

USER'S MANUAL

Air handling unit with heat (energy, heat and energy) recovery

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



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INTRODUCTION

The present user's manual contains technical description, data sheet, installation and mounting guidelines for the air handling unit with heat (energy, heat and energy) recovery VU...2 250 PU EC (hereinafter referred as the unit).

USE

The unit is designed to ensure continuous mechanical air exchange in houses, offices, hotels, cafés, conference halls, and other utility and public spaces as well as to recover the heat energy contained in the air extracted from the premises to warm up the filtered stream of supply air.

The unit is not intended for organizing ventilation in swimming pools, saunas, greenhouses, summer gardens, and other spaces with high humidity.

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 stand-alone operation.

It 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).

Relative humidity of transported air must not exceed 80 % at an ambient temperature of +20 °C.



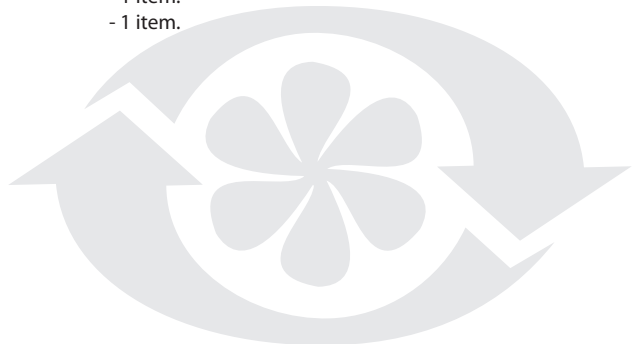
The unit is not designed to be used by children, physically or mentally disabled persons, persons with sensory disorder, persons with no appropriate experience or expertise.

The unit can be operated by qualified experts after appropriate instruction about its use and operation.

Install the unit to be out of reach of unattended children.

DELIVERY SET

- Unit - 1 item;
- User's operation manual - 1 item;
- Packing box - 1 item.
- Control panel - 1 item.



STRUCTURAL DESIGNATION KEY

VUXX2 250 PU EC
Motor type

Electronically commutated

Spigot orientation

U - angular (versatile)

Design features

P - suspended mounting

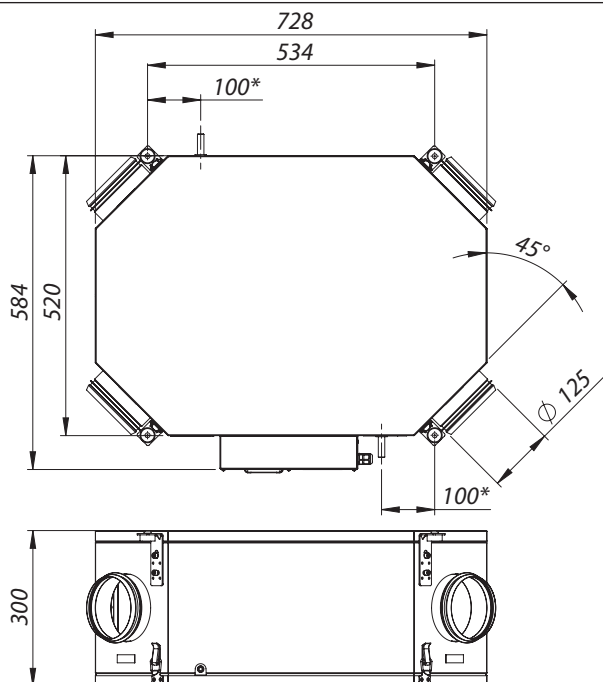
Air capacity [m³/h]**Number of heat exchangers , items****Unit type**

VUT - heat recovery ventilation;

VUE - energy recovery ventilation (enthalpy);

VUTE - heat and energy recovery ventilation.

MAIN TECHNICAL DATA



* - only for the units VUT2 250 PU EC and VUTE2 250 PU EC

Fig. 1. Overall and connecting dimensions of the unit

The unit is designed for indoor application at the ambient temperature ranging from +1°C up to +40°C and relative humidity up to 80%.

In order to prevent condensation on the internal walls of the units, it is necessary that the surface temperature of the casing is 2-3 °C higher than the dew point temperature of the transported air.

