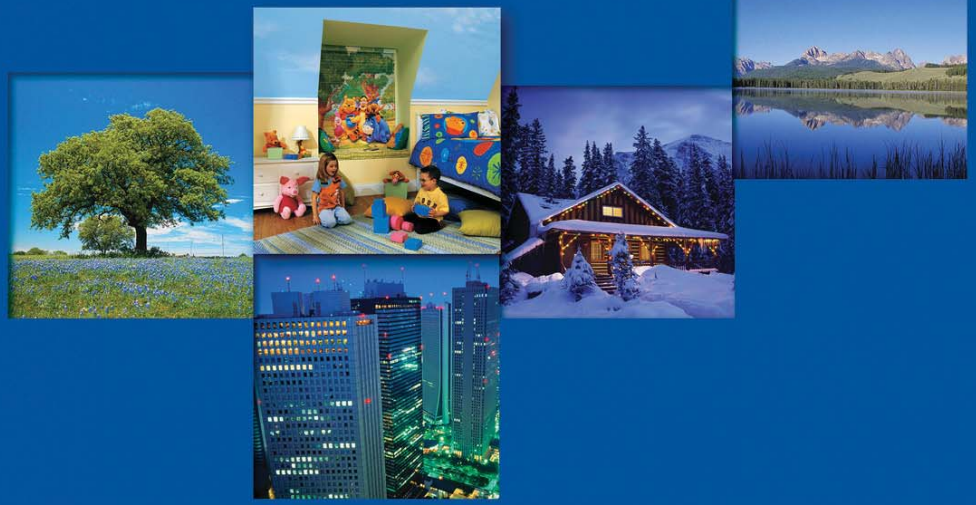
VENTS WORLD VENTILATION LEADER

ENERGY RECOVERY VENTILATION

ventilation systems

www.ventilation-system.com



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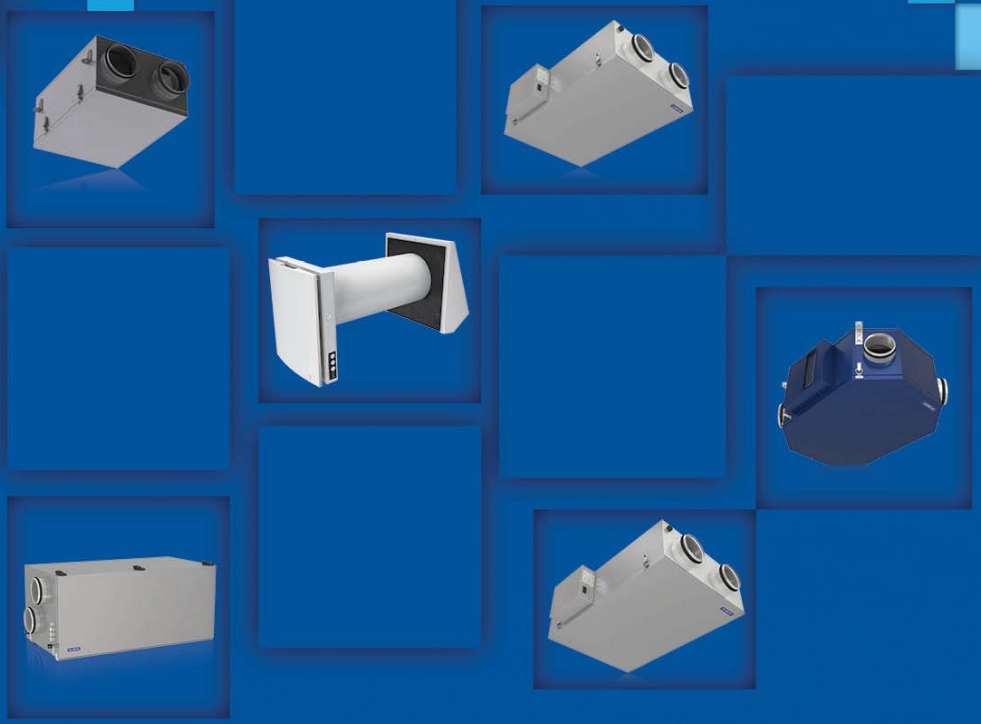
amca MEMBER HVI MEMBER ventilation.system

ENERGY RECOVERY VENTILATION



VENTS

2015

Fresh air in your house!

CONTENTS

WELCOME TO THE VENTS WORLD!

VENTS company was founded in the nineties of the XXth century.

Dynamic development of the enterprise and ongoing study of the consumer demand enabled rapid international leadership of the company in the ventilation industry.

VENTS is a powerful research and development enterprise with 2500 professionals working as a single team to ensure a full production cycle from idea to end product. The production base of the company is located at more than 60 000 m² area. It includes 16 workshops equipped under the latest international standards and each of them is comparable to a separate plant.

Modern equipment, active implementation of advanced technologies and highly automated production are the characteristic features of VENTS company.

The company undergoes rapid dynamic development; fundamental researches and effective designs in climatic equipment industry are in the focus of the company's business strategy.

The joint cooperation of the corporate design department, test laboratories and production workshops let us introduce high quality products to the market.

Special attention is paid to the manufacturing of the goods during all manufacturing stages including monitoring of the technological conditions. Technical characteristics of supplied raw materials are thoroughly checked. Quality control system which meets international standard requirements ISO 9001:2000 was implemented at the enterprise.

Environmental protection is one of the basic components of the corporate development. The technological process at the enterprise is arranged in such a way as to exclude any negative impact to the environment. To solve the global energy saving problem we develop a special climatic equipment that provides comfortable conditions for people and reduces the energy demand significantly.

Perfect quality, competitive prices, high production potential, technical capabilities and the wide product range stimulate long-term partrnership and product promotion all over the world.

The VENTS ventilation products are exported to more than 90 countries and are sold through the distribution network of 120 companies worldwide. Share of the VENTS products globally is above 10%.

VENTS is a member of high-rank international organizations, the leading HVAC experts.

Since 2008 VENTS has been a fully-featured member of HARDI Association (Heating, Air-conditioning and Refrigeration Distributors International, USA).

Since 2010 VENTS has been a participant of AMCA Association (the Air Movement and Control Association (AMCA) International, Inc.). In 2011 VENTS successfully passed tests for compliance with AMCA standards and the VENTS products were certified for the USA market.

In 2011 VENTS joined HVI (Home Ventilation Institute, USA) Association.


Metal processing workshop


Spiral air ducts workshop


Flexible air ducts workshop


Aluminium grilles and diffusers workshop

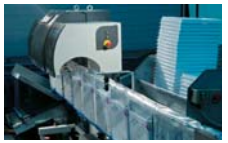

Powder coating workshop


Wet coating workshop


Extrusion workshop


Injection moulding workshop


Residential fans workshop


Ventilation grilles workshop


Electric motors workshop


Industrial fans workshop


Air handling units workshop


AirVents air handling units workshop


Electrical accessories workshop


Extruded grilles workshop

Powerful production facilities, high automation level, active implementation of innovative technologies in the production process made VENTS a worldwide ventilation leader.

We manufacture our products with respect to unique geographical, climatic, technical features of each country and do our best to fulfill the client's wishes anywhere anytime.

Get benefit from cooperation with VENTS TM and enjoy the maximum range of products of the top quality from one manufacturer.

VENTILATION IN OUR LIFE

We are surrounded by air and breathe in and out 20 000 litres of air every day. How much inspired air is applicable for the healthy life?

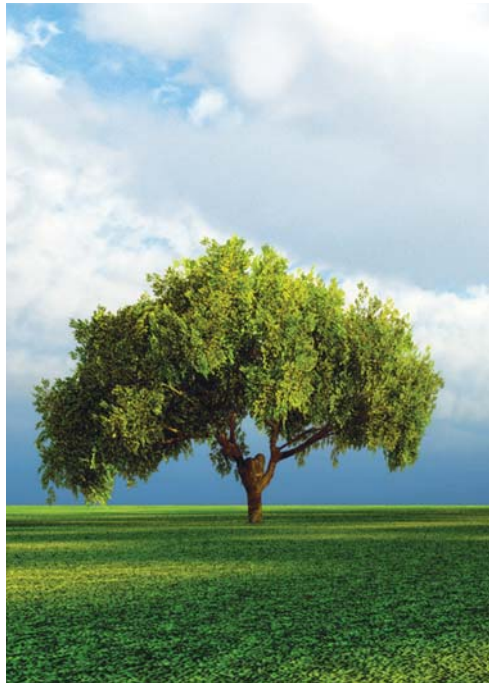
What Is Ventilation Required For?

There is a range of aspects to determine air quality.

