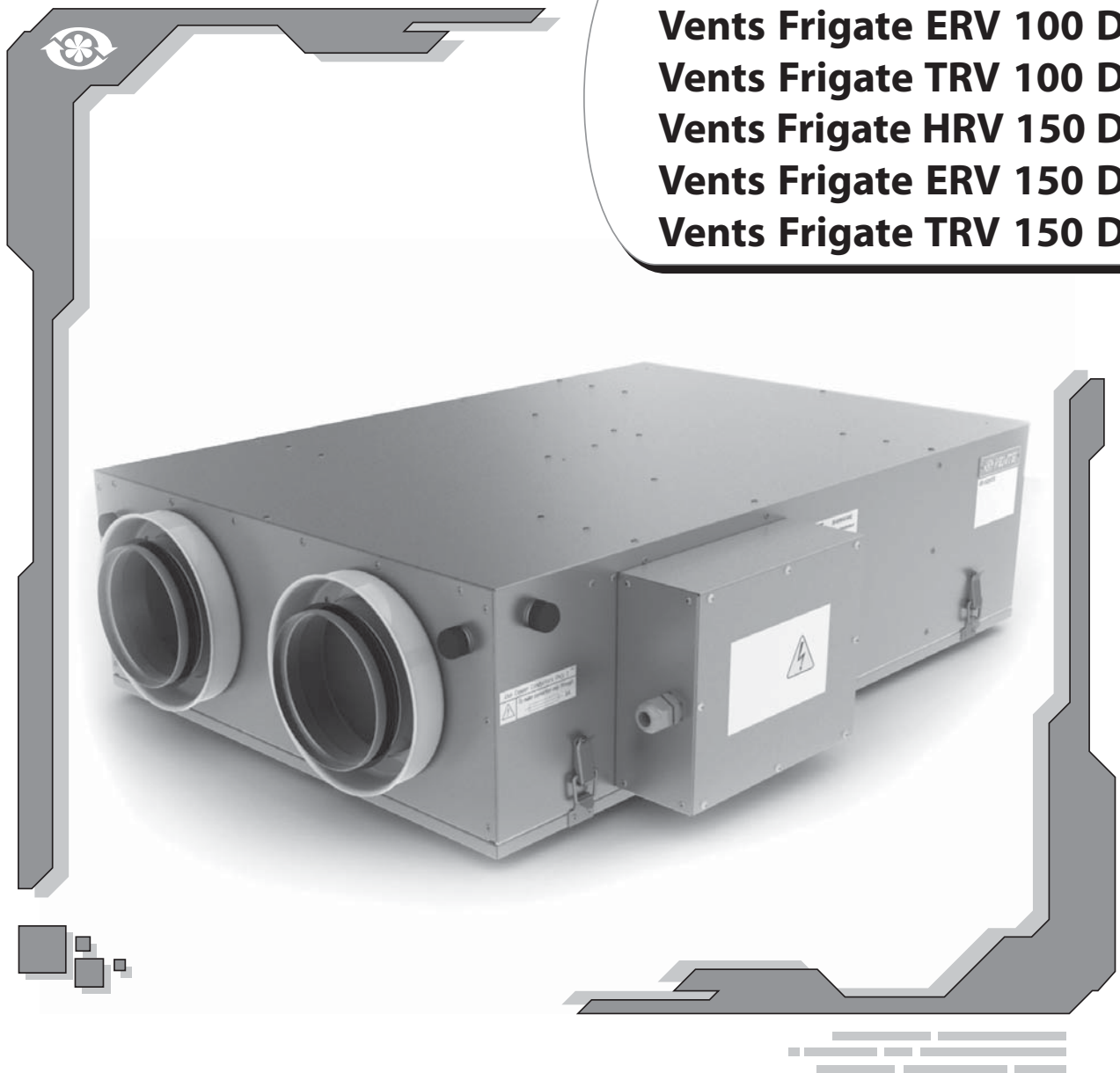


USER'S MANUAL

Heat (Energy, Heat and Energy) Recovery Ventilator

Vents Frigate HRV 100 DS
Vents Frigate ERV 100 DS
Vents Frigate TRV 100 DS
Vents Frigate HRV 150 DS
Vents Frigate ERV 150 DS
Vents Frigate TRV 150 DS



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INTRODUCTION

This user's manual combines technical description, operation and service manual, technical data sheet and installation guidelines for the heat (energy, heat and energy) recovery ventilator Vents Frigate ..RV 100 (150) DS, hereinafter referred to as the unit.

