

# USER'S MANUAL

**VUT2 200 P**  
**VUE2 200 P**  
**VUTE2 200 P**



**Heat (energy / heat and energy)  
recovery air handling unit**

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This user's manual consisting of the technical details, operating instructions and technical specification covers the installation and mounting of the VU\_2 200 P heat (energy / heat and energy) recovery air handling unit (hereinafter referred to as «the unit»).

## SAFETY REQUIREMENTS

- Read the user's manual carefully prior to installing and operating the unit.
- Fulfil the user's manual requirements as well as the provisions of all the applicable local and national construction, electrical and technical norms and standards.
- The warnings contained in the user's manual must be considered most seriously since they contain vital personal safety information.
- Failure to follow the rules and safety precautions noted in this user's manual may result in an injury or unit damage.
- After a careful reading of the manual, keep it for the entire service life of the unit.
- While transferring the unit control the user's manual must be turned over to the receiving operator.

Symbol legend:

	<b>WARNING!</b>
	<b>DO NOT!</b>

## UNIT MOUNTING AND OPERATION SAFETY PRECAUTIONS



- Disconnect the unit from power mains prior to any installation operations.



- The unit must be grounded!



- Do not lay the power cable of the unit in close proximity to heating equipment.



- While installing the unit follow the safety regulations specific to the use of electric tools.



- Do not change the power cable length at your own discretion.
- Do not bend the power cable.
- Avoid damaging the power cable.
- Do not put foreign objects on the power cable.



- Unpack the unit with care.



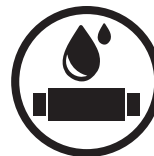
- Do not use damaged equipment or cables when connecting the unit to power mains.



- Do not operate the unit outside the temperature range stated in the user's manual.
- Do not operate the unit in aggressive or explosive environments.



- Do not touch the unit controls with wet hands.
- Do not carry out the installation and maintenance operations with wet hands.



- Do not wash the unit with water.
- Protect the electric parts of the unit against ingress of water.

## UNIT MOUNTING AND OPERATION SAFETY PRECAUTIONS



- Do not allow children to operate the unit.



- Do not store any explosive or highly flammable substances in close proximity to the unit.



- Do not open the unit during operation.



- Do not block the air duct when the unit is switched on.



- Do not sit on the unit and avoid placing foreign objects on it.



- Disconnect the unit from power mains prior to any technical maintenance.



- When the unit generates unusual sounds, odour or emits smoke disconnect it from power supply and contact the Seller.



- Do not direct the air flow produced by the unit towards open flame or ignition sources.



- In case of continuous operation of the unit periodically check the security of mounting.



- Use the unit only for its intended purpose.

## PURPOSE

Due to the ability to save heating energy by means of energy recovery the unit is an important element of energy-efficient premises. The unit is a component part and is not designed for independent operation.

The unit is designed to provide permanent controlled air exchange by means of mechanical ventilation in houses, offices, hotels, cafés, meeting halls and other mechanically ventilated premises as well as utilization of extract air heat energy to warm up supply purified air.

The unit is designed for ceiling mounting, the VUE2 200 P model is designed for ceiling as well as for wall mounting.

The unit is rated for continuous operation.

Transported air must not contain any flammable or explosive mixtures, evaporation of chemicals, sticky substances, fibrous materials, coarse dust, soot and oil particles or environments favourable for the formation of hazardous substances (toxic substances, dust, pathogenic germs).



**THE UNIT MAY NOT BE OPERATED BY CHILDREN OR PERSONS WITH REDUCED PHYSICAL, MENTAL OR SENSORY CAPACITIES, OR LACKING THE APPROPRIATE TRAINING. THE UNIT MUST BE INSTALLED AND CONNECTED ONLY BY PROPERLY QUALIFIED PERSONNEL AFTER THE APPROPRIATE BRIEFING. THE UNIT INSTALLATION SITES MUST PREVENT ACCESS BY UNATTENDED CHILDREN.**

## DELIVERY SET

Name	Number
Air handling unit	1 item
Mounting bracket	2 items
User's manual	1 item
Packing box	1 item

## DESIGNATION KEY

### VU\_2 200 P

□	<b>Design features</b>
□	P — suspended mounting
□	<b>Air capacity [m³/h]</b>
□	<b>Number of heat exchangers [items]</b>
□	<b>Unit type</b>
	VUT - ventilation with heat recovery
	VUE - ventilation with energy recovery
	VUTE - ventilation with heat and energy recovery

## TECHNICAL DATA

The unit is designed for indoor application with the ambient temperature ranging from +1 °C up to +50 °C and relative humidity up to 80 %.

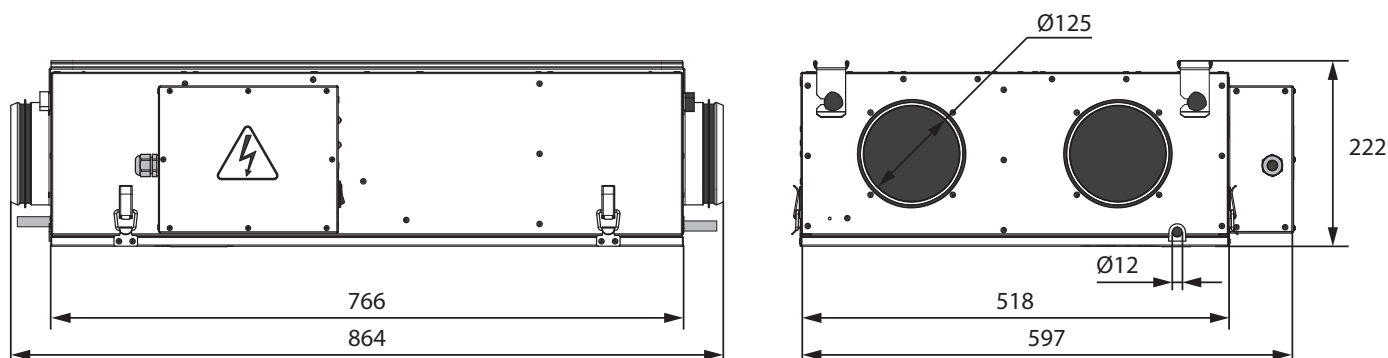
Hazardous parts access and water ingress protection rating:

- IP 44 for the unit motors;
- IP 22 for the assembled unit connected to the air ducts.

Designation of the unit series, main overall and connecting dimensions as well as the unit view and technical parameters of the unit are shown in figure and table below.