- **Oxygen and Carbon Dioxide Concentration.** Oxygen decrease and carbon dioxide increase cause stuffiness in the premises.
- **Content of Harmful Substances and Dust.** High content of dust, tobacco smoke and other substances in the air badly impact human organism and can cause various lung and skin diseases.
- **Odours.** Bad smell causes discomfort or irritates nervous system.
- **Air Humidity.** Increased or decreased moisture cause discomfort and even can result in acute attacks of disease for sick people. High indoor humidity increase load of the air conditioning system and power consumption, also it causes condensate which can damage building and furniture.
- **Air Temperature.** A person feels good in a premise with the temperature 21-23°C. Temperature variation causes the change of comfort feeling that influences a person's physical and mental activity.
- **Air Motion.** Increased air speed in the premises causes the feeling of draft, and decreased speed causes air blanketing. We feel the impact of any of these factors.

Solution:

Any ventilation system must include simultaneous fresh air supply and extract air exhaust thus ensuring the ideal air balance in the room. In case of poor or insufficient air intake from outside the oxygen content decreases and humidity and dustiness level in the room increases. If exhaust ventilation is not provided or it is not effective, polluted air, smells, humidity and harmful substances are not removed. Furthermore, exhaust ventilation is not effective without supply ventilation and none of these systems can operate independently. It is impossible to arrange correct air exhaust from a closed vessel because removed air is not compensated. Supply ventilation in a closed vessel system is not effective either. Some objections can be raised with the example of an exhaust fan in the bathroom or in the kitchen. Once it runs, the ventilation system operates. Really. It looks like it operates. However such ventilation example shows that after extract air is removed by the fan the flat is filled with non-arranged air flows from various slots in the windows, doors and other building structures. Consequently dust and odours are transported with the air flows from outside and air draught can appear. Opened windows and doors are another way for air supply. Such way of ventilation arranging is possible but it has some problems like adupt temperature rising of the conditioned premises, dust and noise from outside, insects invasion through the opened windows. Correct ventilation system is the only solution in this situation. Ventilation system ensures filtered air and conditioned supply as well as removal of polluted extract air from the premises. The joint application of supply ventilation units to supply fresh air to the rooms jointly with exhaust fans provides quality ventilation in your buildings.



The issue of ventilation is the most essentialsubject from the point of view of the air conditioning load reduction and cooling costs saving.

So we come to the point of providing air exchange with minimum energy losses. From 30% to 70% of energy loss is variously estimated for the exhaust ventilation that is traditionally for residential houses. The controllable air exchange and energy recovery are the compulsory attributes in the modern house construction that are ensured by means of air handling units. The forced ventilation allows recuperating up to 90% of the exhaust air energy lost. Such effect is attained due to installation of the heat exchanger (recuperator). The heat exchanger allows saving heat in winter period and contributes to better operation of air conditioners jointly with ventilation in summer period. In addition the heat exchangers have termal- and soundinsulated casing that reduces the noise level produced by equipment in the room. As of today the ventilation systems based on heat exchangers are the most state-of-the-art and progressive solution for air exchange arranging in the premises.

Due to recuperation of the unit its owner can save good money for operation costs. Use of the ventilation units with energy recovery jointly with the air conditioning systems is not only the most effective way to arrange the required microclimate in the room but to cut costs as well. In winter the heat exchanger saves heat and in summer it saves cool.

The plate heat exchanger of cross-flow or counter-flow type is the simpliest one as it contains no movable parts and electrical connections; it separates the air streams fully; requires no additional energy consumption and maintenance.

Use of units with energy recovery in ventilation systems results in shortening of payback period and improving its ecological characteristics in view of low energy consumption, low investment air conditioning equipment, careful attitude to environment.

New series of compact air handling units with EC (electronically commutated) motors provide energy consumption reducing up to 50% as compared to traditional asynchronous motors. Operating costs will be generally reduced by 30%.

Fans with EC motors have the following advantages:

- efficient operation at any rotation speed of fan impeller (down to zero) and significant winding electrical resistance;
- low heat generation that enables reducing performance losses of refrigeration equipment and compensate for heat generation of fan motors in case of use of EC-motor fans in conditioning systems;
- fan overall dimensions can be reduced in case of external rotor and EC-motor design. Consequently the disadvantages related to large-scale overall dimensions that are typical for fans with standard motors are minimized;
- the maximum motor speed does not depend upon frequency (operation both at 50 Hz and 60 Hz is possible);
- high efficiency at low speed;
- external rotor design makes it compact.

MOTOR DESCRIPTION AND PRINCIPLE

Fan types:

Various fan types are applied in air handling units for air transportation through air ducts, direct air supply or air exhaust.

Centrifugal fans consist of two basic components - turbine and scroll casing. Impeller of centrifugal fan is a hollow cylinder with mounted blades inside, circumferentially fixed with disk plates. The hub for mounting the impeller on the shaft is located at the center of the strengthening ring.

During the impeller operation air is trapped between the blades and moves radially from the center compressed. Under centrifugal force air is transported to the scroll casing and then moved to the exhaust pipe.

Forward curved blades

Centrifugal fans incorporate forward- or backward-curved blades. Use of centrifugal impellers with backward-curved blades allows up to 20% energy saving. Another important privilege of backward-curved blades is their high air overload capability.

Centrifugal fans with forward-curved blades ensure the same air capacity and pressure characteristics as the backward-curved blades do but they require smaller impeller diameter and lower speed. So they are able to attain the required result demanding less space and producing less noise.

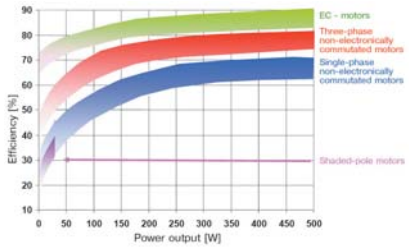
Backward curved blades

External rotor motors

External rotor motor design is similar to asynchronous motor design but the motor rotor is located outside of the stator winding and the stator with the windings is located in the motor centre. Such original modification ensures the compact size of the unit. The motor shaft rotates on the ball bearings mounted inside the stator. The impeller is fixed on the rotor casing. Such design provides air cooling of the electric motor which allows using the fans in the wide temperature range. All the motors and impellers are statically and dynamically balanced at the manufacturing facility.

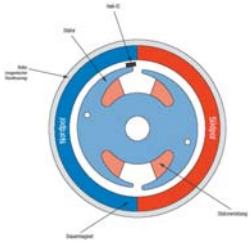
EC motors with external rotor

EC motor with external rotor is the innovative development of EBM-PAPST company with the electronics integrated directly into the motor. The built-in electronics ensures the full control over the energy consumption and speed rate and provides smooth regulation and keeping of the fan parameters. Standard fans require additional control equipment to have the similar functions. EC motors have the energy consumption by 50% less as compared to standard models. The operating costs for EC motors maintenance are also generally by 30% less. Premium efficiency of EC motors reaching up to 90% is their great advantage.



Basic principle of EC motors:

- The permanent magnets integrated into the motor create magnetic field. The above phenomena disables any thermal losses in the rotor which are common with any squirrel-cage motor.
- change of the current direction in the stator winding is effected by means of the integrated commutating electronics based on Hall sensor (controller) which at any moment calculates and supplies to the stator the required for the continuous rotor rotation polarity. Such motor design does not need any brushes requiring regular maintenance.



- EC motors are suitable for connection to direct-current voltage according to the required parameters or through the switching module directly to AC supply (230, 400 V, 50/60 Hz).

High-powered EC motors produce low noise level which makes their application suitable in supermarkets, hotels and other public facilities as well as in residential premises.

EC systems are featured with long service life and are designed for at least 4.5 years of continuous operation, i.e. about 40 000 operating hours. In one line with that service maintenance is minimized because of high reliability.

Due to a complex of considerable advantages the fans equipped with EC motors ensure quick pay off period for owners and investors.

EC motor advantages

COMPACT SIZE

- the systems based on EC motors provide the required operating parameters by smaller fans due to their increased efficiency. Actually the fans have the minimum size.

LOW ENERFY CONSUMPTION

- premium efficiency of the motor reaching up to 90% provides reducing energy consumption at least by 30% for the same operating point without speed control. In case of speed control the energy consumption is by 2-8 times less!

SMOOTH AND ACCURATE SPEED CONTROL

- the fans are programmable and change the air capacity depending on any control parameter like temperature, humidity, pressure, air quality etc. Depending on a setting the EC motors change their rotation speed respectively to a control parameter change and air is supplied in the required for the system volume.

HIGH AUTOMATION DEGREE OF CONTROL PROCESS

- high automation degree of control process reduces the influence of human factor.

