40 mm thick copper tubes and 0.11 mm thick aluminium fins.
The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Upon request, it is possible to install coils with different thermal performance compared to the production standard where previously agreed with the company. The box is equipped with a basin to collect condensation with side drain.

Reversible direct expansion coil (external)
The direct expansion coil is supplied in an box to be installed directly on the air supply flow. The box has the same section and construction features of the basic unit, and it is installed through the special mounting kit supplied with the unit. The coil is made of 0.30 mm thick copper tubes and 0.1 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. The box is equipped with a basin to collect condensation with side drain. Suitable for use with R410A and R32 refrigerant gases, maximum allowable pressure PS=45 Bar. The data in the data sheet are calculated with SH=5 °C and SC=5 °C.

Water regulation valve
Kit with a 3-way valve for water flow rate regulation, to be combined with the hot and/or cold water coil and the electronic modulating servo control. Connection fittings not included (provided by the installer).

Accessories

Air damper with servo control

The damper installed on the machine is an excluding device of the air flow for the fresh air intake and/or the room air return. This option is very useful in the case of installations in environments with cold outdoor temperatures, where you want to avoid dangerous cold air currents self-induced by the system, during the stand-by period of the unit, with the possibility of freezing the water contained inside any coils installed. The dampers are controlled by an On/Off type electric actuator for opening and closing or with spring return.

Silencer

The silencer consists of a cylindrical section in galvanised steel sheet containing a mineral wool mat covered externally with a veil of glass fibre and a perforated containment sheet. The sound-absorbing material is in M0 class. The fabric wrapping film and the perforated sheet protect it from any fraying of the mineral wool even in case of high air speed. The cylindrical section is fixed to the unit by screws.

CO_2 probe

ECO units can be equipped with an air quality CO_2 probe. This accessory is installed and wired at the factory. Installed on the room air return channel, it allows to determine the amount of carbon dioxide present in the environment, increasing the amount of external air to dilute its content.

ATTENTION: The CO_2 probe is not available in the PLUS and TOP versions.

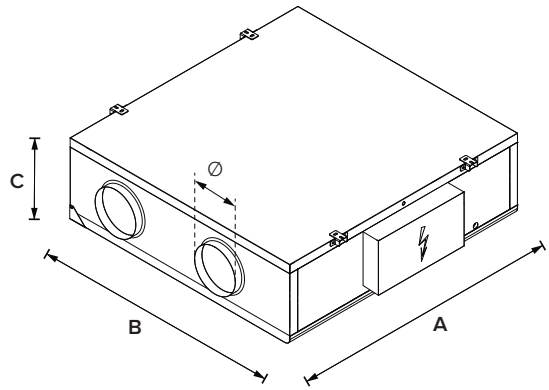
	MODEL	400	600	1000	1500	2000	3000	4000
ECO	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM1 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM10 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (2)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
PLUS	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM1 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM10 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	Fan differential transducers	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (2)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
	Constant PRESSURE unit version	■	■	■	■	■	■	■
TOP	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM$_1$ 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM$_{10}$ 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	Fan differential transducers	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (2)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
	Constant FLOW RATE unit version	■	■	■	■	■	■	■
Accessories	Anti-grease ISO Coarse 40% (G2) pre-filter in return	□	□	□	□	□	□	□
	ePM10 50% (G4) pre-filter in supply/return	□	□	□	□	□	□	□
	ePM1 55% (F7) filtration in return	□	□	□	□	□	□	□
	ePM1 80% (F9) filtration in supply/return	□	□	□	□	□	□	□
	Defrosting system	□	□	□	□	□	□	□
	Post-heating electric coil	□	□	□	□	□	□	□
	Direct expansion coil (1)	□	□	□	□	□	□	□
	Hot water coil (1)	□	□	□	□	□	□	□
	Cold water coil (1)	□	□	□	□	□	□	□
	3-way modulating valve kit (2)	□	□	□	□	□	□	□
	External air damper/expulsion	□	□	□	□	□	□	□
	Damper ON/OFF actuator	□	□	□	□	□	□	□
	Silencers (2)	□	□	□	□	□	□	□
	CO_2 probe (only available for ECO versions)	□	□	□	□	□	□	□

■ Standard □ Optional – Not available

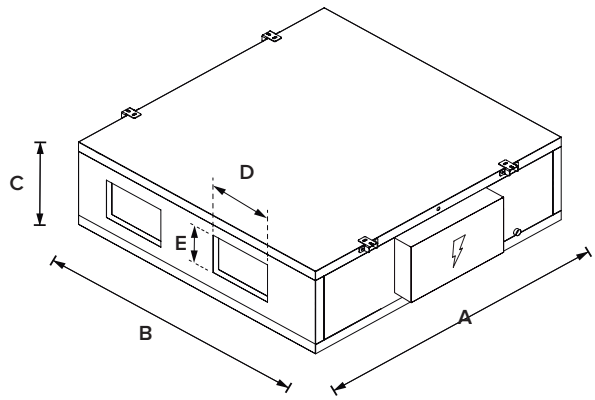
(1) Installed in external box
(2) Supplied separately

Dimensions

Models 400 - 600 - 1000 - 1500 - 2000



Models 3000 - 4000

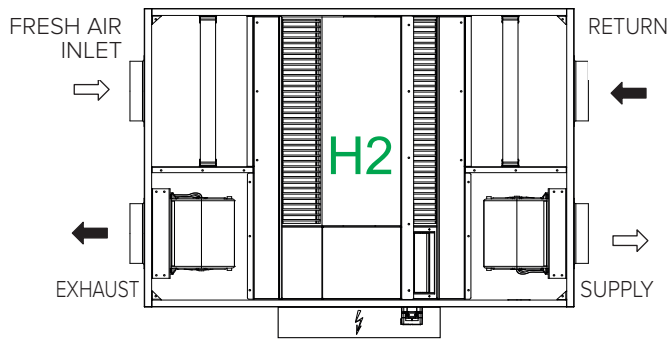


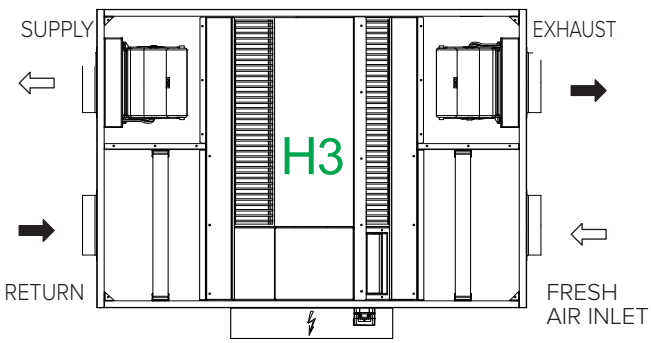
	Models	400	600	1000	1500	2000	3000	4000
QUOTAS	A	1250	1350	1350	1600	1600	1900	1900
	B	700	1000	1300	1300	1550	1650	1900
	C	340	380	380	500	500	580	580
	Ø /DxE	150	200	250	250	250	450x350	450x350
	*Kg	117	89	108	138	172	212	354

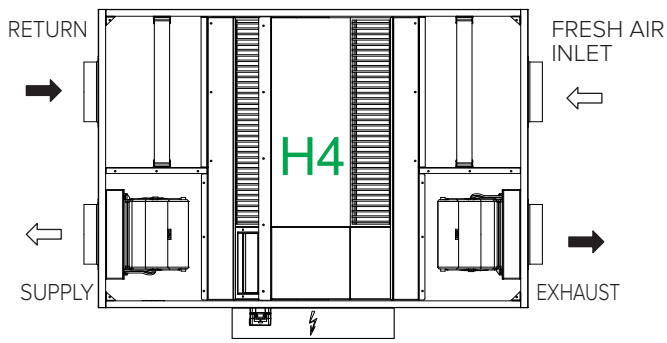
Quotas in mm

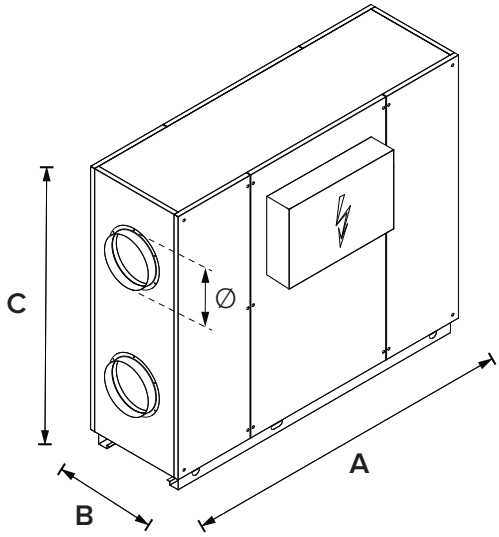
** Weight referring to the basic configuration*

Configurations (plan view) - false ceiling version







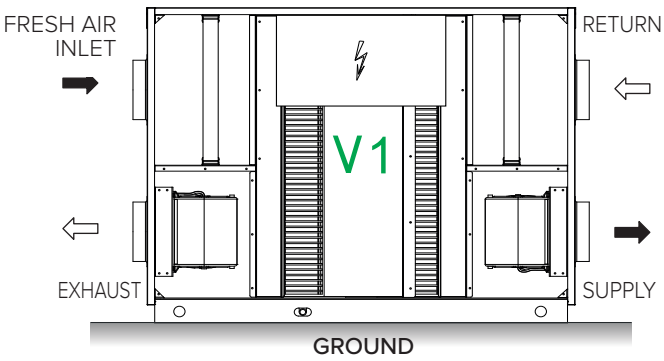


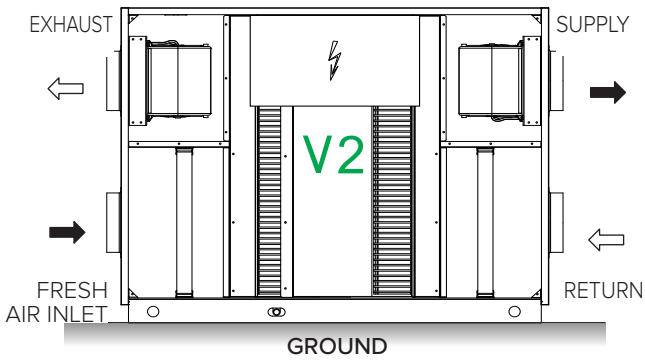
	Models	400	600	1000	1500	2000
QUOTAS	A	1250	1350	1350	1600	1600
	B	340	380	380	500	500
	C	772	1072	1372	1372	1622
	Ø	150	200	250	250	250
	*Kg	92	112	142	178	218

