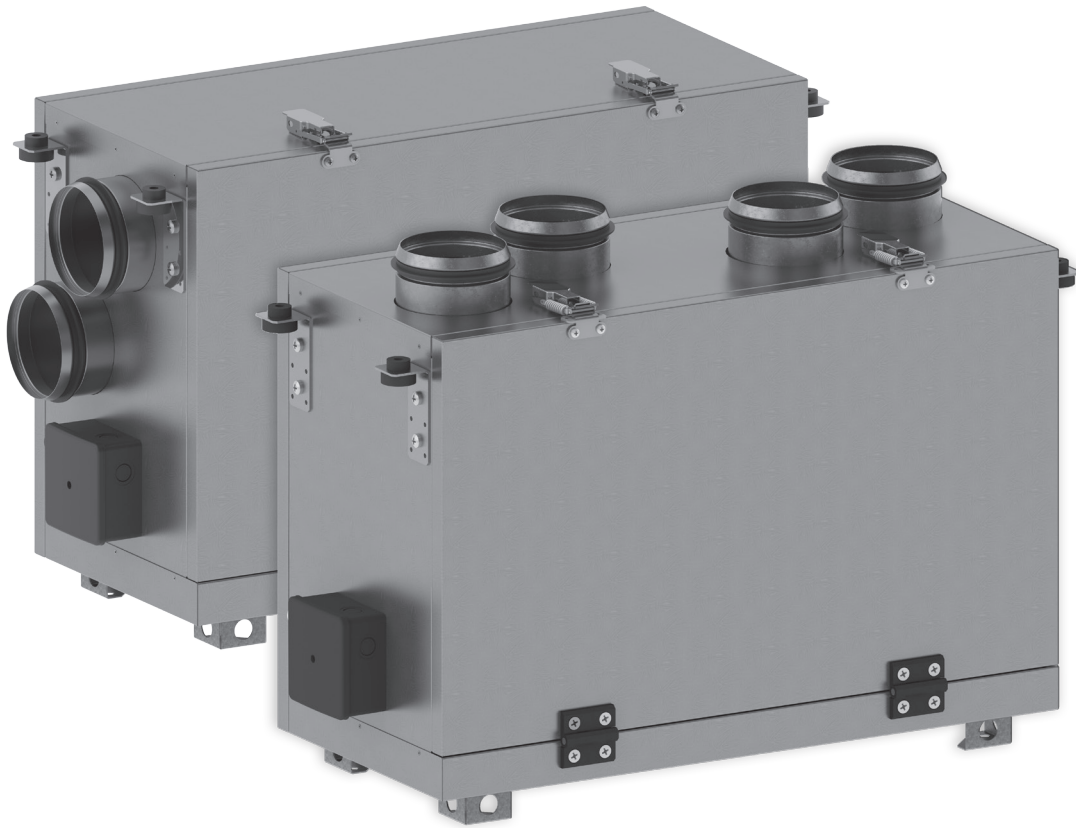


VUT V mini
VUT H mini



HEAT RECOVERY AIR HANDLING UNIT

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SAFETY REQUIREMENTS

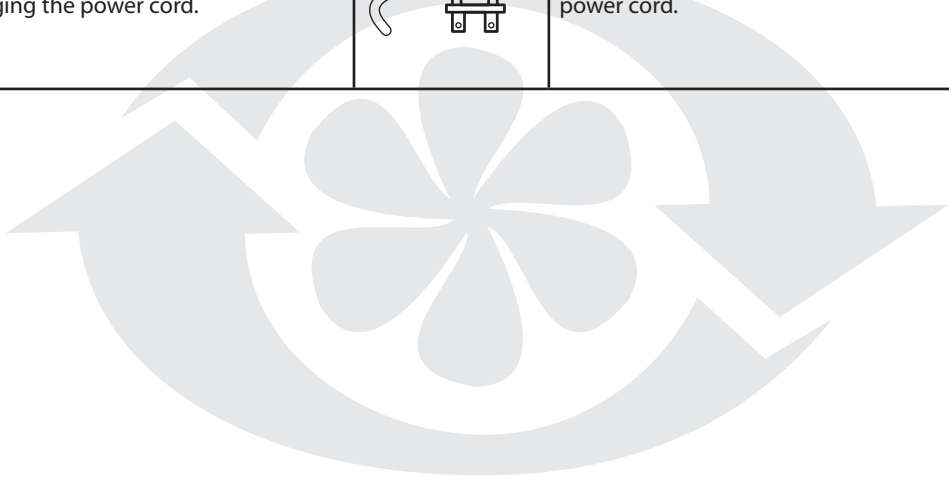
- Read the user's manual carefully prior to the operation and installation of the heat recovery air handling unit, hereinafter the unit.
- Installation and operation of the unit shall be performed in accordance with the present user's manual as well as the provisions of all the applicable local and national construction, electrical and technical codes 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 safety regulations may result in an injury or unit damage.
- Read the manual carefully and keep it as long as you use the unit.
- While transferring the unit control the user's manual must be turned over to the receiving operator.

Symbol legend used in the manual:


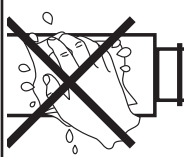
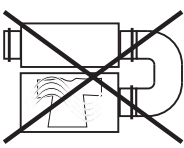


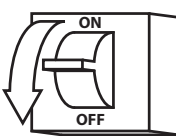
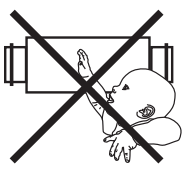

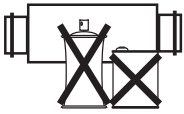
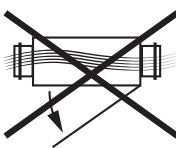
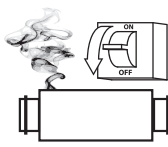
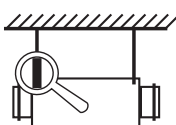
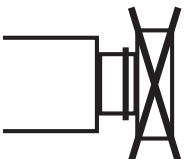
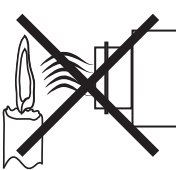
	WARNING!
	DO NOT!

UNIT MOUNTING SAFETY PRECAUTIONS

	The unit must be disconnected from the power supply prior to every installation or repair operation.		The unit must be grounded!
	The unit must not be operated outside the temperature range stated in the user's manual or in aggressive or explosive environments.		Do not use damaged equipment or conductors to connect the unit to power mains.
	While installing the unit follow the safety regulations specific to the use of electric tools.		Unpack the unit with care.
	Do not change the power cord length at your own discretion. Do not bend the power cord. Avoid damaging the power cord.		Do not position any heating devices or other equipment in close proximity to the unit power cord.