INTEGRATED MOTOR PROTECTION

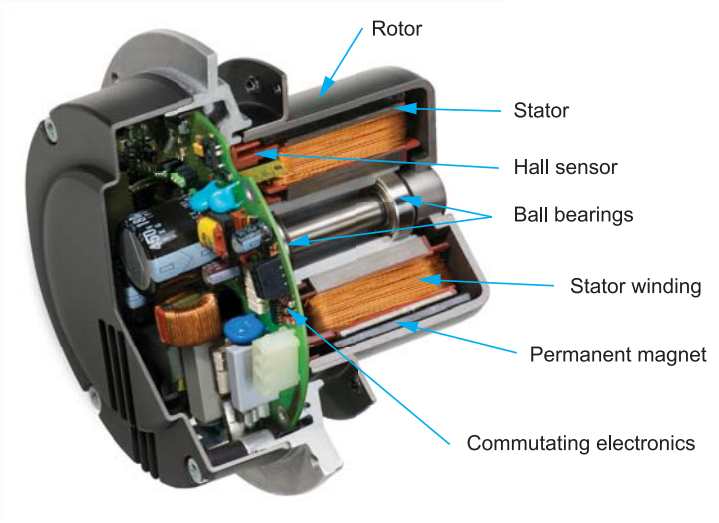
- prevents rotor locking, electrical and temperature overloads that extends the equipment service life due to its resistance to change of voltage.

MINIMUM CROSS SECTION OF POWER CABLE AND POWER TRANSFORMER OUTPUT

- the fans have no startup currents and for that reason they consume much less energy as compared to the standard fans.

MINIMUM MAINTENANCE

- long-term service life (as compared to AC).



Energy-saving EC motor structure

VENTILATION WITH HEAT RECOVERY

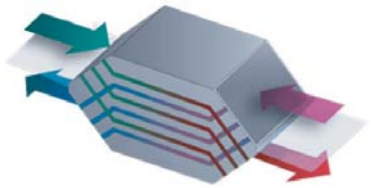
Controllable air exchange and energy recovery are the compulsory attributes in the modern construction that are ensured by means of air handling units. The mechanical ventilation allows recuperating up to 90% of the exhaust air energy lost. Such effect is attained due to installation of the heat exchanger (recuperator).
The plate heat exchangers of cross-flow or counter-flow type are used for energy recovery in Vents VUE and VUT ventilation units. The supply air in the heat exchanger transfers the heat and humidity to the exhaust air.

Structure and principle of operation for the plate heat exchangers

The design of the plate heat exchangers is such as to exclude transfer of contaminants, odours and microbes from exhaust air flow to supply air flow. The air flows are divided by plate elements of heat exchanger plates made of high efficiency paper or polystyrene. Thermal energy quantity that is transferred between supply and exhaust air streams depends exclusively on temperature difference between two flows.
Use of plate heat exchangers in ventilation system results in shorter payback period and better ecological characteristics ensuring the further advantages:

- low energy consumption;
- low investment for air conditioning equipment and its distribution;
- no removable parts which means durability and long service life at continuous operation;
- high-efficient heat recovery and little investment result in high self-repayment;
- environmental protection.

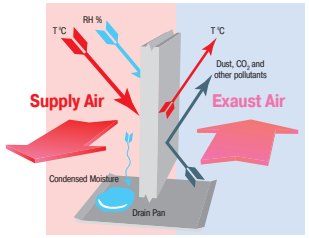
Principle of operation of plate heat recovery of cross-flow type

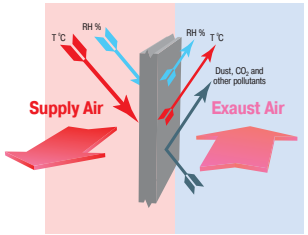


Principle of operation of plate heat recovery of counter-flow type

Enthalpy heat recovery core made of special paper transfer heat and moisture from fresh air to the extract air through the plate to be exhausted outdoor. Precooled and dried fresh air is supplied to the premise. No drain pan is needed.

Plastic heat recovery core transfer sensible heat from fresh air to the extract air through the plate to be exhausted outdoor. Moisture from fresh air is condensed into the drain pan. Precooled and partly dried fresh air is supplied to the premise.





COMFORTABLE CLIMATE IN YOUR HOUSE

Series
VENTS VUE 100 P mini

A3 speed switch

Series
VENTS VUT 100 P mini

A3 speed switch

Air handling units with heat recovery in the compact sound- and heat-insulated casing. Air capacity up to **106 m³/h.** Heat recovery efficiency from 64 up to 76%.

Description

Compact air supply and exhaust ventilation unit VUE 100 P mini is a simple and effective energy-saving solution ventilation of apartments, cottages, single-family houses, workshops and trade premises.

The unit is a fully-featured ventilation unit that provides air cleaning, fresh air supply to the premise and removal of extract air from the premise. Extract air thermal energy is transferred to the cross-flow heat exchanger and is used to warm up the supply air flow. Built-in heat exchanger prevents heat losses and saves operating costs for heating in winter and air conditioning in summer.

Due to the compact casing and silent operation the VUE 100 P mini unit can be installed behind suspended ceiling. The unit is designed for connection to Ø 125 mm round air ducts. Several rooms may be ventilated if they are connected with air distribution network. Air flow regulation with A3 (P3-1-300) speed switch.

Casing

The casing is made of corrosion-resistant alumozink and sound-insulated with 15 mm cellular polyethylene layer. For easy mounting the casing is fitted with mounting brackets.

The detachable panel is swivel connected to the unit to provide fast and easy access to the casing internal components for servicing and maintenance. The unit is equipped with two backdraft dampers, one in the supply and the other in the exhaust air duct.

Filter

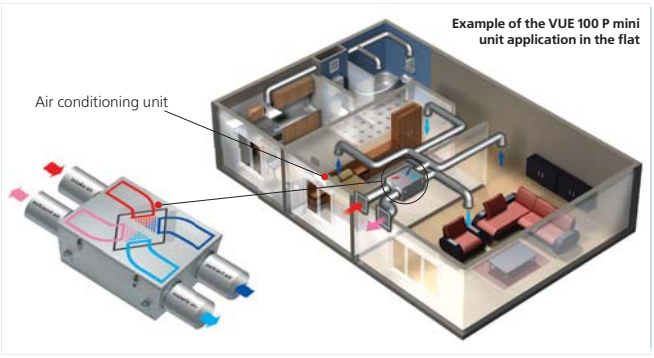
Supply and extract air flows are purified through two filters with filtering class G4. The filters prevent dirt and dust ingress into the room and protect the unit components against contaminations.

Fans

The unit is equipped with reliable supply and exhaust fans with forward curved blades that are powered by motors with low energy demand. The motor has maintenance-free ball bearings that ensure long service life about 40 000 hrs and are greased for the operation period.

Operating logic

- Warm extract air is moved by exhaust fan from the premise through the extract filter and heat exchanger, where it transfers thermal energy to its elements and then is exhausted outside.
- Cold intake air from outside is moved by the supply fan first to the supply filter where it is purified, then to the heat exchanger where it absorbs thermal energy from extract air and then supplied to the room.
- The heat exchanger reduces heat losses and saves operating costs for heating in winter and air conditioning in summer.



Example of the VUE 100 P mini unit application in the flat

Designation key:

Series	Rated air capacity [m³/h]	Mounting type	Type
VENTS VUE **VENTS VUT**	100	**P** – suspended	**mini**

Accessories

Heat exchanger VENTS VUE 100 P mini

Cross-flow polymerized cellulose enthalpy heat exchanger with heat recovery efficiency from 64% up to 72% enables not only heat but humidity recovery and provides indoor humidity balance. In summer season the heat exchanger serves for intake air cooling down and drying and in winter season for warming up and moisturizing. Water vapour is extracted from wet extract air and is absorbed by the heat exchanging plates.

Absorbed heat and moisture are transferred to supply air flow. Supply and extract air flows are fully separated and no microbes and germs are transferred to supply air flow.

Heat exchanger VENTS VUT 100 P mini

The unit is equipped with a high-efficient cross-flow plastic heat exchanger and a drain pan for condensate drainage.

Control

Air capacity (speed) is regulated with A3 (P3-1-300) speed switch.

Low speed – 57 m³/h, 24 dBA

Medium speed – 78 m³/h, 32 dBA

Maximum speed – 106 m³/h, 41 dBA

The external speed switch is comfortable to use at any place.

Heat exchanger protection

For freeze protection at low temperatures the unit is equipped with a thermostat inside the casing that switches the supply fan off in case of freezing danger to let extract air warm up the heat exchanger.

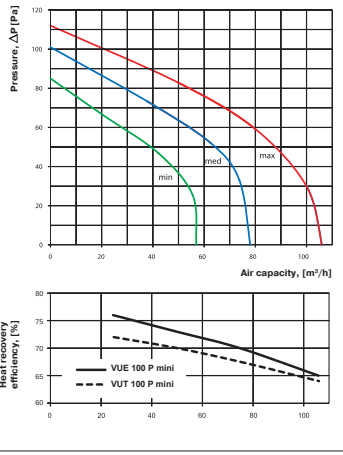
Mounting

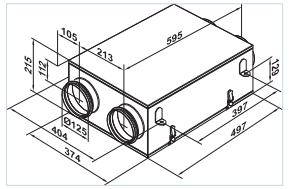
Due to the compact casing height the unit is designed for horizontal indoor installation behind suspended ceilings and connection to Ø 125 mm round air ducts.