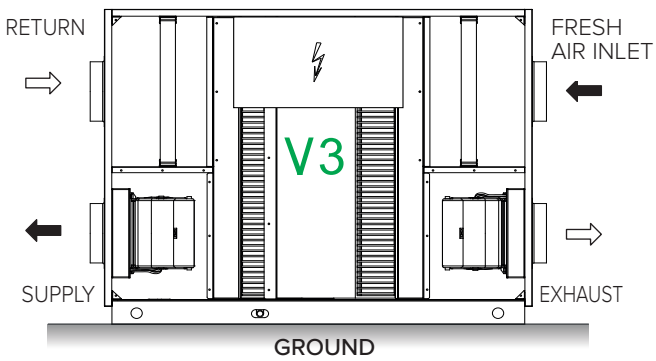
Quotas in mm

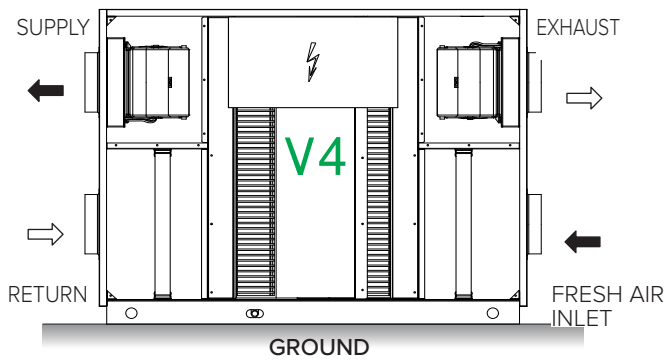
** Weight referring to the basic configuration*

Configurations (front view) - vertical base version









VORT NRG FLAT EVO

Heat recovery units with plate recuperator

The heat recovery units of the VORT NRG FLAT EVO series are available in 7 sizes, with nominal air flow rates from 400 to 4000 m^3/h. The units have been designed for false ceiling (**H**) or ground (**V**) installations, and are available in the **ECO**, **PLUS**, **TOP** versions.

CONSTRUCTION FEATURES

01 CONSTRUCTION

Self-supporting structure in sandwich panels with internal insulation made of high-density polyurethane foam (40 kg/m^3). The panels are 50 mm thick and consist of steel sheets with a thickness of 6/10". The outer side is pre-painted RAL 9010, the inner side is hot-dip galvanised Z140.
The structure is made according to the EN1886 standard, class D1 of mechanical resistance. The airtightness is guaranteed by a particularly adaptable and resilient neoprene gasket, the tightening of the extendable panels is carried out by means of screws that ensure an adequate and constant pressure on the sealing gaskets. In all areas subject to condensation there is a condensate collection basin inclined internally and in compliance with the EN 1.4301 standard.
All internal components are accessible from below through removable panels in order to ensure proper routine and extraordinary maintenance.

03 FILTERS

EPM10 60% (M5) filters for stale air extraction and ePM1 55% (F7) filtration for fresh air intake. Both types of filters are mounted on guides equipped with gaskets to ensure effective sealing. Their position, upstream of the internal components, also guarantees their protection.

04 FANS

Independently controllable, they consist of centrifugal impellers with backward blades, directly coupled to motors of the electronic commutation type (EC brushless), with external rotor, single-phase or three-phase (depending on the model), integrated thermal protections and able to adapt the performances to the needs of the moment (modulating regulation of the air flow), guaranteeing low consumption and reduced noise emissions.

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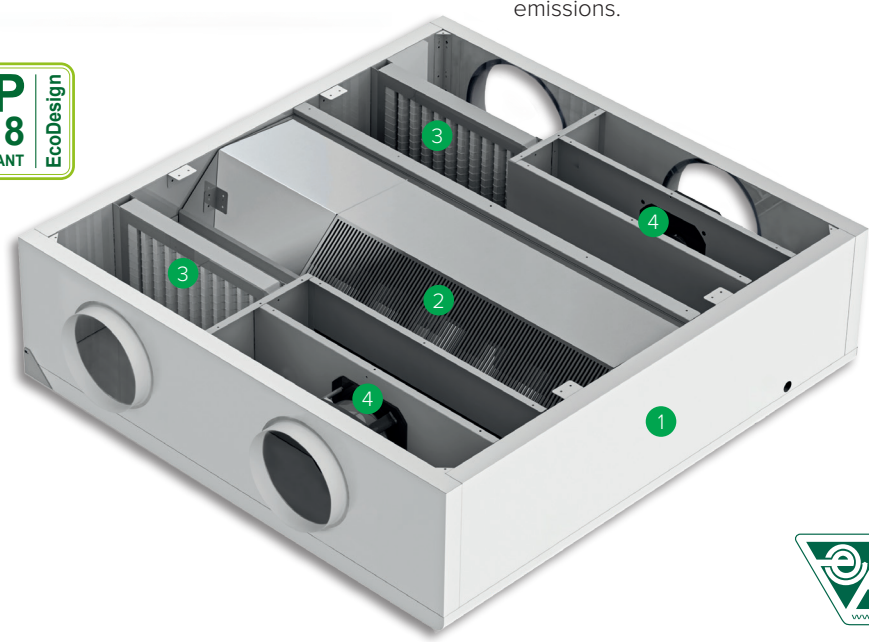


EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

02 HEAT EXCHANGER

The units are equipped with a counter-current heat recuperator in aluminium used to transfer heat from the expelled air to the incoming external air. The spacing between the fins is optimised in order to reduce the loss of air-side load and the electric consumption of the fan. The heat recuperator is equipped with an additional by-pass damper for the management of the free-cooling and free-heating modes as required by the ErP regulation. By-pass damper 100% of air flow rate. The exchanger participates in the **Eurovent Certification** programme and is sized in accordance with the **ECO Design directive**.

ADDITIONALS COILS
(optional + external module)
External module that can accommodate heating and/or cooling coils with a high number of rows.

DEFROSTING SYSTEM
(optional)
The automatic defrosting system can be carried out either electrically (consisting of a self-regulating electric coil installed on the room air return), or with unbalanced air flows (consisting of a specific device and a software that avoids an excessive drop in the temperature of the expelled air).

Technical data

MODEL		4000	6000	1000	1500	2000	3000	4000
Type of ventilation unit		UVNR-B (Non Residential Ventilation Units - Bidirectional)						
Type of drive installed		Analog signal on EC fan (0-10 Vdc)						
Type of fans	type/n°	EC/2	EC/2	EC/4	EC/4	EC/2	EC/2	EC/2
Type of heat recovery system (HRS)	type/n°							
Winter Thermal Efficiency (ηt_nrvu) [1]	%	81.2	82.5	81.4	81.6	82.1	82.1	81.7
Winter Thermal Efficiency [2]	%	87.7	88.8	87.8	88.9	89.3	90.2	89.9
Nominal air flow rate (at 150 Pa)	m³/h	410	650	1000	1620	2150	3040	3980
Electric power consumption	kW	0.155	0.219	0.374	0.637	0.888	1.348	1.754
Installed electric power	kW	0.33	0.33	0.67	0.67	1.00	1.50	2.46
SFP_{int}	W/(m³/h)	749	554	752	862	913	1016	1076
SFP_{lim} 2018	W/(m³/h)	1329	1358	1311	1291	1283	1246	1195
Front speed at design flow rate	m/s	2.17	1.61	2.03	2.14	1.93	2.22	2.42
External nominal pressure $\Delta p_{s,\ ext}$ [3]	Pa	150	150	150	150	150	150	150
Internal pressure drop $\Delta p_{s,\ int}$ Ret./Sup.	Pa	179/186	120/132	177/199	224/242	221/255	256/269	303/328
Fans static efficiency (UE) no. 327/2011	%	47.5	44.0	48.7	52.6	50.9	49.9	57.2
Max. external/internal leakage percentage	%							
Filter energy classification		ePM1 55% (F7) I ePM10 60% (M5)						
Filter pressure switch								
Sound power level [4]	dB(A)	68.6	72.5	73.0	73.8	79.0	83.2	83.4
Sound pressure level [5]	dB(A)	53.1	57.0	57.5	58.3	63.5	67.7	67.9
Power supply	V/ph/Hz	230/1/50						400/3/50

[1] Ratio between the thermal gain of the inlet air (0 °C) and the thermal loss of the expulsion air (20 °C), both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of Annex V of EU Regulation No. 1253/2014.

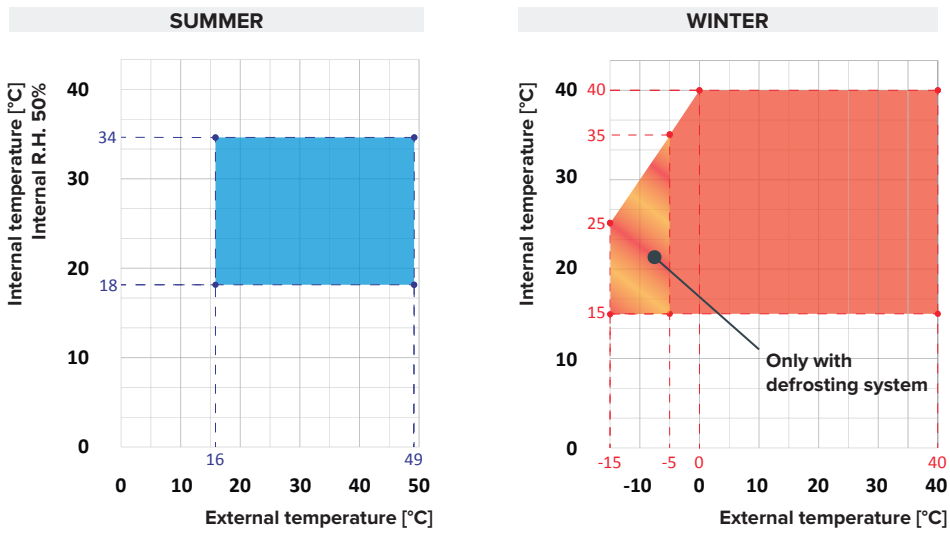
[2] External air: -5 °C / 80% RH - Internal air: 20 °C / 50% RH.

[3] Performance with clean filters.

[4] Sound power level calculated in accordance with EN 3744.

