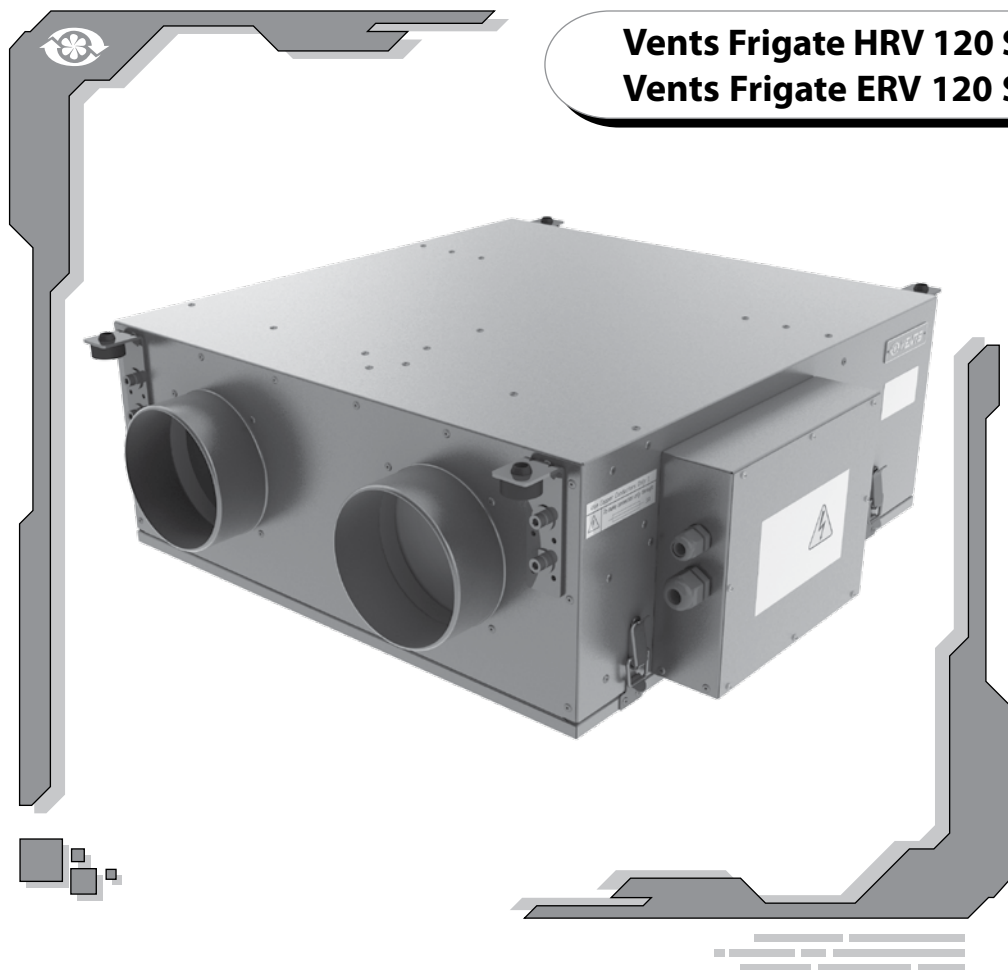


USER'S MANUAL

Heat (Energy) Recovery Ventilator

Vents Frigate HRV 120 S
Vents Frigate ERV 120 S



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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) recovery ventilator Vents Frigate HRV (ERV) 120 S, hereinafter referred to as the unit.

APPLICATION

The unit with heat (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 120 S).

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 HRV(ERV) 120 S | - 1 pce; |
| ■ User's manual | - 1 pce; |
| ■ Packing box | - 1 pce. |



UNIT DESIGNATION KEY

Frigate HRV(ERV) 120 S

Mounting design modification

S - suspended

Air capacity [CFM]

Unit type

HRV - Heat Recovery Ventilator

ERV - Energy Recovery Ventilator (enthalpy)

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 120 S unit net weight is 53 lbs (24 kg); the Vents Frigate ERV 120 S unit net weight is 51 lbs (23 kg).