Technical data:

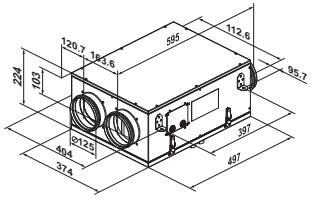
	VUE 100 P mini			VUT 100 P mini		
Speed	min.	med.	max.	min.	med.	max.
Voltage [V / Hz]	1~ 220-240 / 50			1~ 220-240 / 50		
Unit power [W]	30	38	56	30	38	56
Unit current [A]	0.18	0.23	0.34	0.18	0.23	0.34
Air capacity [m³/h]	57	78	106	57	78	106
RPM	1300	1950	2500	1300	1950	2500
Noise level at 3m [dBA]	24	32	41	24	32	41
Transported air temperature [°C]	-25 up to +50					
Casing material	aluzinc					
Insulation	15 mm cellular polyethylene					
Filter: extract / supply	G4 / G4					
Connected air duct diameter [mm]	Ø 125					
Weight [kg]	10			13		
Heat recovery efficiency	from 64 up to 72%			from 65 up to 76%		
Heat exchanger type	cross-flow					
Heat exchanger material	polymerized cellulose			plastic		

VENTS VUE 100 P mini / VENTS VUT 100 P mini





VUE 100 P mini



VUT 100 P mini

Series

VENTS VUT2 200 P
VENTS VUE2 200 P
VENTS VUTE2 200 P

Suspended air handling units in heat- and sound-insulated casing with horizontal spigot orientation. Air capacity up to **220 m³/h**, heat recovery efficiency up to 89 %.

Description

The suspended air handling units VUT2, VUE2 and VUTE2 200 P are the fully-featured ventilation units that ensure air filtration, fresh air supply and stale air extract.
The model VUT2 ensures sensible heat recovery and the models VUE2 and VUTE2 ensure sensible heat and moisture recovery in two plate heat exchangers.
The units are applied as components of ventilation and air conditioning networks for various premises. The units are featured with extremely low noise level due to the fans located between two heat exchangers.
High heat recovery efficiency of the units meets the strict energy saving market demands. Compatible with round Ø 125 mm air ducts.

Modifications

VENTS VUT2 200 P – unit with two aluminium cross-flow heat exchangers.
VENTS VUE2 200 P – unit with two cross-flow heat exchangers of polymerized cellulose.
VENTS VUTE2 200 P – unit with two cross-flow heat exchangers (one made of polymerized cellulose and another made of aluminium).

Casing

Made of aluzinc, internally filled with 10 mm cellular polypropylene heat- and sound-insulating layer.

Filter

Supply and extract air flows are purified through two bag filters with filtering class G4.

Fans

The unit is equipped with a supply and exhaust centrifugal fan with backward curved blades and integrated overheating protection thermostat with automatic restart. The motors and the impellers are dynamically balanced in two planes.

Heat exchangers

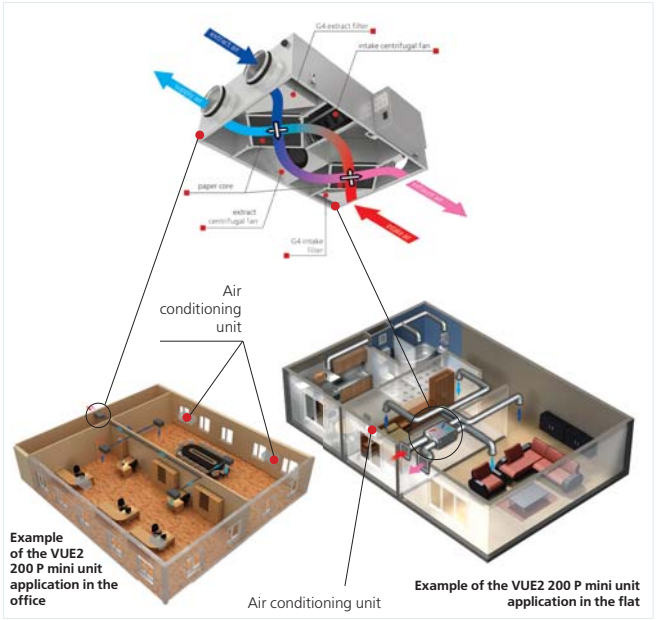
The units incorporate two heat exchangers types:
The aluminium heat exchangers are designed to ensure sensible heat energy transfer from extract to supply air flow. The heat exchangers are distinguished by long service life in a cold climate.
The enthalpy polymerized cellulose heat exchanger are designed to recuperate sensible heat and latent energy contained in the extract air to warm up supply air flow. The heat exchangers are frostproof and produce no condensate. The units with such heat exchangers are recommended for use in air conditioned premises.
The unit VUT2 200 P is equipped with two aluminium cross-flow heat exchangers with drain pans and heat exchanger freezing protection.
The VUE2 200 P unit is equipped with two enthalpy polymerized cellulose counter-flow heat exchangers.
The unit VUTE2 200 P is equipped with two cross-flow heat exchangers, one made of aluminium and another of polymerized cellulose. The unit has a drain pan to remove condensate from the aluminium heat exchanger.

Control and automation

The unit is equipped with a switch that enables selection of one of three unit operation modes: standby mode, low speed (LOW) and medium speed (MED).
The unit may be equipped with P3-1-300 (A3) switch that enables switching the unit on/off and setting one of three unit operation modes: low speed (LOW), medium speed (MED) and high speed (HIGH).
The unit may be equipped with a CO_2 sensor (not included into the delivery set). In case of high CO_2 concentration it switches the unit to maximum (HIGH) speed.
The unit may be equipped with A13 LCD control panel (not included into the delivery set) for turning the unit on/off, switching to low, medium and high speed as well as room temperature displaying.
The integrated freezing protection system is designed to prevent the heat exchanger freezing at low temperatures. In case of freezing danger indication by the temperature sensor the supply fan is turned off to let warm extract air flow pass by the heat exchangers and warm them up. After freezing danger is no longer actual, the supply fan is turned on and the unit reverts to the standard operation mode.

Mounting

The unit is designed for suspended ceiling mounting in balcony, storeroom, basement, attic and other auxiliary premises. The unit is also suitable for installation in major premises directly to the ceiling,
behind the false ceiling or in the ceiling recess. Acess for servicing and cleaning through the bottom panel.The unit is suitable for wall mounting as well.



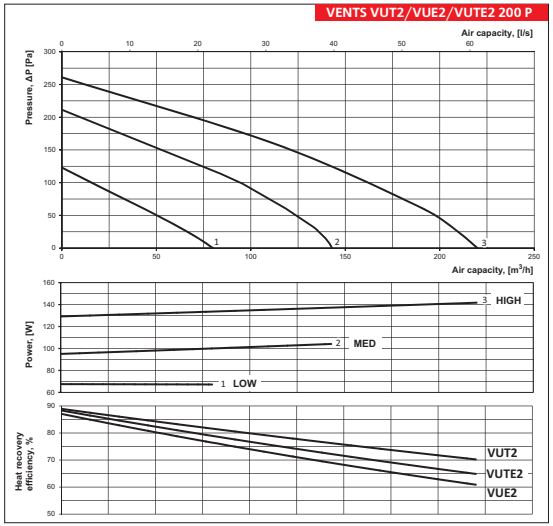
Example of the VUE2 200 P mini unit application in the office

Example of the VUE2 200 P mini unit application in the flat

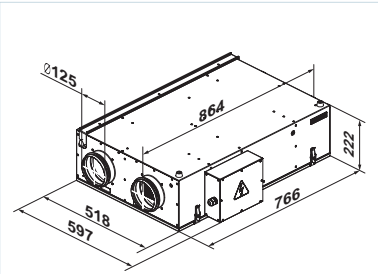
Technical data:

	VUT2 200 P VUE2 200 P VUTE2 200 P		
Ventilation mode (speed)	LOW (low)	MED (medium)	HIGH (maximum)
Voltage [V / Hz]	1~ 220-240 / 50		
Max. unit power [W]	67	104	142
Fan current [A]	0.58	0.63	0.68
Max. air capacity [m³/h]	80	143	220
RPM [min⁻¹]	1120	1890	2910
Sound pressure level at 3 m [dBA]	20	28	36
Max. transported air temperature [°C]	from - 25 °C up to +40 °C		
Casing material	aluzinc		
Insulation	10 mm cellular polypropylene		
Filter: extract / supply	bag type G4 (order code SFK VUT2 200-250 P/P EC G4)		
Connected air duct diameter [mm]	Ø 125		
Heat recovery efficiency	up to 89 %		
Heat exchanger type	cross-flow, 2 items		

* maximum speed is activated by a signal from the control panel, humidity sensor, thermostat, CO_2 sensor, etc.



