

USER'S MANUAL

VUT V EC A11 Series
VUT VB EC A11 Series
VUE V EC A11 Series
VUE VB EC A11 Series



Heat recovery and heat
and humidity recovery
air handling unit



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The user's manual consisting of the technical details, operating instructions and technical specification applies to the installation and mounting of the heat recovery air handling unit series VUT VB EC A11 and VUT V EC A11 and of the heat and humidity recovery air handling unit series VUE VB EC A11 and VUE V EC A11 (hereinafter «the unit» as mentioned in the «Safety Requirements» and «Manufacturer's Warranty» sections as well as in warnings and information blocks).

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:



WARNING!



DO NOT!

UNIT MOUNTING AND OPERATION SAFETY PRECAUTIONS



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



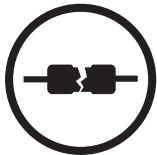
- Unpack the unit with care.



- 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.



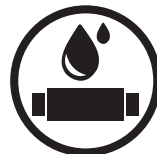
- Do not use damaged equipment or cables when connecting the unit to power mains.



- 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.



- Do not allow children to operate the unit.



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



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



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



- Do not open the unit during operation.



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



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



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



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



- Use the unit only for its intended purpose.



THE PRODUCT MUST BE COLLECTED SEPARATELY AT THE END OF SERVICE LIFE.

DO NOT DISPOSE OF AS UNSORTED MUNICIPAL WASTE.

PURPOSE

The unit is an energy saving unit based on heat recovery technology and is one of the energy saving components used in the buildings and premises. The unit is a component part and is not designed for stand-alone 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 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.

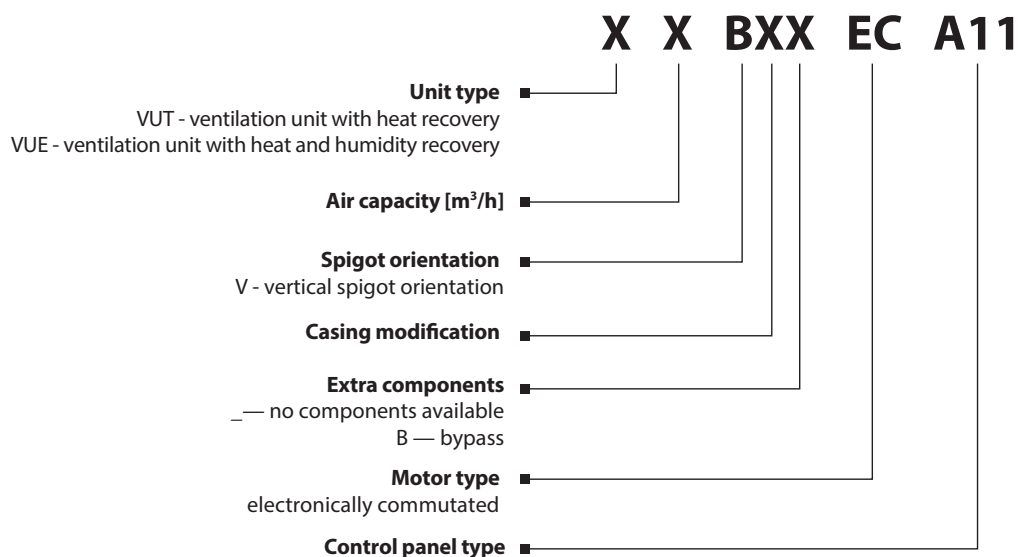
THE CHOICE OF UNIT INSTALLATION LOCATION MUST PREVENT UNAUTHORIZED ACCESS BY UNATTENDED CHILDREN.

Transported air must not contain any flammable or explosive mixtures, evaporation of chemicals, coarse dust, soot and oil particles, sticky substances, fibrous materials, pathogens or any other harmful substances.

DELIVERY SET

Unit	Number
User's manual	1 item
Control panel user's manual	1 item
Control panel	1 item
Outdoor temperature sensor	1 item
Drain pipe	1 item
Packing box	1 item