UNIT OPERATION SAFETY PRECAUTIONS

	Do not touch the unit speed controller or the control panel with wet hands. Do not carry out the unit maintenance with wet hands.		Do not wash the unit with water. Protect the unit electric parts from water ingress.
	Use the unit only as intended by the manufacturer. Do not connect a clothes dryer or other similar equipment to the ventilation system.		Do not put any water containers on the unit. i.e. flower vases.
	Do not sit on the unit and do not put any objects on it.		Disconnect the unit from power supply prior to maintenance.
	Do not let children operate the unit.		Do not damage the power cable while operating the unit. Do not put any objects on the power cable.
	Keep combustible gases and inflammable products away of the unit.		Do not open the operating unit.
	In case of unusual sounds, smoke disconnect the unit from power supply and contact the service centre.		During long-term operation of the unit periodically check the mounting for reliability.
	Do not block the air duct when the unit is on.		Do not let air flow from the unit be directed to the open flame devices or candles.

INTRODUCTION

This user's manual includes technical description, operation, installation and mounting guidelines, technical data for the heat recovery air handling unit VENTS VUT... mini, hereinafter the unit.

USE

The heat recovery unit is designed to save heat energy by means of heat energy utilization and is one of the energy saving components used in buildings and premises.

The unit is a component unit and is not designed for independent operation.

The unit enables continuous air exchange by means of mechanical ventilation in private residences, offices, hotels, cafes, conference rooms as well as recovery of the waste heat energy contained in the extract air to warm up the clean supply air.

The unit is rated for continuous operation always connected to power mains.

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.



THE UNIT IS NOT INTENDED TO BE USED BY CHILDREN, PHYSICALLY OR MENTALLY DISABLED PERSONS, PERSONS WITH SENSORY DISORDER, PERSONS WITH NO APPROPRIATE QUALIFICATION.

ANY OPERATIONS WITH THE UNIT MUST BE PERFORMED ONLY BY PROPERLY QUALIFIED PERSONNEL AFTER THE APPROPRIATE SAFETY BRIEFING.

THE UNIT INSTALLATION SITES MUST PREVENT ACCESS BY UNATTENDED CHILDREN.

DELIVERY SET

- Unit - 1 item;
- RS-1-400 speed controller - 1 item;
- User's manual - 1 item;
- Packing box - 1 item.

DESIGNATION KEY

VUT XXX X mini

Spigot orientation:

V - vertical;
H - horizontal.

Air capacity [m³/h]

200, 300

Unit type:

VUT - heat recovery ventilation

TECHNICAL PARAMETERS

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%.

The unit is classified as a class I electric appliance.

Hazardous parts access and water ingress protection standard:

- Unit motors - IP 44;
- Unit assembly connected to air ducts - IP 22.

Main overall and connecting dimensions, outer view and technical parameters are shown in fig. 1 and tables 1,2.

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

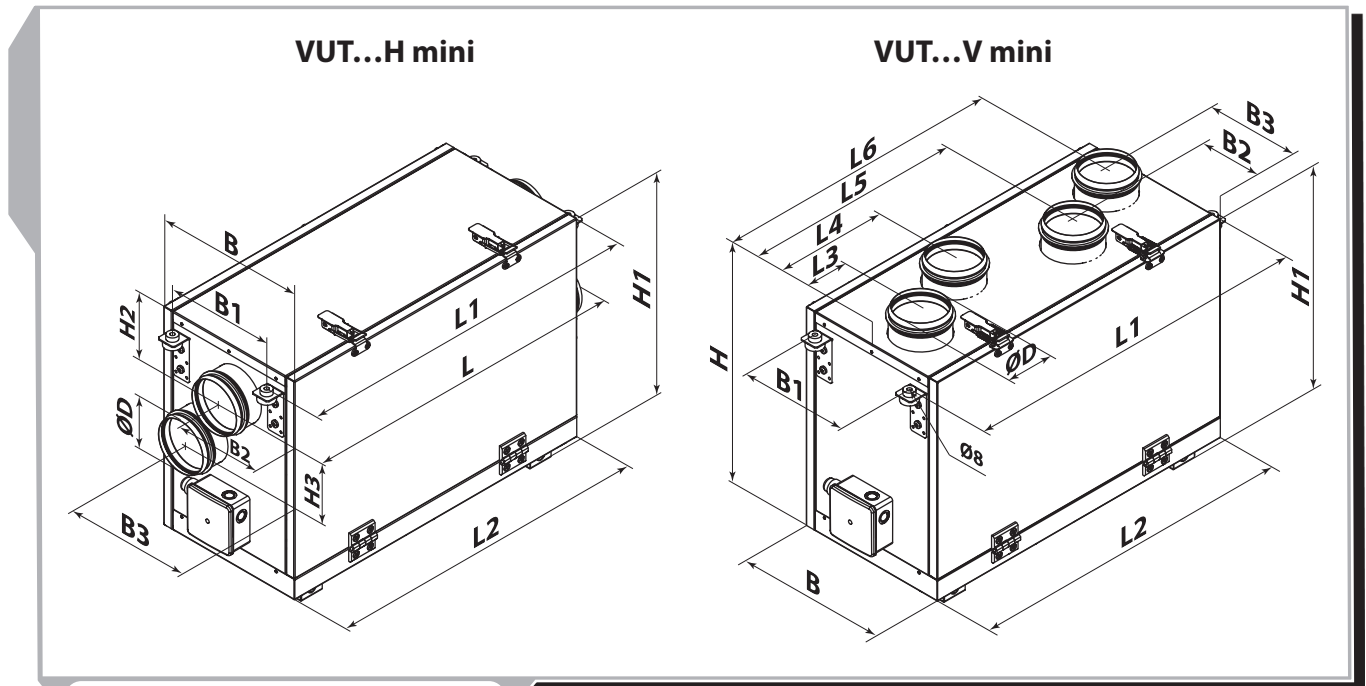


Fig. 1. Unit overall dimensions

Table 1. Unit overall dimensions

Model	Dimensions [mm]										
	ØD	B	B1	B2	B3	H1	H2	H3	L	L1	L2
VUT 200 H mini	99	278	200	121	192	431	84	107	699	640	600
VUT 300 H mini	124	278	200	139	139	431	89	207	699	640	600

Model	Dimensions [mm]												
	ØD	B	B1	B2	B3	H	H1	L1	L2	L3	L4	L5	L6
VUT 200 V mini	99	278	200	109	169	450	431	640	600	73,5	204	396	529
VUT 300 V mini	124	278	200	100	178	450	431	640	600	74	210	390	526