APPLICATION

The unit with heat (energy, heat and energy) recovery is designed to save thermal energy by means of heat and energy recovery and is one of the energy saving components used in the buildings and premises. The ventilator is a component unit and is not designed for independent operation.

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

The unit is for ceiling mounting and wall mounting (only for Vents Frigate ERV 100 DS and Vents Frigate ERV 150 DS).

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

Transporting medium 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.



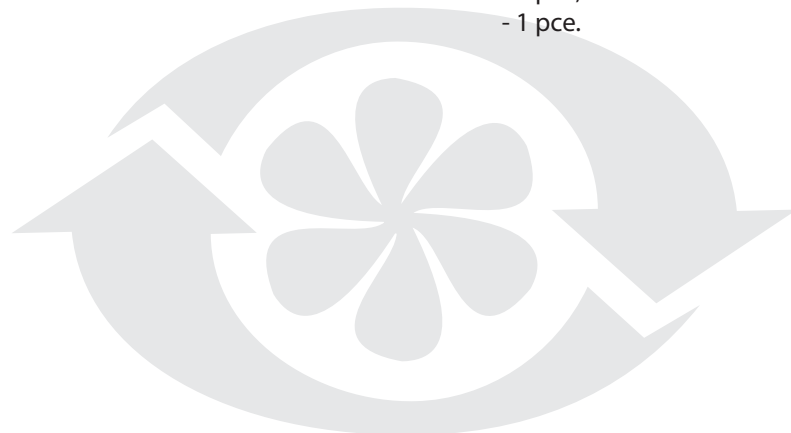
The unit is not designed to be used by children, physically or mentally disabled persons, persons with sensory disorder, persons with no appropriate experience or expertise.

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

The unit shall be mounted in places inaccessible for children.

DELIVERY SET

- Unit Vents Frigate ...RV 100 (150) DS - 1 pce;
- User's manual - 1 pce;
- Packing box - 1 pce.



UNIT DESIGNATION KEY

Frigate ..RV 100(150) DS

Mounting design modification

D - two recovery cores

S - suspended

Air capacity [CFM]

Unit type

HRV - Heat Recovery Ventilator;

ERV - Energy Recovery Ventilator (enthalpy);

TRV - Total (Heat and Energy) Recovery Ventilator.

TECHNICAL DATA

The heat (energy) recovery ventilator is designed for indoor application with the ambient temperature ranging from +34 °F (+1 °C) up to +122 °F (+50 °C) and relative humidity up to 80%.

Ingress Protection rating:

- IP44 for the unit motors;
- IP 22 for the assembled unit connected to air ducts.

The Vents Frigate HRV 100(150) DS unit net weight is 66 lbs (30 kg); the Vents Frigate ERV 100(150) DS unit net weight is 62 lbs (28 kg); the Vents Frigate TRV 100(150) DS unit net weight is 64 lbs (29 kg).

The unit series designation, basic overall and connecting dimensions are shown in fig. 1.

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

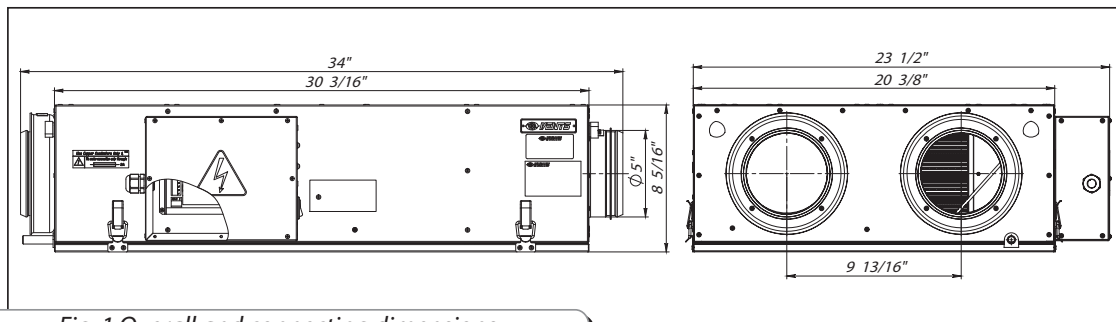


Fig. 1 Overall and connecting dimensions

The maximum allowable air parameters for the paper heat recovery core are stated in the table 1.