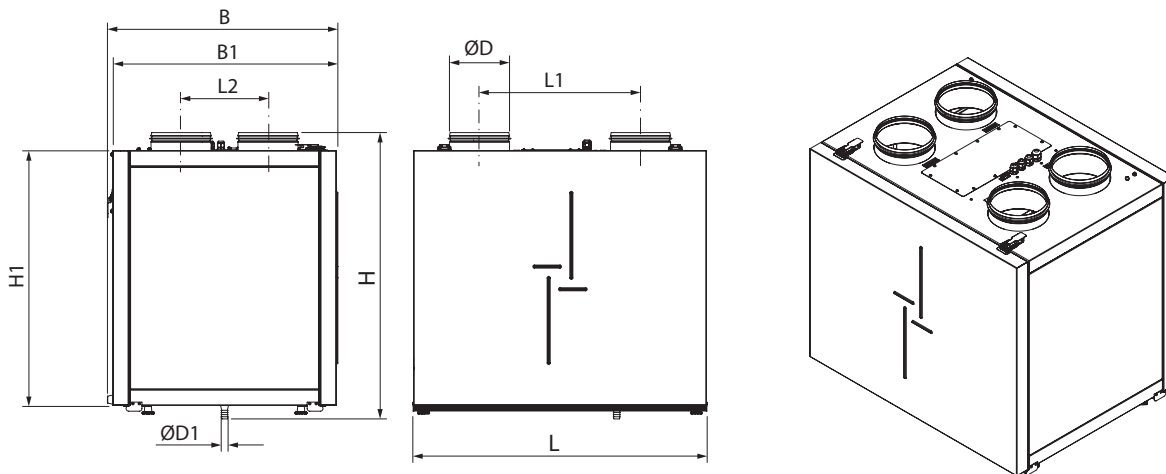
DESIGNATION KEY



TECHNICAL DATA

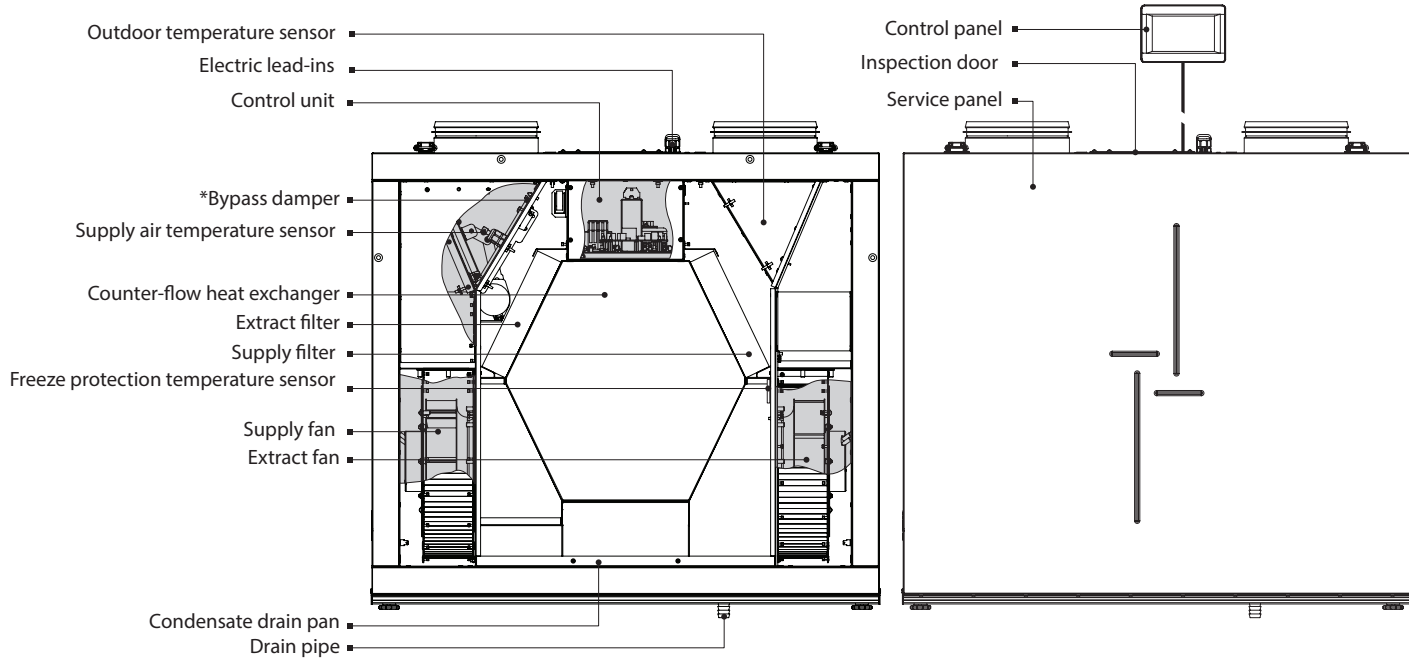
The unit is designed for indoor application with the ambient temperature ranging from +1 °C up to +40 °C and relative humidity up to 80 %.
 Hazardous parts access and water ingress protection rating: IP 44 for the unit motors, IP 22 for the assembled unit connected to the air ducts.
 The unit design is regularly improved, so some models can slightly differ from those ones described in this manual.

Technical data	VUT/VUE 160 VEC A11	VUT/VUE 160 V1 EC A11	VUT/VUE 160 VB EC A11	VUT/VUE 160 V1B EC A11	VUT/VUE 350 VB EC A11	VUT/VUE 350 V1B EC A11	VUT/VUE 300 V2B EC A11	VUT/VUE 550 VB EC A11	VUT/VUE 550 V2B EC A11
Unit voltage [V /50-60 Hz]	1~ 230								
Max. unit power [W]	51	51	51	51	170	170	170	333	370
Max. unit current [A]	0,4	0,4	0,4	0,4	1,3	1,3	1,3	2,3	2,5
Max. air capacity [m³/h]	180	180	180	180	415	415	415	750	625
RPM	3770	3770	3770	3770	3200	3200	3200	3230	3230
Sound pressure level at 3 m distance [dB(A)]	24	22	24	22	28	28	30	28	28
Transported air temperature [°C]	from -25 up to +60								
Casing material	painted steel								
Insulation	20 mm mineral wool	40 mm mineral wool	20 mm mineral wool	40 mm mineral wool	40 mm mineral wool	40 mm mineral wool	20 mm mineral wool	40 mm mineral wool	20 mm mineral wool
Extract filter	G4								
Supply filter	F7								
Heat exchanger type	counter-flow								
Heat exchanger material	polystyrene/enthalpy membrane								
Connected air duct diameter [mm]	Ø 125	Ø 125	Ø 125	Ø 125	Ø 160	Ø 160	Ø 160	Ø 200	Ø 200
Heat recovery efficiency [%]	88-98/80-94	88-98/80-94	88-98/80-94	88-98/80-94	80-89/76-89	84-94/74-90	85-93/76-90	85-88/72-92	73-88/71-92
Weight [kg]	42	47	44	49	66	55	53	83	62