Table 2. Technical characteristics

	VUT 200 H mini	VUT 200 V mini	VUT 300 H mini	VUT 300 V mini
Supply voltage, 50 Hz [V]	1~ 230		1~ 230	
Max. fan power [W]	2 items x 58		2 items x 58	
Fan current [A]	2 items x 0.26		2 items x 0.26	
Total unit power [W]	116		116	
Total unit current [A]	0.52		0.52	
Max. air capacity [m ³ /h]	200		300	
RPM [min ⁻¹]	2500		2500	
Noise level, 3 m, [dB(A)]	24-45		28-47	
Max. transported air temperature [°C]	-25 up to +50		-25 up to +50	
Casing material	zinc aluminium		zinc aluminium	
Insulation	20 mm min. wool		20 mm min. wool	
Filter:	G4 panel type		G4 panel type	
Replaceable filter*	SF VUT mini G4		SF VUT mini G4	
Summer block*	VL VUT mini		VL VUT mini	
Connected air duct diameter [mm]	Ø100		Ø125	
Weight [kg]	30		30	
Heat recovery efficiency	up to 85%		up to 85%	
Heat exchanger type	Cross flow		Cross flow	
Heat exchanger material	aluminium		aluminium	

*extra replaceable filter sets and summer blocks are the specially ordered items and are available upon separate order

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, where it is filtered, then air flows through the heat exchanger and is exhausted outside by the extract fan through the air ducts.

Clean cold air from outside is moved by the supply fan to the supply filter of the air handling unit. Then filtered air flows through the heat exchanger and is moved by the supply filter to the room through the air ducts.

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, energy demand and operating costs for air heating accordingly.

The air handling unit construction includes specially designed and sealed service panels for repair and preventing operations. The terminal block on the side panel incorporates a terminal block. Power and ground cables are connected to the terminal block through the sealed electric lead-ins.



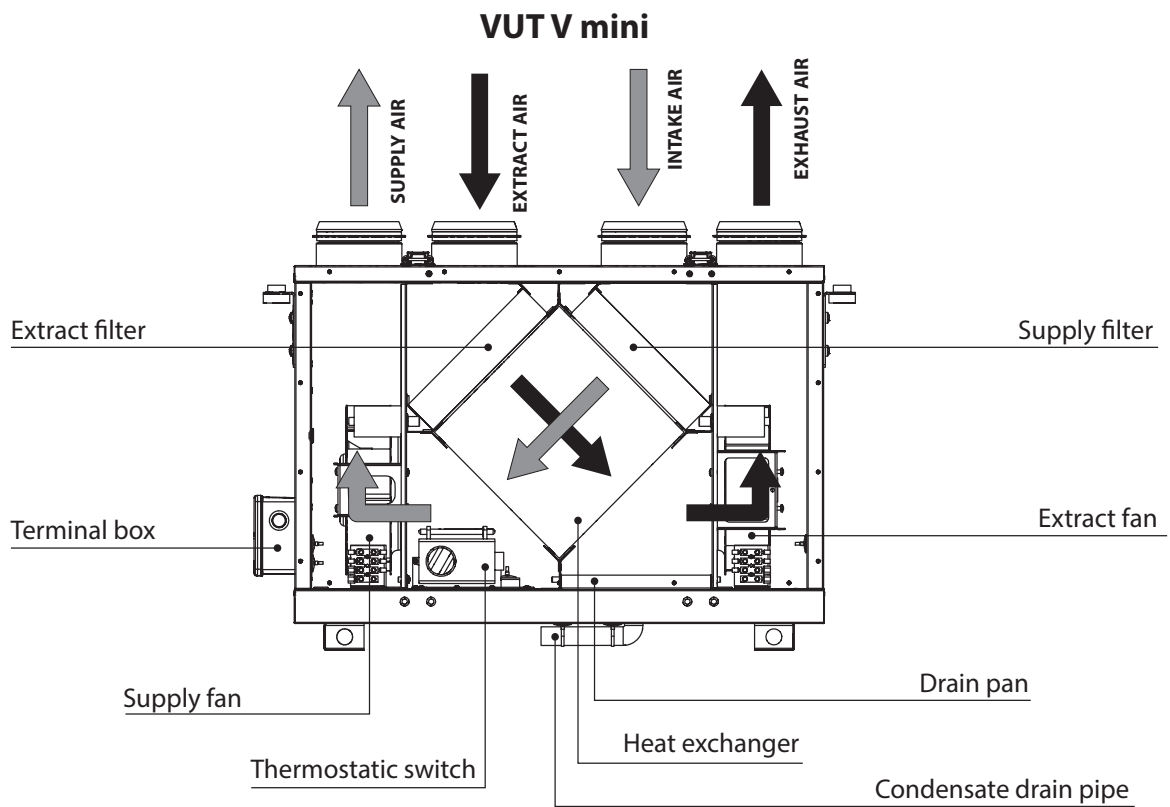
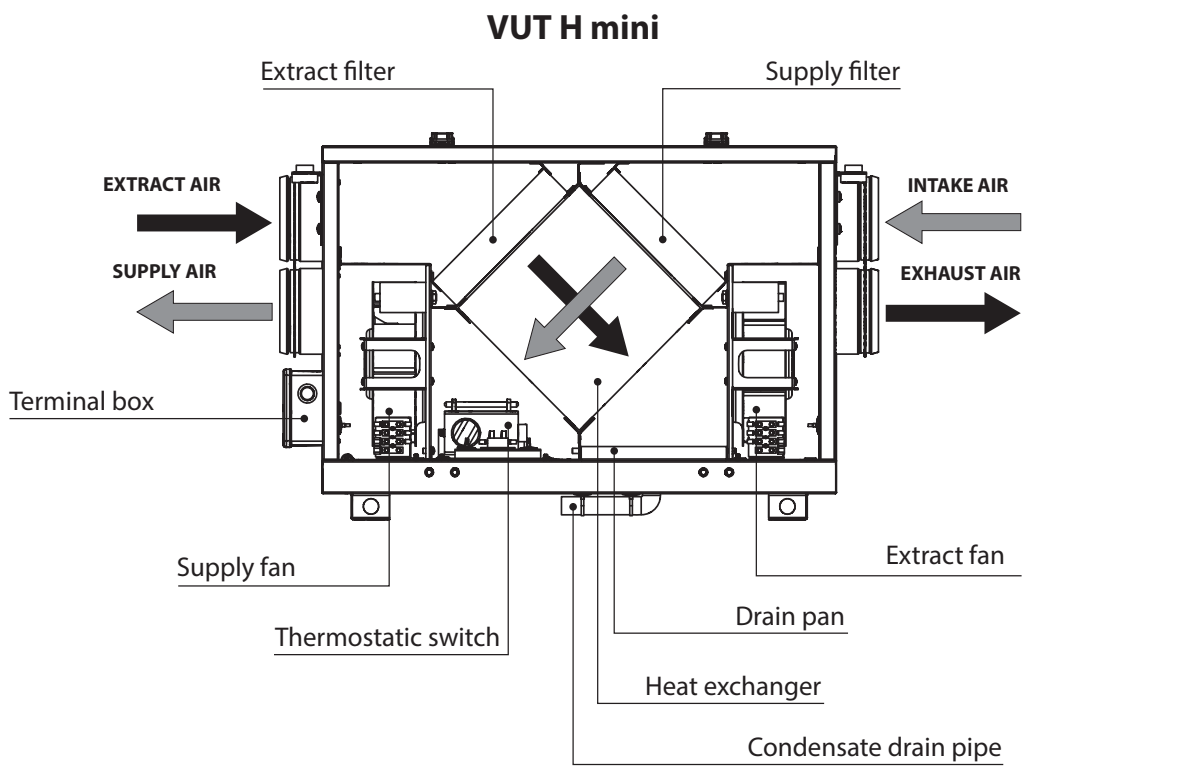