Temperature [° C]	-30...+60 ° C (-22 °F...140 °F)
Relative humidity [%]	80%
Service life	Warranty service life is 2 years
	Operating service life is 5 years

SAFETY REQUIREMENTS

While operating and mounting unit fulfill the requirements of the present operation manual as well as general requirements of all applicable codes and standards valid in USA and Canada.

Ground the unit!

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.

Connection of the unit to power mains by duly qualified and authorized electricians only!



Warning!

Mounting, servicing, connection and repair works of the unit are allowed after the unit is disconnected from power mains.



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 environment.**



STRUCTURE 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 recovery core and exhausted outside by exhaust fan. Clean cold air from outside is moved by supply fans to the unit where it is purified through the supply filter. Then clean air flows through the heat recovery core and is supplied to the room by supply fan.

Thermal energy of warm extract air is transferred to clean intake fresh air and warms it up. The extract and intake air flows are fully separated during heat recovery which excludes any transfer of odors and pathogens to supply air. Heat recovery minimizes thermal energy losses, energy demand and heating costs.

Both sensible thermal energy and latent moisture energy contained in the extract air are transferred in the heat recovery cores of the Vents ERV (TRV) 100 (150) DS unit to the cold intake air flow from outside to warm them up before supplying to the room.

The paper heat recovery cores of the units Vents Frigate ERV (TRV) 100 (150) DS operate as a moisture balancer in case of too low outdoor humidity or as air dryers in case of high outdoor air humidity. Due to high hygroscopic features of the heat and energy recovery core material the unit does not need condensate drainage. Application of the heat exchanger provides decreasing thermal energy losses and heating costs saving during cold season.