The unit design is constantly being improved, so some models can slightly differ from those ones described in this manual.

### OVERALL DIMENSIONS OF THE UNIT, MM



### UNIT TECHNICAL DATA

Ventilation mode (speed)	LOW (low)	MED (medium)	MAX (maximum)*
Unit supply voltage, 50 Hz [V]	1 ~ 230		
Maximum fan power [W]	67	104	142
Fan current [A]	0,58	0,63	0,68
Maximum air capacity [m³/h]	80	143	220
R.p.m.	1120	1890	2910
Sound pressure level at 3 m distance [dB(A)]	20	28	36
Maximum transported air temperature [°C]	from -25 °C to +40 °C		
Casing material	aluzinc		
Insulation	foamed polypropylene, 10 mm		
Filter: extract/intake	pocket G4		
Connected air ducts 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 peripheral control elements: control panel, humidity sensor, thermostat, CO2 sensor etc.

### MODIFICATIONS

Model	VUT 200 P	VUE2 200 P	VUTE2 200 P
Heat exchanger material	aluminum	polymerized cellulose	aluminium / polymerized cellulose

## UNIT DESIGN AND OPERATING LOGIC

The unit has the following operating logic:

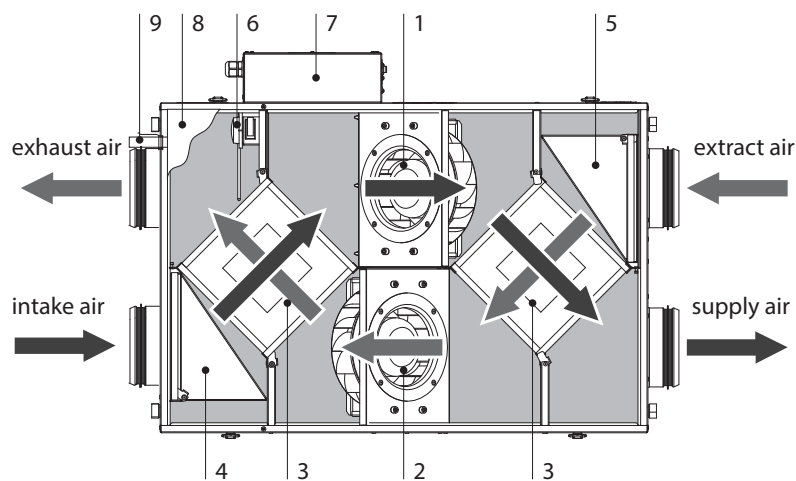
Warm stale extract air from the room flows to the unit, where it is filtered, then air flows through the heat exchangers and is exhausted outside by the extract fan. Clean cold air from outside is moved to the supply filter. Then filtered air flows through the heat exchangers and is moved to the room with the supply fan.

Heat energy of warm extract air is transferred to clean intake fresh air from outside and warms it up. Heat recovery minimizes thermal energy losses and space heating expenses in cold seasons.

The polymerized cellulose heat exchangers are used to recover both sensible and latent energy contained in the extract air and transfer it to the cold intake air flow from outside.

The polymerized cellulose heat exchangers act as air moisture accumulators when the ambient air humidity is too low or as supply air dehumidifiers if the ambient humidity is high. Due to the excellent water-absorbing properties of the heat exchanger material the unit drainage is not required. Heat recovery minimizes heat losses, which reduces the cost of space heating in the cold season.

### UNIT DESIGN AND OPERATING LOGIC



1. The supply centrifugal fan has an impeller with backward curved blades and a maintenance-free electric motor with an external rotor and built-in overheat protection thermostats.
2. The extract centrifugal fan has an impeller with backward curved blades and a maintenance-free electric motor with an external rotor and built-in overheat protection thermostats.
3. Plate cross flow heat exchanger
4. G4 intake air filter.
5. G4 extract air filter.
6. Freeze protection thermostat relay.
7. Control unit.
8. Drain pan (except VUE 2 200 P).
9. Drain pipe (except VUE 2 200 P).

### Freeze protection

The heat exchanger freeze protection function of the unit is implemented with a thermostat installed in the exhaust air duct downstream of the heat exchanger. In case of a freezing danger the supply fan is turned off and the heat exchanger is warmed up with warm extract air flow. The recommended thermostat operating temperature is +3 °C (factory setting).

## MOUNTING AND SET-UP

### UNIT MOUNTING



**THE UNIT MUST BE MOUNTED BY A QUALIFIED EXPERT ONLY, PROPERLY TRAINED AND HAVING THE REQUIRED TOOLS AND MATERIALS.**

While mounting the unit provide enough access for maintenance or repair work.

When selecting a mounting location of the unit provide free opening of the service panel.

To attain the best performance of the unit and to minimise turbulence-induced air pressure losses connect a straight air duct section on both sides of the unit while mounting.

Minimum straight air duct length:

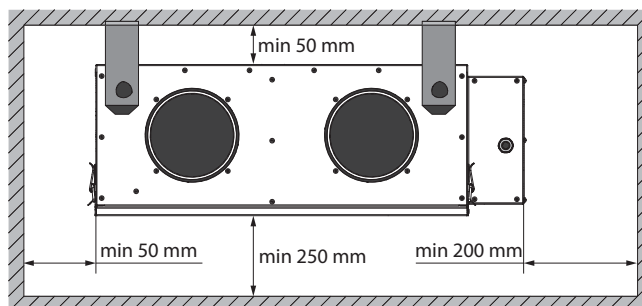
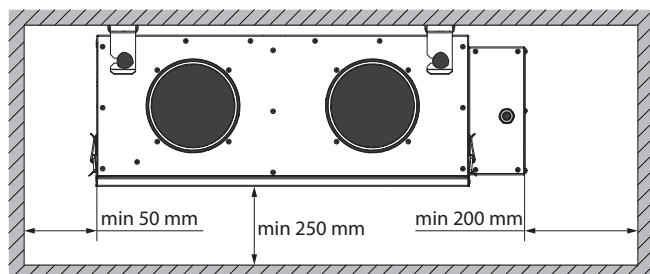
- equal to 1 air duct diameter on intake side
- equal to 3 air duct diameters on outlet side

If the air ducts are too short or not connected, protect the unit parts from ingress of foreign objects, e.g. by covering the spigots with a protecting grille or other protecting device with mesh width not more than 12.5 mm to prevent uncontrollable access to the fans.