Model	Dimensions [mm]								
	Ø D	Ø D1	B	B1	H	H1	L	L1	L2
VUT/VUE 160 V EC A11	124	18	348	330	650	550	600	388	143
VUT/VUE 160 V1 EC A11	124	18	388	370	680	590	640	388	143
VUT/VUE 160 VB EC A11	124	18	348	330	690	580	600	388	143
VUT/VUE 160 V1B EC A11	124	18	385	370	690	620	640	388	143
VUT/VUE 350 VB EC A11	159	18	610	592	758	675	730	426	230
VUT/VUE 350 V1B EC A11	159	18	488	475	760	673	730	426	190
VUT/VUE 300 V2B EC A11	159	18	465	451	737	634	735	426	190
VUT/VUE 550 VB EC A11	198	18	741	722	758	675	828	493	284
VUT/VUE 550 V2B EC A11	198	18	566	550	737	634	810	493	259

UNIT DESIGN AND OPERATING LOGIC



The unit is equipped with a removable front service panel for maintenance and repair operations. The removable service panel design enables to change the service side location.

The control unit is accessible for mounting and wiring operations through the inspection door on top of the unit. For accessing the control unit remove the service panel after mounting and wiring operations. The control unit is accessible for service operations through the swivel mounting plate. The power cable and ground cable are connected to the control unit via the cable entries. The difference between the supply and extract air flow temperature leads to condensate generation. Condensate is collected in the drain pan and is removed outside through the drain pipe.

The bypass damper is open or closed depending on operation mode of the unit.

*The bypass damper is available for the models VUT/VUE VB EC A11.

Accessories for the unit are available on a separate order:

- **HV1 humidity sensor.** The unit with the installed humidity sensor maintains a set indoor humidity point. As the extract air humidity rises above the set point, the unit fans switch to the maximum speed. As the humidity drops down below the set point the unit fans return to the previous mode. The humidity sensor must be installed and connected by a service technician on site, page 8.
- **NKP duct heater for supply air pre-heating.** The heater maintains the air temperature in the intake air duct at a point that prevents freezing of the heat exchanger. A control system regulates heater operation. Mounting and connection of the heater, see page 8.

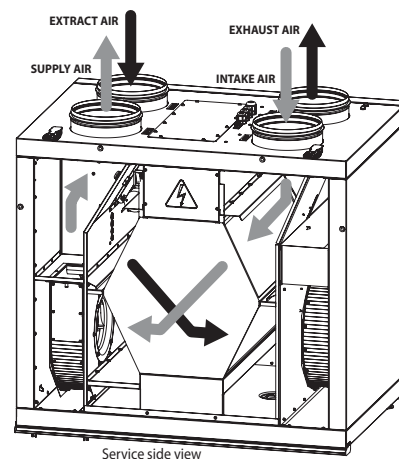
UNIT OPERATION MODES

Heat recovery

Warm extract air from the room flows into the unit and is cleaned in the extract filter. Then the air is moved through the heat exchanger and is exhausted outside with the extract fan.

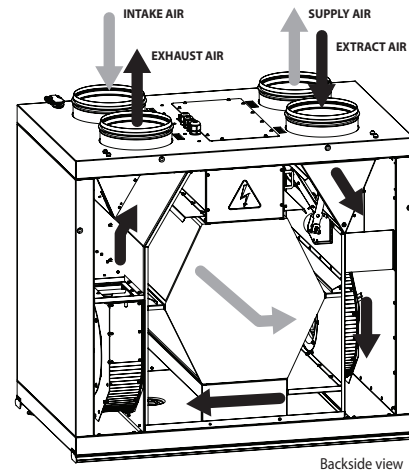
Cold fresh air from outside flows into the unit, where it is cleaned in the supply filter. Then the air flows through the heat exchanger and is moved to the room with the supply fan.

Supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. The air flows are fully separated while flowing through the heat exchanger. Heat recovery minimizes heat losses, which reduces the cost of space heating in the cold season.



Summer cooling mode

The bypass damper is opened, the extract air that is removed from the premises bypasses the heat exchanger. The air stream temperature remains constant.

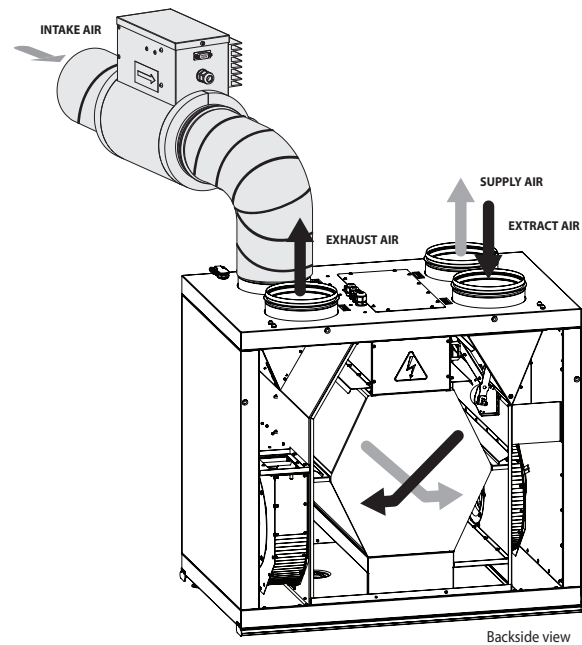
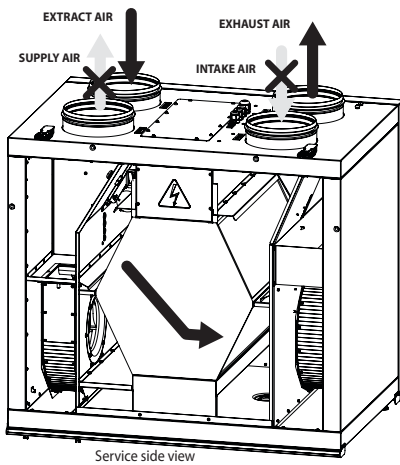


Defrosting mode

The defrosting mode is designed for heat exchanger freezing protection and is activated on feedback from the freeze protection temperature sensor. The temperature sensor is fixed to the inner surface of the extract air duct.