Fig. 2. Design and operating logic

MOUNTING AND SET-UP

The unit is designed for suspended mounting by means of the threaded rods fixed in the threaded dowel pin. The unit is also suitable for rigid fixation on a horizontal plane, fig. 3-5.

While mounting the unit provide the minimum required access to the unit for maintenance and repair. The required minimum distances from the unit to the wall is shown in fig. 3-5.

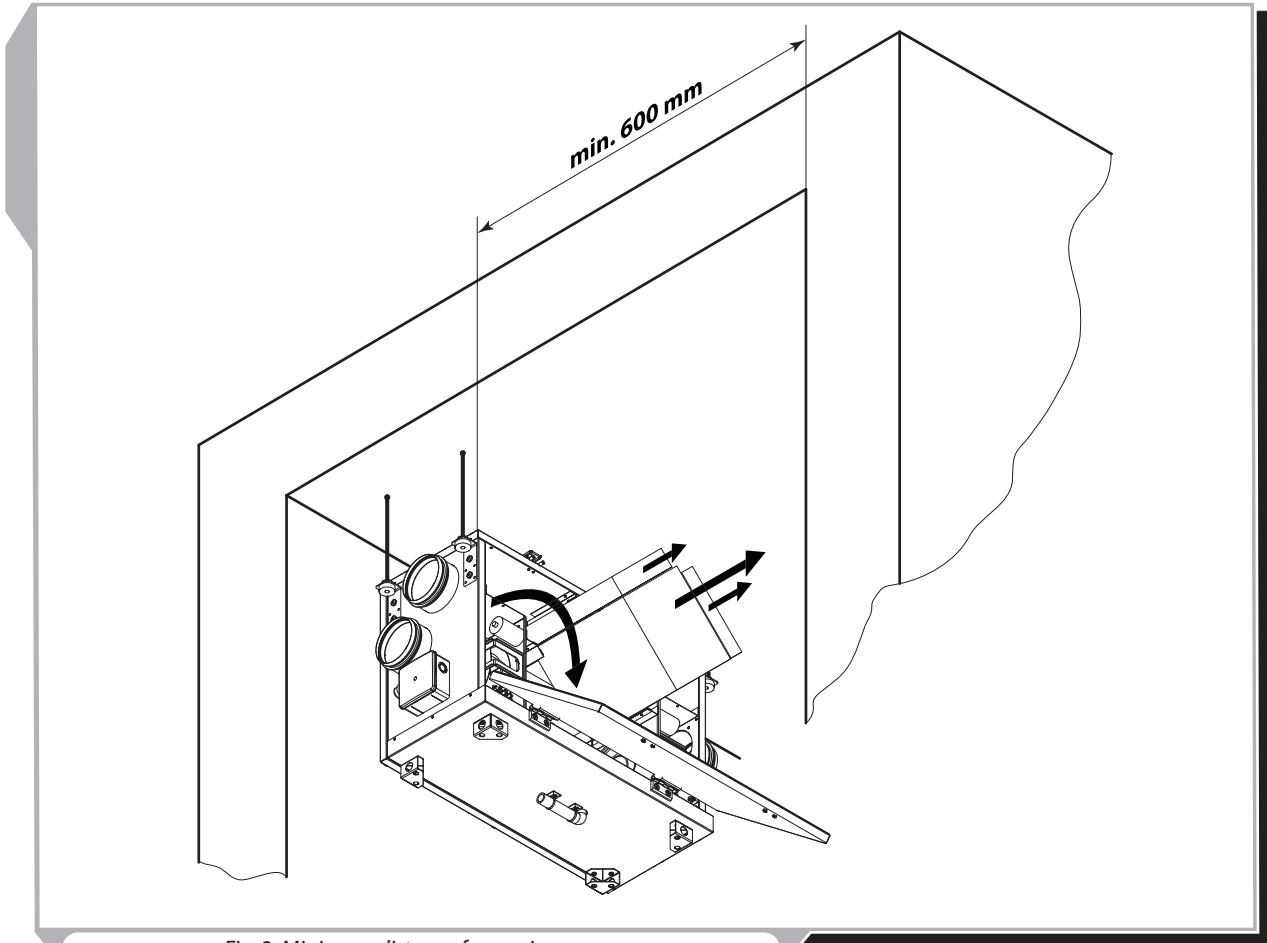


Fig. 3. Minimum distance for service access

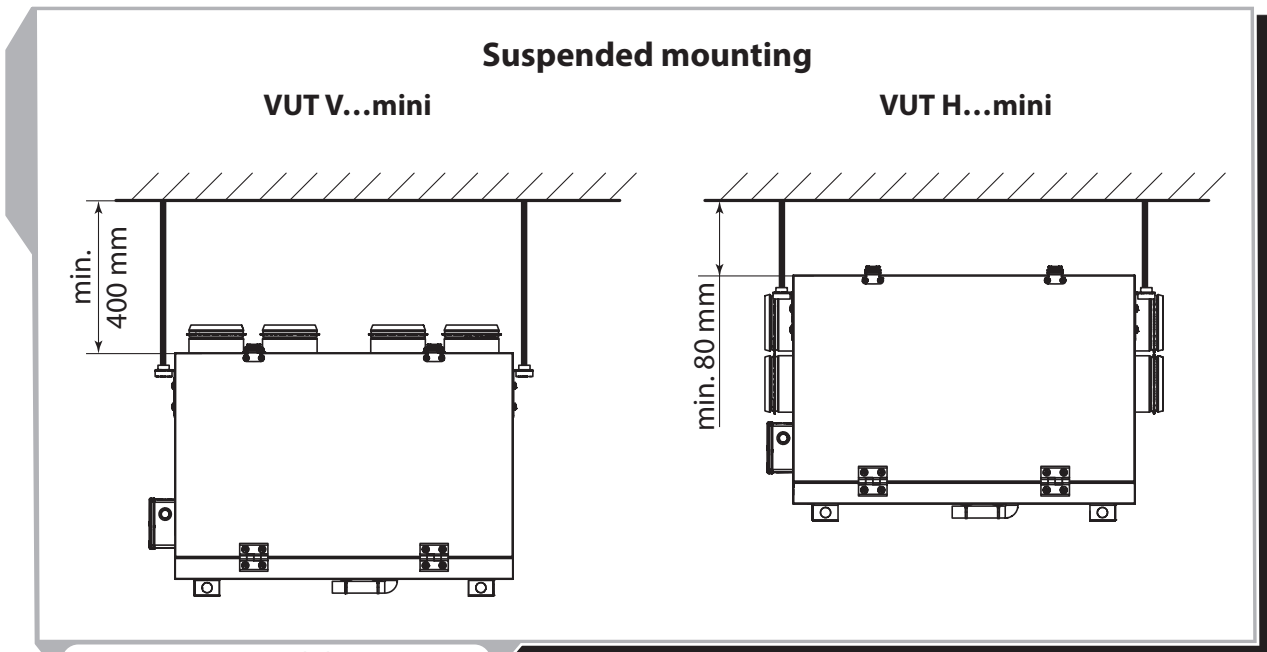


Fig. 4. Unit suspended mounting.

Mounting on a horizontal plane

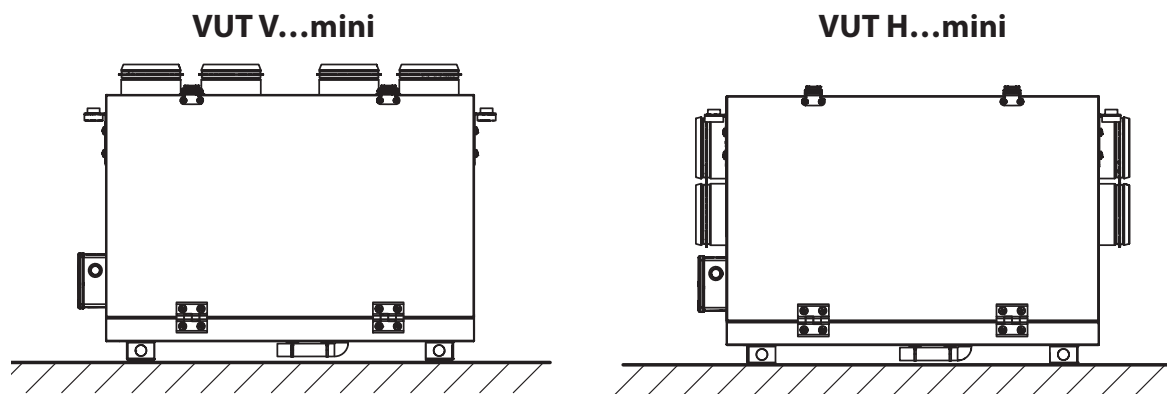


Fig. 5. Unit mounting on a horizontal plane

Safety precautions:

The unit is designed for mounting on a rigid and stable structure. Prior to mounting check the technical specifications and the unit weight.

The unit is mounted with anchor bolts. Make sure that a mounting construction has sufficient load capacity matching the unit weight. Otherwise reinforce an installation place by beams, etc. Then insert the threaded rods fixed inside the threaded expansion anchors in the ceiling. If mounting construction has insufficient rigidity the unit can generate abnormal noise and resonate with the ceiling.

While mounting the unit ensure enough access for the unit servicing and provide an inspection hole for servicing of the filters, heat exchangers and the fans. Each unit must be serviced by the individual hole. For more details, refer to the outline drawing, fig. 1.

Install M8 anchor bolts. Install an anchor bolt M8 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.