The unit series designation, basic overall and connecting dimensions, external view, technical data are shown in fig. 1 and in tables 1 and 2.

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

Table 1

Model	Speed	Volts	Max. Watts	Max. Amps	RPM	Airflow CFM (L/s)										Efficiency of heat exchanger, %	Duct Dia.	Sones	
						0,1" (25 Pa)	0,2" (50 Pa)	0,3" (75 Pa)	0,4" (100 Pa)	0,5" (125 Pa)	0,6" (150 Pa)	0,7" (175 Pa)	0,8" (200 Pa)	0,9" (225 Pa)	1,0" (250 Pa)				1,2" (300 Pa)
HRV 120S, ERV 120S	high	120V, 60Hz	142	1.23	2460.	150 (71)	143 (67)	137 (65)	127 (60)	116 (55)	104 (49)	91 (43)	78 (37)	64 (30)	49 (23)	18 (8)	<80%	5"	2.8
	low		67	0.98	1325	65 (31)	51 (24)	41 (19)	25 (12)	12 (6)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)			<80%

The maximum allowable air parameters for the paper heat recovery core are stated in the table 2.

Table 2

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

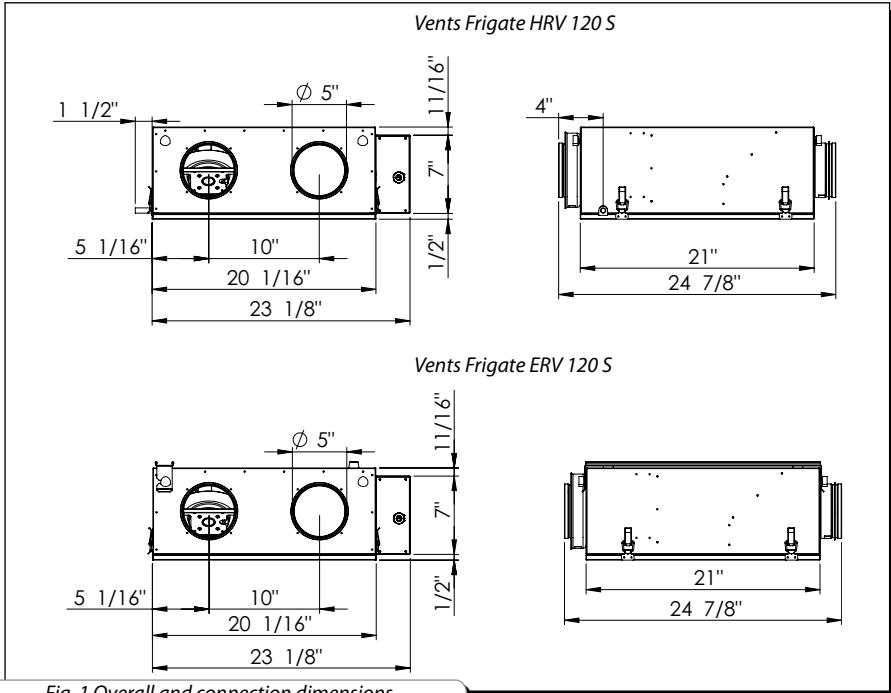


Fig. 1 Overall and connection dimensions

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 Vents Frigate ERV 120 S unit heat recovery core to the cold intake air flow from outside to warm it up before supplying to the room.

The paper heat recovery core of the unit Vents Frigate ERV 120 S operates as a moisture balancer in case of too low outdoor humidity or as an air dryer 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.