Defrosting procedure is possible in two ways:

- Shutdown of the supply fan. For details, please refer to the user's manual for the control panel. See section «Engineering menu», «Extra options», «Supply fan shutdown».
- Intake air pre-heating with the duct pre-heater NKP (accessory). For details, please refer to the user's manual for the control panel. See section «Engineering menu», «Extra options», «Heating control».



MOUNTING AND SET-UP

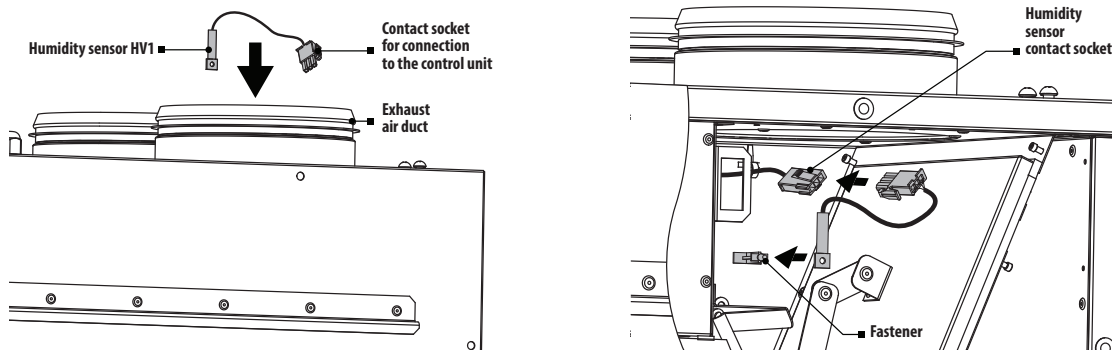


THE UNIT MUST BE MOUNTED BY A QUALIFIED EXPERT ONLY, PROPERLY TRAINED AND HAVING THE REQUIRED TOOLS AND MATERIALS.

HV1 HUMIDITY SENSOR MOUNTING AND CONNECTION

The HV1 humidity sensor is not included in the scope of delivery and should be ordered separately. The humidity sensor must be installed prior to unit mounting.

Install the humidity sensor through the extract spigot into the mount located in the extract section of the casing. Then connect the humidity sensor contact socket to the respective contact socket on the control unit, refer the wiring diagram.



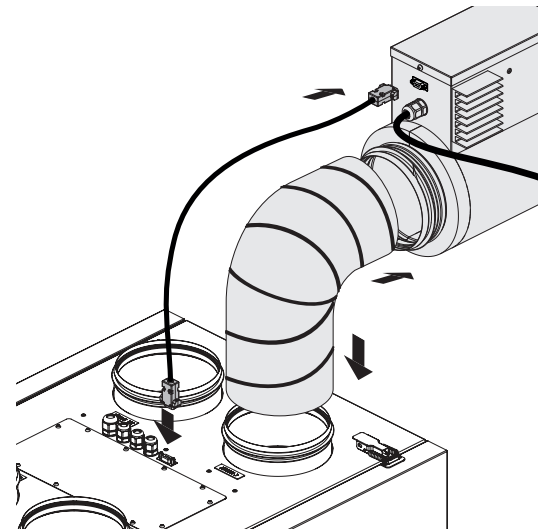
NKP HEATER MOUNTING AND CONNECTION

The NKP pre-heater is not included in the delivery and is available on a separate order.

The heater is rated for connection to single-phase AC 230 V/50 (60) Hz.

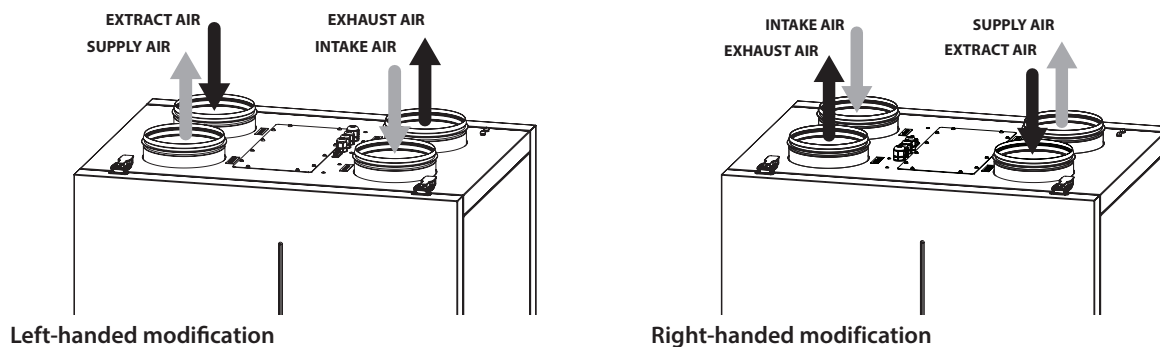
The heater is designed for mounting in the air duct connected with the intake spigot of the unit.

The heater and the air handling unit must be connected via the cable with the DB-9M connectors through the DB-9F connectors on the unit and on the heater.