While installing the unit ensure convenient access for subsequent maintenance and repair. The unit must be mounted on a plane surface. Mounting of the unit to an uneven surface can lead to the unit casing distortion and operation disturbance.

### DISTANCE TO THE UNIT

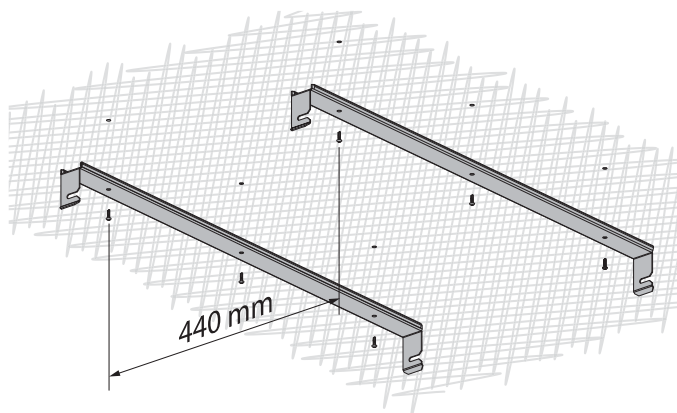
When selecting the installation site provide minimum allowed distances to the unit.



### SUSPENDED MOUNTING OF THE UNIT

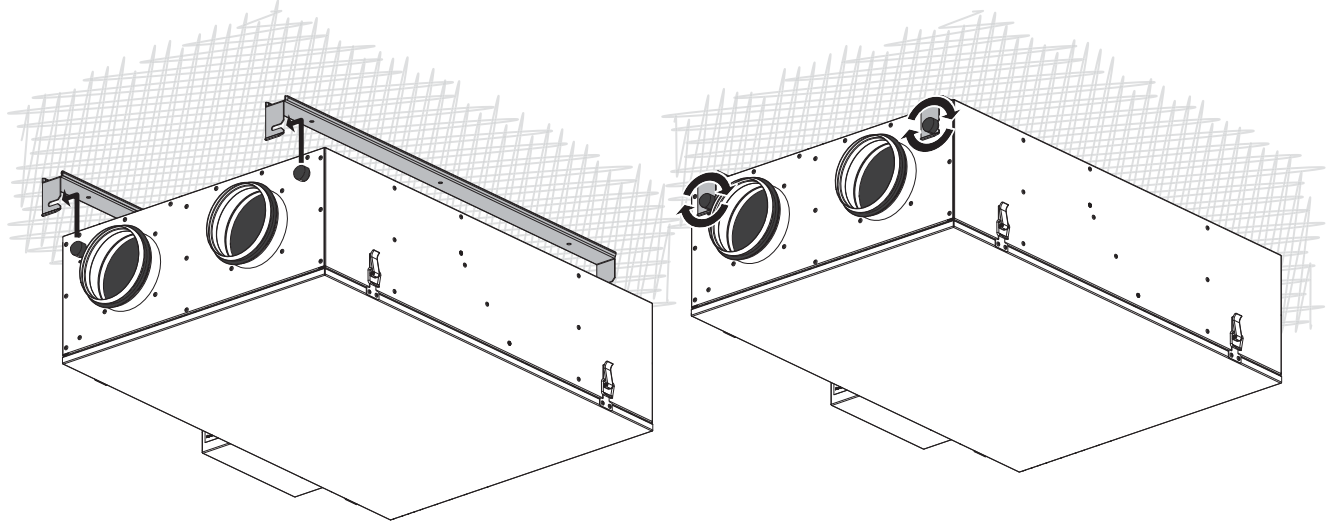
The unit is suspended with the suspension brackets (included in the delivery set) or belts.

Attach two mounting brackets within a distance of 400 mm away from each other using dowels with screws or self-tapping screws (not included in the delivery set) depending on the type of the surface. When attaching the mounting bracket consider the surface material and the unit weight.





Loosen the three-sided thumbscrews. Set the unit thumbscrews into the mating cutouts in the mounting brackets as it is figured below. Then tighten the three-sided thumbscrews to fix the unit.

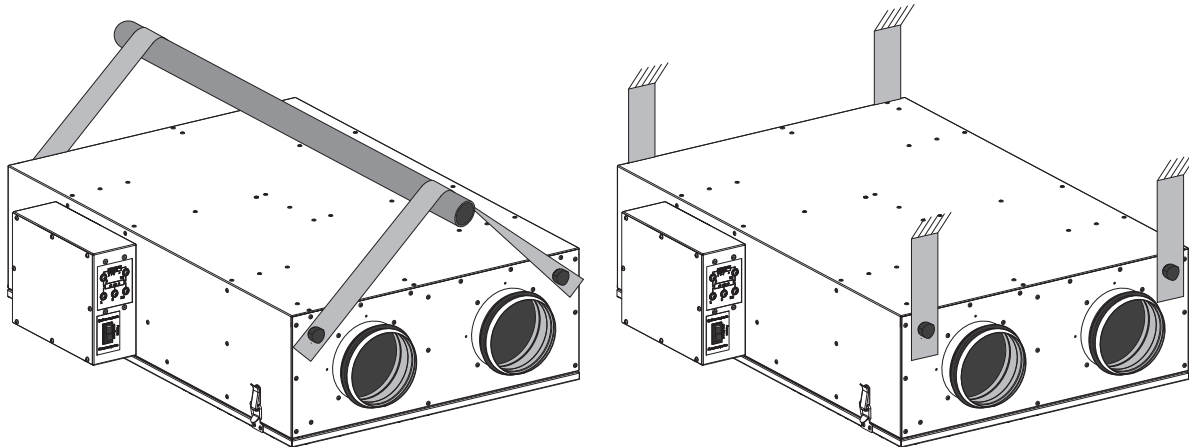


### Mounting using belts

The unit is suspended with the belts which must be selected to match the unit weight. The belt must have an opening or a hook to fix the three-sided thumbscrews to the unit.