If the bolts used for the unit mounting are too short, the unit may generate abnormal noise and resonate with the ceiling.

If the unit connection place to the spiral seam duct is supposed to be the source of abnormal noise, install a flexible air duct instead of the flexible one. Normally this measure is enough to troubleshoot the resonance.

Optionally the flexible connectors may also be used to prevent resonating.

Access to the unit must be prevented by installing a protecting grille or any other device with the mesh width up to 12.5 mm.

CONDENSATE DRAINAGE

Connect the unit to the drain system, fig. 6.

Connect the pipe, U-trap (not included in delivery package) and sewage collection system with metal, plastic or rubber connecting pipes and. The pipe slope downwards must be at least 3°. Fill up the system with water before connecting the unit to the power mains! The U-trap must be filled with water at all times during the unit operation. Make sure that the water flows freely into the sewage collection system or otherwise condensed water may build up in the unit during the heat exchanger operation.

The condensate drainage system is designed for normal operation in premises with air temperatures above 0 °C.

If the expected air temperatures are below 0 °C the condensate drainage system must be equipped with heat insulation and pre-heating facilities.



DO NOT CONNECT SEVERAL DRAIN PIPES FROM SEVERAL AIR HANDLING UNITS TO ONE U-TRAP!

DIRECT CONDENSATE OUTSIDE WITHOUT CONNECTION TO DRAIN SYSTEM IS NOT ALLOWED!