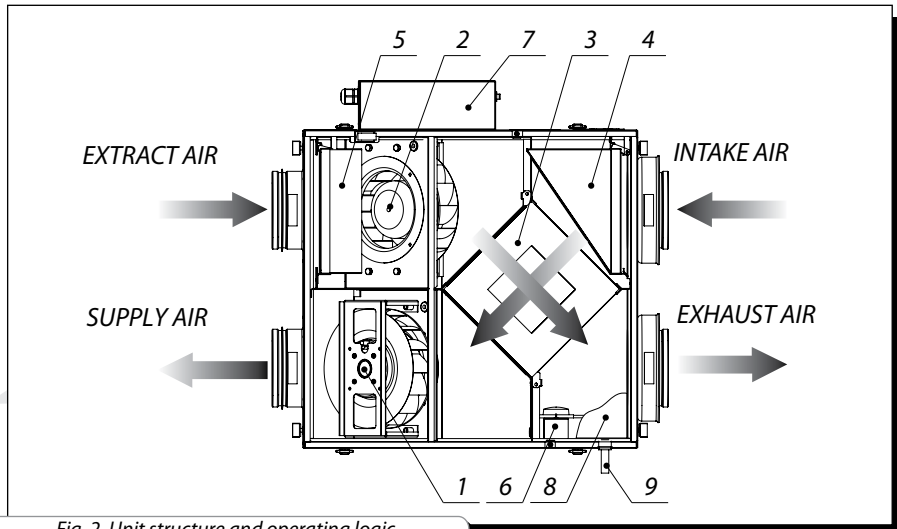


Fig. 2. Unit structure and operating logic

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 120 S — paper heat recovery core, Vents Frigate HRV 120 S — aluminium heat recovery core).
4. G4 supply air filter.
5. G4 extract air filter.
6. Frost protection thermostat.
7. Control block.
8. Drain pan (for Frigate HRV 120 S only).
9. Drain hose (for Frigate HRV 120 S only).

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 unit Frigate ERV 120 S).

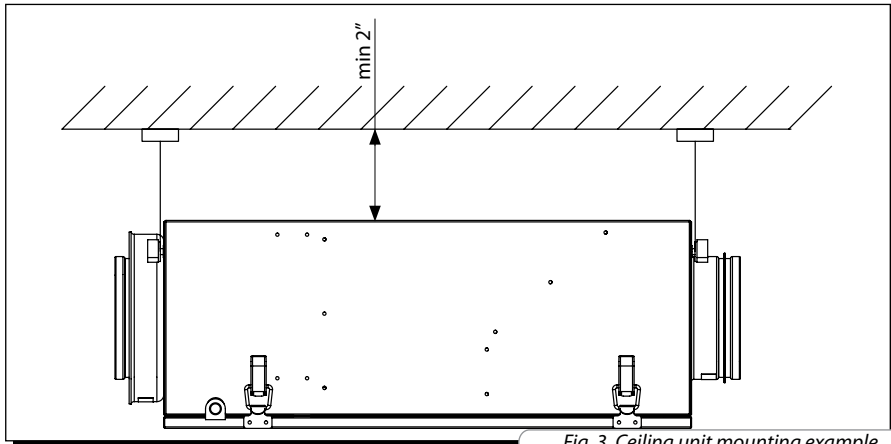


Fig. 3. Ceiling unit mounting example



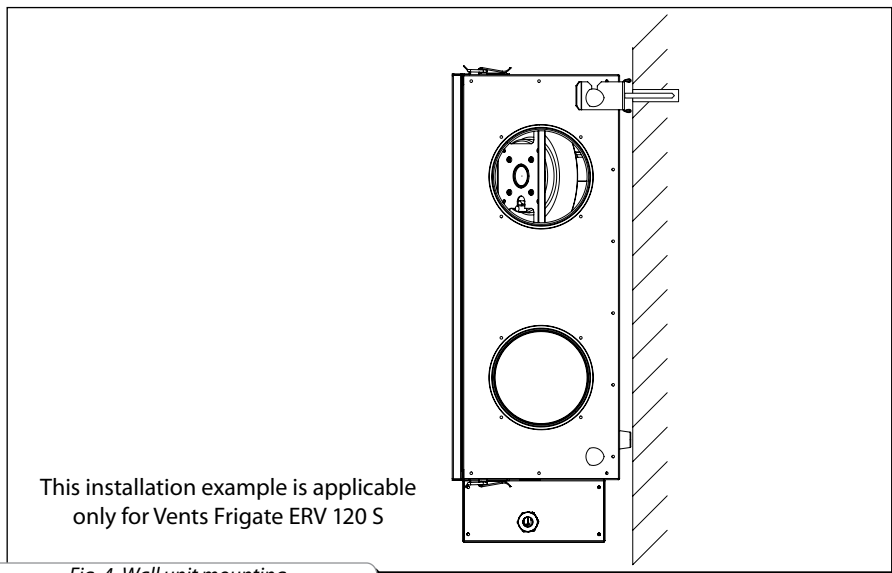


Fig. 4. Wall unit mounting

CONDENSATE DRAINAGE

The Vents Frigate HRV 120 S unit is 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.