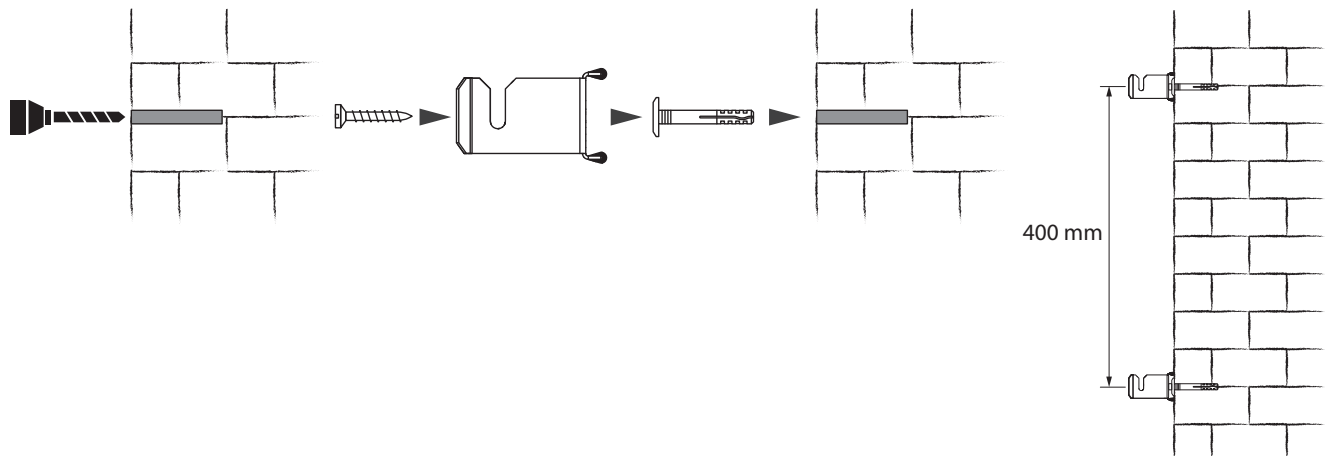
Remove all the three-sided thumbscrews from the unit for suspended mounting by means of belts. Then insert them into a mounting opening or a belt hook. Fix the belts as necessary and screw the three-sided thumbscrews back to the unit.

Example of a suspended mounting is figured below.

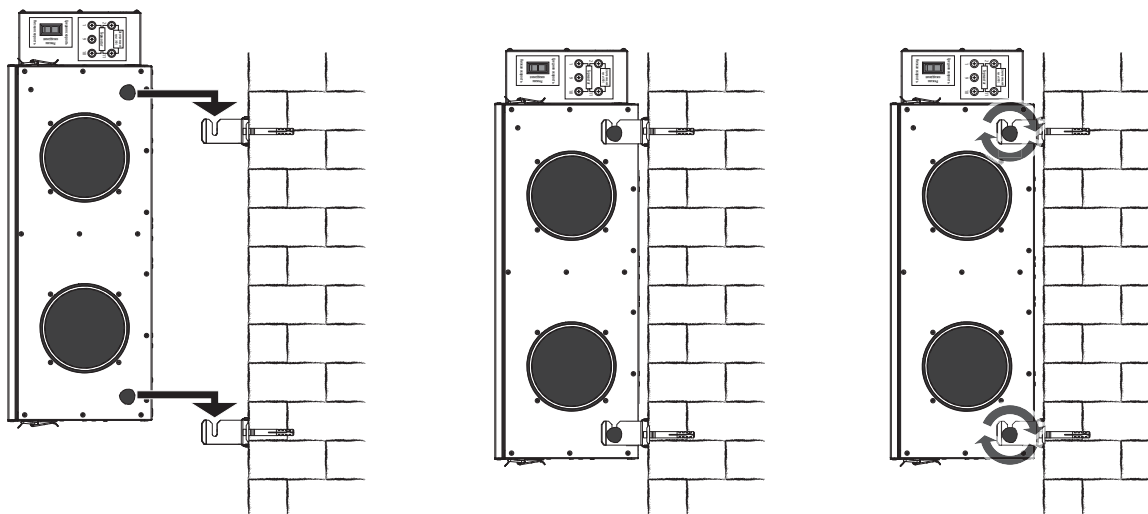


### UNIT WALL SURFACE MOUNTING (only for VUE2 200 P)

Attach the wall mounting bracket to the wall considering the wall material and the unit weight.



Install the unit on the mounting brackets. Tighten the three-sided thumbscrews on the mounting brackets.

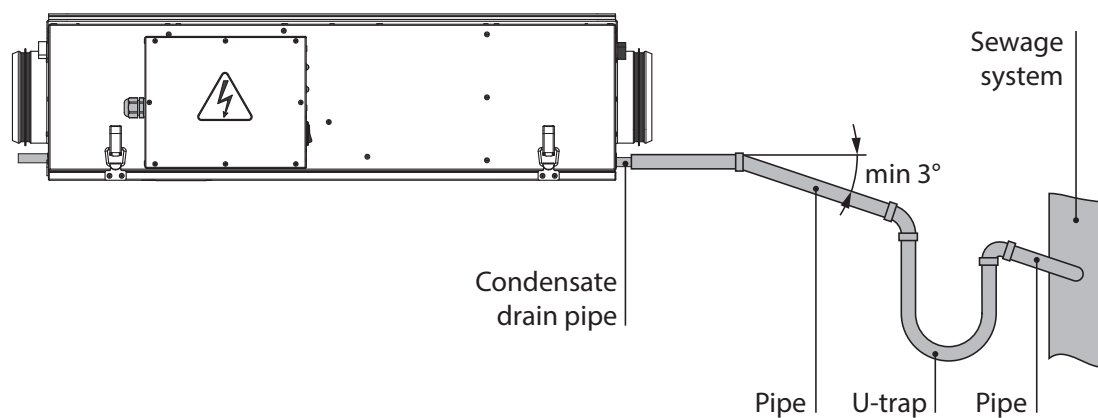


### CONDENSATE DRAINAGE

The unit is equipped with drain pans designed to remove condensate formed in the process of heat exchangers operation.

Connect the drain pipes, the U-traps and the sewage system with plastic or rubber pipes for condensate disposal arrangement. The pipe slope downwards must be at least  $3^\circ$ .

Before starting the unit fill the system with water and check that the U-trap is always filled with water. Check for any obstructions to the free flow of water into the sewage system to prevent condensate accumulation inside the unit, which may cause equipment failure and water ingress into the premises.



## CONNECTION TO POWER MAINS



**DISCONNECT THE UNIT FROM POWER MAINS PRIOR TO ANY OPERATIONS. THE UNIT MUST BE CONNECTED TO POWER MAINS BY A QUALIFIED ELECTRICIAN. THE RATED ELECTRICAL PARAMETERS OF THE UNIT ARE GIVEN ON THE MANUFACTURER'S LABEL.**



**ANY TAMPERING WITH THE INTERNAL CONNECTIONS IS PROHIBITED AND WILL VOID THE WARRANTY.**

The unit is rated for connection to single-phase AC 230 V / 50 Hz power mains.