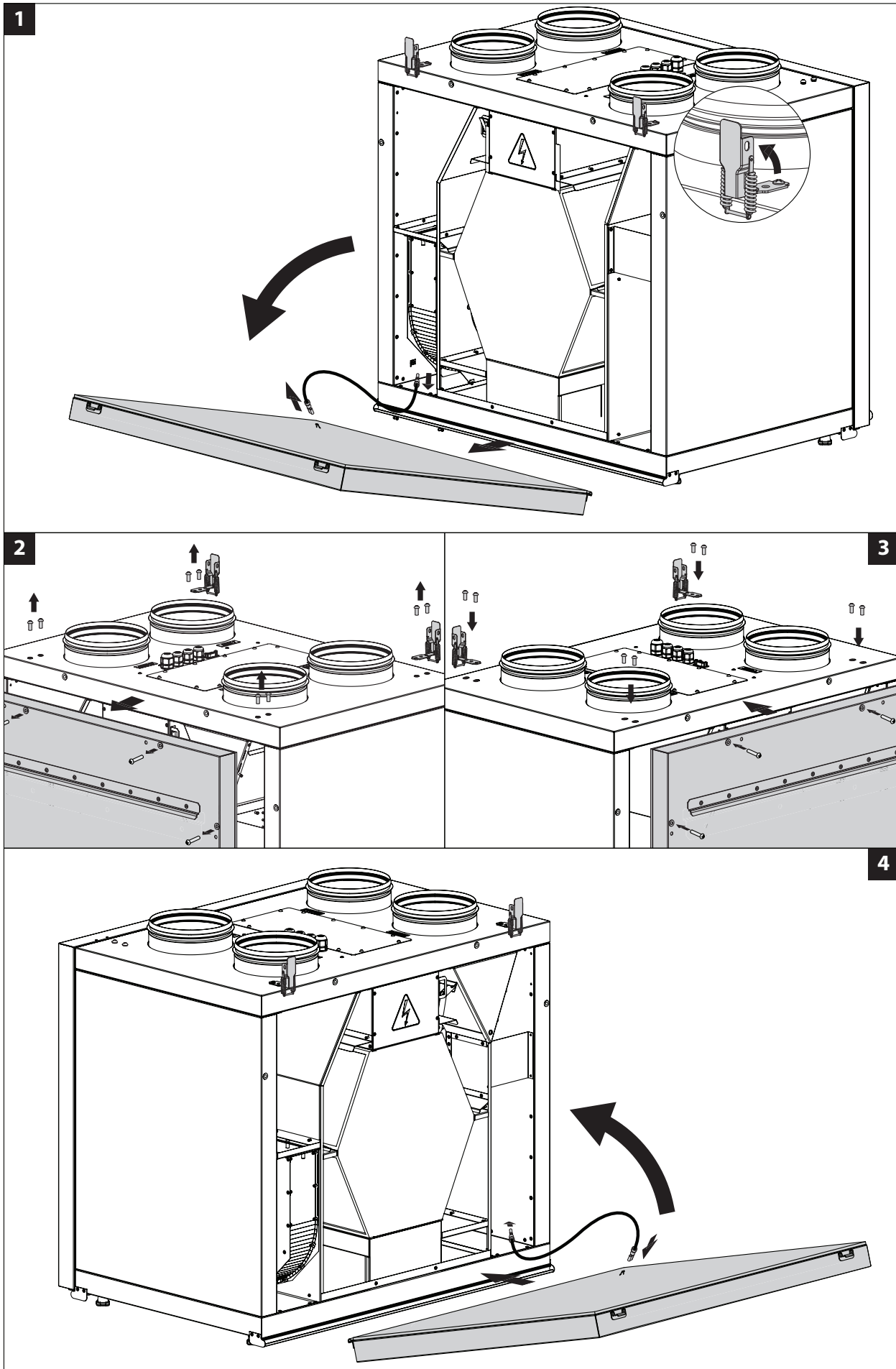


SERVICE SIDE CHANGE

Make sure of the correct unit service side selection. Unit mounting position should enable free access to the service panel for maintenance and service operations.



Service side change for unit mounting:



UNIT MOUNTING

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

Minimum straight air duct length:

- equal to 1 air duct diameter on intake air spigot.
- equal to 3 air duct diameter on supply air spigot.

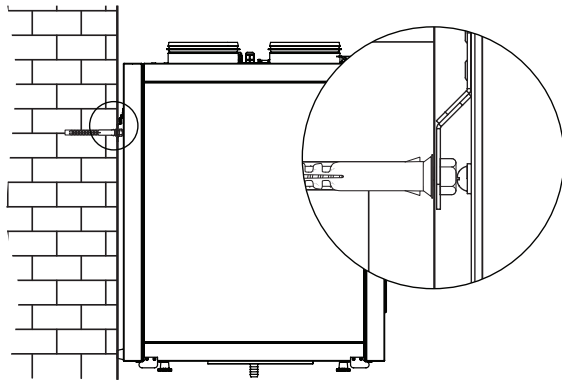
If the air ducts are not connected or the connected air ducts are too short cover the spigots with a protecting grille or other protecting device with mesh width not more than 12.5 mm to prevent uncontrollable access to the fans.

