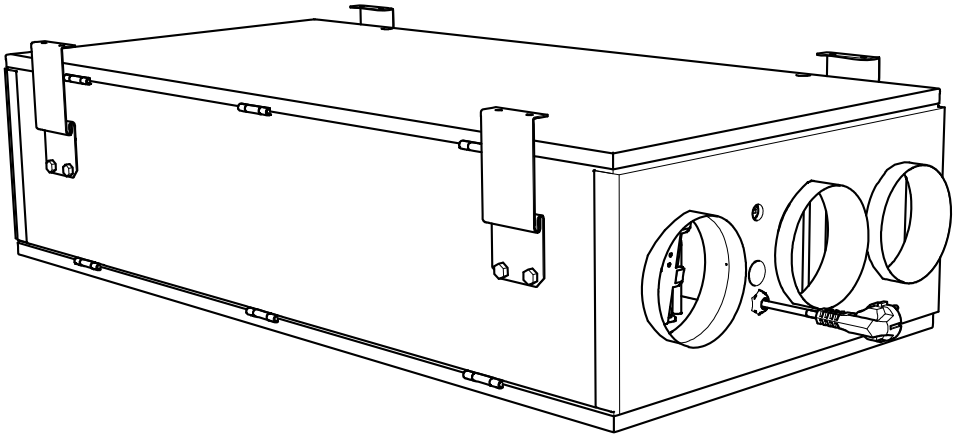
VR-250 ECH/B

Air Handling Unit



GB **Operation and maintenance instructions**

10-02 (16-11-2010)

Introduction

Installation, operation and maintenance manual concerns air handling unit type VR 250 ECH/B manufactured by Systemair AB. It consists of basic instructions and recommendations concerning the design, installation, start-up and operation, which shall be obeyed to ensure proper and fail-free operation of the unit. For proper and safe operation, read this manual thoroughly. Use the unit according to guidelines given and follow all safety requirements.

Table of contents

Safety information

In order to avoid electrical shock, fire or other damage which might occur in connection with faulty use and operation of the unit, it is important to consider the following:

Warning!

- **The system should operate continuously, and only be stopped for maintenance and service**
- **Beware of sharp edges when mounting and during maintenance. Use protective gloves!**
- **Tumble dryer must not be connected directly to the ventilation system**
- **Make sure that filters are mounted in their place before running the system**
- **Before performing any maintenance or electrical work make sure that the mains supply is disconnected**
- **Maintenance must be performed according to below instructions.**