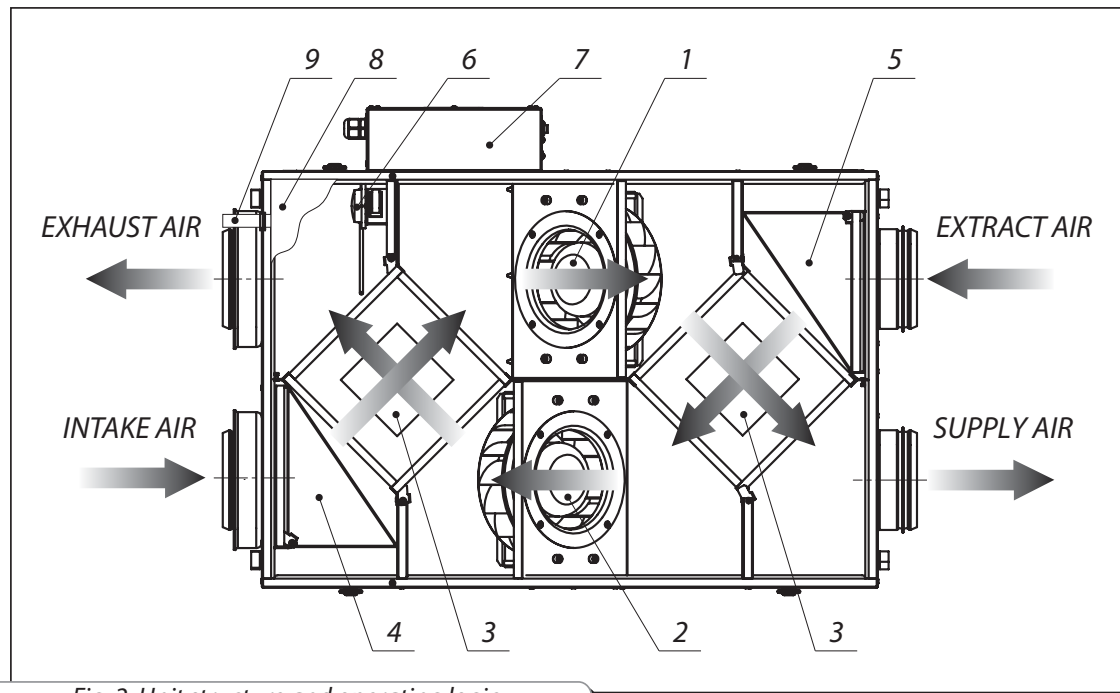


Fig. 2. Unit structure and operating logic

1. Supply fan with backward curved blades and maintenance-free motor with external rotor and integrated thermal protection;
2. Extract fan with backward curved blades and maintenance-free motor with external rotor and integrated thermal protection;
3. Plate cross flow heat recovery core (Vents Frigate ERV 100 (150) DS — paper heat recovery core, Vents Frigate HRV 100 (150) DS — aluminium heat recovery core, Vents Frigate TRV 100(150) DS - one paper and one aluminium heat recovery core).
4. G4 supply air filter.
5. G4 extract air filter.
6. Frost protection thermostat.
7. Control block
8. Drain pan (only for Vents Frigate HRV 100(150) DS and Vents Frigate TRV 100(150) DS).
9. Drain hose (only for Vents Frigate HRV 100(150) DS and Vents Frigate TRV 100(150) DS).

MOUNTING AND SETTING-UP

While mounting the unit provide enough access for the unit maintenance and servicing. Mount the unit to ceiling by means of the belts that are rigidly fixed to horizontal plane (fig. 3) or with threaded rods fixed inside the dowels attached to the ceiling. The unit may be mounted to the wall with a suspension bracket (fig. 4) that is fixed to the unit with three screws and dowels (only for the units Vents Frigate ERV 100 DS и Vents Frigate ERV 150 DS).