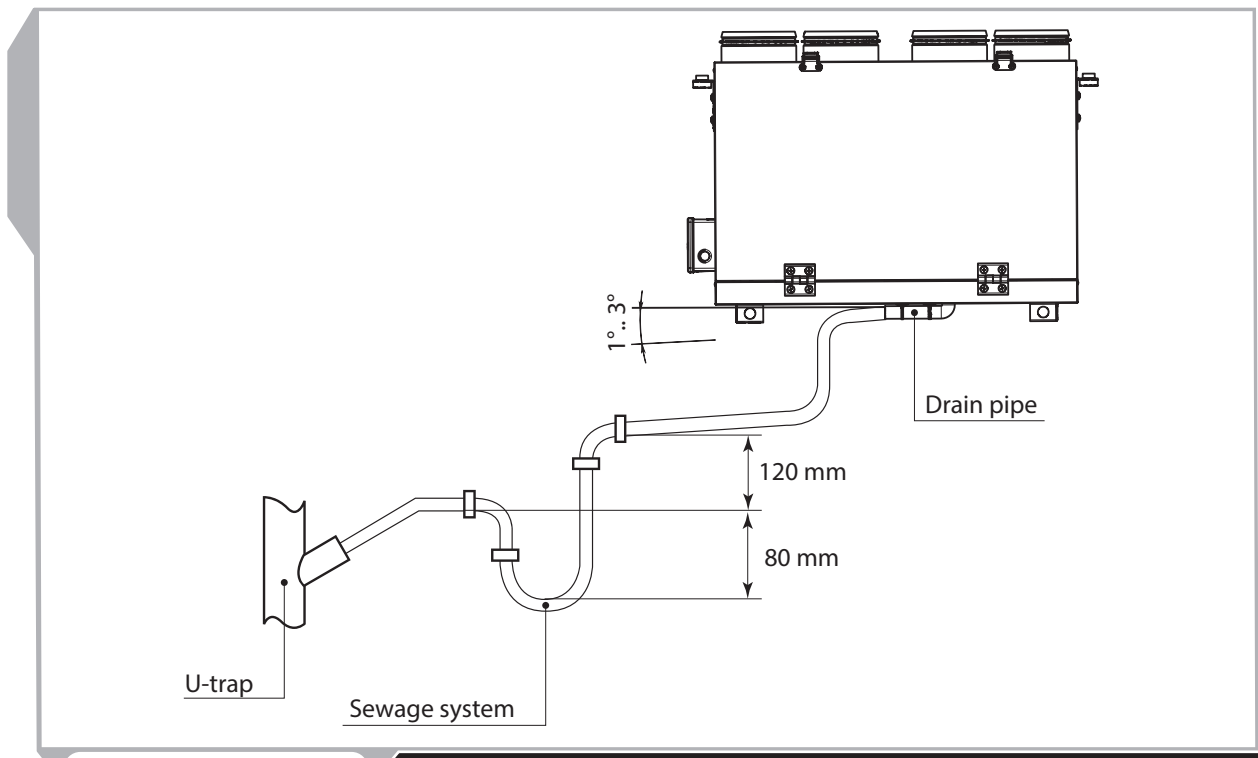


Fig. 6. Condensate drainage

CONNECTION TO POWER MAINS



THE POWER MAINS CONNECTION SHALL ONLY BE PERFORMED BY QUALIFIED PERSONS AFTER CAREFUL STUDY OF THE USER'S MANUAL.

THE UNIT IS INTENDED FOR AC MAINS SUPPLYING THE VOLTAGE COMPLIANT WITH THE TECHNICAL SPECIFICATION CHART.

CHECK THE CABLE FOR CHOKING.

DO NOT SWITCH ON THE UNIT IF THE CABLE IS DAMAGED. NEVER UNPLUG THE UNIT FROM THE SOCKET WITH WET HAND OR BY HOLDING THE ELECTRIC CABLE.

DISCONNECT THE UNIT FROM POWER SUPPLY PRIOR TO ANY OPERATIONS WITH THE UNIT!

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 must be connected to power mains with insulated, durable and heat-resistant conductors (cables, wires) with minimum cross section 0.75 mm².

The given conductor sections are for reference only. The conductor section selection shall account for the wire type, maximum permissible wire heating, insulation, length and installation method.

Use only copper core wires.

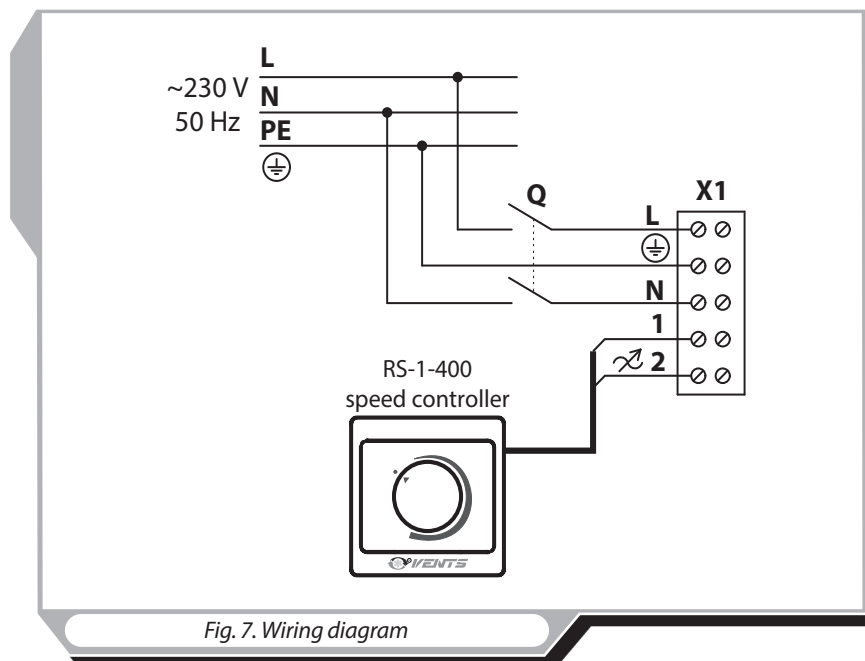
The unit must be properly earthed.

Connect the unit to power mains on the terminal block located in the terminal box in compliance with the wiring diagram and terminal marking, fig. 7. Connect all the control and power cables in compliance with the terminal marking!

The terminal marking is shown inside of the terminal box. The unit terminal clamps are marked according to the marking on the wiring diagram.

Route the wires to the terminal box through the electric lead-in on the unit side panel to preserve the electrical protection class.

Connect the unit to power mains through the external automatic circuit breaker with magnetic trip integrated into the fixed wiring system with the rated current not below the rated current consumption (above 1 A).