The unit has a power cord with a plug to connect to a standard grounded outlet. The power cord is pre-wired to the terminal block.

The external power input must be equipped with an automatic circuit breaker built into the stationary wiring to open the circuit in the event of overload or short-circuit.

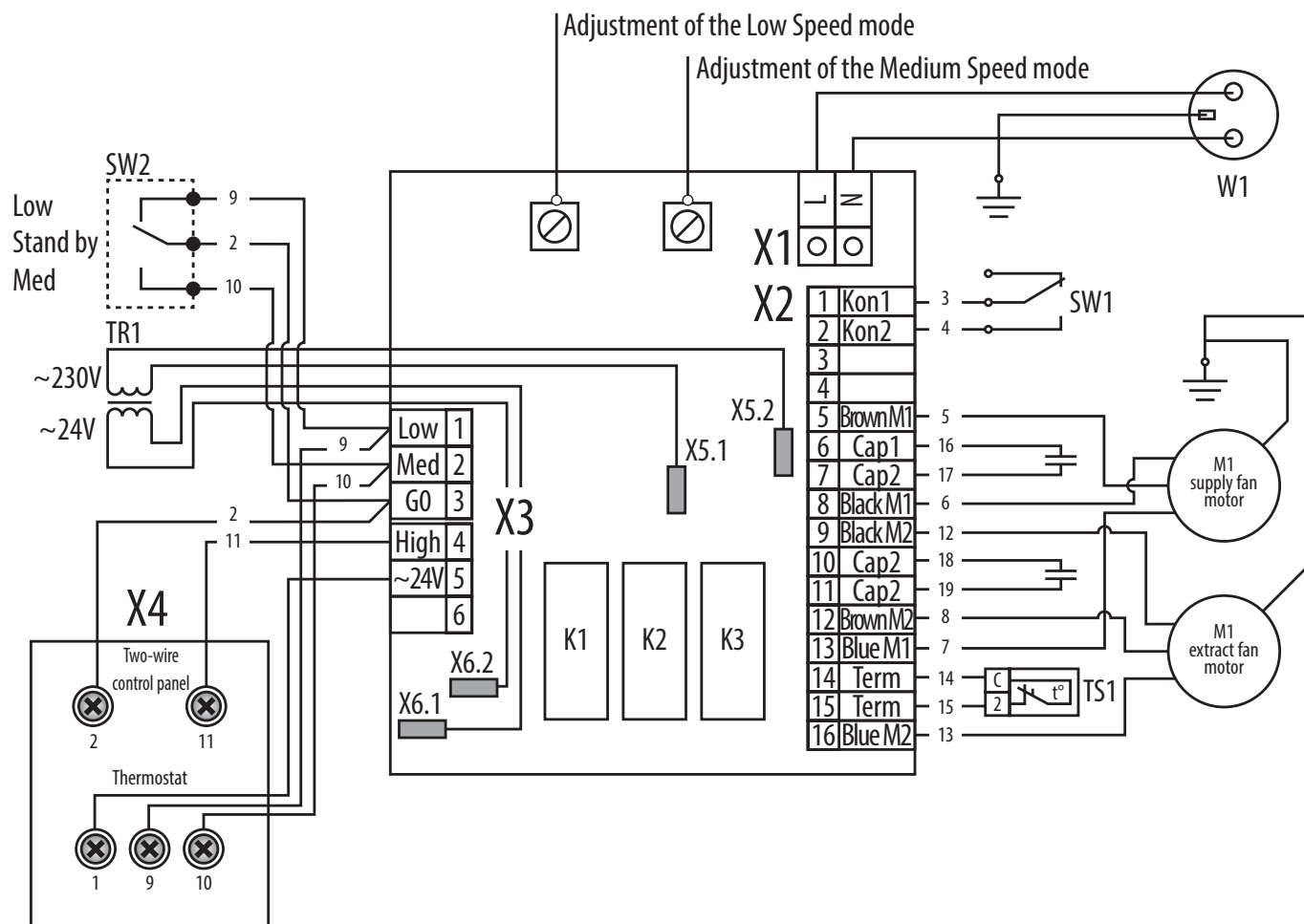
The external switch location must ensure free access for quick shutdown of the unit.

The thermal fuse protects the unit circuit against overloading. In case of an overload or a short circuit the thermal fuse blows. To replace the thermal fuse disconnect the unit from power mains, eliminate the cause of overload or short circuit, replace the thermal fuse and check the installation.

The wiring diagram of the unit is shown in the figure below.

The TS1 thermostat relay in the unit casing provides freeze protection of the heat exchanger during cold season (see the wiring diagram). In case of a freezing danger the supply fan is turned off and the heat exchanger is warmed up with warm extract air flow. To set the thermostat operation temperature turn the control knob until reaching the desired value. The threshold switching value is set individually depending on the operating conditions of the unit. The recommended thermostat set point is +3°C (factory setting).