Ingress Protection (IP) rating from solid objects and liquids:

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

The unit overall and connecting dimensions, external view, technical data are shown in fig. 1 and in table 1.

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

Table 1. Technical parameters of the unit

Model	VU..2 250 PU EC		
Ventilation mode	MIN	NORMAL	MAX
Unit voltage, 50 Hz [V]	1 ~ 230		
Max. fan power [W]	26	66	135
Fan current [A]	0,20	0,48	0,87
Max. air capacity [m ³ /h]	90	170	275
Rotation speed [min ⁻¹]	1310	1930	2650
Noise level, 3 m [dB(A)]	25	32	38
Max. transported air temperature [°C]	from -25 up to +40 °C		
Casing material	Painted steel		
Insulation	20 mm mineral wool		
Filter: extract / supply	panel filter G4		
Connected duct diameter [mm]	ø 125		
Weight [kg]	25		
Heat recovery efficiency	up to 88%		
Heat exchanger type	cross-flow, 2 items		

SAFETY PRECAUTIONS

While operating and mounting the unit consider the requirements of the present operation manual as well as general requirements of all applicable local and national building and electrical codes and standards.

The unit must be grounded!

Before connecting the unit to power mains make sure that the unit is free of any visible damages or any other foreign objects inside the casing that can damage the impeller blades. Otherwise please contact your Seller.



Warning!

Disconnect the unit from power supply prior to any mounting, servicing, connection or repair operations with the unit.

**Do not!**

- **Do not operate the unit beyond the specified temperature range or in an aggressive and explosive medium!**
- **Do not connect clothes dryers or similar equipment to the ventilation system!**
- **Do not operate the unit in the air and dust mixture medium!**

DESIGN AND OPERATING LOGIC

The unit has the following operating logic (fig. 2):

Warm stale extract air from the room flows through the air ducts to the unit, is purified in the extract filter and is supplied to the heat exchanger and exhausted outside by the extract fan.

Clean cold air from outside is moved by supply fans to the unit where from it is directed to the supply filter. Then cleaned air flows through the heat exchanger and is moved by the supply fan to the room along air ducts.

Thermal energy of warm extract air is transferred to clean intake fresh air from outside and warms it up. The air flows are fully separated.

Heat recovery minimizes thermal energy losses, energy demand and operating costs for air heating accordingly.

The unit design and operating logic are shown in fig. 2.

The basic unit modification includes:

1. Extract impeller.
2. Supply impeller.
3. Plate cross-flow heat exchanger.
4. Extract filter, G4 filter class
5. Supply filter, G4 filter class
6. Drain pan:
 - for the unit VUT2 250 PU EC - 2 items.
 - for the unit VUTE2 250 PU EC - 1 item.
 - no drain pan for the unit VUE2 250 PU EC.
7. Condensate drain pipe:
 - for the unit VUT2 250 PU EC - 2 items.
 - for the unit VUTE2 250 PU EC - 1 item.
 - no drain pipe for the unit VUE2 250 PU EC.
8. Control unit.

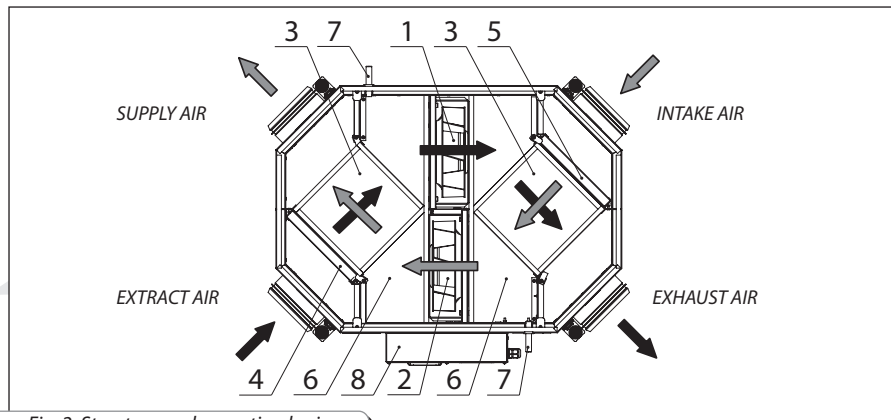


Fig. 2. Structure and operating logic

MOUNTING AND SET-UP

Mount the unit to provide enough access for maintenance or repair operations. The unit may be suspended to the ceiling on the threaded rod that is fixed inside the dowel (fig. 3).