Overall dimensions:



Designation key:

Series	Number of heat exchangers	Rated air capacity [m³/h]	Mounting type	Control panel
VENTS VUT **VENTS VUE** **VENTS VUTE**	**2**	200	**P** – suspended	**A 13** **A 3**

Accessories

A13 control panel

P3-1-300 (A3) switch

Series

VENTS VUT2 250 P EC
VENTS VUE2 250 P EC
VENTS VUTE2 250 P EC

A5 control panel

Suspended air handling units in heat- and sound-insulated casing with horizontal spigot orientation. Air capacity up to **257 m³/h**, heat recovery efficiency up to 89 %.

Description

The suspended air handling units VUT2, VUE2 and VUTE2 250 P EC are the fully-featured ventilation units that ensure air filtration, fresh air supply and stale air extract.

The model VUT2 ensures sensible heat recovery and the models VUE2 and VUTE2 ensure sensible heat and moisture recovery in two plate heat exchangers.

The units are applied as components of ventilation and air conditioning networks for various premises. The units are featured with extremely low noise level due to the fans located between two heat exchangers as well as EC motor technology.

High heat recovery efficiency of the units meets the high energy saving market demands.

Modifications

VENTS VUT2 250 P EC – unit with two plastic cross-flow heat exchangers.

VENTS VUE2 250 P EC – unit with two cross-flow heat exchangers of polymerized cellulose.

VENTS VUTE2 250 P EC – unit with two cross-flow heat exchangers (one made of polymerized cellulose and another made of plastic).

Casing

Made of aluzinc, internally filled with 10 mm cellular polypropylene heat- and sound-insulating layer.

Filter

Supply and extract air flows are purified through two bag filters with filtering class G4.

Fans

High-efficient electronically-commutated motors with external motor and impeller with backward curved blades. Such motors are the most state-of-the-art energy-saving solution. EC motors are featured with high performance and total speed controllable range. High efficiency reaching 90% is the premium advantage of the electronically-commutated motors.

Heat exchangers

The units incorporate two heat exchanger types:

The plastic heat exchangers are designed to ensure sensible energy transfer from extract to supply air flow. The heat exchangers are distinguished by long service life in a cold climate.

The enthalpy heat exchangers of polymerized cellulose are designed to recuperate both sensible and latent energy. These heat exchangers are frostproof and produce no condensate. The units with polymerized cellulose heat exchangers are recommended for use in air conditioned premises.

The unit VUT2 250 P EC is equipped with two plastic cross-flow heat exchangers and two drain pans.

The unit VUE2 250 P EC is equipped with two cross-flow heat exchangers of polymerized cellulose.

The unit VUTE2 250 P EC is equipped with two various heat exchangers, one made of plastic and another made of polymerized cellulose. The unit has a drain pan to remove condensate from the plastic heat exchanger.

Control and automation

The unit includes integrated automation and a multifunctional control panel A5 with LED indication.

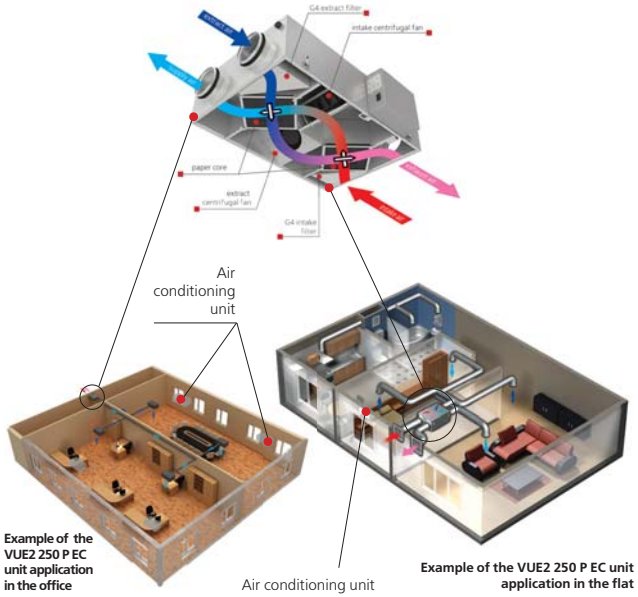
The delivery set includes a signalling cable for connection with the control panel. The integrated freezing protection system is designed to prevent the heat exchanger freezing at low temperatures. In case of freezing danger indication by the temperature sensor the supply fan is turned off to let warm extract air flow pass by the heat exchangers and warm them up. After freezing danger is no longer actual, the supply fan is turned on and the unit reverts to the standard operation mode.

Control panel functions:

- Turning unit on/off;
- Ventilation mode selection: minimum, medium, maximum;
- Minimum mode setup in the range of 7 pre-set speeds. The medium speed is automatically set 80 m³/h above the minimum speed, but it does not exceed the maximum speed.
- Filter replacement indication.

Mounting

The unit is designed for suspended ceiling mounting in balcony, storeroom, basement, attic and other auxiliary premises. The unit is also suitable for installation in major premises directly to the ceiling,
behind the false ceiling or in the ceiling recess. Acess for servicing and cleaning through the bottom panel.

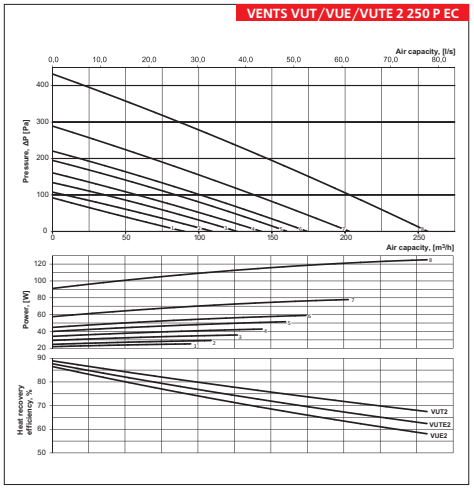


Example of the VUE2 250 P EC unit application in the office

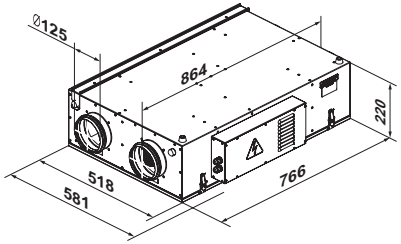
Example of the VUE2 250 P EC unit application in the flat

Technical data:

	VUT2 250 P EC VUE2 250 P EC VUTE2 250 P EC
Voltage [V / Hz]	1~ 220-240 / 50-60
Max. fan power [W]	125
Fan current [A]	0.87
Max. air capacity [m³/h]	257
RPM [min⁻¹]	2930
Sound pressure level at 3 m [dBA]	39
Transported air temperature [°C]	from -25 °C up to +40 °C
Casing material	aluzinc
Insulation	10 mm cellular polypropylene
Filter: extract / supply	bag type G4 (order code SFK VUT2 200-250 P/P EC G4)
Connected air duct diameter [mm]	Ø 125
Heat recovery efficiency	up to 89 %
Heat exchanger type	cross-flow, 2 items



Overall dimensions:



Designation key:

Series	Number of heat exchangers	Rated air capacity [m³/h]	Mounting type	Motor type
VENTS VUT **VENTS VUE** **VENTS VUTE**	**2**	250	**P** – suspended	**EC** – synchronous electronically commutated motor

Accessories

Series

VENTS VUT2 250 PU EC
VENTS VUE2 250 PU EC
VENTS VUTE2 250 PU EC

A5 control panel

The suspended air handling unit in heat- and sound-insulated casing with versatile spigot orientation. Air capacity up to **275 m³/h**, heat recovery efficiency up to 90 %.

Description

The suspended air handling units VUT2, VUE2 and VUTE2 250 PU EC are the fully-featured ventilation units that ensure air filtration, fresh air supply and stale air extract.
The model VUT2 ensures sensible heat recovery and the models VUE2 and VUTE2 ensure sensible heat and moisture recovery in two plate heat exchangers.
The units are applied as components of ventilation and air conditioning networks for various premises.
The units are featured with extremely low noise level due to the fans located between two heat exchangers as well as EC motor technology.
High heat recovery efficiency of the units meets the strict energy saving market demands.
Compatible with round Ø 125 mm air ducts.

Modifications

VENTS VUT2 250 PU EC – unit with two metal cross-flow heat exchangers.
VENTS VUE2 250 PU EC – unit with two cross-flow heat exchangers of polymerized cellulose.
VENTS VUTE2 250 PU EC – unit with two cross-flow heat exchangers (one made of polymerized cellulose and another made of metal).