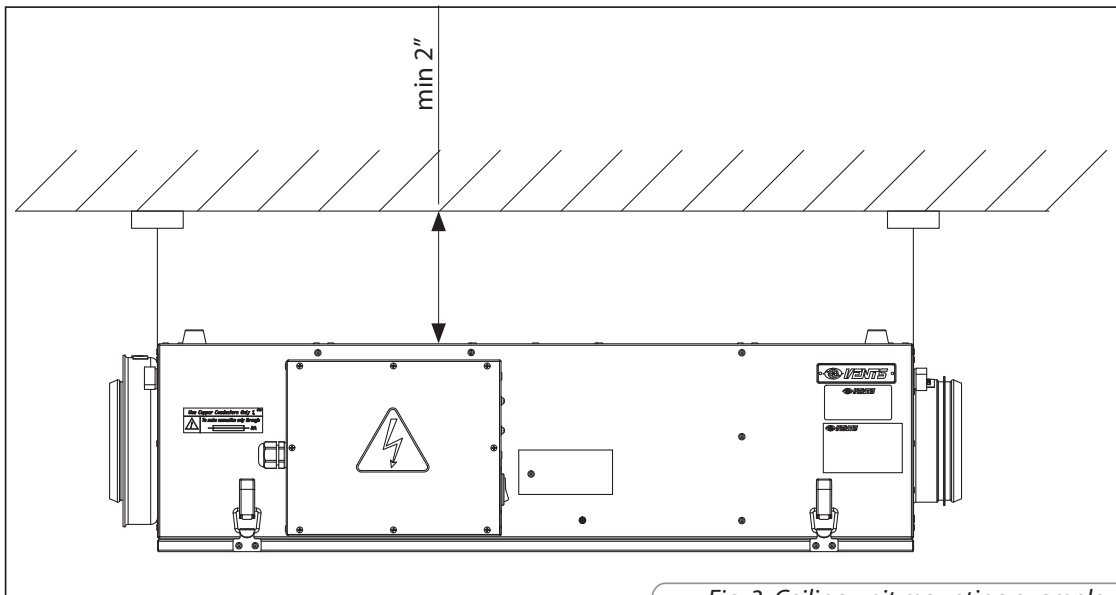


Fig. 3. Ceiling unit mounting example

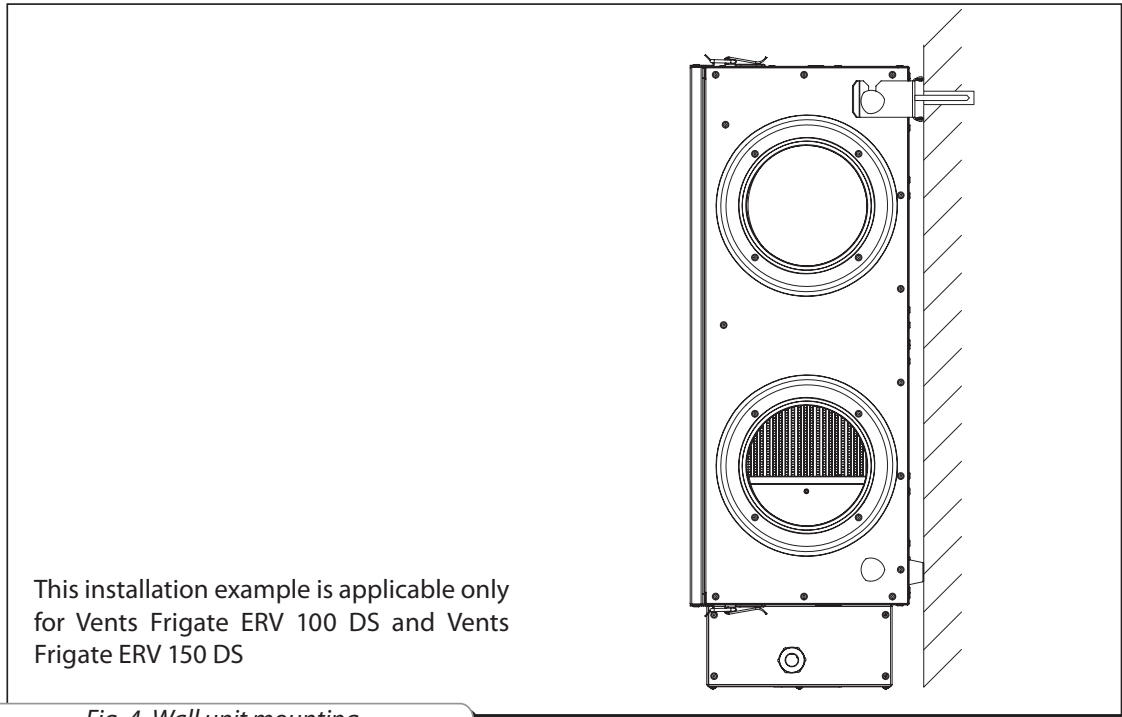


Fig. 4. Wall unit mounting

CONDENSATE DRAINAGE

The Vents Frigate HRV 100 (150) DS and Vents Frigate TRV 100 (150) DS units are equipped with a condensate drain hose for condensate drainage (fig. 5). Connect the drain hose (1), U-trap (3) and drain system (5) with metal, plastic or rubber pipes (2 and 4). The pipes must be sloped down at least by 3°. Before starting operation of 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, otherwise some condensate may be accumulated inside the unit and provoke subsequent equipment damage and water ingress to the room. The condensate drainage system is designed for operation at the ambient temperature above 32 °F (0 °C). If the ambient temperature is below 32 °F (0 °C), insulate the drain system and provide air heating.

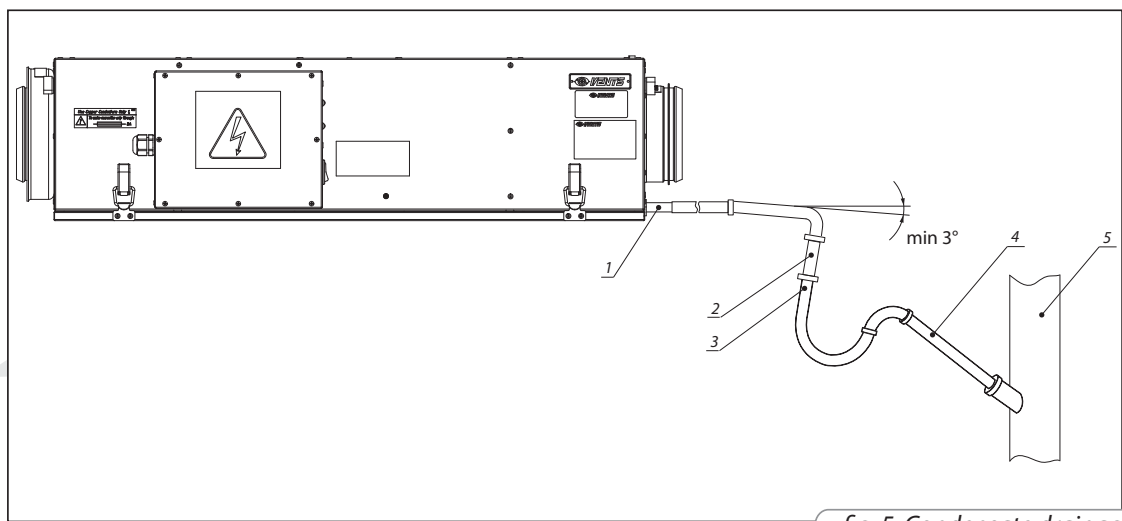


fig. 5. Condensate drainage

CONNECTION TO POWER MAINS



Cut power supply off before any operations with the unit. The unit shall be connected to power mains by a duly qualified electrician only. Rated values of the electrical parameters are shown on the rating plate. Any modifications of the internal connections are not allowed and will void the warranty.