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

Unit wall mounting

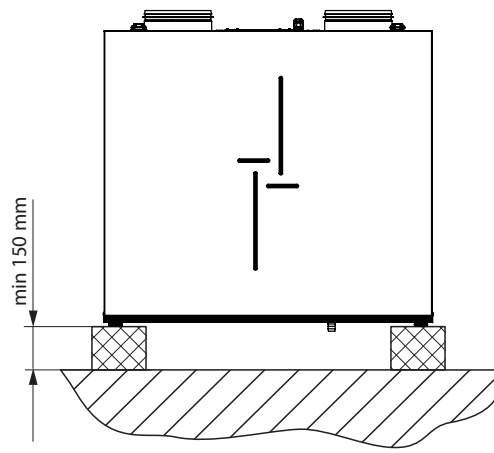
Fasteners for wall-mounting are not included into delivery set and should be ordered separately. While selecting fasteners consider the material of the mounting surface as well as the unit weight. For details, refer Technical Data. Fasteners for unit mounting should be selected by Customer Service technician.

Fix the wall-mounted hook at the required height and hang the unit on the hook.



Unit floor mounting

Install the unit on the pre-set floor supports, minimum 150 mm height, to ensure sufficient access for the drain pipe connection to the U-trap and for condensate drain system mounting.



WALL-MOUNTED CONTROL PANEL INSTALLATION

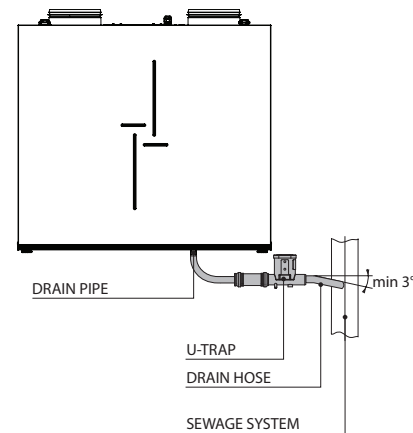
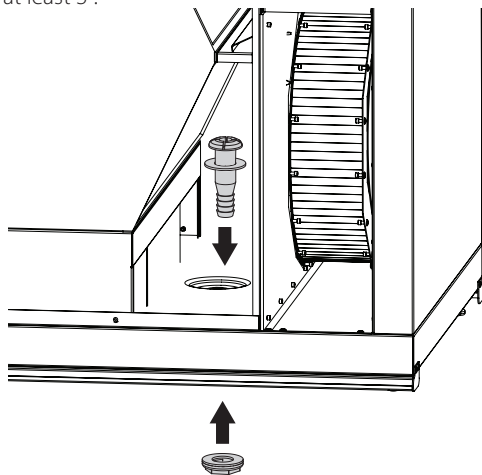
Fixing methods for control panel wall mounting: wall surface mounting and wall flush mounting.

Example of wall flush mounting using a junction box is shown in the control panel user's manual. The junction box and the mounting kit must be purchased separately.

CONDENSATE DRAINAGE

Condensate drainage is required for the unit series VUT VB EC A11 and VUT V EC A11.

The hole for the drain pipe is at the bottom of the unit. Remove the plug from the hole, open the service panel and install the drain pipe from the delivery set into the hole, then connect the drain pipe to the sewage system using the SG-32 U-trap kit (available upon separate order). The pipe slope downwards must be at least 3°.



CONNECTION TO POWER MAINS



DISCONNECT THE UNIT FROM POWER SUPPLY PRIOR TO ANY ELECTRIC INSTALLATION OPERATIONS.

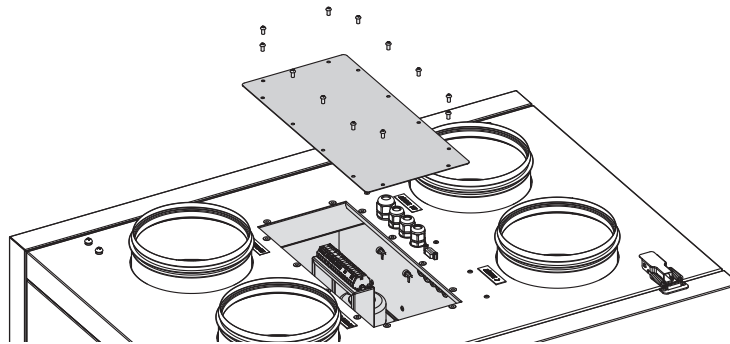
INSTALLATION SHALL ONLY BE PERFORMED BY A PROFESSIONAL ELECTRICIAN QUALIFIED FOR UNASSISTED OPERATIONS WITH ELECTRICAL INSTALLATIONS UP TO 1000 V AFTER CAREFUL STUDY OF THE PRESENT USER'S MANUAL.

THE RATED ELECTRICAL PARAMETERS ARE STATED ON THE RATING PLATE. ANY TAMPERING WITH THE INTERNAL CONNECTIONS IS PROHIBITED AND WILL VOID THE WARRANTY.

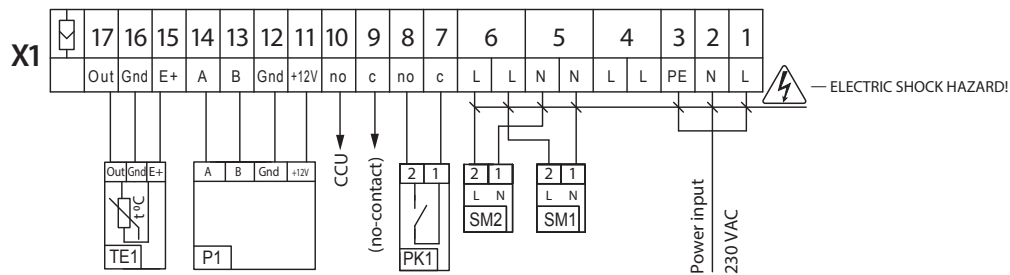
The unit is rated for connection to a single-phase ac 230 V / 50-60 Hz. The unit shall be connected to power supply by means of insulated, durable and thermal-resistant cords (cable, wires). Connect the unit to power mains using the pre-wired power cord with the Euro Plug XP. Connection is made through the external automatic circuit breaker with magnetic trip integrated into the fixed wiring system. The rated current of the circuit breaker must not be below the unit current consumption, refer to the Technical data. The external circuit breaker position must ensure unhampered access for emergency shutdown of the unit.