Pre-install the anchor bolts (M8).

Install an anchor bolt into the fixation for the ceiling suspension mount and fix it with nuts and washers.

Make sure of no foreign objects (e.g., foil or paper) inside the unit casing before installation.

To attain the best performance of the unit while mounting connect a straight 1 m duct section on both sides of the unit.

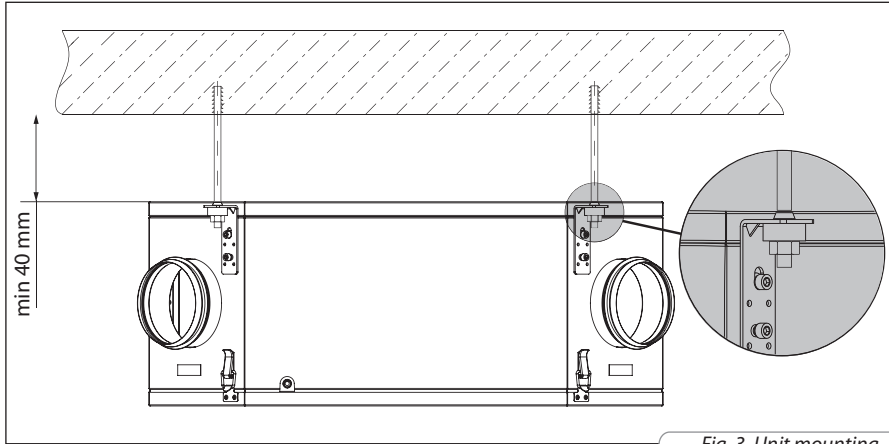


Fig. 3. Unit mounting

CONDENSATE DRAINAGE

The drain pan inside the heat recovery section is equipped with drain pipes to remove condensate outside.

Connect the condensate drain pipe 1, U-trap 3 (not included into delivery set) and the drainage system (5) with metal, plastic or rubber tubes (2 and 4). The tubes must be sloped down by min. 3 °. Before starting the unit fill the system with water and check that U-trap is always filled with water. Make sure that the water drainage is correct. Wrong connection to drainage system may result in condensate accumulation and outflow to the premise.



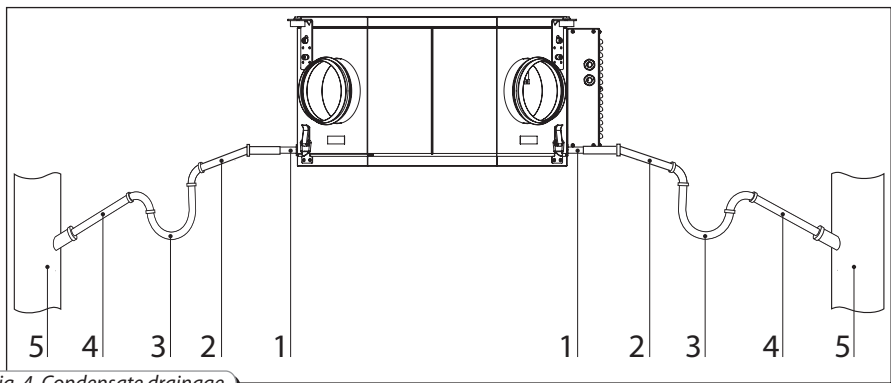


Fig. 4. Condensate drainage

The condensate drainage system is designed for operation at the ambient temperature above 0 °C. If the ambient temperature is below 0 °C, the condensate drainage system must be thermally insulated and pre-heated.

CONNECTION TO POWER MAINS



Disconnect the unit from power mains prior to any operations with it. Connect the unit to a properly installed and earthed socket. The rated electric parameters of the unit are shown on the rating plate. Any internal connection modifications are not allowed and void warranty.