The unit is designed for connection to single-phase ac 120 V / 60 Hz power mains.

The unit is equipped with a power cable and a plug and can be connected to any standard grounded outlet. The power cable is connected to the terminal X1 by default.

Connect the unit to power mains through the external automatic switch integrated into the fixed wiring system that breaks the circuit in case of short circuit or overload.

Install the circuit breaker to have a free quick access in case of need to turn the unit off promptly.

The unit has overload protection provided by the thermal fuse which is activated in case of overload or short circuit. To replace the thermal fuse, disconnect the unit from power mains, remove the overload or short circuit. Remove the thermal fuse and check the unit.

Wiring diagram is shown in fig. 6.

The thermostat TS1 (fig. 6) provides freezing protection of the unit during cold season. As the thermostat is activated, the supply fan stops and the heat recovery core is warmed up with extract air stream. To adjust the thermostatic switch, rotate the control dial to required setpoint. The setpoint depends on the operating conditions. Recommended setting of the thermostat is 37°F (+3°C), set in the factory by default.

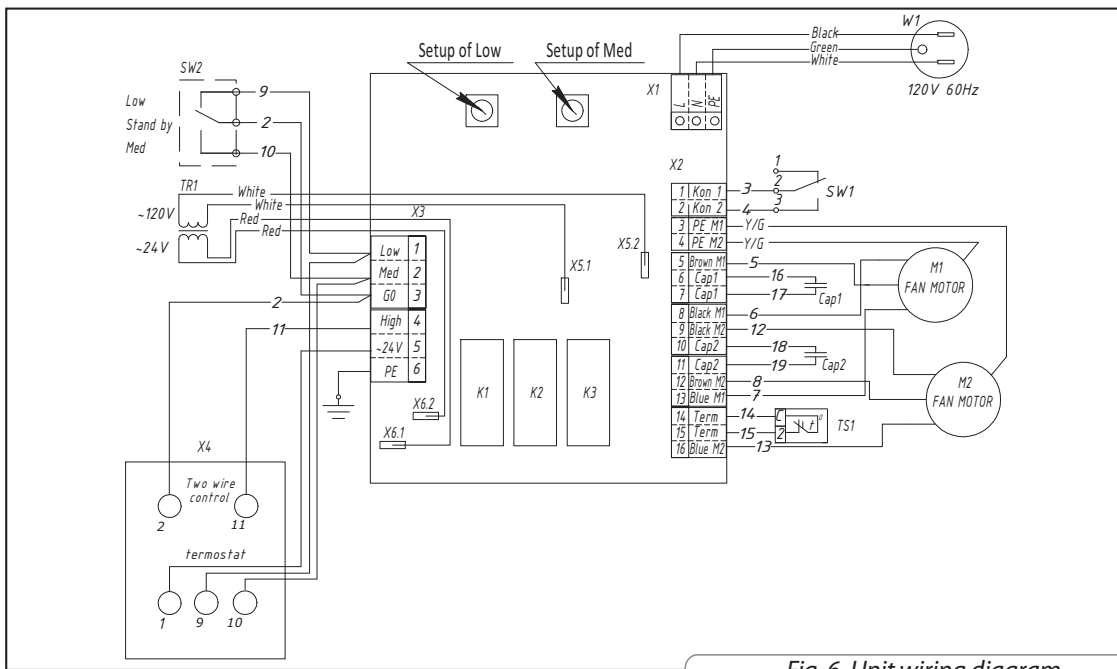
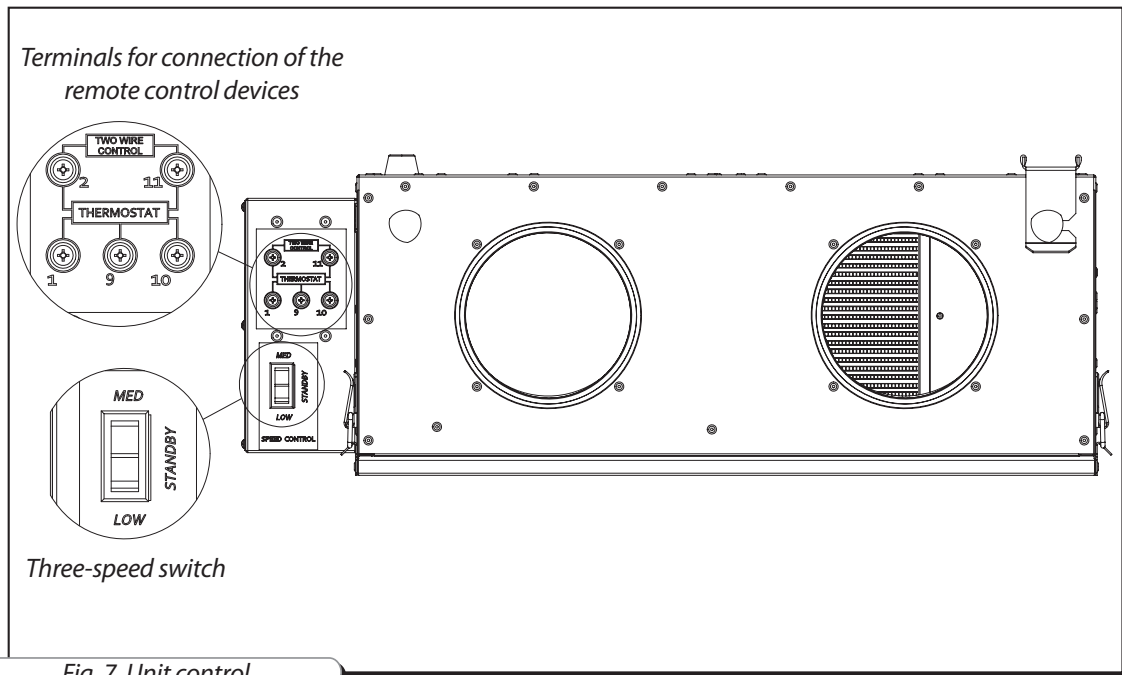