Casing

Made of polymer coated steel, internally filled with 20 mm mineral wool heat- and sound-insulating layer.

Filter

Supply and extract air flows are purified through two panel filters with filtering class G4.

Fans

High-efficient electronically-commutated motors with external motor and impeller with backward curved blades. Such motors are the most state-of-the-art energy-saving solution.
EC motors are featured with high performance and total speed controllable range. High efficiency reaching 90 % is the premium advantage of the electronically-commutated motors.

Heat exchangers

The units incorporate two heat exchanger types:
The aluminium heat exchangers are designed to ensure sensible heat energy transfer from extract to supply air flow. The heat exchangers are distinguished by long service life in a cold climate.
The enthalpy heat exchangers of polymerized cellulose are designed to recuperate both sensible and latent energy. These heat exchangers are frost-proof and produce no condensate. The units with polymerized cellulose heat exchangers are recommended for use in air conditioned premises.
The unit VUT2 250 PU EC is equipped with two aluminium cross-flow heat exchangers and two drain pans.
The unit VUE2 250 PU EC is equipped with two enthalpy cross-flow heat exchangers of polymerized cellulose.
The unit VUTE2 250 PU EC is equipped with two cross-flow various heat exchangers, one made of aluminium and another one of polymerized cellulose. The unit has a drain pan to remove condensate from the aluminium heat exchanger.

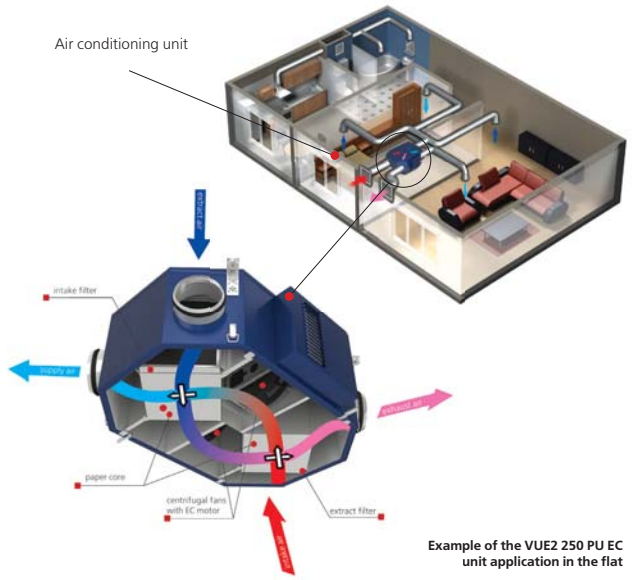
Control and automation

The unit includes integrated automation and a multifunctional control panel (R3/010 T) with LED indication.
The delivery set includes a signalling cable for connection with the control panel.
The integrated freezing protection system is designed to prevent the heat exchanger freezing at low temperatures. In case of freezing danger indication by the temperature sensor the supply fan is turned off to let warm extract air flow pass by the heat exchangers and warm them up. After freezing danger is no longer actual, the supply fan is turned on and the unit reverts to the standard operation mode.
Control panel functions:

- Turning unit on/off.
- Ventilation mode selection: minimum, medium, maximum.
- Minimum mode setup in the range of 7 pre-set speeds. The medium speed is automatically set 80 m³/h above the minimum speed, but it does not exceed the maximum speed.
- Filter replacement indication.

Mounting

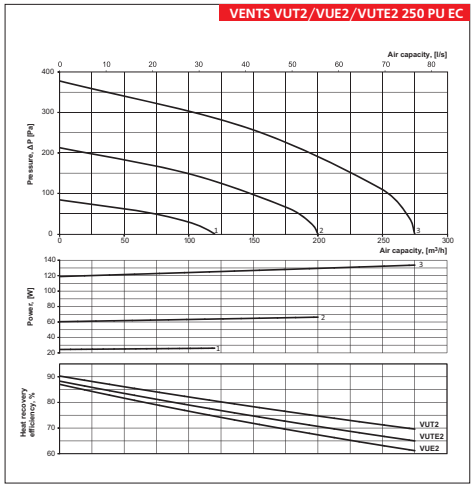
The unit is designed for suspended ceiling mounting in balcony, storeroom, basement, attic and other auxiliary premises. The unit is also suitable for installation in major premises directly to the ceiling,
behind the false ceiling or in the ceiling recess. Acess for servicing and cleaning through the bottom panel.



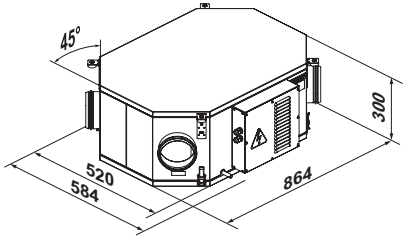
Example of the VUE2 250 PU EC unit application in the flat

Technical data:

	VUT2 250 PU EC VUE2 250 PU EC VUTE2 250 PU EC
Voltage [V / Hz]	1~ 220-240 / 50-60
Max. fan power [W]	135
Fan current [A]	0.87
Max. air capacity [m³/h]	275
RPM [min⁻¹]	2650
Sound pressure level at 3 m [dBA]	38
Max. transported air temperature [°C]	from -25 °C up to +40 °C
Casing material	polymer coated steel
Insulation	20 mm mineral wool
Filter: extract / supply	panel type G4
Connected air duct diameter [mm]	Ø 125
Heat recovery efficiency	up to 90 %
Heat exchanger type	cross-flow, 2 items



Overall dimensions:



Designation key:

Series	Number of heat exchangers	Rated air capacity [m³/h]	Mounting type	Duct connection	Motor type
VENTS VUT **VENTS VUE** **VENTS VUTE**	**2**	250	**P** – suspended	**U** – angle (versatile)	**EC** – synchronous electronically commutated motor

Accessories

Series

VENTS VUT H EC ECO
VENTS VUT EH EC ECO

A11 control panel

The air handling units in heat- and sound-insulated casing. Air capacity up to **940 m³/h**, heat recovery efficiency up to 98%.

Description

The air handling units VUT H EC ECO and VUT EH EC ECO are the fully-featured ventilation units that ensure air filtration, fresh air supply and stale air extract.
The sensible heat contained in the extract air is recuperated in the high-efficient plate counter-flow heat exchanger to warm up supply air.
The units are applied as components of ventilation and air conditioning networks for various premises.
Due to high-efficient EC motors and expanded counter-flow heat exchanger surface the energy saving parameters of the ECO series units are the best at the market.
Compatible with round Ø160, 200 and 250 mm air ducts.

Modifications

VENTS VUT H EC ECO model is equipped with a counter-flow heat exchanger, a bypass and EC motors.
VENTS VUT EH EC ECO model is equipped with a counter-flow heat exchanger, a bypass, EC motors and an electric heater.

Casing

Made of aluzinc, internally filled with 25 mm mineral wool heat- and sound-insulating layer.

Filter

Supply air flow is purified through a bag filter with G4 filtering class. F7 class filter is available upon separate order. Extract air flow is purified through a panel filter with G4 filtering class.

Fans

High-efficient electronically-commutated motors with external motor.
Such motors are the most state-of-the-art energy-saving solution.
EC motors are featured with high performance and total speed controllable range. High efficiency reaching 90% is the premium advantage of the electronically-commutated motors.
The unit sizes 300 and 400 are equipped with constant flow fans with forward curved blades. These fans provide constant set air flow even in case of variable air resistance in the ventilation system, i.e. in case of clogged filters.
The 900 size units are equipped with fans with backward curved blades.

Heat exchanger

High-efficient plate counter-flow polystyrene heat exchanger. The drain pan under the heat exchanger block is used for condensate drainage.

Heater

The VUT EH EC ECO units are equipped with an electric heater to enable supply air warming up to set temperature.
The VUT H EC ECO have no built-in electric heater. It is available upon separate order and may be integrated into the unit.

Bypass

The unit is equipped with a bypass which is automatically opened if there is a need to cool down the ventilated area with cool intake air.
In the unit is equipped with an electric heater the bypass is used for freezing protection of the heat exchanger.

Control and automation

The unit includes an integrated automation and a multifunctional control panel with a sensor graphical display.
The delivery set includes a 10 m connecting cable for connection of the unit to the control panel. The freezing protection function is performed by means of two freeze protection mechanisms:
If the unit is equipped with an electric heater in case of freezing danger according to the temperature sensor readings the bypass damper is opened to let supply air flow through the bypass duct and not come in contact with the heat exchanger. The heater warms up supply air up to the required temperature and the heat exchanger is heated by the warm extract air. After the heat exchanger defrosting the bypass damper closes the bypass duct and the unit reverts to the standard operation mode.
If the unit is not equipped with an electric heater in case of freezing danger according to the temperature sensor readings the supply fan is stopped and warm extract air warms up the heat exchanger. After the heat exchanger defrosting and when the freezing danger is no longer imminent the supply fan is restarted and the unit reverts to the standard operation mode.