## WIRING DIAGRAM

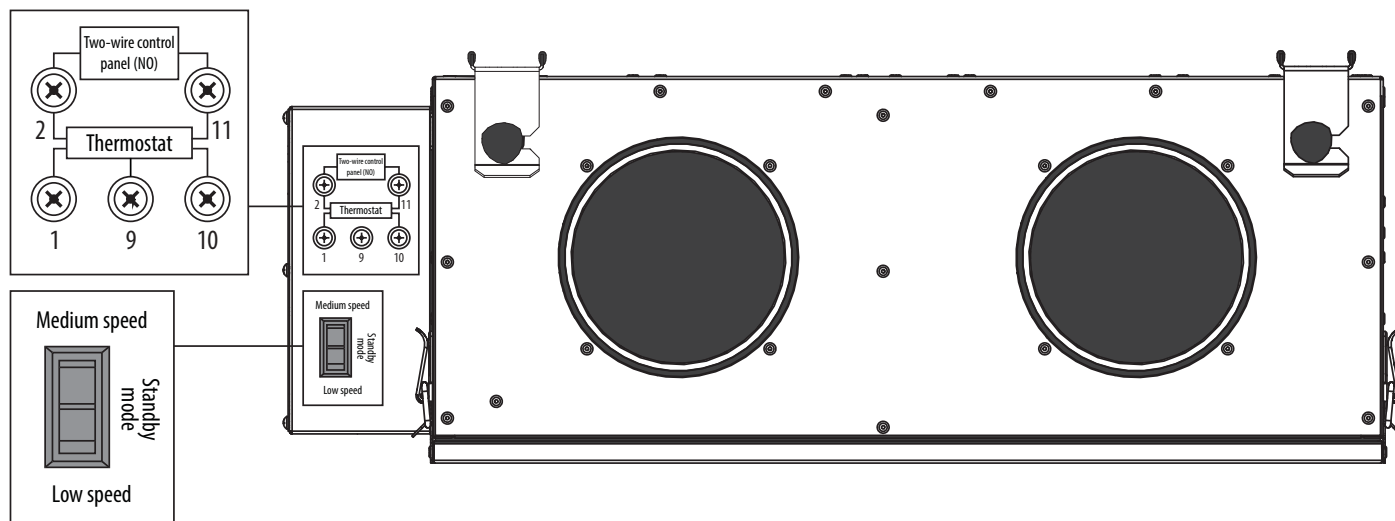


## UNIT CONTROL

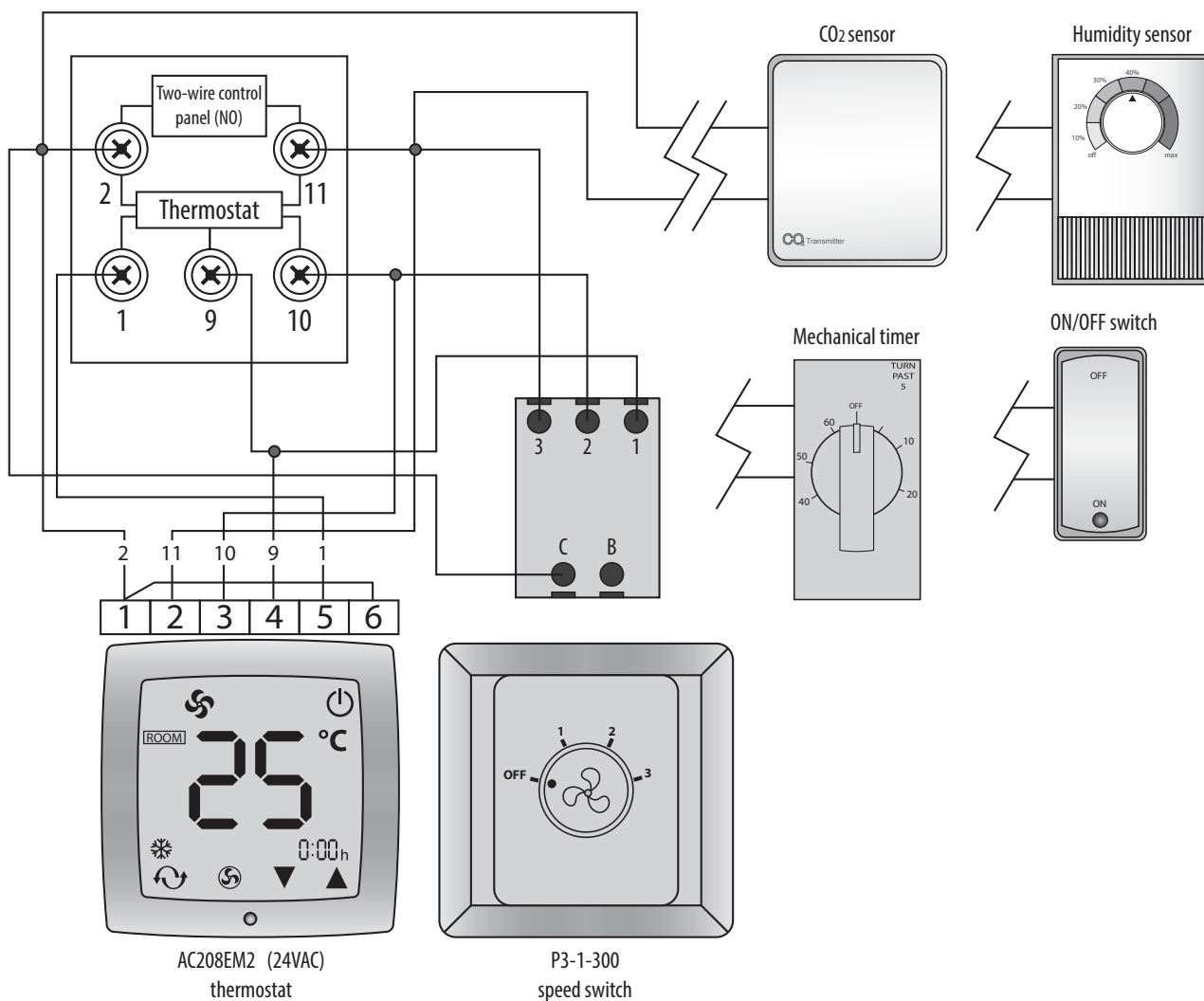
The unit is operated via the three-position switch allowing to set one of three operating modes: Low Speed (LOW), Medium Speed (MED) or Standby mode (Stand by), which gives complete control over the air quality.

Up to 5 external controls can be connected to the contacts located at the side panel of the control unit. In case of activation of any connected controls the unit switches to high speed ventilation mode.

CONTROL UNIT SIDE PANEL



EXTERNAL CONTROL UNITS WIRING DIAGRAM



### 1. AC208EM2 (24VAC) control panel (digital thermostat).

The AAC208EM2 (24VAC) control panel (digital thermostat) provides:

- Switching the air handling unit ON/OFF.
- Selecting one of 3 speed modes.
- Display of room temperature.
- Scheduled operation.



### 2. P3-1-300 speed switch.

The P3-1-300 rotary speed switch is used for switching one of three speeds and for switching the unit on/off.



### 3. CO<sub>2</sub> sensor.

The CO<sub>2</sub> sensor with a no-contact is used in utility and public spaces and ensures high-speed ventilation when the level of carbon dioxide is higher than the set maximum value.

Any CO<sub>2</sub> sensor commutating voltage of 24 V (0.1 A) can be used for connection to the unit.

**WARNING: The CO<sub>2</sub> sensor must close a contact if the CO<sub>2</sub> level exceeds the set point and open it when the CO<sub>2</sub> level falls below the set point.**



### 4. Mechanical humidity sensor.

The mechanical humidity sensor with a no-contact is used for humidity level control in the room. If humidity exceeds the set point, the unit switches from the regular operation mode to the high speed mode. The unit will operate in the high-speed ventilation mode until the relative humidity falls below the set point. Adjust the level of humidity if necessary.