The unit is rated for connection to single-phase ac 230 V / 50 Hz power mains. Connect the unit to power mains through a pre-wired power cable with Euro Plug.

Connect the unit to power mains through the external automatic thermal-magnetic circuit breaker integrated into the fixed wiring system. The circuit breaker rated current must be not less than 2 A.



UNIT CONTROL

The unit is controlled from a control panel (fig. 5).

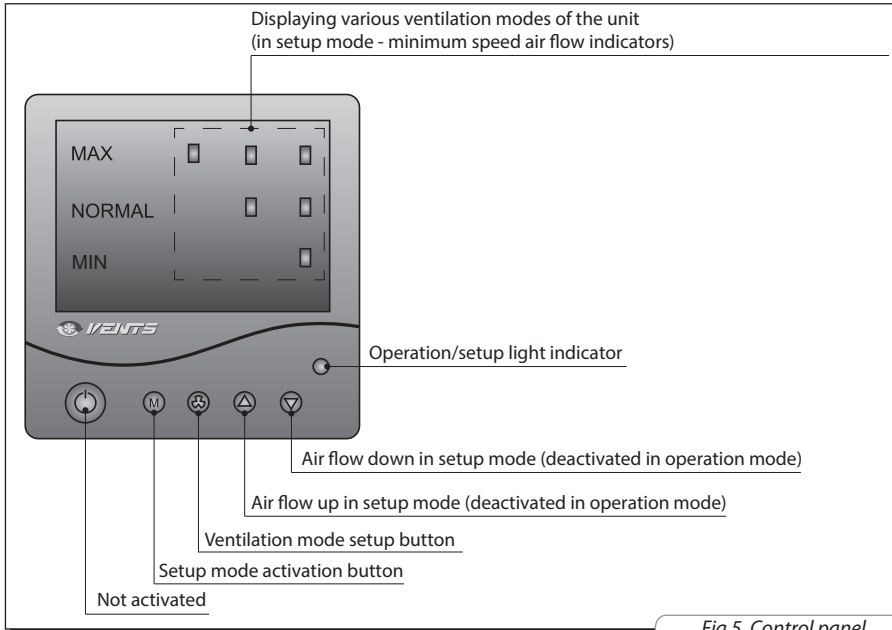


Fig.5. Control panel

1. Ventilation mode control

The unit has three operation modes:

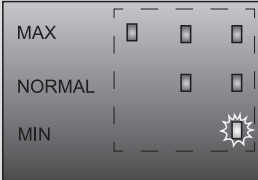
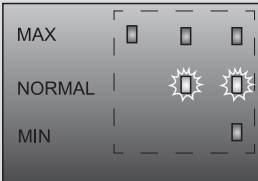
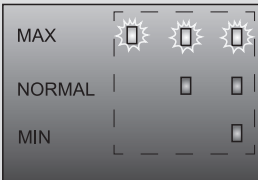
- MIN - main ventilation mode. Air flow is set in setup mode in compliance with the data in table 3, refer item 2, Setup mode);
- NORMAL - air flow is by 80 m³/h higher as compared to MIN mode. The unit reverts to MIN mode in 30 minutes;
- MAX - air flow in this mode is maximum for this unit.

The ventilation modes are indicated in accordance with table 2.


To switch the ventilation modes press the button . The ventilation modes are switched in cycles.





Table 2





Mode	Combination of light indicators	Operation mode
MIN		Minimum air flow. Time is not limited.
NORMAL		Minimum air flow + 80 m ³ /h. Time 30 min.
MAX		Maximum air flow. Time is not limited.

2. Setup mode.

To enter the setup mode, press and hold the button  (fig. 5) at least for 10 seconds until the operation/setup light indicator changes from green to red.



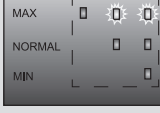

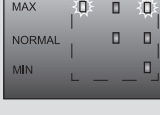
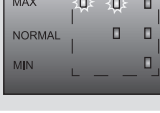

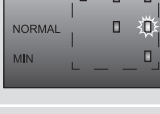

The light indicators of the main operation modes will display the minimum air flow of the first unit speed according to table 3.