Connect the cables to the control unit using the electric lead-ins on the top of the unit and make the electric connections through the terminal block X1, located in the control unit, in compliance with the external connections wiring diagram.

Access to the control board of the control unit



External connection wiring diagram



Design.	Description	Type	Wire**
CCU*	DX cooler	N0	2 x 0,75 mm ²
SM1*	Supply air damper actuator	LF230	2 x 0,75 mm ²
SM2*	Exhaust air damper actuator	LF230	2 x 0,75 mm ²
PK1*	Contact from fire alarm panel	N0	2 x 0,75 mm ²
P1	Control panel		
TE1	Outdoor temperature sensor		

* is not included in the delivery.

** Maximum connecting cable length is 20 m!

WARNING! The NKP pre-heater must be connected to power supply prior to connection of the air handling unit!

If the electric heater is not available in the air handling unit while its connection to power supply, the control panel displays DI1 and DI3 errors. To troubleshoot the errors disconnect the unit from power supply, connect the heater and turn the unit on.

UNIT CONTROL

The unit is operated with the control panel. For detailed information, read the control panel user's manual.

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 regular cleaning 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. Replace the filters after two consecutive cleanings. Contact the product Seller to purchase new filters.

2. **Heat exchanger maintenance (once per year).**

Some dust may accumulate on the heat exchanger block even in case of regular maintenance of the filters. To maintain the high heat exchange efficiency, regular cleaning is required. To clean the heat exchanger(s) pull it(them) out of the unit and flush it(them) with warm detergent solution. After cleaning install the dry heat exchanger(s) back to the unit.

3. **Fan maintenance (once per 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. No water and abrasive detergent, sharp objects or solvents are allowed for cleaning to prevent the impeller damage.

4. **Condensate drainage maintenance (once per year).**

The drain pipes may get clogged with the extracted particles. Pour some water inside the drain pan to check the pipe for clogging. Clean the U-trap and the drain pipe if required.

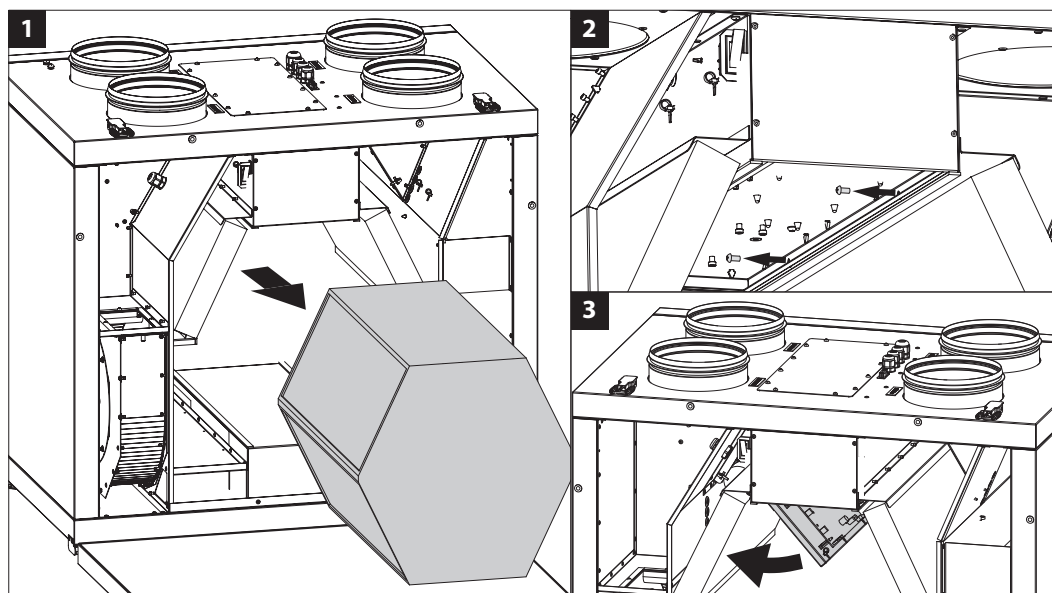
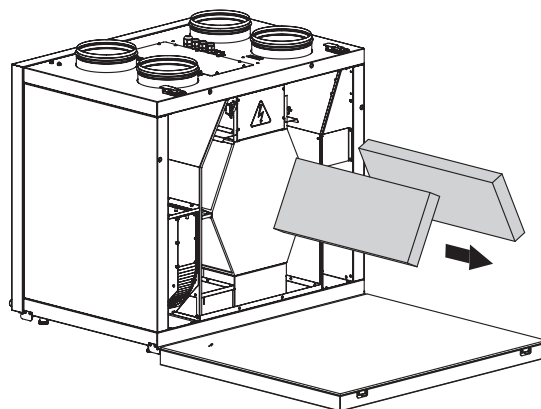
5. **Ductwork system maintenance (once in 5 years).**

Even if you follow all the listed maintenance guidelines, some dust can accumulate inside the air ducts and reduce the unit performance. Duct maintenance means regular cleaning or replacement.

6. **Control unit maintenance (if necessary).**

The control unit maintenance must be performed by an expert qualified for unassisted operations with electrical installations with the voltage up to 1000 V after careful reading of the user's manual.