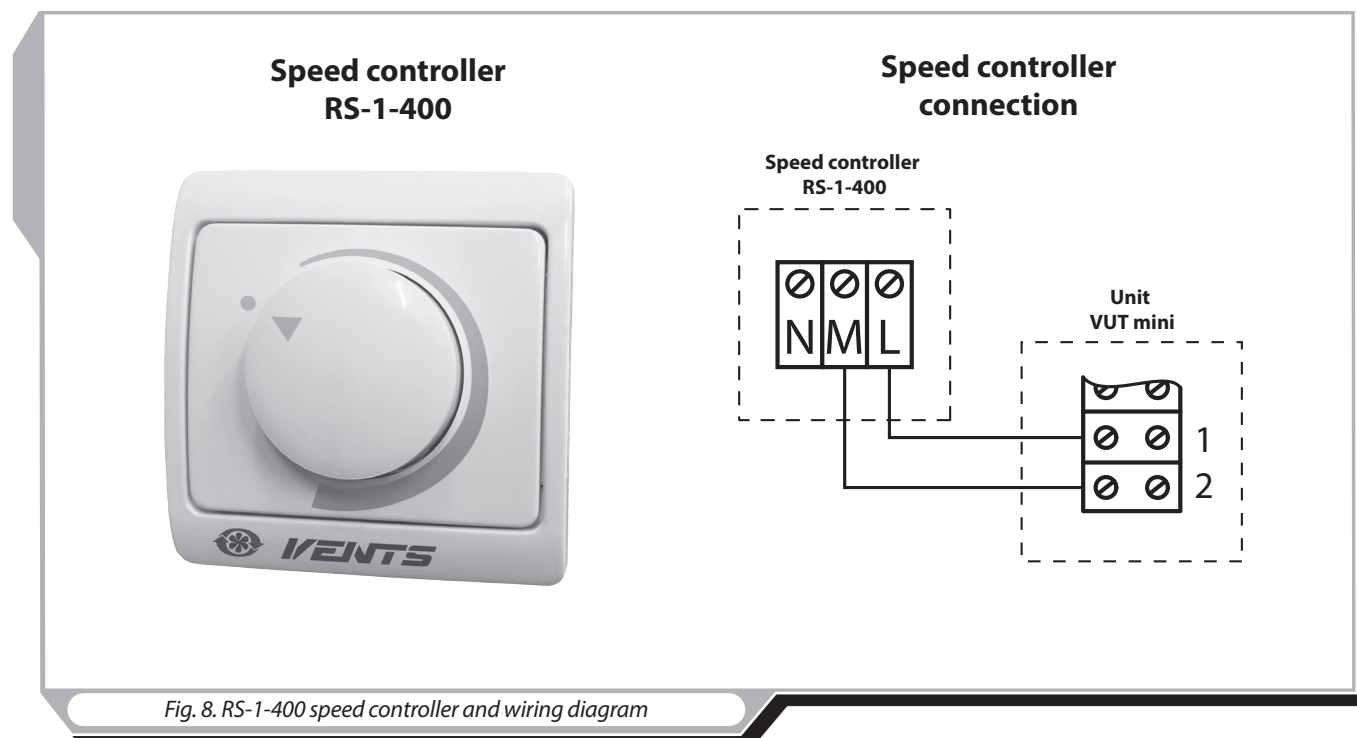


UNIT CONTROL

Smooth speed control is performed with the RS-1-400 speed controller, hereinafter the speed controller, fig. 8.

The speed is controlled from minimum to maximum value by rotating the control dial.

Install the speed controller in an easy operated place. The speed controller is pre-wired to the terminal block located in the terminal block on the unit side panel in compliance with fig. 8.



The freeze protection thermostat is installed in the exhaust air duct downstream of the heat exchanger. In case of a freeze danger the thermostat switches the supply fan off and the heat exchanger is warmed up with warm extract air flow, fig. 2. Rotate the thermostat control dial to set the operation temperature of the thermostat sensor. The thermostat set point is selected individually depending on the unit operating specifics.

The recommended thermostat operating temperature is +5 °C (factory setting).

The unit must undergo technical maintenance 3 to 4 times a year. Maintenance includes general cleaning of the unit and the following operations:

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

Contaminated filters increase air resistance thus impairing supply air delivery into the premises. The filters should be cleaned as they get dirty, but at least 3-4 times a year. Clean the filter with a vacuum cleaner or replace it with a new one. For new filters contact your Seller.

2. Heat exchanger maintenance (once per year).

Even regular technical maintenance may not completely prevent dirt accumulation on the heat exchanger casing. Clean the heat exchanger on a regular basis to ensure high heat recovery efficiency. To clean the heat exchanger remove it from the unit and wash with warm neutral detergent solution. Re-install the dry heat exchanger into the unit.

Removing of the filters and the heat exchanger is as following:

- make sure the unit is disconnected from power mains;
- undo two clips that fix the front panel to open the unit, fig. 9.1. The hinged panel is opened, fig. 9.2.
- remove the filters, fig. 9.3.
- remove the heat exchanger, fig. 9.4.
- after cleaning the heat exchanger insert all the parts in the reverse order and close the unit.

3. Fan maintenance (once a year).

Even regular technical maintenance of the filters may not completely prevent dirt accumulation in the fans which reduces the fan capacity and impairs supply air delivery into the premises.

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

4. Condensate drain check (once a year).

The condensate 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. Fresh air supply duct check (twice a year).

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

6. Duct system check (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. The air duct maintenance includes their periodic cleaning or replacement.

7. Maintenance of the exhaust louve shutters and supply diffusers (as required).

Remove the disc valves and the louvre shutters and wash those with warm detergent solution. Do not change the positions of the disc valves and the louvre shutters.