To change air flow, press the button  to increase or the button  to decrease the parameter. Set air flow is displayed by six light indicators for the main ventilation modes only if operation/setup light indicator glows.

To exit from the setup mode press the button  or  once again. Exit from the setup mode is performed automatically 60 seconds after last pressing of the button  or . The operation/setup light indicator changes from red to green.

After exit from the setup mode the last set minimum air flow will be saved in nonvolatile memory of the unit even after power supply cutoff.

Table 3

No [s/n]	Indication	Air flow [m ³ /h]
1		90
2		105
3		120
4		135
5		150
6		165
7		180
8		195
9		210

3. Control panel connection.

The control panel view on power input connector side is shown in fig. 6

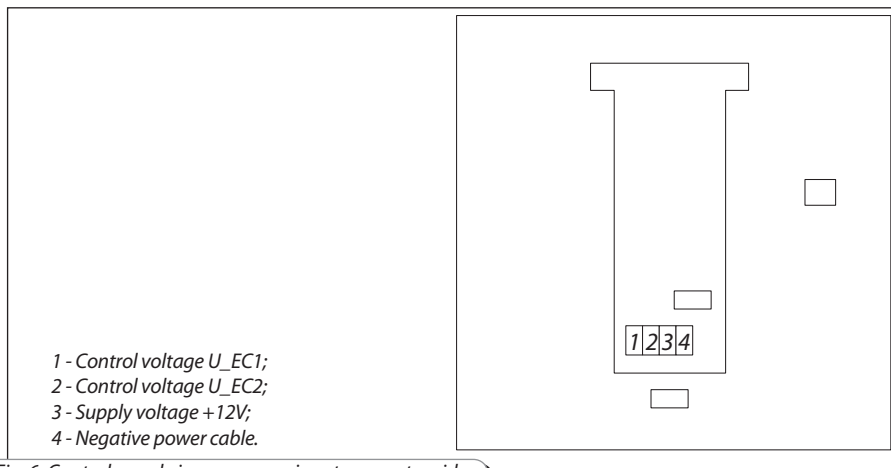


Fig. 6. Control panel view on power input connector side

Electric wiring diagram of the unit is shown in fig. 7.

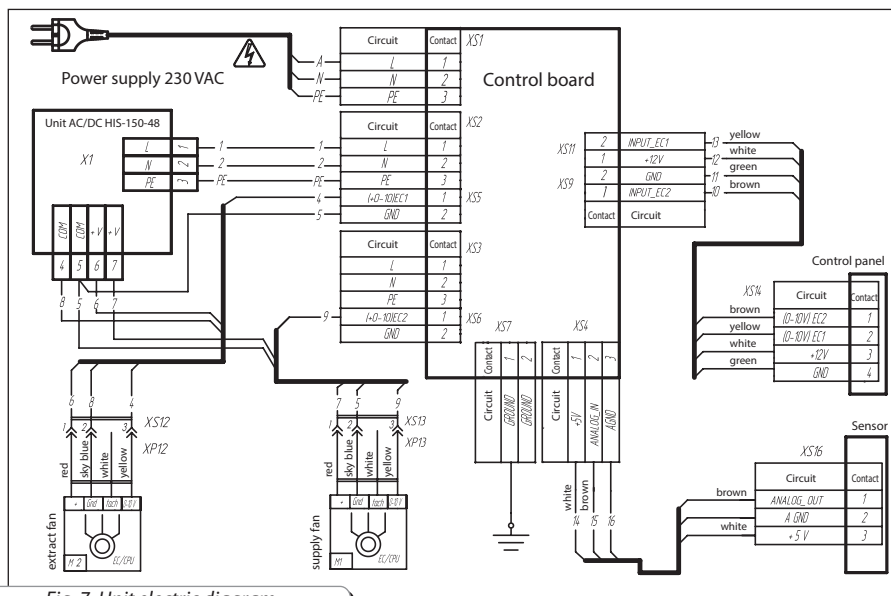


Fig. 7. Unit electric diagram

4. Heat exchanger freezing protection.

The unit is equipped with the heat exchanger freezing protection. It turns the supply fan off if the temperature in the exhaust air duct drops below +5°C. The supply fan is turned on after the air temperature in the exhaust fan rises above +5°C.