Control and protection functions

- from the control panel: turning on/off, speed selection, timer, day- and week-scheduled operation, errors;
- maintaining set room or duct air temperature;
- control by HV1 duct humidity sensor (special accessory) or by a built into air duct humidity sensor;
- three fan speed control;
- integrated or optional electric heater control;
- filter clogging control by motor hours.

Mounting

TThe unit is designed for the suspended or floor mounting. Service access to the unit is on the front panel side.

Designation key:

Series	Rated air capacity [m³/h]	Heater	Duct connection	Motor type	Extra designation	Service side
VENTS VUT	300; 400; 900	**_** – no heater **E** – electric heater	**H** – horizontal	**EC** – synchronous electronically commutated motor	**ECO**	**L** – left **R** – right

Accessories

Duct humidity sensor HV1

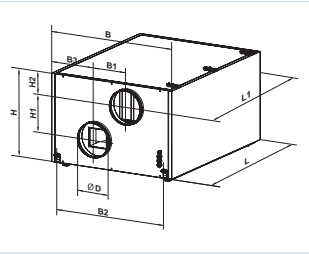
Electric heater

Technical data:

	VUT 300 H EC ECO	VUT 300 EH EC ECO	VUT 400 H EC ECO	VUT 400 EH EC ECO	VUT 900 H EC ECO	VUT 900 EH EC ECO
Voltage [V / Hz]	1~ 220-240 / 50-60					
Max. unit power without electric heater [W]	138		306		340	
Max. unit current without electric heater [A]	0,9		2		2,2	
Integrated electric heater power [kW]	–	3,0	–	3,0	–	3,0
Integrated electric heater current [A]	–	13,0	–	13,0	–	13,0
Optional electric heater power [kW]	3,0	–	3,0	–	3,0	–
Optional electric heater current [A]	13,0	–	13,0	–	13,0	–
Max. air capacity [m³/h]	300		450		940	
RPM [min⁻¹]	1380		2600		1740	
Sound pressure level at 3 m [dBA]	24-45		28-47		28-47	
Max. transported air temperature [°C]	-25 up to +60					
Casing material	aluzinc					
Insulation	25 mm min.wool					
Filter: extract	G4 panel type					
Filter: supply	G4 bag type (F7*)					
Connected air duct diameter [mm]	Ø160		Ø200		Ø250	
Weight [kg]	40	42	45	47	77	80
Heat recovery efficiency	86 up to 98%		85 up to 98%		81 up to 98%	
Heat exchanger type	counter-flow					
Heat exchanger material	polystyrene					
*modification						

Overall dimensions:

Type	Dimensions [mm]									
	Ø D	B	B1	B2	B3	H	H1	H2	L	L1
VUT 300 EH EC ECO	159	566	125	391	186	475	202	118	1081	1187
VUT 400 EH EC ECO	199	687	255	588	220	514	235	139	1092	1174
VUT 900 EH EC ECO	249	940	250	837	345	620	262	156	1200	1282

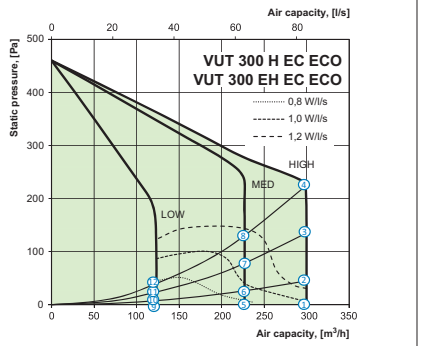


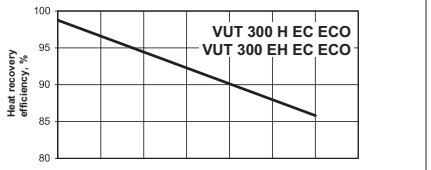
AHU accessories:

Type	G4 replaceable bag filter	F7 replaceable bag filter	G4 replaceable bag filter	Duct humidity sensor	Electric heater
VUT 300 H EC ECO	SFK VUT 300 H / EH EC ECO G4	SFK VUT 300 H / EH EC ECO F7	SF VUT 300 H / EH EC ECO G4	HV1	NK-VUT 300 EH EC ECO
VUT 300 EH EC ECO					–
VUT 400 H EC ECO	SFK VUT 400 H / EH EC ECO G4	SFK VUT 400 H / EH EC ECO F7	SF VUT 400 H / EH EC ECO G4		NK-VUT 400 EH EC ECO
VUT 400 EH EC ECO					–
VUT 900 H EC ECO	SFK VUT 900 H / EH EC ECO G4	SFK VUT 900 H / EH EC ECO F7	SF VUT 900 H / EH EC ECO G4		NK-VUT 900 EH EC ECO
VUT 900 EH EC ECO					–

HEAT RECOVERY AIR HANDLING UNITS

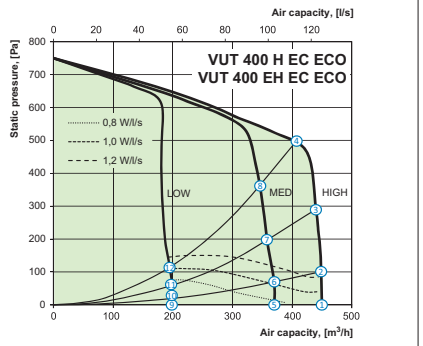
VENTS VUT H EC ECO / VENTS VUT EH EC ECO

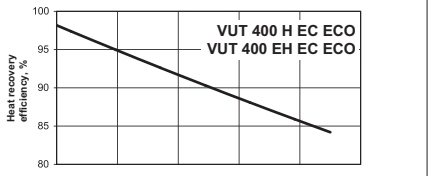




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	51	30	48	46	37	42	36	32	21
L_{wA} to outlet	dBA	60	41	54	57	55	44	46	35	24
L_{wA} to environment	dBA	33	23	23	32	27	19	15	19	18

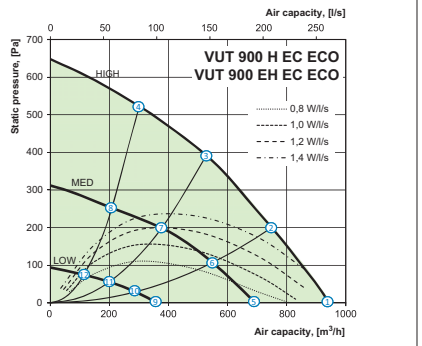
VENTS VUT H EC ECO / VENTS VUT EH EC ECO

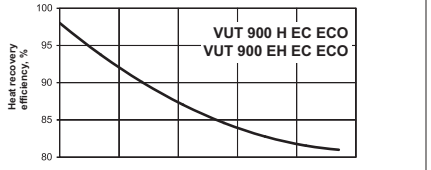




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	54	32	50	51	40	43	40	37	25
L_{wA} to outlet	dBA	65	44	57	58	54	51	48	38	27
L_{wA} to environment	dBA	37	27	28	32	29	22	19	21	23

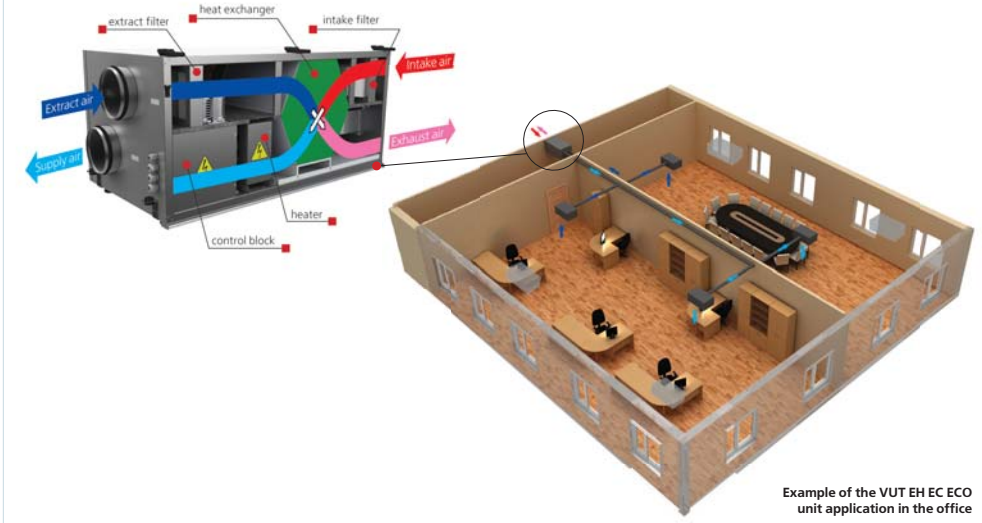
VENTS VUT H EC ECO / VENTS VUT EH EC ECO





Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	57	36	55	51	41	47	42	38	28
L_{wA} to outlet	dBA	67	47	62	62	59	53	52	42	29
L_{wA} to environment	dBA	41	26	29	36	32	24	22	26	26

point	Unit single power [W]		
	VUT 300 H EC ECO/ VUT 300 EH EC ECO	VUT 400 H EC ECO/ VUT 400 EH EC ECO	VUT 900 H EC ECO/ VUT 900 EH EC ECO
1	83	87	340
2	96	145	340
3	124	247	336
4	134	299	300
5	45	79	138
6	48	103	140
7	60	143	120
8	73	217	110
9	20	28	33
10	22	32	32
11	25	41	32
12	27	56	28



Example of the VUT EH EC ECO unit application in the office

SINGLE-ROOM ENERGY SAVING VENTILATION

Series
TwinFresh Expert

A new series of single-room energy recovery ventilator

Description
TwinFresh Expert is the most state-of-the-art and efficient solution for a comfortable indoor climate and required air exchange in renovated premises, brand new recently inhabited houses or reconstructed apartments.