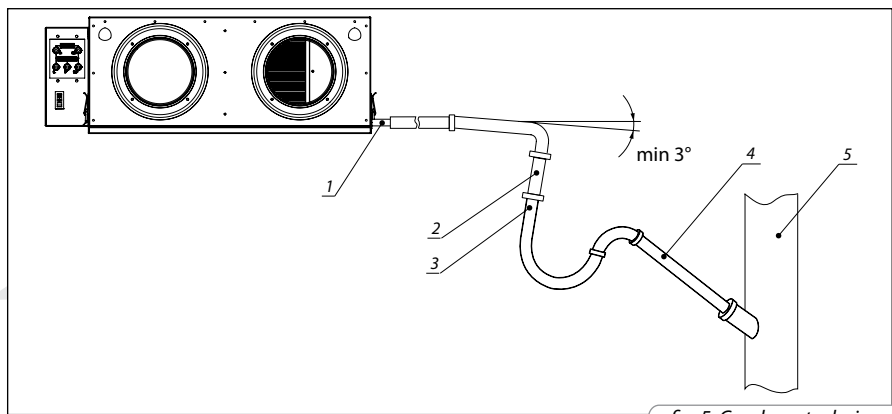


fig. 5. Condensate drainage

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.

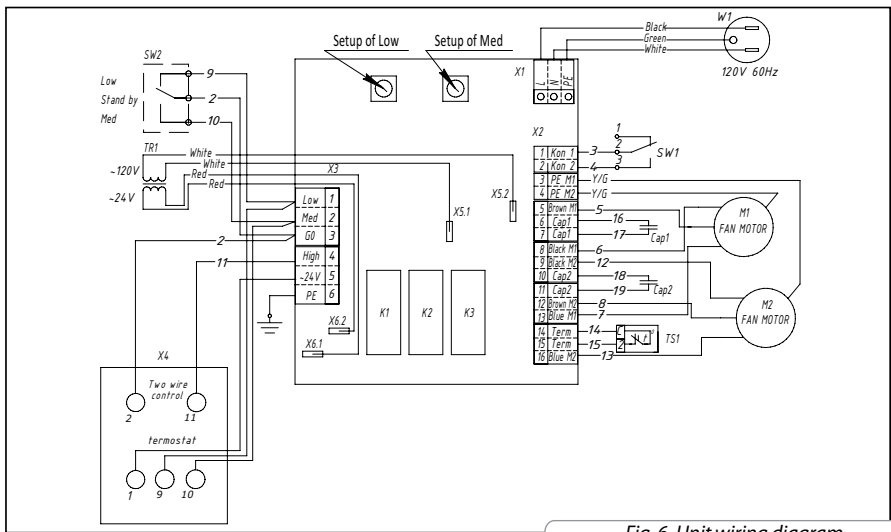
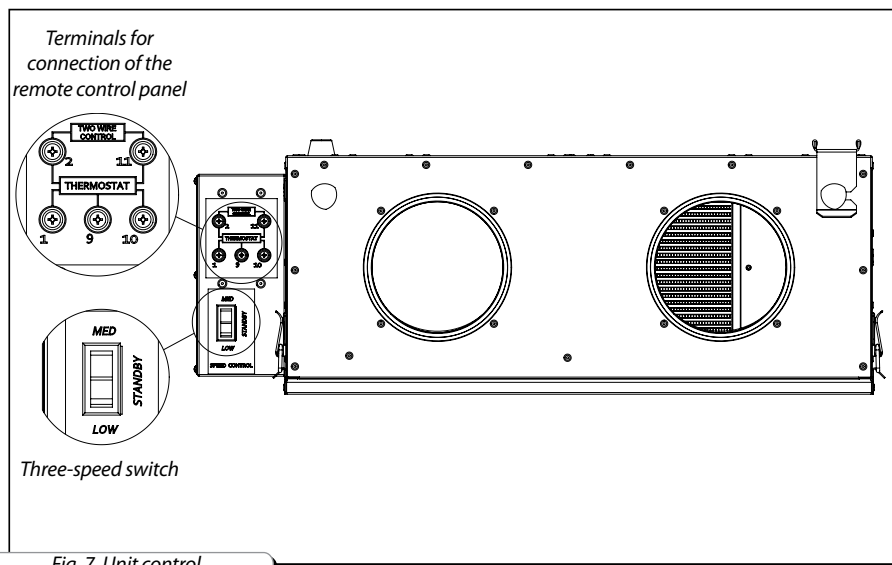