TECHNICAL MAINTENANCE

The unit requires maintenance works 3-4 times per year. Maintenance includes regular cleaning and the following operations:

1. Filter maintenance (3-4 timed per year).

Dirty filters increase air resistance in the system and reduce supply air volume. Clean the filters as required but at least once in 3-4 months. Clean the filters with a vacuum cleaner or replace with a new filter. Contact your local manufacturer representative for new filters.

To remove the filters, follow the procedures shown in fig. 8:

1. Open the latches and remove the bottom panel.
2. Turn the latches and remove the condensate drain pan(s).
3. Turn the latches and remove the filters.
4. Turn the latches and remove the heat exchangers.

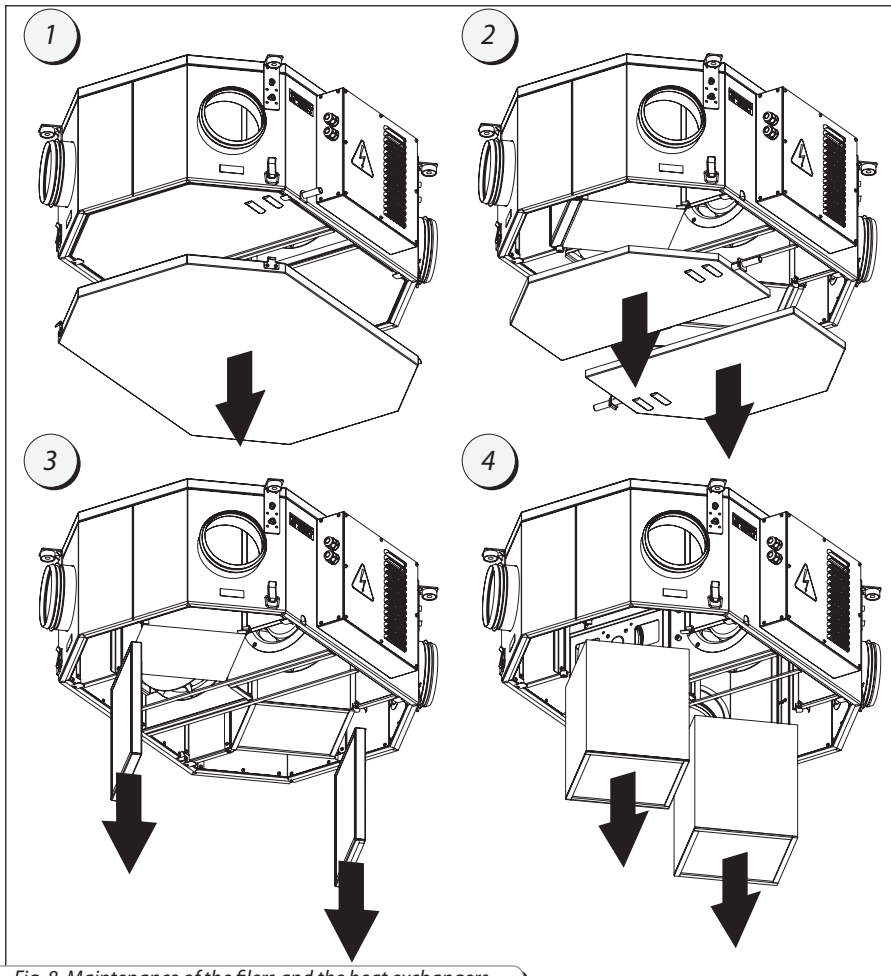


Fig. 8. Maintenance of the filters and the heat exchangers

2. Heat exchanger inspection (once per year).

Some dust can get accumulated 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 pull it out of the unit and flush it with warm soap or mild detergent water solution. Re-install the dry heat exchanger to the unit.

3. Fan inspection (once per year).

Even in case of regular filter maintenance, some dust and grease can get accumulated 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 (once per year).

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

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

Leaves and other pollutions can clog the supply air grille and reduce the unit performance and supply air volume. Check the supply grille twice per year and clean it as required.