[5] Sound pressure level measured at a distance of 1m in free field, in accordance with EN 3744.

Operation limits



Adjustments

The units are supplied complete with control system and available in three versions: **ECO, PLUS** and **TOP**.

ECO: complete with air temperature probes installed on the fresh air intake and room air return. The control allows you to select, manually from the control panel, in continuous variation, the speeds of the supply and return fans and automatically manages the by-pass damper of the heat recuperator through the motorised On/Off control, the summer/winter seasonal change and the programming for daily time slots.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

PLUS: this control version is set to operate at constant pressure, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

TOP: this control version is set to operate at constant flow rate, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

GRAPHIC LCD REMOTE DISPLAY
(all versions)

Accessories

Anti-grease ISO Coarse 40% (G2) pre-filter
The filter is used in the presence of dust and large pollutants suspended in the air or in the case of oil mist filtration. The filtering material is washable and can be installed as a pre-filter in combination with the ePM10 55% (M5), ePM1 55% (F7) or ePM1 80% (F9) filters placed on the room air return side.

ePM10 50% (G4) air pre-filter
The filtering septum has low pressure drops and can be installed as a pre-filter in combination with ePM10 60% (M5), ePM1 55% (F7) or ePM1 80% (F9) filters.

ePM10 60% (M5) air filter
The filtering septum has an ePM10 60% (M5) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

ePM1 55% (F7) air filter
The filtering septum has an ePM1 55% (F7) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

ePM1 80% (F9) air filter
The filtering septum has an ePM1 80% (F9) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

Guides for additional filters
The additional filter guides are used in case a second additional filter in addition to the one used as standard is used.

Unbalanced flows defrosting system
The defrosting system (optional) consists of a specific device and a software that avoids an excessive drop in the temperature of the expelled air, slowing down the flow of the supply and return air and, if necessary, the opening of the by-pass damper. This system is normally supplied in combination with the hot water coil (optional).

Defrosting system
The automatic defrosting system consists of a self-regulating electric coil in PWM mode of the power absorbed, installed on the room air return. The system is controlled by a special temperature probe positioned on the air expulsion and guarantees a considerable reduction in the power absorbed compared to traditional systems on the market.

Post-heating electric coil (internal)
All units can be supplied complete with internal post-heating electric coil, consisting of armoured steel electric resistors, supplied complete with PWM control system, safety thermostat already wired and installed on board.

Hot water coil (external)
The hot water coil is supplied in an box to be installed directly on the air supply flow. The box has the same section and construction features of the basic unit, and it is installed through the special mounting kit supplied with the unit. The coil is made of 0.40 mm thick copper tubes and 0.11 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Upon request, it is possible to install coils with different thermal performance compared to the production standard where previously agreed with the company.

Cold water coil (external)
The coil is made of 0.40 mm thick copper tubes and 0.11 mm thick aluminium fins.
The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Upon request, it is possible to install coils with different thermal performance compared to the production standard where previously agreed with the company. The box is equipped with a basin to collect condensation with side drain.

Reversible direct expansion coil (external)
The direct expansion coil is supplied in an box to be installed directly on the air supply flow. The box has the same section and construction features of the basic unit, and it is installed through the special mounting kit supplied with the unit. The coil is made of 0.30 mm thick copper tubes and 0.1 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. The box is equipped with a basin to collect condensation with side drain. Suitable for use with R410A and R32 refrigerant gases, maximum allowable pressure PS=45 Bar. The data in the data sheet are calculated with SH=5 °C and SC=5 °C.

Water regulation valve

Kit with a 3-way valve for water flow rate regulation, to be combined with the hot and/or cold water coil and the electronic modulating servo control. Connection fittings not included (provided by the installer).

Air damper with servo control

The damper installed on the machine is an excluding device of the air flow for the fresh air intake and/or the room air return. This option is very useful in the case of installations in environments with cold outdoor temperatures, where you want to avoid dangerous cold air currents self-induced by the system, during the stand-by period of the unit, with the possibility of freezing the water contained inside any coils installed. The dampers are controlled by an On/Off type electric actuator for opening and closing or with spring return.

Silencer

The silencer consists of a cylindrical section in galvanised steel sheet containing a mineral wool mat covered externally with a veil of glass fibre and a perforated containment sheet. The sound-absorbing material is in M0 class. The fabric wrapping film and the perforated sheet protect it from any fraying of the mineral wool even in case of high air speed. The cylindrical section is fixed to the unit by screws.

CO_2 probe

ECO units can be equipped with an air quality CO_2 probe. This accessory is installed and wired at the factory. Installed on the room air return channel, it allows to determine the amount of carbon dioxide present in the environment, increasing the amount of external air to dilute its content.

ATTENTION: The CO_2 probe is not available in the PLUS and TOP versions.

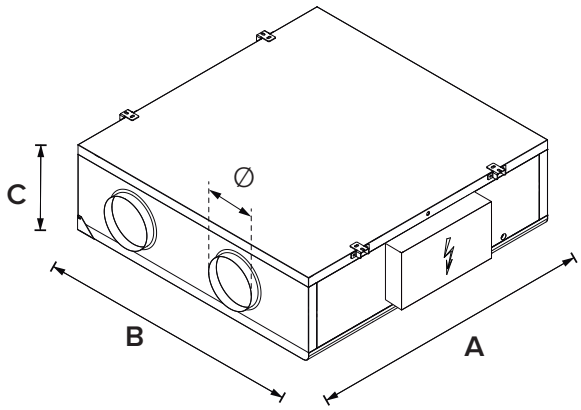
	MODEL	400	600	1000	1500	2000	3000	4000
ECO	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM1 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM10 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (2)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
PLUS	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM1 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM10 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	Fan differential transducers	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (2)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
	Constant PRESSURE unit version	■	■	■	■	■	■	■
TOP	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM$_1$ 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM$_{10}$ 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	Fan differential transducers	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (2)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
	Constant FLOW RATE unit version	■	■	■	■	■	■	■
Accessories	Anti-grease ISO Coarse 40% (G2) pre-filter in return	□	□	□	□	□	□	□
	ePM10 50% (G4) pre-filter in supply/return	□	□	□	□	□	□	□
	ePM1 55% (F7) filtration in return	□	□	□	□	□	□	□
	ePM1 80% (F9) filtration in supply/return	□	□	□	□	□	□	□
	Defrosting system	□	□	□	□	□	□	□
	Post-heating electric coil	□	□	□	□	□	□	□
	Direct expansion coil (1)	□	□	□	□	□	□	□
	Hot water coil (1)	□	□	□	□	□	□	□
	Cold water coil (1)	□	□	□	□	□	□	□
	3-way modulating valve kit (2)	□	□	□	□	□	□	□
	External air damper/expulsion	□	□	□	□	□	□	□
	Damper ON/OFF actuator	□	□	□	□	□	□	□
	Silencers (2)	□	□	□	□	□	□	□
	CO_2 probe (only available for ECO versions)	□	□	□	□	□	□	□

■ Standard □ Optional – Not available

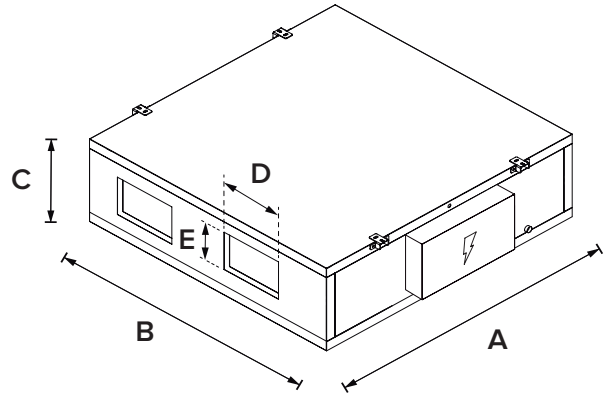
(1) *Installed in external box*
(2) *Supplied separately*

Dimensions

Models 400 - 600 - 1000 - 1500 - 2000



Models 3000 - 4000

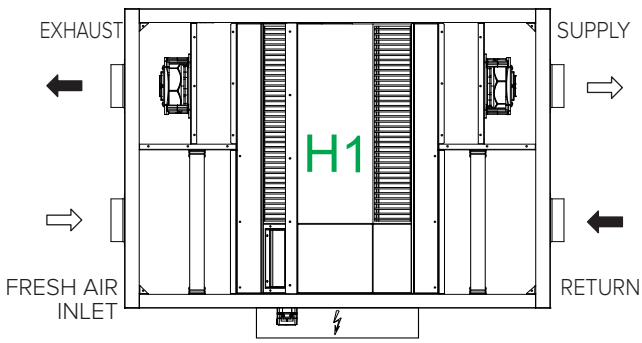


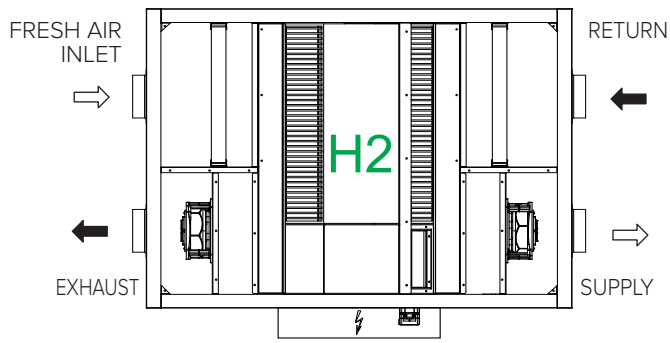
	Models	400	600	1000	1500	2000	3000	4000
QUOTAS	A	1300	1400	1400	1650	1650	1950	1950
	B	750	1050	1350	1350	1600	1700	1950
	C	390	430	430	550	550	630	630
	Ø / DxE	Ø 150	Ø 200	Ø 250	Ø 250	Ø 250	450x350	450x350
	*Kg	117	133	180	226	288	338	369