Fig. 6. Unit wiring diagram

UNIT CONTROL

The unit is controlled by a three-position speed switch that enables low-speed modes «Low» and «Med» as well as «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 that turn the unit to high-speed ventilation in case of activation of any of the control devices (fig. 6).



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

The following controls may be connected to the unit:

1. Remote control panel SAS908PIT digital thermostats

Remote control panel SAS908PIT digital thermostats (fig. 8) provides the function:

- Switching the unit on/off;
- Setting required air flow;
- Displaying indoor temperature.

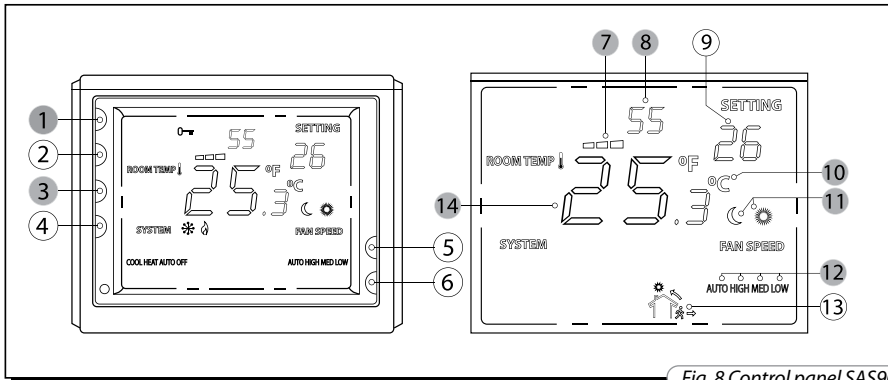


Fig. 8 Control panel SAS908

The control panel has the following buttons:

1. On/off button;
2. Not active;
3. Fan speed control adjustment (auto/high/med/low);
4. Not active;
5. Not active;
6. Not active;
7. Heating power scale;
8. Heating power value;
9. Not active;
10. Temperature measuring unit;
11. Not active;
12. Selected fan speed;
13. Not active;
14. Indoor temperature.

To turn the unit on/off press the button (1). Required fan speed (air flow) is set by means of consecutive pressing the button 3. The speed settings are displayed on the control panel, 12. The indoor temperature indicator (14) displays indoor temperature.

2. CO₂ transmitter

The CO₂ transmitter Tongdy CO₂ (fig. 9) is designed for use in offices and other public premises. It switches fans to higher speed as CO₂ indoor concentration exceeds setpoint.





Fig. 9. CO₂ transmitter

3. Humidistat

The humidistat (fig. 10) is used for indoor humidity control. If the indoor humidity exceeds the setpoint, the humidistat switches the ventilation to high-speed mode. The unit operates in high-speed mode until humidity drops to setpoint. Adjust the humidity setpoint if required.



Check that the humidistat closes contact if indoor humidity exceeds the setpoint and breaks contact if the indoor humidity is below the setpoint.