6. Ductworks inspection (once in 5 years).

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

7. Control unit maintenance (as required).

Maintenance of the control unit must be performed by a qualified electrician duly authorized for unassisted electric operations up to 1000 V. Read the user's manual prior to the control unit servicing!

While servicing the control unit (fig. 9):

1. Remove eight screws that fix the control unit cover.
2. Remove the control unit cover.

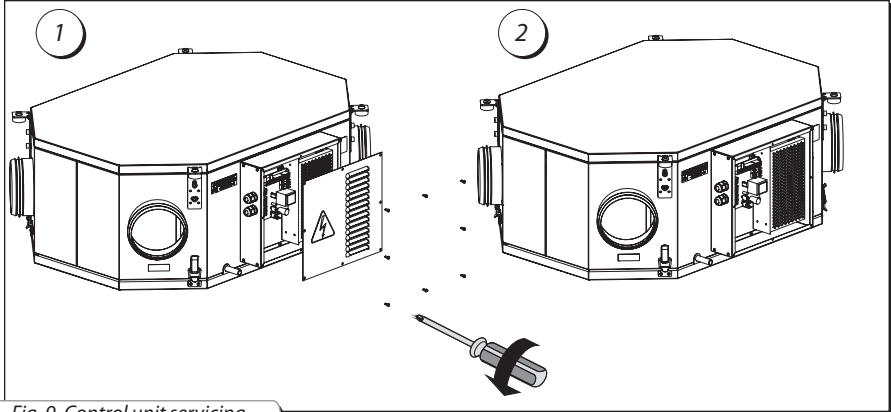


Fig. 9. Control unit servicing

FAULT HANDLING
Possible faults and fault handling

Problem	Possible reasons	Fault handling
The fan(s) do(es) not get started	No power supply.	Make sure the power supply line is connected correctly, otherwise troubleshoot the connection error.
Cold supply air.	The extract filter is soiled.	Clean or replace the extract filter.
	The heat exchanger is frozen.	Check the heat exchanger for icing. Shutdown the unit if required and turn it on after the freezing danger is no longer imminent.
Low air flow.	The filters, the fans are soiled, the heat exchanger is soiled.	Clean or replace the filters; clean the fan(s) and the heat exchanger.
	The ventilation system is soiled or damaged.	Make sure that the diffusers and louvre shutters are closed; check the exhaust hood and the supply grille and clean those if required; make sure that the air ducts are not soiled and not damaged.
Noise, vibration.	The fan impellers are soiled.	Clean the fan impellers.
	Loose screw tightening of the fans.	Check the screw tightening.
Water leakage.	The drain system is soiled, damaged or wrong arranged or wrong slope angle of the unit toward the drain system.	Clean the drain system. Check the drain slope angle. Make sure that the U-trap is filled with water and the drain pipes are frost protected.



STORAGE AND TRANSPORTATION RULES

Store the unit in the manufacturer's original packing box in a closed ventilated premise with temperature range from +10°C up to +40°C and relative humidity less than 80% (at +20°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. Fulfill the requirements for transportation of the specified cargo type during cargo-handling operations.

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

Manufacturer hereby guarantees normal performance of the unit during two years from the date of retail sale provided compliance with transport, storage, mounting and operation regulations. In case of no confirmation of the sales date the warranty period is calculated from the manufacturing date.

In case of failures in the unit operation during the warranty period the manufacturer will accept reclamations and complaints from the owner of the device only after receiving technically sound act with detailed description of the failure.

Unit damage as a result of unauthorized tampering with the circuit diagram is not a warranty case.

For warranty and post-warranty services of the unit please contact the product manufacturer. In case of warranty claim please submit the present user's manual with the seller's stamp, filled connection certificate and warranty card.

Warranty repair services (provided that the warranty card and the seller's stamp and the present user's manual) and post-warranty services are fulfilled at the manufacturing facility.



WARRANTY CLAIMS ARE ACCEPTED WITH THIS USER'S MANUAL AND FILLED CONNECTION CERTIFICATE ONLY.



The MANUFACTURER is not responsible for any mechanical or physical damages resulting from the manual requirements violence, the unit misuse or gross mechanical effect.

Fulfill the requirements set in the user's manual to ensure proper functioning of the unit.