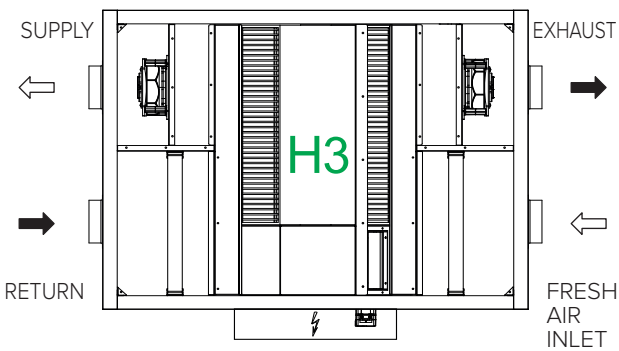
Quotas in mm

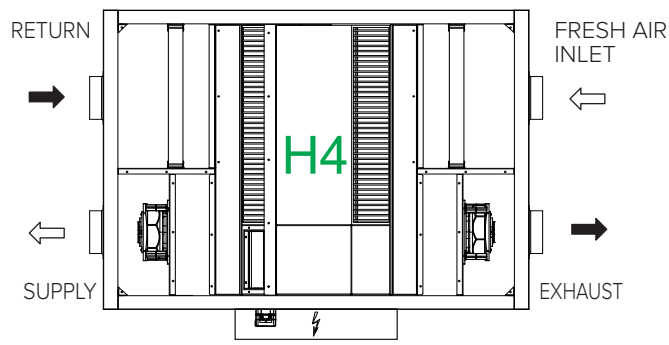
** Weight referring to the basic configuration*

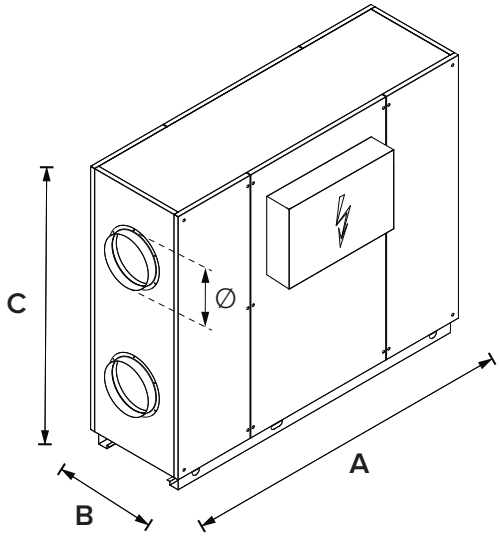
Configurations (plan view) - false ceiling version









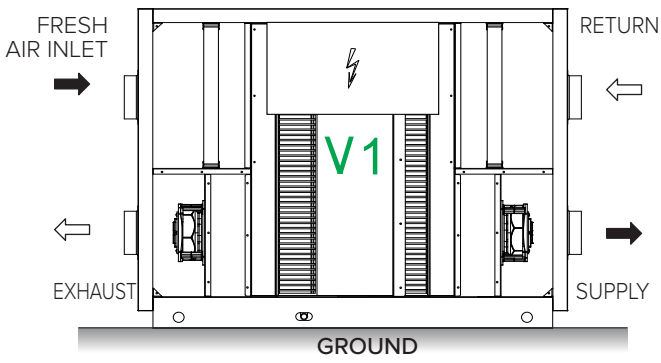


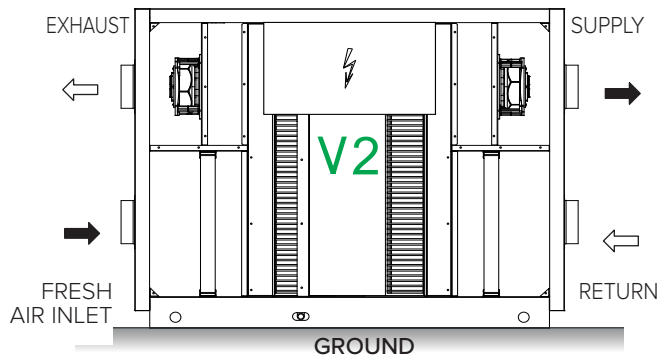
	Models	500	600	1000	1500	2000
QUOTAS	A	1300	1400	1400	1650	1650
	B	390	430	430	550	550
	C	822	1122	1422	1422	1672
	Ø	150	200	250	250	250
	*Kg	120	137	184	232	294

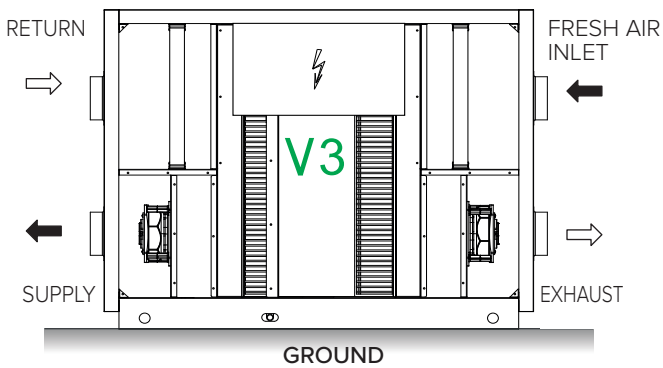
Quotas in mm

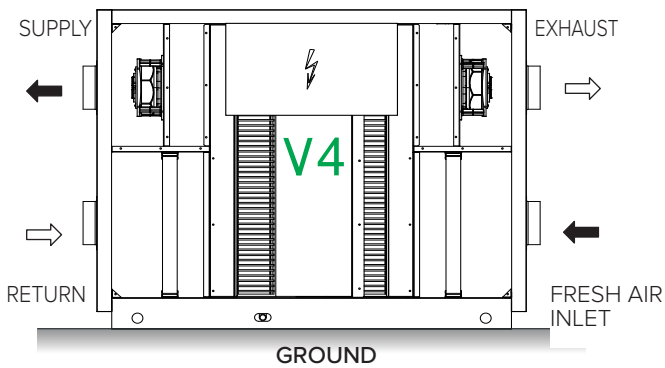
** Weight referring to the basic configuration*

Configurations (front view) - vertical base version









VORT NRG FLAT EVO V

Heat recovery units with plate recuperator

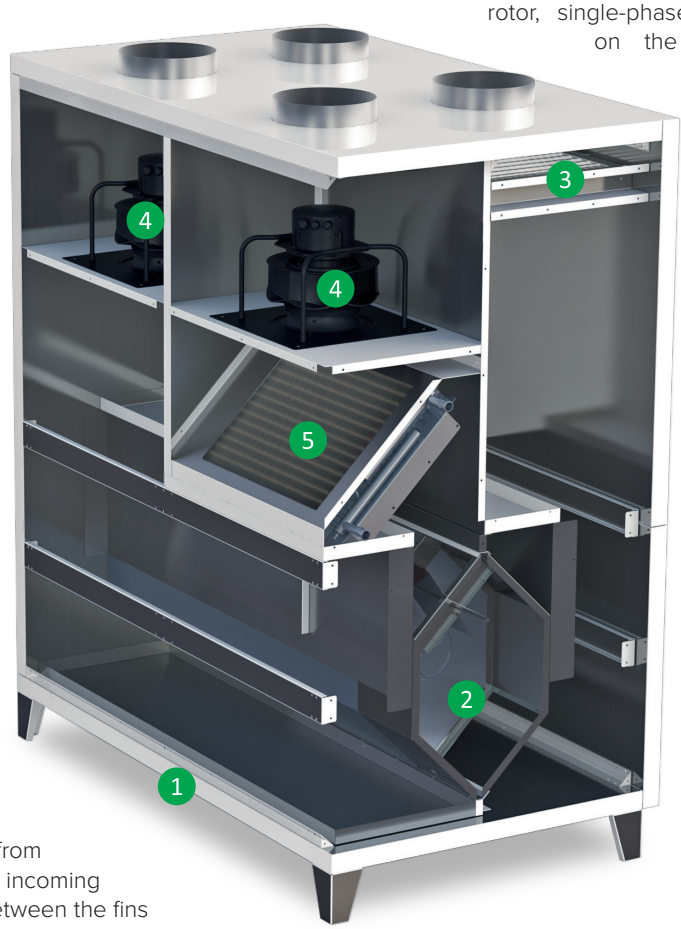
ErP 2018 COMPLIANT EcoDesign

CONSTRUCTION FEATURES

01 CONSTRUCTION

Self-supporting structure in sandwich panels with internal insulation made of high-density polyurethane foam (40 kg/m^3). The panels are 50 mm thick and consist of steel sheets with a thickness of 6/10". The outer side is pre-painted RAL 9010, the inner side is hot-dip galvanised Z140. The structure is made according to the EN1886 standard, class D1 of mechanical resistance.

The airtightness is guaranteed by a particularly adaptable and resilient neoprene gasket, the tightening of the extendable panels is carried out by means of screws that ensure an adequate and constant pressure on the sealing gaskets. In all areas subject to condensation there is a condensate collection basin inclined internally and in compliance with the EN 1.4301 standard.
All internal components are accessible from the front through removable panels in order to ensure correct ordinary and extraordinary maintenance.



02 HEAT EXCHANGER

The units are equipped with an aluminium counter-current heat recuperator used to transfer heat from the expelled air to the incoming external air. The spacing between the fins is optimised in order to reduce the loss of air-side load and the electric consumption of the fan. The heat recuperator is equipped with an additional by-pass damper for the management of the free-cooling and free-heating modes as required by the ErP regulation. By-pass damper 100% of air flow rate. The exchanger participates in the **Eurovent Certification** programme and is sized in accordance with the **ECO Design directive**.

03 FILTERS

The units can accommodate different types of filters, both in room air return and in fresh air inlet. They are mounted on guides equipped with gaskets to ensure effective sealing. Their position, upstream of the internal components, also guarantees their protection.

04 FANS

Independently controllable, they consist of centrifugal impellers with backward blades, directly coupled to motors of the electronic commutation type (EC brushless), with external rotor, single-phase or three-phase (depending on the model), integrated thermal protections and able to adapt the performances to the needs of the moment (modulating regulation of the air flow), guaranteeing low consumption and reduced noise emissions.

05 ADDITIONAL COILS (optional)

Units can accommodate heating and/or cooling coils.

DEFROSTING SYSTEM (optional)

The automatic defrosting system can be carried out either electrically (consisting of a self-regulating electric coil installed on the room air return), or with unbalanced air flows (consisting of a specific device and a software that avoids an excessive drop in the temperature of the expelled air).