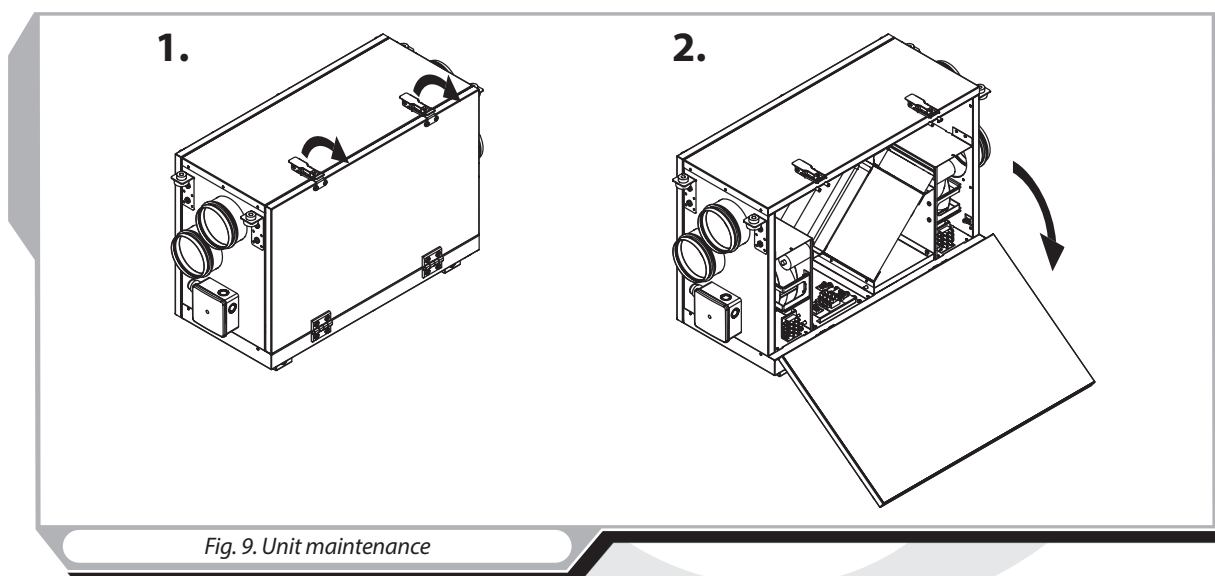
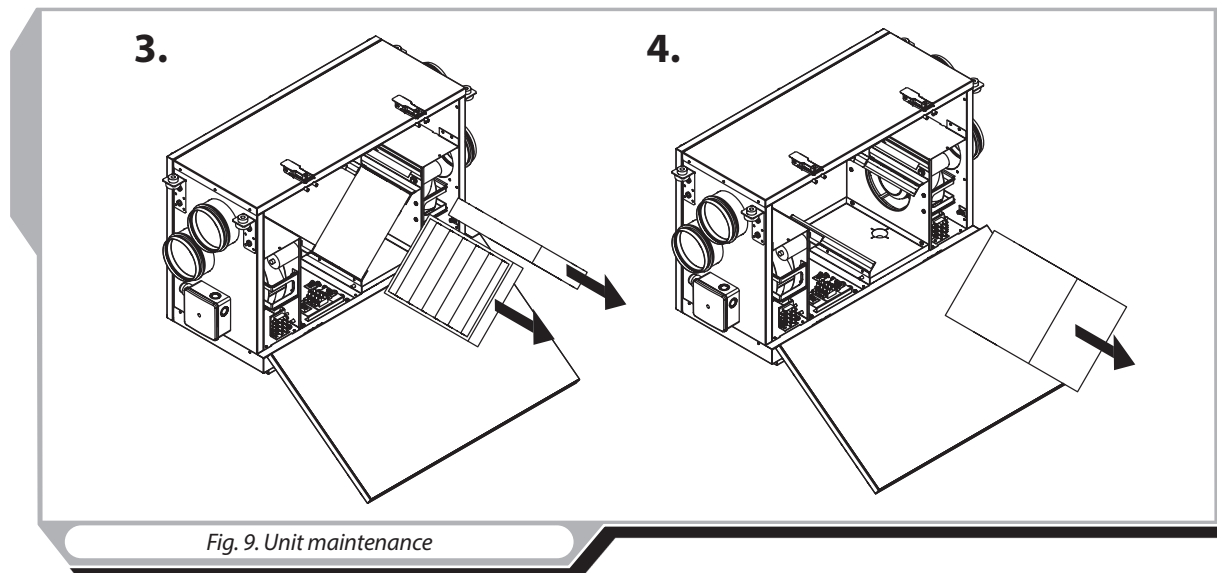


Fig. 9. Unit maintenance



TROUBLESHOOTING

Table 3

Possible faults and troubleshooting

Fault	Possible reasons	Fault handling
The fan does not start up during the unit start-up.	No power supply.	Make sure that the unit is properly connected to power mains and make any corrections, if necessary.
	Motor is jammed, the impeller are clogged.	Turn the unit off. Troubleshoot the motor jam and the impeller clogging. Clean the blades. Restart the unit.
Automatic switch tripping following the unit turning on.	Overcurrent resulted from short circuit in the electric circuit.	Turn the unit off. Contact the service centre.
Low air flow.	Low set fan speed.	Set higher speed.
	The filters, the fans or the heat exchanger are dirty.	Clean or replace the filter, clean the fans and the heat exchanger.
	The ventilation system components (air ducts, diffusers, louver shutters, grilles) are clogged or damaged.	Clean or replace the ventilation system components, such as air ducts, diffusers, louver shutters, grilles.
	The air dampers, diffusers or the louver shutters are closed.	Make sure the air dampers, diffusers or the louver shutters are fully opened.
High noise, vibration.	The impeller(s) are soiled.	Clean the impeller(s).
	The screw connection is too loose.	Tighten the fan or casing screw connection against stop.
	No anti-vibration dampers.	Install anti-vibration rubber mounts (available upon separate order).
Water leakage.	The drain pipe is clogged, damaged or wrong mounted.	Clean the drain line, if necessary. Check the drain line slant, inspect the U-trap and make sure the drain line is equipped with frost protection.

STORAGE AND TRANSPORTATION RULES

Store the unit in the manufacturer's original packing box in a dry ventilated premise at the temperatures from +10 °C up to +40 °C. Storage environment must not contain aggressive vapours and chemical mixtures provoking corrosion, insulation and sealing deformation.

Use hoist machinery for handling and storage operations to prevent the unit damage. Fulfil the handling requirements applicable for the applicable freight type.

Transportation with any vehicle type is allowed provided that the unit is protected against mechanical and weather damage. Avoid any mechanical shocks and strokes during handling operations.

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 through the 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 works 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 your 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 non-authorized by the manufacturer persons;
- 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 blockade);
- 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.



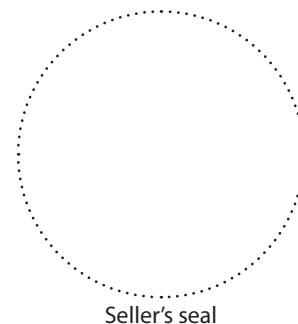
USERS' CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE SALE DATE STAMP.

ACCEPTANCE CERTIFICATE

Product Type	Heat recovery air handling unit
Model	VUT_____mini
Serial number	
Manufacturing date	
Is recognized as serviceable.	
The product complies with the requirements according to the EU norms and directives, to the relevant EU-Low Voltage Equipment Directives, EU-Directives on Electromagnetic Compatibility.	
We hereby declare that the following 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. Assessment of compliance of the product with the requirements relating to electromagnetic compatibility was based on the above standards.	
Quality Inspector's Stamp	

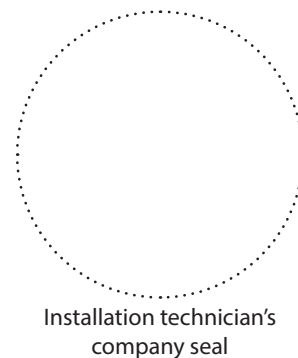
SELLER'S INFORMATION

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



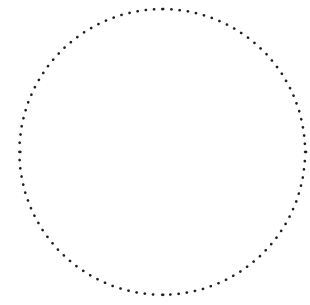
MOUNTING CERTIFICATE

The heat recovery air handling unit VUT_____mini has been connected to power mains pursuant to the requirements stated in the present user's manual.	
Company name	
Address	
Telephone	
Installation technician's full name	
Installation date:	Signature:
This is to certify that the works specific to the unit installation have 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

Product type	The heat recovery air handling unit
Model	VUT _____ mini
Serial number	
Manufacturing date	
Sales date	
Warranty period	
Sales company	



Seller's seal

Large rectangular area with horizontal lines for text entry.