Fig. 6. Unit wiring diagram

UNIT CONTROL

The unit is controlled by a three-position speed switch that enables low-speed modes «Low» as well as «Med» and «Stand by» mode which enables total air quality control (fig. 7).

Up to five external control devices may be connected to the terminals 2-11 (fig. 7) that turn the unit to high-speed ventilation in case of activation of any of the control devices.



Switch the three-position speed controller to «Standby» mode for correct operation from the remote control panel.



1. Remote control (Thermostat).



Set the three-position switch into the Stand by position to activate the remote control.

Remote control (thermostat) functions:

- Unit turning on/off
- Setting air flow
- Displaying indoor air temperature

2. CO2 sensor.

Recommended for use in office buildings and public premises. When carbon dioxide concentration exceeds the set point, the unit changes into the High Speed Mode.

3. Humidistat.

The humidistat is used for indoor humidity control. When indoor humidity level rises above the set point, the unit changes into the High Speed Mode and runs with the high speed until the humidity level falls down below the set point. The humidity set point is adjustable.

4. Remote mechanical timer.

In case of the timer activation the unit changes into the High Speed Mode.

5. Switch.

In case of the switch contact closing the unit changes into High Speed Mode and reverts to permanent Low Speed Mode when the switch contacts are opened.



SERVICING AND MAINTENANCE

Servicing of the unit is required 3-4 times per year. Besides general cleaning, the following operations are required:

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

Dirty filters increase air resistance in the system and reduce supply air flow to the premises.

- Clean or replace the filters as often as required, but at least 3-4 times per year. Clean the filter with running water or a vacuum cleaner.
- After two cleaning replace the filter. Contact your local supplier for new filters.

2. Heat recovery core maintenance (once per year).

Some dust can get accumulated on the heat recovery core block even if you clean or replace the filters regularly in compliance with above procedure. To maintain the high heat exchange efficiency, regular cleaning is required.

- To clean the paper heat and energy recovery core of the units Vents Frigate ERV 100 (150) DS and Vents Frigate TRV 100 (150) DS, pull it out of the unit and clean it with a vacuum cleaner. Do not use water, sharp objects, abrasive detergents and aggressive solvents to prevent the heat recovery core damage. Make sure that the heat and energy recovery core is dry and re-install it back inside the unit.

- To clean the aluminium heat recovery core of the units Vents Frigate HRV 100 (150) DS and Vents Frigate TRV 100 (150) DS, pull it out of the unit and clean the heat recovery core with warm detergent solution. Make sure that the heat recovery core is dry and re-install it back inside the unit.