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

VORTICE

Technical data

MODEL		500	600	1000	1500	2000	3000	4000
Type of ventilation unit		UVNR-B (Non Residential Ventilation Units - Bidirectional)						
Type of drive installed		Analog signal on EC fan (0-10 Vdc)						
Type of fans	type/n°	EC / 2	EC / 2	EC / 4	EC / 4	EC / 2	EC / 2	EC / 2
Type of heat recovery system (HRS)	type/n°	Static with counter-current flows / 1						
Winter Thermal Efficiency (ηt_nrvu) [1]	%	80.8	81.4	81.6	81.8	82.0	82.2	82.0
Winter Thermal Efficiency [2]	%	88.0	88.4	88.5	88.7	88.9	89.0	88.9
Nominal air flow rate (at 150 Pa)	m³/h	410	650	1000	1620	2150	3040	3980
Electric power consumption	kW	0.15	0.22	0.35	0.56	0.82	1.32	1.58
Installed electric power	kW	0.35	0.35	0.70	0.72	1.16	1.56	2.29
SFP_{int}	W/(m³/h)	786	580	714	764	840	1011	1004
SFP_{lim} 2018	W/(m³/h)	1318	1326	1315	1297	1282	1248	1206
Front speed at design flow rate	m/s	2.18	1.61	2.03	2.14	1.93	2.21	2.41
External nominal pressure $\Delta p_{s,\ ext}$ [3]	Pa	150	150	150	150	150	150	150
Internal pressure drop $\Delta p_{s,\ int}$ Ret./Sup.	Pa	203/178	141/120	187/166	238/208	230/209	279/229	334/301
Fans static efficiency (UE) no. 327/2011	%	48.4	45.2	49.4	53.0	52.2	50.5	62.9
Max. external/internal leakage percentage	%	max 3.5% at -400 Pa I max 5.0% at +250 Pa						
Filter energy classification		ePM1 55% (F7) I ePM10 60% (M5)						
Filter pressure switch		present						
Sound power level [4]	dB(A)	63	71	69	76	80	84	84
Sound pressure level [5]	dB(A)	49	57	54	60	64	67	67
Power supply	V/ph/Hz	230/1/50						400/3/50

[1] Ratio between the thermal gain of the inlet air (0 °C) and the thermal loss of the expulsion air (20 °C), both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of Annex V of EU Regulation No. 1253/2014.

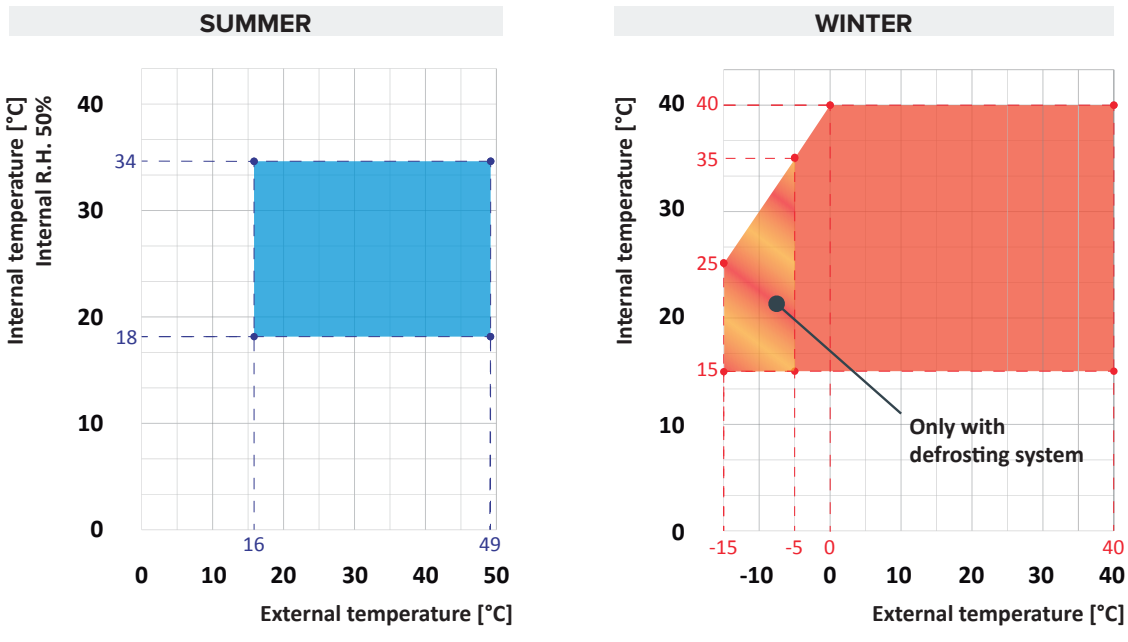
[2] External air: -5 °C / 80% RH - Internal air: 20 °C / 50% RH.

[3] Performance with clean filters.

[4] Sound power level calculated in accordance with EN 3744.

[5] Sound pressure level measured at a distance of 1m in free field, in accordance with EN 3744.

Operation limits



Adjustments

The units are supplied complete with control system and available in three versions: **ECO, PLUS** and **TOP**.

ECO: complete with air temperature probes installed on the fresh air intake and room air return. The control allows you to select, manually from the control panel, in continuous variation, the speeds of the supply and return fans and automatically manages the by-pass damper of the heat recuperator through the motorised On/Off control, the summer/winter seasonal change and the programming for daily time slots.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

PLUS: this control version is set to operate at constant pressure, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

TOP: this control version is set to operate at constant flow rate, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

GRAPHIC LCD REMOTE DISPLAY
(all versions)

Accessories

Anti-grease ISO Coarse 40% (G2) pre-filter
The filter is used in the presence of dust and large pollutants suspended in the air or in the case of oil mist filtration. The filter material is washable and can be installed as a pre-filter in combination with the ePM10 60% (M5), ePM1 55% (F7) or ePM1 80% (F9) filters.

ePM10 50% (G4) air pre-filter
The filtering septum has low pressure drops and can be installed as a pre-filter in combination with the ePM10 60% (M5), ePM1 55% (F7) or ePM1 80% (F9) filters.

ePM10 60% (M5) air filter
The filtering septum has an ePM10 60% (M5) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

ePM1 55% (F7) air filter
The filtering septum has an ePM1 55% (F7) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

ePM1 80% (F9) air filter
The filtering septum has an ePM1 80% (F9) filtration degree according to ISO 16890 and has a large filtering surface that guarantees long operating life and less frequent replacements.

Guides for additional filters
The additional filter guides are used in case a second additional filter in addition to the one used as standard is used.

Electric defrosting system
The (optional) automatic defrosting system consists of a self-regulated electric coil in PWM mode of the absorbed power, installed on the room air return. The system is controlled by a special temperature probe positioned on the air expulsion and guarantees a considerable reduction in the power absorbed compared to traditional systems on the market.

Defrosting system with unbalanced air flows
The defrosting system (optional) consists of a specific device and a software that avoids an excessive drop in the temperature of the expelled air, slowing down the flow of the supply and return air and, where appropriate, the opening of the by-pass damper. This system is normally supplied in combination with the hot water coil (optional).

Post-heating electric coil (internal)
All units can be supplied complete with internal post-heating electric coil, consisting of armoured steel electric resistors, supplied complete with PWM control system, safety thermostat already wired and installed on board.

Hot water coil (internal)
All units can be supplied complete with internal post-heating hot water coil. The coil is made of 0.40 mm thick copper tubes and 0.11 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Upon request, it is possible to install coils with different thermal performance compared to the production standard where previously agreed with the company.

Cold water coil (internal)
All units can be supplied complete with internal cold water coil. The coil is made of 0.40 mm thick copper tubes and 0.11 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Upon request, it is possible to install coils with different thermal performance compared to the production standard where previously agreed with the company. The section is equipped with a basin to collect condensation with side drain.

Reversible direct expansion coil (internal)
The coil is made of 0.30 mm thick copper tubes and 0.1 mm thick aluminium fins. The tubes are mechanically expanded in the aluminium fins to increase the heat exchange factor. Suitable for use with R410A and R32 refrigerant gas, maximum allowable pressure PS=45 Bar.
The data in the data sheet are calculated with SH=5 °C and SC=5 °C.

3-way modulating valve kit
Kit with a 3-way valve for water flow rate regulation, to be combined with the hot and/or cold water coil and the electronic modulating servo control. Connection fittings not included (provided by the installer).

Air damper with servo control
It is an excluding device of the air flow for the fresh air intake and/or the room air return. It is very useful in the case of installations in environments with cold outdoor temperatures, where you want to avoid dangerous cold air currents self-induced by the system, during the stand-by period of the unit, with the possibility of freezing the water contained inside any coils installed. The dampers are controlled by an On/Off type electric actuator for opening and closing or with spring return.

Silencer
The silencer consists of a cylindrical section in galvanised steel sheet containing a mineral wool mat in M0 class. The fabric wrapping film and the perforated sheet protect it from any fraying of the mineral wool even in case of high air speed.

CO_2 probe
ECO units can be equipped with an air quality CO2 probe. This accessory is installed and wired at the factory. Installed on the room air return, it allows to determine the amount of carbon dioxide present in the environment by increasing the amount of external air to dilute its content.

ATTENTION: The CO2 probe is not available in the PLUS and TOP versions.

	MODEL	400	600	1000	1500	2000	3000	4000
ECO	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM1 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM10 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (1)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
PLUS	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM1 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM10 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	Fan differential transducers	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (1)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
	Constant PRESSURE unit version	■	■	■	■	■	■	■
TOP	Brushless EC supply/return fans	■	■	■	■	■	■	■
	ePM$_1$ 55% (F7) filtration in supply	■	■	■	■	■	■	■
	ePM$_{10}$ 60% (M5) filtration in return	■	■	■	■	■	■	■
	Pressure switches signalling dirty filters in supply/return	■	■	■	■	■	■	■
	Fan differential transducers	■	■	■	■	■	■	■
	100% by-pass damper with motorised control	■	■	■	■	■	■	■
	Command system with microprocessor	■	■	■	■	■	■	■
	Remote control panel with graphic LCD display (1)	■	■	■	■	■	■	■
	On-board control probes	■	■	■	■	■	■	■
	RS485 MODBUS serial port	■	■	■	■	■	■	■
	Constant FLOW RATE unit version	■	■	■	■	■	■	■
Accessories	Anti-grease ISO Coarse 40% (G2) pre-filter in return	□	□	□	□	□	□	□
	ePM10 50% (G4) pre-filter in supply/return	□	□	□	□	□	□	□
	ePM1 55% (F7) filtration in return	□	□	□	□	□	□	□
	ePM1 80% (F9) filtration in supply/return	□	□	□	□	□	□	□
	Defrosting system	□	□	□	□	□	□	□
	Post-heating electric coil	□	□	□	□	□	□	□
	Direct expansion coil	□	□	□	□	□	□	□
	Hot water coil	□	□	□	□	□	□	□
	Cold water coil	□	□	□	□	□	□	□
	3-way modulating valve kit (1)	□	□	□	□	□	□	□
	External air damper/expulsion	□	□	□	□	□	□	□
	Damper ON/OFF actuator	□	□	□	□	□	□	□
	Silencers (1)	□	□	□	□	□	□	□
	CO_2 probe (only available for ECO versions)	□	□	□	□	□	□	□