Any mechanical humidity sensor that can commute 24 V (0,1 A) voltage is suitable for connection to the unit.

**WARNING: The humidity sensor must close a contact if the humidity level exceeds the set point and open it when the humidity level falls below the set point.**

### 5. Mechanical timer

The remote mechanical timer must be installed in areas of air pollution. The timer is used for switching from regular operation mode to the high speed ventilation mode. Up to 5 timers can be installed in a building within a distance to the unit of maximum 150 m.

Any mechanical timer commutating voltage of 24 V (0.1 A) can be used for connection to the unit.

### 6. ON/OFF switch.

The ON/OFF switch must be installed in areas of air pollution. When the contacts of the ON/OFF switch are closed the unit switches to a high speed ventilation mode. Open the contacts of the ON/OFF switch to return to a continuous low-speed ventilation mode.

Any switch commutating voltage of 24 V (0.1 A) can be used for connection to the unit.

## TECHNICAL MAINTENANCE



**DISCONNECT THE UNIT FROM POWER MAINS PRIOR TO ANY MAINTENANCE OPERATIONS.**

Maintenance operations of the unit are required 3-4 times per year. Maintenance includes general cleaning of the unit and the following operations:

### 1. Filter maintenance (3-4 times per year).

Dirty filters increase air resistance in the system and reduce supply air volume. The filters require cleaning not less than 3-4 times per year. Vacuum cleaning is allowed. After two consecutive cleanings filters must be replaced. For new filters contact the Seller. The steps to replace the filters are as follows (refer to the figure below):

1. Unlatch and remove the service panel.
2. Unlatch and remove the drain pans.
5. Turn the latch and remove the filters.

### 2. Fan maintenance (once a year).

Even in case of regular maintenance of the filters, some dust may accumulate inside the fans and reduce the fan performance and supply air flow.

Clean the fans with a soft brush or cloth. Do not use water, aggressive solvents or sharp objects as they may damage the impeller.

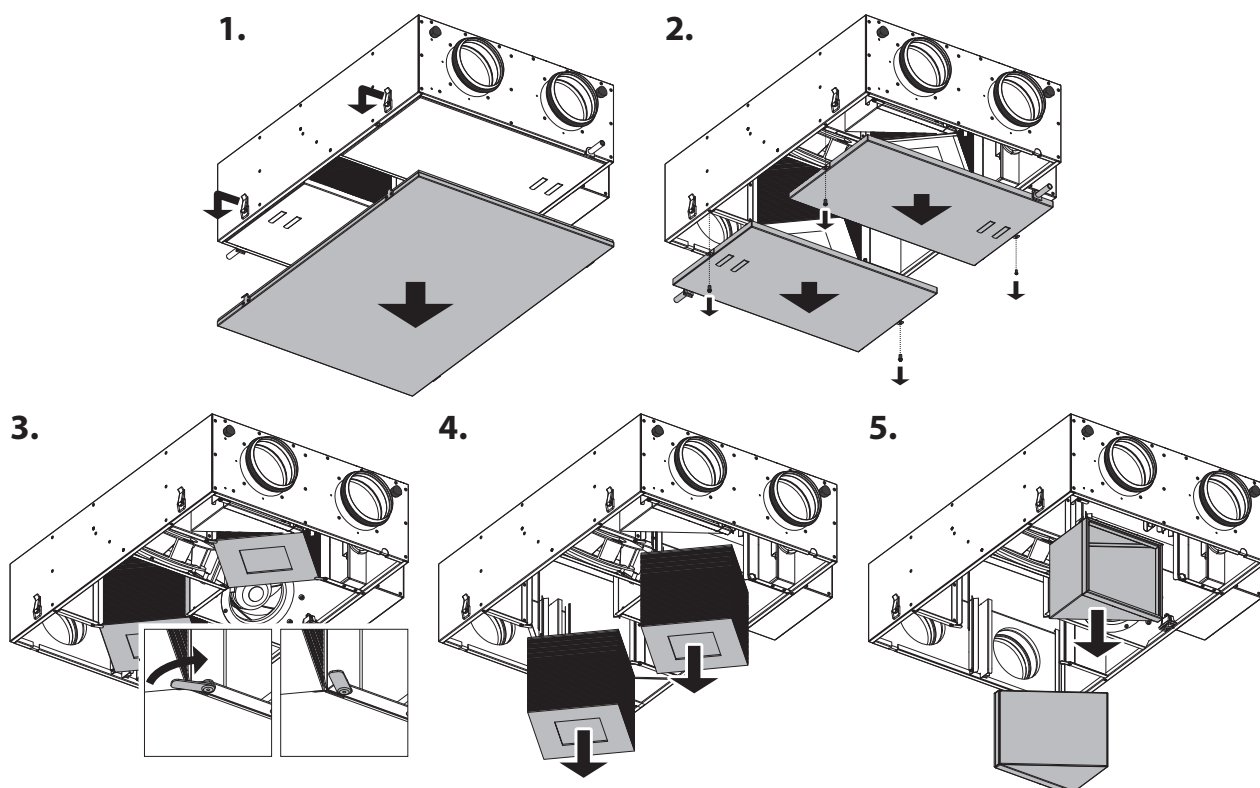
### 3. Heat exchanger maintenance (once a year).

Some dust may accumulate on the heat exchanger block even in case of regular maintenance of the filters. To maintain the high heat recovery efficiency, regular cleaning is required.

- Clean the paper heat exchanger (VUE 200 P and VUTE 200 P models) with vacuum cleaner and then install it back to the unit. Cleaning with water, abrasive detergents, solvents or sharp objects, which can damage the unit, is not allowed.
- Clean the aluminium heat exchanger (VUT2 200 P and VUTE2 200 P models) with mild detergent solution and then install a dry heat exchanger back to the unit.

The steps to remove the filters and the heat exchanger are as follows (refer to the figure below):

1. Unlatch and remove the service panel.
2. Unlatch and remove the drain pans.
3. Turn the latch.
4. Remove the heat exchangers.



#### 4. Technical maintenance of condensate drainage system (once a year).

The condensate drainage (drain line) may get clogged by dirt and dust particles contained in the exhaust air. Check the drain line operation by filling the drain pan under the unit with water, clean the U-trap and the drain line, if necessary.

#### 5. Supply air flow control (twice per year).

The supply duct grille may get clogged with leaves and other objects reducing the unit performance and supply air delivery. Check the supply grille twice per year and clean it as required.