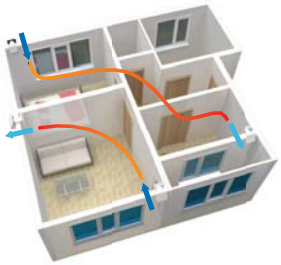
Features
- Efficient supply and exhaust single room ventilation up to 50 m³/h
- High-tech ceramic core with Sensible Recovery Efficiency – 97%
- Reversible EC ventilator with as low energy demand as 3.61 W and safe 12 V voltage
- Integrated automation
- Silent operation 20 dB(A) @ 1 m
- Easy mounting and servicing
- Filters with total filter class G3 (F7 optional) ensure air cleaning
- Rated for continuous operation
- No condensate generation during operation

Reversible EC fan
Air is supplied or extracted by a reversible axial fan with EC motor. Due to EC technology the fan is distinguished with low energy demand. The fan is powered by safe voltage 12 V. The motor has integrated overheating protection and ball bearings for long service life.

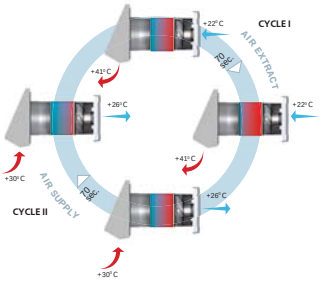
Ceramic core
The high-tech ceramic core with recovery efficiency up to 97 % is used for heating of supply air by energy recovered from extract air . Due to its honeycomb structure, the unique core has larger air contact area and excellent heat conducting and accumulating properties.
The ceramic core has a special anti-bacterial treatment to prevent bacteria generation inside of the core. The antibacterial treatment is rated for 10 years operation.

Air filters
Two built-in filters with total filter class G3 are used to clean supply and extract air flows. The filters ensure fresh air cleaning of dust and insects and prevent the ventilator parts from soiling. The filters have antibacterial treatment. The filters are cleaned either with a vacuum cleaner or flushed with water with no harm to the antibacterial treatment.F7 filter is available as an option, being installed it reduces maximum airflow down to 35 m³/h.

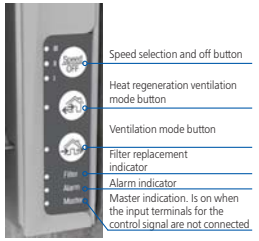
Mounting
The unit is designed for through-the-wall installation inside a prepared hole in an outer wall of the building.
The best ventilation solution is pairwise installation of reverse phase connected units. Some units ensure supply of fresh air to the room and the other units extract air from the premise. This way the most efficient balanced ventilation is arranged.
In case of brand new construction, units are mounted in two stages:
1. Pre-installation at the stage of the indoor finishing and outer decorative wall finishing. It includes installation of an air duct, an outer ventilation hood and cable installation.;
2. Final mounting before commissioning of a house. It includes installation of a regenerator with a fan and filters and mounting and wiring of an indoor unit with a controller and shutters.

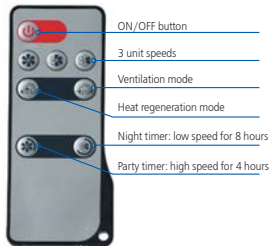


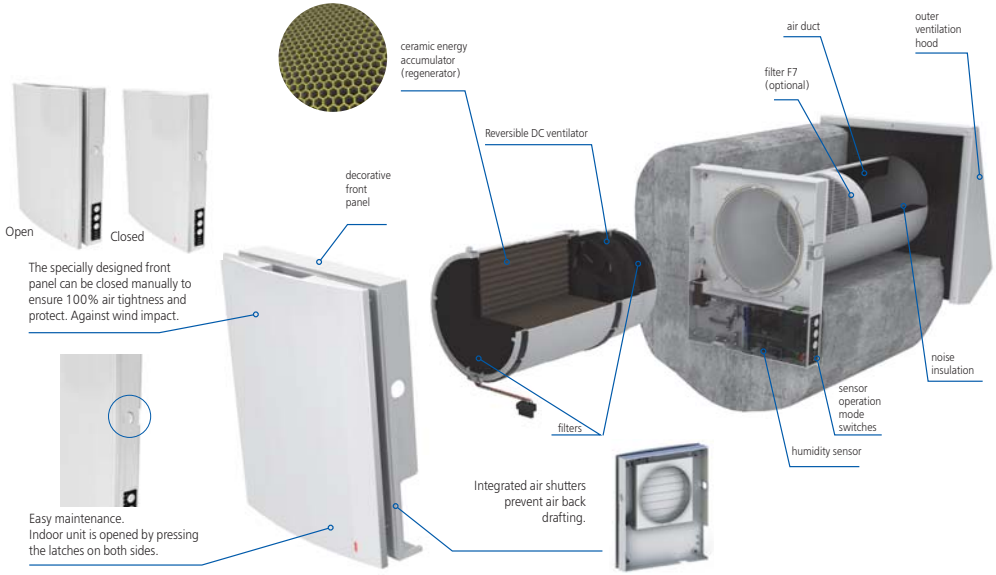
Ventilator operating logic
The ventilator is designed both for reversible mode with energy regeneration and for supply or extract mode with no regeneration.
- **CYCLE I.** Warm stale air is extracted from the room, then it passes through the ceramic energy accumulator and while flowing through it, heats and moistens the ceramic accumulator and transfers up to 90% of the contained thermal energy. As the ceramic accumulator gets heated, the ventilator switches to supply mode automatically.
- **CYCLE II.** Clean fresh air from outside passes through the ceramic energy accumulator, absorbs moisture and is heated up to the room temperature due to the accumulated heat. As temperature of the accumulator drops down, the fan switches to extract mode and the cycle is renewed. The ventilator changes its operation mode between supply and extract ventilation every 70 seconds.



Control
Control of the unit operation mode is performed by means of sensor control panel located on the unit casing or a remote controller.





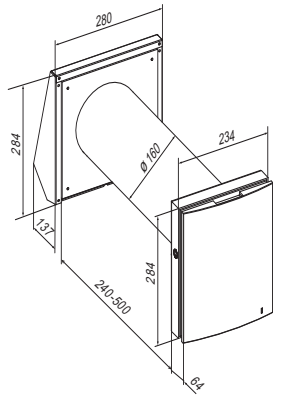


Technical data

	TwinFresh Expert RA1-50		
Speed	1	2	3
Supply voltage, 50/60 Hz [V]	1~100-230		
Power [W]	3.61	4.15	5.2
Max. current consumption [A]	0.025	0.030	0.039
Max. air capacity [m³/h]	15	30	50
RPM [min⁻¹]	800	1300	1900
Sound pressure level at 1 m distance [dB(A)]	20*	27*	30*
Sound pressure level at 3 m distance [dB(A)]	11*	18*	21*
Outdoor sound pressure attenuation [dB(A)]*	42**		
Max. transported air temperature [°C]	from -20 up to + 50		
Regenerating efficiency	97***	90***	82***
Regenerator type	Ceramic		
Ingress Protection	IP 24		

* In accordance with ISO 3741: 2004
** In accordance with DIN EN 20140
*** In accordance with DIBt Lb-A 20

Overal dimensions



Accessories

Duct 160-500
0.5 m long duct
Foamed plug

Duct 160-700
0.7 m long duct
Foamed plug

SF TwinFresh Expert RA-50 G3
G3 filters kit (2 pcs.)

SF TwinFresh Expert RA-50 F7
F7 panel filter (1 pcs.)

T TwinFresh Expert RA-50
Carton templet for installation of the inner block

RC TwinFresh Expert RA-50
Remote contol

TwinFresh Expert RA-50 completion kit
- Inner block;
- Cartridge with energy regenerator, fan and two filters;
- Sound insulation material;
- Remote control.

CO2-1 / CO2-2
CO2 sensor