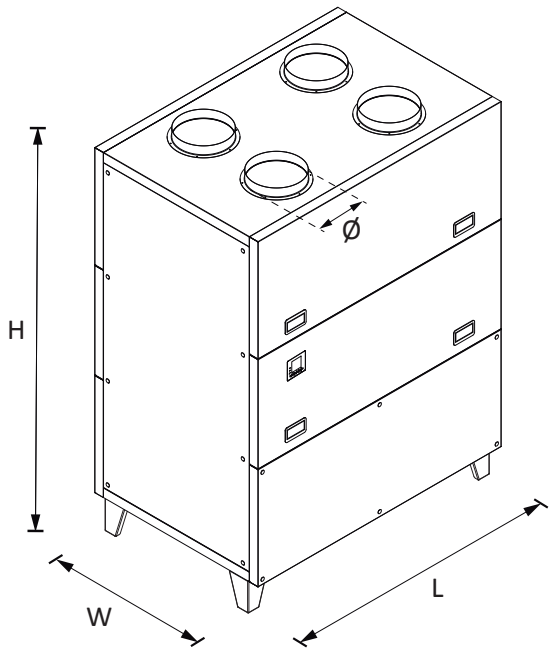
■ Standard □ Optional – Not available

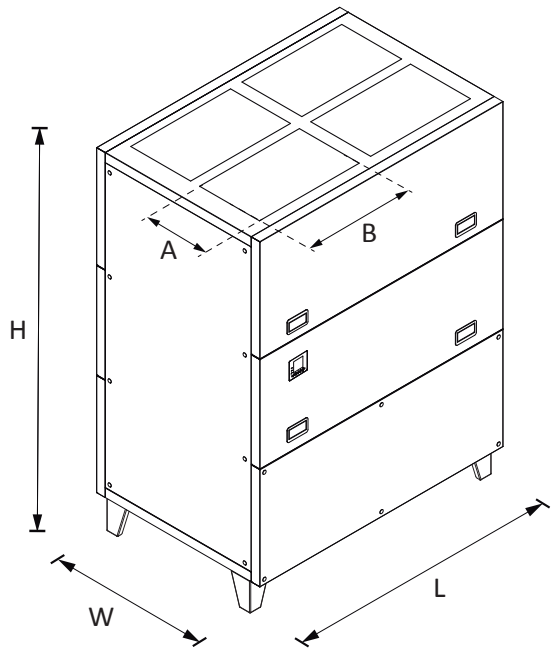
(1) *Supplied separately*

Dimensions

MODELS	
500	
600	1500
1000	2000

MODELS
3000
4000



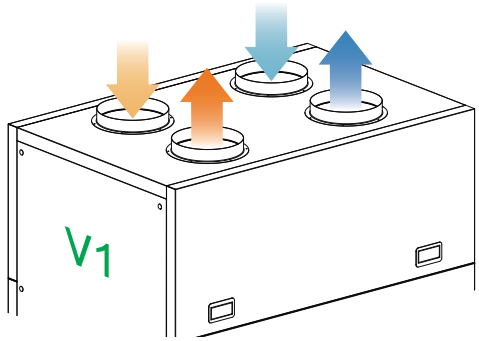


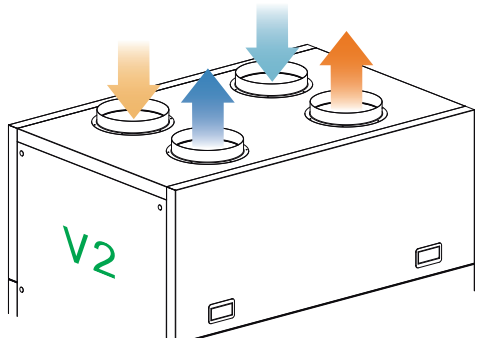
	Models		500	600	1000	1500	2000	3000	4000
QUOTAS	L	mm	745	1110	1345	1345	1595	2110	2110
	W	mm	670	760	760	1010	1000	1110	1110
	H	mm	1450	1450	1610	1800	1850	2110	2110
	Ø /BxA	mm	Ø 150	Ø 200	Ø 250	Ø 250	Ø 250	450x350	450x350
	*Weight	Kg	117	134	178	226	286	338	368

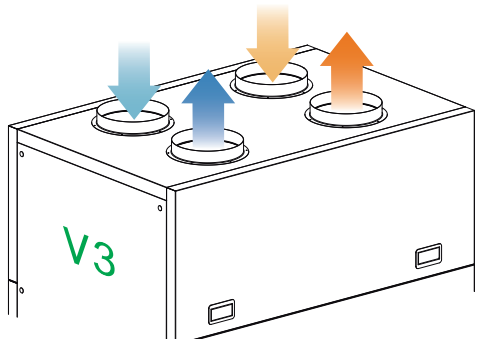
Quotas in mm

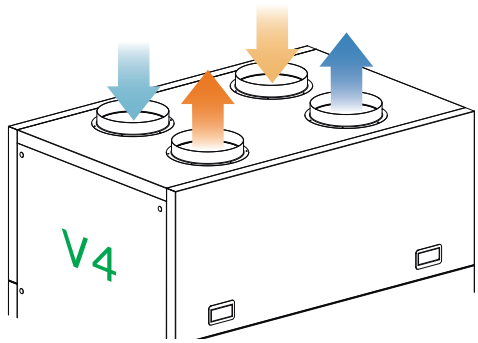
** Weight referring to the basic configuration*

Configurations









ROOM AIR RETURN

ROOM AIR EXPULSION

FRESH AIR INLET

AIR SUPPLY IN THE ENVIRONMENT

VORT NRG MEGA

Heat recovery units
with base heat recuperator

VORT NRG MEGA-R

Heat recovery units
with rotary base recuperator

Any occupied room requires the correct supply of external air and at the same time the control of the internal thermo-hygrometric conditions. Thanks to the recovery of energy from the air extracted from the environment, through static counter-current recovery units, the degree of well-being of the occupants is guaranteed, both in summer and winter.

For buildings that need air changes and are not equipped with dedicated air conditioning systems, the installation of these units allows the introduction of primary air at a controlled temperature without substantially changing the internal conditions in the occupied spaces.

These units also allow the air conditioning system to be supported in the intermediate seasons using free-cooling or free-heating modes. These units, if installed on existing buildings, guarantee the energy requalification of the system through the management of air exchange without additional charges; in the case of new installations, on the other hand, the air exchange is completely carried out, allowing the size of the main air conditioning system to be reduced.

In the intermediate seasons, the building will benefit from free cooling or partially generated by these units, which during the partial load phases, allow the main system to operate with greater efficiencies.

CONSTRUCTION FEATURES

STRUCTURE AND PANELS

The structure of the units can be made in two versions:

VERSION 1

50 x 50 mm profiles in self-supporting extruded anodised aluminium, with mechanical strength requirements in accordance with EN 1886: D1 (M). 50 mm thick panels of the double-walled sandwich type with exterior in RAL 9010 pre-painted galvanised steel sheet and interior in hot-dip galvanised sheet with interposed insulation made with polyurethane foam with a density of 40 kg/m^3. This structure has a sealing class L1, while the thermal transmittance and the characteristic of the thermal bridge is class T3/TB4 with respect to the EN1886 standard.

VERSION 2

Thermal cutting profiles 60 x 60 mm in self-supporting extruded anodised aluminium, with mechanical resistance requirements in accordance with EN 1886: D1 (M). 63 mm thermal cutting panels of the double-walled sandwich type with exterior in RAL 9010 pre-painted galvanised steel sheet and interior in hot-dip galvanised sheet with interposed insulation made with polyurethane foam with a density of 40 kg/m^3.
This structure has a sealing class L1, while the thermal transmittance and the characteristic of the thermal bridge is class T2/TB2 with respect to the EN1886 standard.
Safety microswitches are applied to the inspection doors to allow internal access to the various compartments of the unit only when the unit is completely switched off. The main access and inspection panels consist of constrained doors with perimeter hinges made of non-corrosive polyamide and closures with handles.
All units can be supplied in both monobloc and modular section versions for on-site assembly when required.

AIR FILTERS

ePM10 60% (M5) filters for stale air extraction an ePM1 55% (F7) filtration with rigid pockets for fresh air intake. Both types of filters are mounted on guides equipped with gaskets to ensure effective sealing. Their position, upstream of the internal components, also guarantees their protection.

FANS

The units are equipped with high-efficiency plug-fan type fans with incorporated brushless EC motor. This way, it is possible to ensure an accurate air flow regulation in both the supply and return section, ensuring that all regulatory requirements such as SFP are met. The air flow of the fan is managed through the integrated electronic control system, thus ensuring, according to the needs of the system, that the correct operation of the unit is maintained with consequent savings in the energy absorbed by the unit. The fans are fixed to the frame by means of self-centring brackets to ensure the correct distance between the impeller and the mouthpiece, thus optimising performance.

PLATE HEATRECOVERY UNIT (VORT NRG MEGA)

The units are equipped with an aluminum counter-current heat recuperator used to transfer the heat from the expelled air to the incoming external air. Heat exchange takes place in counter-current with efficiencies greater than 80% in dry air. Under some conditions of low external air temperature and high humidity, the exchanger may start to frost. The units are equipped with a defrosting system used in the case of very low outdoor temperatures. The defrosting system can be electrically driven or by means of a hot water coil. The heat recuperator is also equipped with an additional by-pass damper for managing the free-cooling and free-heating modes. The recovery unit participates in the Eurovent Certification programme and is sized in accordance with the ECO Design directive.