#### 6. Technical maintenance of air duct system (every 5 years).

Even regular fulfilling of all the prescribed above maintenance operations may not completely prevent dirt accumulation in the air ducts which reduces the unit capacity. Duct maintenance means regular cleaning or replacement.

### TROUBLESHOOTING

Problem	Possible reasons	Troubleshooting
The fan(s) do(es) not start.	No power supply.	Make sure the power supply line is connected correctly, otherwise troubleshoot a connection error.
Cold supply air	Extract filter clogging.	Clean or replace the extract filter.
	The heat exchanger is frosted.	Check the heat exchanger for icing. Switch the unit off if required and turn it on after the freezing danger is no longer imminent.
Low air flow	Filters, fans or the heat exchanger are soiled.	Clean or replace the filters, clean the fans and the heat exchanger.
	The ventilation system is soiled or damaged.	Clean the ventilation system components. Replace the damaged components.
Noise, vibration	The impellers are soiled.	Clean the impellers.
	The fan or casing screw connection is loose.	Tighten the screw connection of the fans or the casing against stop.
Water leakage	The drainage system is soiled, damaged or arranged not correctly.	Clean the drain line. Check the drain line slope angle. Make sure that the U-trap is filled with water and the drain pipes are frost protected.

### STORAGE AND TRANSPORTATION REGULATIONS

Store the unit in the manufacturer's original packing box in a dry closed ventilated premise with temperature range from +5 °C to + 40°C. Vapours or particles which can cause corrosion or damage the insulation or connection tightness are not allowed in the storage environment. Use hoist machinery for handling and transportation to prevent possible mechanical damages of the unit. Follow the handling requirements applicable for the particular type of cargo.

Use any vehicle types for the unit transportation provided that it is protected against mechanical or weather damage.

Avoid any mechanical shocks and strokes during handling operations.

## MANUFACTURER'S WARRANTY

The manufacturer hereby warrants normal operation of the unit for 24 months after the retail sale date provided the user's observance of the transportation, storage, mounting and operation regulations.

Should any malfunctions occur in the course of the unit operation through the Manufacturer's fault during the guaranteed period of operation the user is entitled to elimination of faults by the manufacturer by means of warranty repair at the factory free of charge.

The warranty repair shall include work specific to elimination of faults in the unit operation to ensure its intended use by the user within the guaranteed period of operation. The faults are eliminated by means of replacement or repair of the unit components or a specific part of such unit component.

**The warranty repair does not include:**

- routine technical maintenance
- unit installation / dismantling
- unit setup.

To benefit from warranty repair the user must provide the unit, the user's manual with the purchase date stamp and the payment document certifying the purchase.

The unit model must comply with the one stated in the user's manual.

**Contact the Seller for warranty service.**

**The manufacturer's warranty does not apply to the following cases:**

- User's failure to submit the unit with the entire delivery package as stated in the user's manual including submission with missing component parts previously dismounted by the user.
- Mismatch of the unit model and the brand name with the information stated on the unit packing and in the user's manual.
- User's failure to ensure timely technical maintenance of the unit.
- External damage to the unit casing (excluding external modifications as required for installation) and internal components caused by the user.
- Redesign or engineering changes to the unit.
- Replacement and use of any assemblies, parts and components not approved by the manufacturer.
- Unit misuse.
- User's violation of the unit installation regulations.
- User's violation of the unit control regulations.
- Unit connection to the power mains with a voltage different from the one stated in the user's manual.
- Unit breakdown due to voltage surges in the power mains.
- Discretionary repair of the unit by the user.
- Unit repair by any persons without the manufacturer's authorization.
- Expiration of the unit warranty period.
- User's violation of the unit transportation regulations.
- User's violation of the unit storage regulations.
- Wrongful actions against the unit committed by third parties.
- Unit breakdown due to circumstances of insuperable force (fire, flood, earthquake, war, hostilities of any kind, blockades).
- Missing seals if provided by the user's manual.
- Failure to submit the user's manual with the unit purchase date stamp.
- Missing payment document certifying the unit purchase.



**FOLLOWING THE REGULATIONS STIPULATED HEREIN WILL ENSURE A LONG AND TROUBLE-FREE OPERATION OF THE UNIT.**



**USERS' WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP.**

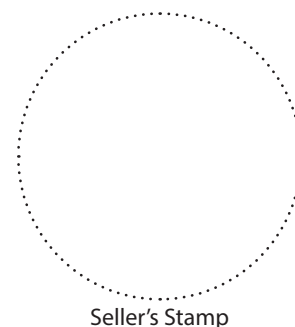


## ACCEPTANCE CERTIFICATE

<b>Unit Type</b>	Heat (energy / heat and energy) recovery air handling unit
<b>Model</b>	VU ____ 2 200 P
<b>Serial Number</b>	
<b>Manufacture Date</b>	
«We hereby declare that the product complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. This certificate is issued following test carried out on samples of the product referred to above.»	
<b>Quality Inspector's Stamp</b>	

## SELLER INFORMATION

<b>Seller</b>	
<b>Address</b>	
<b>Phone Number</b>	
<b>E-mail</b>	
<b>Purchase Date</b>	
This is to certify delivery of the complete unit with the user's manual.	
<b>Customer's Signature</b>	



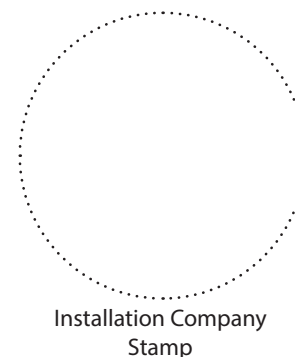
## INSTALLATION CERTIFICATE

VU \_\_\_\_ 2 200 P heat (energy / heat and energy) recovery air handling unit has been connected to power mains pursuant to the requirements stated in the present user's manual.

<b>Company Name</b>		
<b>Address</b>		
<b>Phone Number</b>		
<b>Installation Technician's Full Name</b>		
<b>Installation Date:</b>		<b>Signature:</b>

This is to certify that the works specific to the unit installation has been performed in accordance with all the applicable provisions of local and national construction, electrical and technical codes and standards. The unit operates normally as intended by the manufacturer.

**Signature:**



## WARRANTY CARD

<b>Unit Type</b>	Heat (energy / heat and energy) recovery air handling unit
<b>Model</b>	VU ____ 2 200 P
<b>Serial Number</b>	
<b>Manufacture Date</b>	
<b>Purchase Date</b>	
<b>Warranty Period</b>	
<b>Seller</b>	