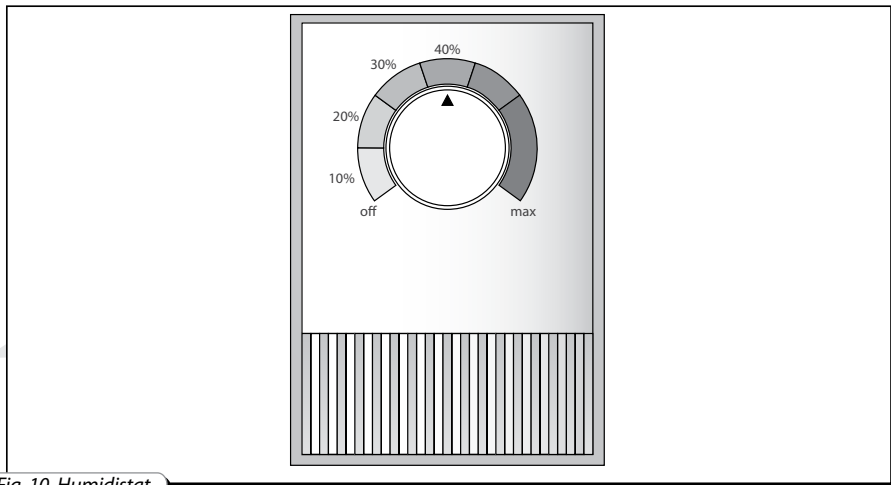


Fig. 10. Humidistat

4. Mechanical timer

The remote mechanical timer (fig. 11) is designed for installation in pollutable areas. As the timer is activated the unit is switched to high-speed mode. You can connect up to 5 timers in the premise at 500 feet (152 m) distance to the unit.

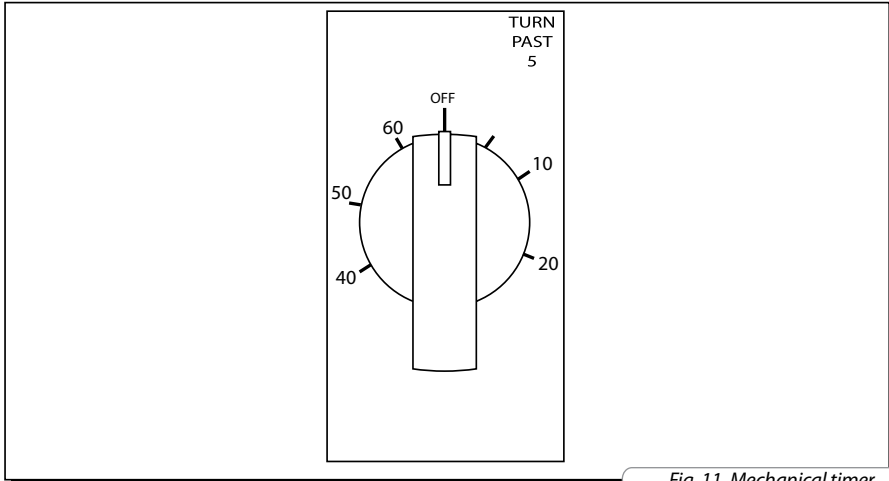


Fig. 11. Mechanical timer

5. Switch

The switch (fig. 12) is designed for indoor installation in pollutable areas. As the switch is activated and the contacts are closed, the unit is switched to high-speed ventilation mode. To reset the unit to continuous low-speed operation press the switch to break the contacts.