ROTATING HEAT RECOVERYUNIT (VORT NRG MEGA-R)

The units are equipped with an air-to-air rotary heat recuperator, consisting of a cylindrical rotor containing thousands of channels and characterised by a very high surface development, a containment frame and a drive system formed by an electric motor. The exchange surface, very high in relation to volume, allows very high thermal efficiencies compared to other types of recuperators, even reaching yields of more than 80%. In rotating heat recuperators, heat exchange occurs due to heat accumulation in the rotor; in fact, while the cylinder slowly rotates, the expulsion air passes through one half of the casing and gives heat to the rotor matrix that accumulates it. The renewal air, which passes through the other half, absorbs the accumulated heat. Continuing the rotation, the parts that absorb and transfer heat are continuously reversed, and the process can continue indefinitely. The exchanger participates in the Eurovent Certification programme and is sized in accordance with the ECO Design directive.

Adjustments

The units are supplied complete with control system and available in three versions: **ECO, PLUS** and **TOP**.

ECO: complete with air temperature probes installed on the fresh air intake and room air return. The control allows you to select, manually from the control panel, in continuous variation, the speeds of the supply and return fans and automatically manages the by-pass damper of the heat recuperator through the motorised On/Off control, the summer/winter seasonal change and the programming for daily time slots.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

PLUS: this control version is set to operate at constant pressure, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

TOP: this control version is set to operate at constant flow rate, it is supplied complete with pressure transducer and air temperature probes installed on the fresh air intake and on the room air return. The control system allows you to select, in continuous variation, the speeds of the supply and return fan and automatically manages the by-pass damper of the heat recuperator through the On/Off motorised control.

It also manages the summer/winter seasonal change and the scheduling of the daily time slots. The control can also manage an optional hot or cold water post-treatment coil, controlled by a 3-way modulating valve and managed via the supply air probe, in order to maintain a fixed-point adjustment.

The same logic can also be used to manage a post-heating electric coil, if present. The control is also able to manage the defrosting system of the unit (optional), through an additional temperature probe located on the expulsion side of the heat recuperator. Finally, the system warns of the need to replace the filters (the clogging status of the filters is monitored by a pair of differential pressure switches supplied as standard) or of the activation of a possible alarm. It can be integrated into modern home automation systems via serial port RS485 with Modbus protocol, supplied as standard.

GRAPHIC LCD REMOTE DISPLAY
(all versions)

VORT NRG MEGA

Heat recovery units with plate base recuperator

Technical data

MODEL		1000	2000	3000	4500	6000	8000
Type of ventilation unit		UVNR-B (Non Residential Ventilation Units - Bidirectional)					
Type of drive installed		Analog signal on EC fan (0-10 Vdc)					
Type of fans	type/n°	EC / 2	EC / 2	EC / 2	EC / 2	EC / 2	EC / 2
Type of heat recovery system (HRS)	type/n°	Static with counter-current flows / 1					
Winter Thermal Efficiency (ηt_nrvu) [1]	%	80.7	81.1	80.5	81.4	81.3	81.0
Winter Thermal Efficiency [2]	%	89.5	90.7	90.2	91.8	91.9	91.6
Nominal air flow rate	m³/h	1000	2000	3000	4500	6000	8000
Electric power consumption	kW	0.45	0.86	1.30	2.10	2.78	3.92
Installed electric power	kW	1.00	1.50	2.46	3.80	5.00	5.80
SFP_{int}	W/(m³/h)	770	782	816	910	944	1021
SFP_{lim} 2018	W/(m³/h)	1289	1260	1200	1165	1099	1040
Front speed at design flow rate	m/s	1.07	1.24	1.21	1.67	1.67	1.65
External nominal pressure $\Delta p_{s, ext}$ [3]	Pa	250	250	250	250	250	250
Internal pressure drop $\Delta p_{s, int}$ Ret./Sup.	Pa	191 / 212	220 / 245	238 / 256	246 / 275	277 / 311	304 / 342
Fans static efficiency (UE) no. 327/2011	%	47.5	44.0	48.7	52.6	50.9	62.9
Max. external/internal leakage percentage	%	L1 I max 5.0% +250 Pa					
Filter energy classification		ePM1 55% (F7) I ePM10 60% (M5)					
Filter pressure switch		present					
Sound power level [4]	dB(A)	63.0	66.0	63.0	69.0	69.0	72.0
Sound pressure level [5]	dB(A)	51.0	54.0	51.0	57.0	57.0	60.0
Power supply	V/ph/Hz	230/1/50		400/3/50			

[1] ratio between the thermal gain of the inlet air (0 °C) and the thermal loss of the expulsion air (20 °C), both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of Annex V of EU Regulation No. 1253/2014.

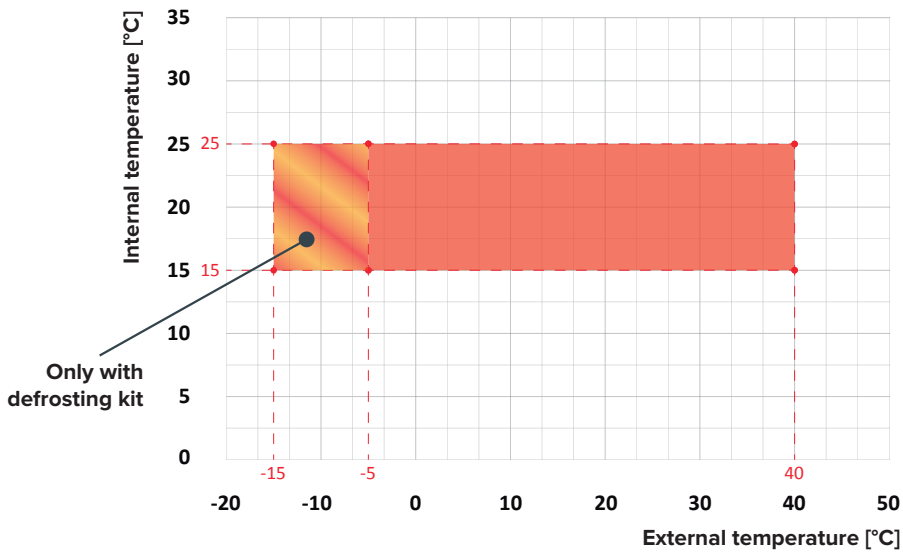
[2] External air: -5 °C / 80% RH - Internal air: 20 °C / 50% RH.

[3] Performance with clean filters.

[4] Sound power level calculated in accordance with EN 3744.

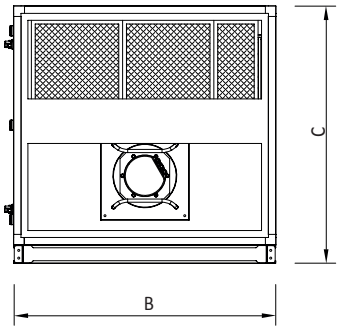
[5] Sound pressure level measured at a distance of 1m in free field, in accordance with EN 3744.

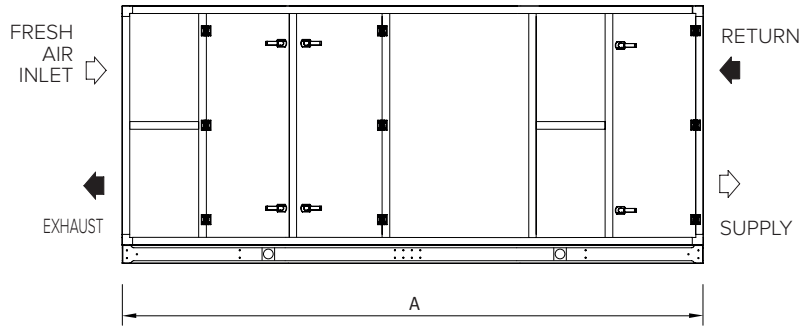
Operation limits



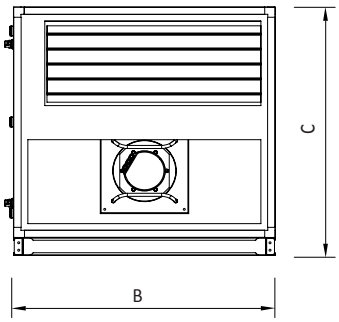
Dimensions

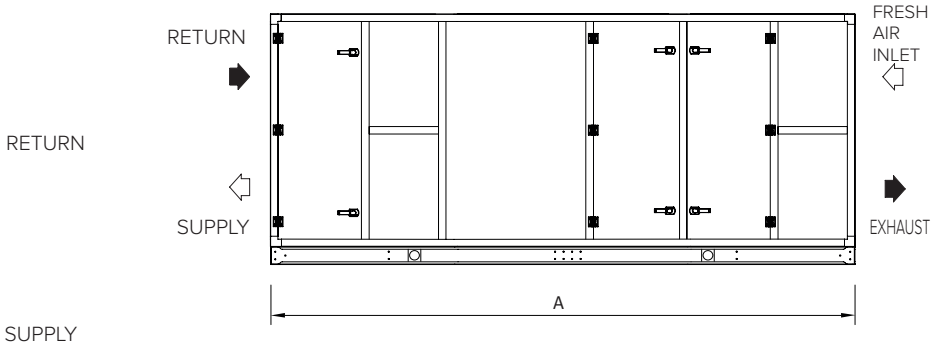
Configuration H1





Configuration H2





Dimensional data (profile 50 mm Monobloc)

	Models	1000	2000	3000	4500	6000	8000
QUOTAS	A	2870	2980	3080	3380	3580	3930
	B	750	950	1300	1300	1500	1880
	C	1070	1320	1420	1520	1700	2050
	*Kg	324	403	537	643	825	1078

Quotas in mm

** Dimensions and weights refer to standard version without accessories*

Dimensional data (profile 60 mm Monobloc)

	Models	1000	2000	3000	4500	6000	8000
QUOTAS	A	2890	3000	3100	3400	3600	3950
	B	770	970	1320	1320	1520	1900
	C	1090	1340	1440	1540	1720	2070
	*Kg	327	407	542	649	833	1089

Quotas in mm

** Dimensions and weights refer to standard version without accessories*

Accessories

MODEL	1000	2000	3000	4500	6000	8000
ePM10 60% (M5) filters in return/ePM1 55% (F7) filters in supply	■	■	■	■	■	■
Brushless EC fans in supply/return	■	■	■	■	■	■
Pressure switches for dirty filters signalling in supply and return	■	■	■	■	■	■
Fan pressure differential transducers	■	■	■	■	■	■
Microprocessor control system with display	■	■	■	■	■	■
Serial port RS-485, Modbus protocol	■	■	■	■	■	■
Structure 50 mm or 60 mm with Thermal Cutting	□	□	□	□	□	□
Thermal insulation of panels with polyurethane 40 kg/m^3	□	□	□	□	□	□
Thermal insulation panels with mineral wool 90 kg/m^3	□	□	□	□	□	□
ePM1 55% (F7) filters in return and/or ePM1 80% (F9) filters in supply/return.	□	□	□	□	□	□
ePM10 50% (G4) pre-filtration in supply/return	□	□	□	□	□	□
Anti-grease ISO Coarse 40% (G2) filter in return	□	□	□	□	□	□
Electric antifreeze coil	□	□	□	□	□	□
Unbalanced flow defrosting system	□	□	□	□	□	□
Electric/hot water heating coil	□	□	□	□	□	□
Cold water/direct expansion coil	□	□	□	□	□	□
3-way modulating valve kit [1]	□	□	□	□	□	□
Air circular connection	□	□	□	□	□	□
Expulsion damper/external air	□	□	□	□	□	□
Damper ON/OFF actuator	□	□	□	□	□	□
Sound-absorbing septa silencers [1]	□	□	□	□	□	□
Protection roof for outdoor installation	□	□	□	□	□	□
45° connection with anti-bird net	□	□	□	□	□	□
Anti-vibration joint for channel connection	□	□	□	□	□	□
Remote control panel [1]	□	□	□	□	□	□
CO_2 probe (only available for ECO versions)	□	□	□	□	□	□

■ Standard □ Optional – Not available

[1] Accessory provided in a separate package.