Access to the control unit for maintenance operations:



TROUBLESHOOTING

Problem	Possible reasons	Troubleshooting
The fan(s) do(es) not get started.	No power supply to the air handling unit.	Make sure the power supply line is connected correctly, otherwise troubleshoot a connection error.
Low air flow.	Contaminated filters, fans or the heat exchanger.	Clean or replace the filters; clean the fan(s) and the heat exchanger.
	Contaminated or damaged ventilation system.	Clean the ventilation system components. Replace damaged components.
Noise, vibration.	Contaminated impeller.	Clean the impellers.
	Loose screw connection in the fan or the casing.	Tighten the mounting screws of the fans or the casing against stop.
Water leakage.	Contaminated, damaged or wrong mounted drainage system.	Clean the drainage system. Check the drain line slope angle. Make sure that the U-trap is filled with water and the drain pipes are frost protected.
DI1 or DI3 errors are displayed on the control panel.	Missing heater during activated heating mode.	Deactivate the heating mode to troubleshoot the alarm indicators. If the errors are still displayed on the control panel, please refer to the product Seller for troubleshooting.

STORAGE AND TRANSPORTATION RULES

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. Fulfil the requirements for transportation of the specified cargo type.

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. Do not expose the unit to sudden changes in temperature. Such changes can lead to condensation of moisture inside the unit and performance disturbance when the unit is switched on. Prior to the initial power-up after transportation at subzero temperatures allow the unit to warm up at room temperature for at least 2 hours.

MANUFACTURER'S WARRANTY

The manufacturer hereby warrants normal operation of the unit over the period of 24 months from the retail sale date provided the user's observance of the transportation, storage, installation and operation regulations.

Should any malfunctions occur during the unit operation due to manufacturer's fault during the warranty period the user is entitled to elimination of faults by means of warranty repair performed by the manufacturer.

The warranty repair includes work specific to elimination of faults in the unit operation to ensure its intended use by the user within the warranty period. The faults are eliminated by means of replacement or repair of the complete unit or the faulty part thereof.

The warranty repair does not include:

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

To benefit from warranty repair the user must provide the unit, the user's manual with stamped sale date 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 provide the unit with the entire delivery package as stated in the user's manual or with missing component parts previously dismantled by the user;
- mismatch of the unit model and make with the respective details 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 casing (excluding external modifications of the unit as required for its installation) and the internal components of the unit;
- alteration of the unit design or engineering changes of the unit;
- replacement and use of the unit 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;
- user's discretionary repair of the unit;
- unit repair performed by any persons not authorized by the manufacturer;
- expiry of the unit warranty period;
- user's violation of the established regulations specific to the unit transportation;
- user's violation of the unit storage regulations;
- wrongful acts against the unit committed by third persons;
- unit breakdown due to circumstances of insuperable force (fire, flood, earthquake, war, hostilities of any kind or blockades);
- missing seals if provided by the user's manual;
- failure to provide the user's manual with the sale 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.



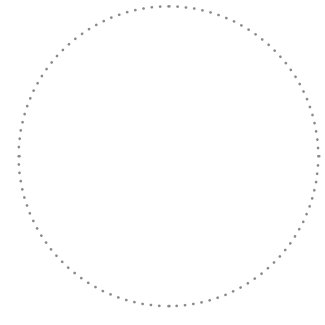
USERS' CLAIMS SHALL BE A SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE SALE DATE STAMP.

ACCEPTANCE CERTIFICATE

Product Type	Heat recovery/heat and humidity recovery air handling unit
Model	<input type="checkbox"/> VUT / <input type="checkbox"/> VUE _____ V___ EC A11
Serial Number	
Manufacturing Date	
<p>is compliant with the technical specifications and is hereby declared ready for service. is compliant with the technical specifications and is hereby declared ready for service. 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.</p>	
Quality Inspector's Stamp	

SELLER INFORMATION

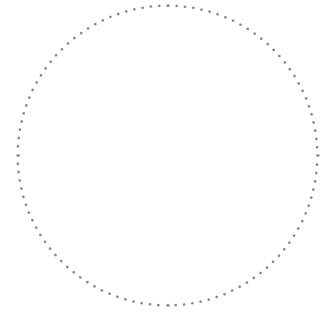
Shop name	
Address	
Phone number	
E-mail	
Sales date	
<p>This is to certify delivery of the complete unit with the user's manual. The warranty terms are acknowledged and accepted.</p>	
Customer's signature	



Seller's seal

CONNECTION CERTIFICATE

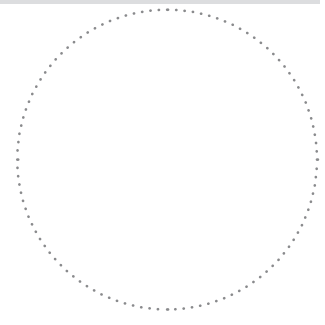
<p>The unit has been connected to power mains pursuant to the requirements stated in the present user's manual.</p>	
Company name	
Address	
Phone number	
Installation technician's full name	
Installation date:	Signature:
<p>This is to certify that the works specific to the unit installation has been 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.</p>	
Signature:	



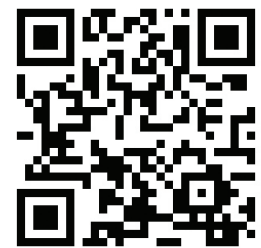
Installation technician's
company seal

WARRANTY CARD

Product type	Heat recovery/heat and humidity recovery air handling unit
Model	<input type="checkbox"/> VUT / <input type="checkbox"/> VUE _____ V___ EC A11
Serial number	
Manufacturing date	
Sales date	
Warranty period	
Sales company	



Seller's seal



V106-2EN-06