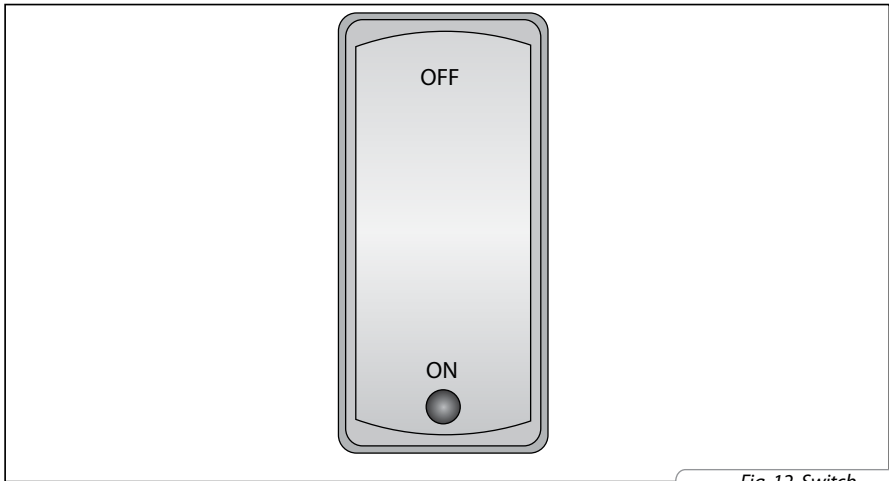


Fig. 12. Switch

Connect all the above external controls in compliance with the wiring diagram in fig. 13.
The terminals (2) and (11) are designed for connection up to five control devices.

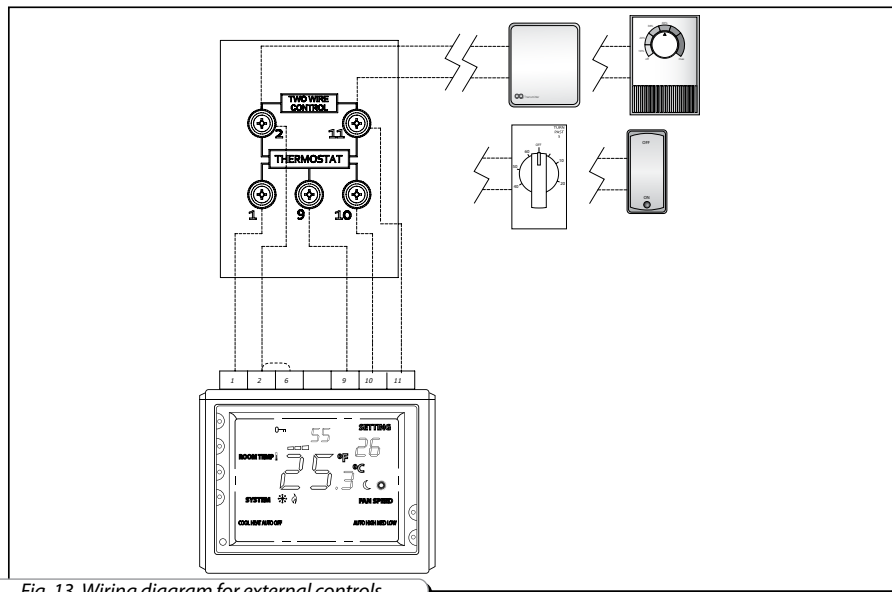


Fig. 13. Wiring diagram for external controls



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 unit Vents Frigate ERV 120 S, 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 unit Vents Frigate HRV 120 S, 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

Manufacturer hereby guarantees normal performance of the unit within 2 years since the date of its sale in accordance to the rules of transportation, storage, assembling and operation. In case of no confirmation of sales date the warranty period is calculated from the production date.

In case of any unit operation malfunctions during the warranty period the manufacturer accepts any claims from the Customer if the technical certificate with detailed description of the malfunction is provided.

The unit damage as a result of any unauthorized modifications of the electric circuit is not a warranty case.

Both warranty and post-warranty services for the unit are provided at the manufacturing facility. For warranty and post-warranty services contact your seller or the product manufacturer.



RECLAMATIONS AND CLAIMS FOR REPLACEMENT SHALL NOT BE ACCEPTED WITHOUT A COMPLETED CONNECTING CERTIFICATE.



ACCEPTANCE CERTIFICATE

Acceptance certificate
The heat (energy) recovery ventilator
VENTS Frigate HRV(ERV) 120 S

is recognized serviceable and compliant with the technical parameters.

Stamp of the acceptance inspector _____

Date of production _____

Sold by

Name of the vendor, stamp of the shop _____

Sale date _____

CONNECTION CERTIFICATE

This is to certify that the heat (energy) recovery ventilator VENTS Frigate HRV(ERV) 120 S has been connected to power mains pursuant to the requirements stated in this User's Operation Manual by the electrical engineer:

Company name: _____

Electrical engineer name: _____

Date _____ Signature _____

WARRANTY CARD