VORT NRG MEGA R

Heat recovery units with rotating base recuperator

Technical data

MODEL		1000	2000	3000	4500	6000	8000
Type of ventilation unit		UVNR-B (Non Residential Ventilation Units - Bidirectional)					
Type of drive installed		Analog signal on EC fan (0-10 Vdc)					
Type of fans	type/n°	EC / 2	EC / 2	EC / 2	EC / 2	EC / 2	EC / 2
Type of heat recovery system (HRS)	type/n°	Rotating / 1					
Winter Thermal Efficiency (ηt_nrvu) [1]	%	81.1	80.9	80.7	80.7	80.9	80.7
Nominal air flow rate	m³/h	1000	2000	3000	4500	6000	8000
Electric power consumption	kW	0.49	0.91	1.29	2.28	2.82	3.79
Installed electric power	kW	1.03	1.54	2.50	3.84	5.18	5.98
SFP_{int}	W/(m³/h)	822	802	750	1031	829	890
SFP_{lim} 2018	W/(m³/h)	1301	1254	1206	1144	1087	1031
Front speed at design flow rate	m/s	1.07	1.24	1.21	1.67	1.67	1.65
External nominal pressure $\Delta ps_{, ext}$ [2]	Pa	250	250	250	250	250	250
Internal pressure drop $\Delta ps_{, int}$ Ret./Sup.	Pa	205 / 226	226 / 251	216 / 234	290 / 319	240 / 274	253 / 291
Fans static efficiency (UE) no. 327/2011	%	52.3	59.8	60.8	60.1	62.5	62.5
Max. external/internal leakage percentage	%	L1 I max 5.0% +250 Pa					
Filter energy classification		ePM1 55% (F7) I ePM10 60% (M5)					
Filter pressure switch		present					
Sound power level [3]	dB(A)	64.0	66.0	63.0	69.0	69.0	70.0
Sound pressure level [4]	dB(A)	52.0	52.0	54.0	51.0	57.0	58.0
Power supply	V/ph/Hz	230/1/50		400/3/50			

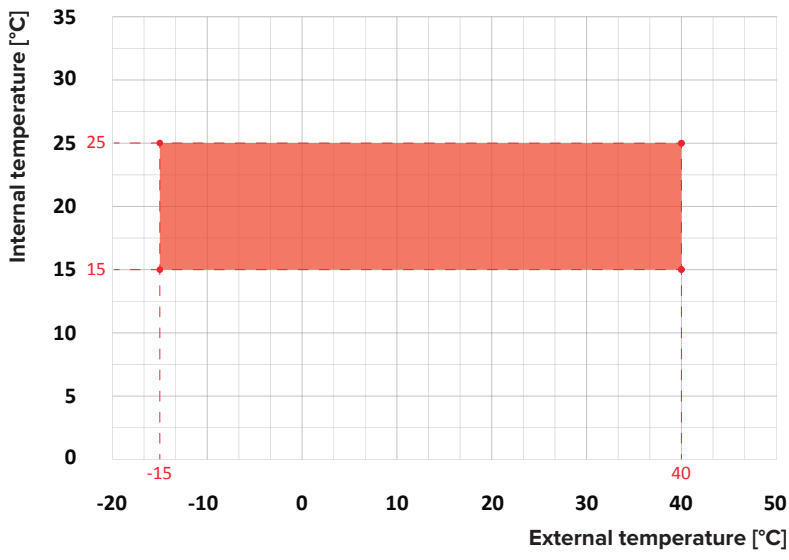
[1] ratio between the thermal gain of the inlet air (0 °C) and the thermal loss of the expulsion air (20 °C), both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of Annex V of EU Regulation No. 1253/2014.

[2] Performance with clean filters.

[3] Sound power level calculated in accordance with EN 3744.

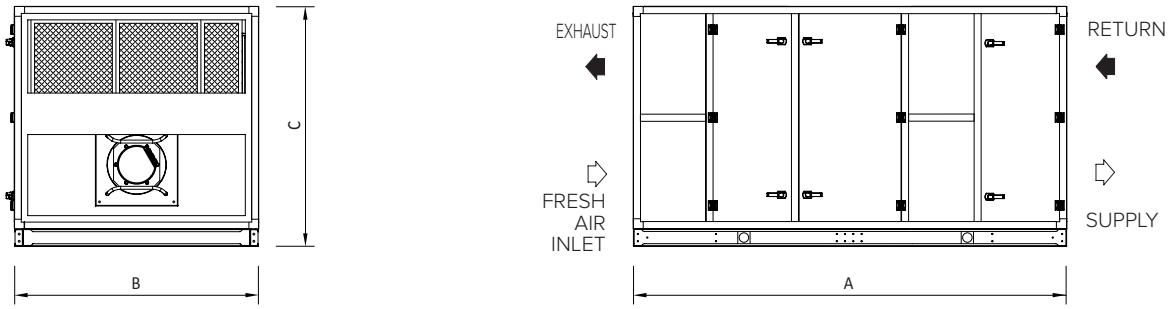
[4] Sound pressure level measured at a distance of 1m in free field, in accordance with EN 3744

Operation limits

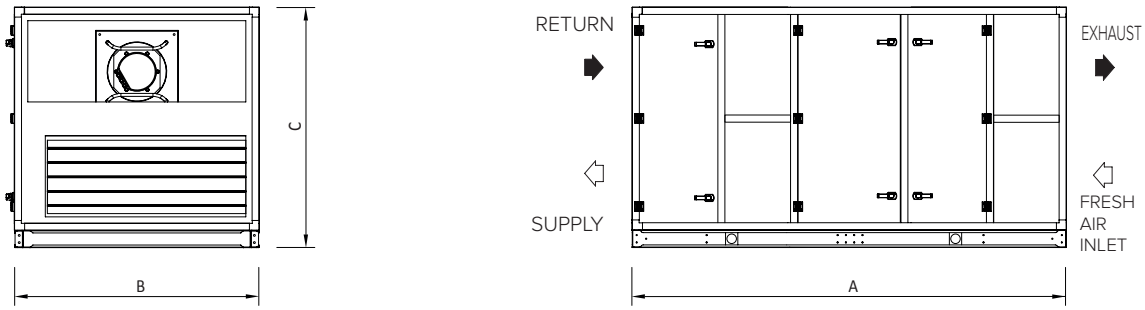


Dimensions

Configuration H1



Configuration H2



Dimensional data (profile 50 mm Monobloc)

	Modelli	1000	2000	3000	4500	6000	8000
QUOTAS	A	2360	2390	2560	2560	2690	2850
	B	750	950	1300	1300	1500	1880
	C	1070	1320	1420	1520	1700	2050
	*Kg	282	345	472	523	650	874

Quotas in mm

** Dimensions and weights refer to standard version without accessories*

Dimensional data (profile 60 mm Monobloc)

	Modelli	1000	2000	3000	4500	6000	8000
QUOTAS	A	2380	2410	2580	2580	2710	2870
	B	770	970	1320	1320	1520	1900
	C	1090	1340	1440	1540	1720	2070
	*Kg	285	348	477	528	656	883

Quotas in mm

** Dimensions and weights refer to standard version without accessories*

Accessories

MODEL	1000	2000	3000	4500	6000	8000
ePM10 60% (M5) filters in return/ePM1 55% (F7) filters in supply	■	■	■	■	■	■
Brushless EC fans in supply/return	■	■	■	■	■	■
Pressure switches for dirty filters signalling in supply and return	■	■	■	■	■	■
Fan pressure differential transducers	■	■	■	■	■	■
Microprocessor control system with display	■	■	■	■	■	■
Serial port RS-485, Modbus protocol	■	■	■	■	■	■
Structure 50 mm or 60 mm with Thermal Cutting	□	□	□	□	□	□
Thermal insulation of panels with polyurethane 40 kg/m^3	□	□	□	□	□	□
Thermal insulation panels with mineral wool 90 kg/m^3	□	□	□	□	□	□
ePM1 55% (F7) filters in return and/or ePM1 80% (F9) filters in supply/return.	□	□	□	□	□	□
ePM10 50% (G4) pre-filtration in supply/return	□	□	□	□	□	□
Anti-grease ISO Coarse 40% (G2) filter in return	□	□	□	□	□	□
Electric antifreeze coil	□	□	□	□	□	□
Electric/hot water heating coil	□	□	□	□	□	□
Cold water/direct expansion coil [1]	□	□	□	□	□	□
3-way modulating valve kit [1]	□	□	□	□	□	□
Air circular connection	□	□	□	□	□	□
Expulsion damper/external air	□	□	□	□	□	□
Damper ON/OFF actuator	□	□	□	□	□	□
Sound-absorbing septa silencers [1]	□	□	□	□	□	□
Protection roof for outdoor installation	□	□	□	□	□	□
45° connection with anti-bird net	□	□	□	□	□	□
Anti-vibration joint for channel connection	□	□	□	□	□	□
Remote control panel [1]	□	□	□	□	□	□
CO_2 probe (only available for ECO versions)	□	□	□	□	□	□

■ Standard □ Optional – Not available

[1] Accessory provided in a separate package.

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