3. Fan maintenance (once per year).

Even if you perform regular maintenance of the filters and the heat recovery core, 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 dry cloth. No water and abrasive detergent, sharp objects or solvents are allowed for cleaning to prevent the impeller damage.

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

The drain hose can get clogged with the extracted particles. Clean the drain hose is required. Check proper functioning of the drain system by pouring some water into the drain pan at the unit bottom. Clean the U-trap and the drain tubes if required.

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

Leaves and other objects can clog the intake grille and decrease the unit performance and supply air flow. Check the intake grille twice per year and clean it if required.

6. Air ductwork maintenance (once in 5 years).

Even if you fulfill all the above maintenance guidelines regularly, a certain amount of dust is accumulated inside air ducts. That reduces the ventilation system performance. Clean or replace the air ducts periodically.



TROUBLESHOOTING

Possible malfunctions and fault handling

Problem	Possible reasons	Solving
The fan(s) do(es) not start running.	Power supply is off.	Make sure the power supply line is connected correct, otherwise troubleshoot the connection error.
	Thermal fuse is melted.	Disconnect the unit from power mains. Remove the overload. Replace the thermal fuse and check the unit.
Cold supply air.	The extract filter is clogged.	Clean or replace the extract filter.
	The heat recovery core is frozen.	Check the heat recovery core condition. Shutdown the unit and turn it on after the freezing danger is no longer imminent. Check the thermostat setpoints.
Low air capacity.	Too low set rotation speed.	Check the speed control settings.
	The filters, fans or heat recovery core are clogged.	Clean or replace the extract filters; clean the fans and the heat recovery core.
	The ventilation system is clogged or damaged.	Check the diffusers and louvre gravity shutters opening, check the exhaust hood and intake grille and clean those if required; make sure that the air ducts are not clogged or damaged.
Noise, vibration.	The impeller(s) is (are) clogged.	Clean the fan impeller(s).
	Fan screw tightening is loose.	Check and tighten the screws if required.
Water leakage	The drain system is clogged, damaged or wrong arranged.	Clean the drain pipe is required. Check the drain pipe slope, U-trap and temperature conditions.



STORAGE AND TRANSPORTATION RULES

Store the unit in the manufacturer's original packing box in a ventilation premise with the temperature range from +14 °F (-10 °C) up to +104 °F (+40 °C) and relative humidity less than 60% (at +68 °F (+20 °C)). Vapors or particles which can cause corrosion or damage the insulation or connection tightness are not allowed in the stock. Use hoist equipment for loading and storage operations to prevent the unit falling or excessive oscillation.

Transportation with any vehicle type is allowed provided that the goods are protected against mechanical and weather damage.

MANUFACTURER'S WARRANTY

Production meets standard operating requirements in the USA and Canada. VENTS US warrants to the original purchaser of the unit that it will be free from defects in materials or workmanship for a period of 60 months from the date of original purchase. The VENTS US warrants to the original purchaser of the unit that the integrated control unit will be free from defects in materials and workmanship for a period of 24 months from the date of original purchase.

VENTS US warrants to the original purchaser of the unit that it will be free from defects in materials or workmanship for a period of 60 months from the date of original purchase. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. During the stated warranty period, VENTS US will, at its option, repair or replace, without charge, any product or part which is found to be defective under normal use and service. This warranty does not cover (a) normal maintenance and normal service or (b) any products or parts which have been subject to misuse, negligence, accident, improper maintenance or repair (other than by VENTS US), faulty installation or negligence, accident, improper maintenance or repair (other than by VENTS US), faulty installation or installation contrary to recommended installation instructions. Labor to remove and replace products is not covered. The duration of any implied warranty is limited to the time period specified for the express warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

VENTS US OBLIGATION TO REPAIR OR REPLACE, AT VENTS US OPTION, SHALL BE THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY. VENTS US SHALL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH PRODUCT USE OR PERFORMANCE. Some states do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty supersedes all prior warranties. If proof of sales date is absent, warranty period is calculated from the production date.

The unit can be exchanged at the following address:

Bodor Vents, LLC DBA: Vents-US

11013 Kenwood Road Cincinnati, Ohio 45242

Phone: (513)348-3853

e-mail: sales@ventsus.com

Please follow guidelines in this manual for product problem-free operation.