General

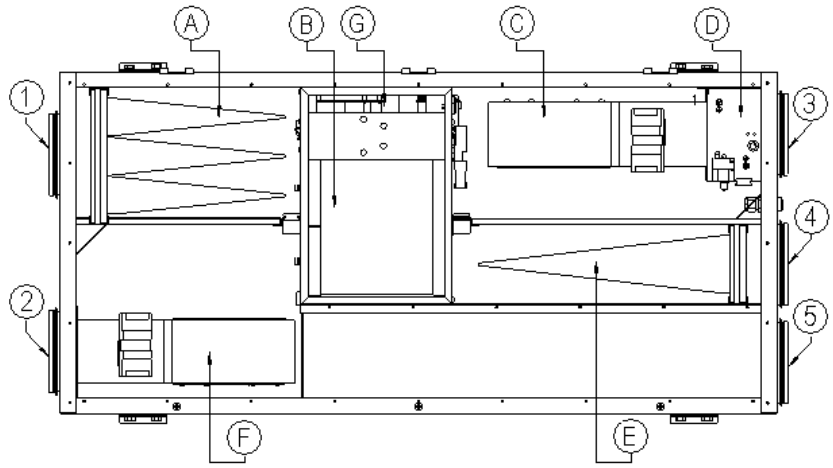


Fig. 1

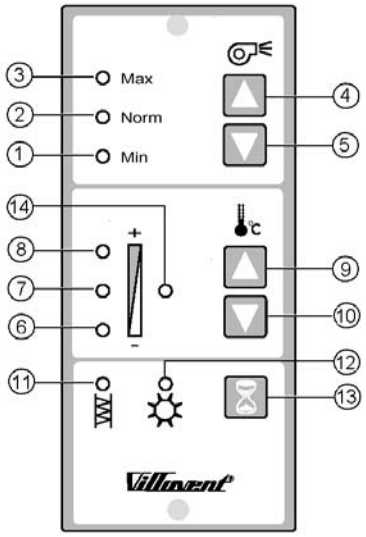
A) Fresh air filter, EU7
B) Rotating heat exchanger
C) Inlet fan
D) Electric re-heater battery, 500 W
E) Extract filter, EU3
F) Extract fan
G) Control equipment
1) Outdoor air
2) Discharge air
3) Supply air to living areas
4) Extract from wet rooms and kitchen
5) Extract from cooker hood (bypass)

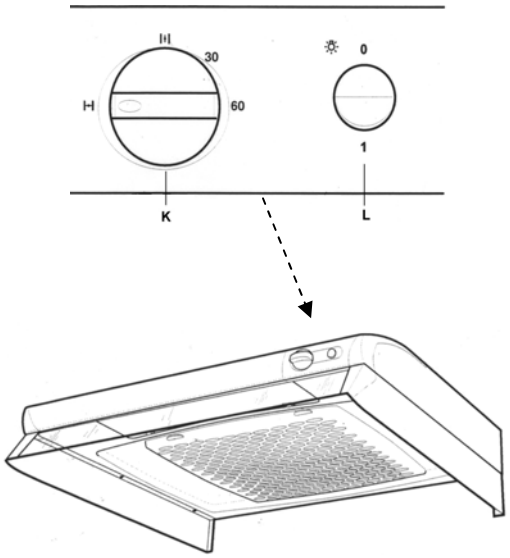
VR 250 ECH/B is a complete ventilation unit for supply of filtered and preheated outdoor air to residential areas and extract of a corresponding amount of used air from wet rooms and kitchen. The unit is equipped with a heat exchanger block to ensure safe and economical ventilation.

VR 250 ECH/B is especially designed for installation in flats and apartments where duct runs, smells and pollution from the kitchen extract (cooker hood) often is a great challenge. A damper solution in the VR 250 ECH/B makes is possible to connect the unit to cooker hood. The kitchen extract goes directly to the extract fan avoiding fumes and pollution to be led into the heat exchanger.

The unit will automatically alternate between winter operation with heat recovery and summer operation without heat recovery.

Operation





①②③	Signal airflow
④⑤	Switches airflow
⑥⑦⑧	Signal supply air temperature
⑨⑩	Switches supply air temperature
⑪	Signal filter change
⑫	Signal summer operation
⑬	Reset of operation time after filter change
⑭	Signal heater battery ON

Fig. 2

The unit is controlled from a separate controller, with the following functions:

Airflow (Fan speed)

Buttons to increase or decrease airflow in 3 steps (4) and (5) **(fig.2)**. Lamp signals (1), (2) and (3) show set airflow.

Min(1)	Minimum ventilation. To be used during holidays or when the building is not in use.
Norm(2)	Normal ventilation adapted to the building. Airflow for normal ventilation can be chosen by means of a potentiometer on the main print card (see installation instructions-Commissioning).
Max(3)	Forced ventilation. Is used when extra airflow is required.

Supply air temperature

Buttons to increase or decrease inlet air temperature in 5 steps **(fig.2)**. Supply air temperature is increased/de-creased by pressing buttons (9) and (10) alternatively. Lamp signals (6), (7) and (8) show set supply air temperature.

Step 1 Lamp (6) lights (factory setting).
Step 2 Lamp (6) and (7) light.
Step 3 Lamp (7) lights
Step 4 Lamp (7) and (8) light
Step 5 Lamp (8) lights

When heat recovery from the extract air is in-sufficient to obtain set supply air temperature, an electrical heater battery will automatically be switched on. Lamp signal (14) will light up when the heater battery is in operation. (In general it is recommended to set supply air temperature as low as possible, avoiding the feeling of draught. This gives the ultimate energy and ventilation efficiency).

Filter

Lamp signal (11) comes on when set operation time between changing of air filters (pos. A & E, **fig. 1**) has expired. The ventilation unit can still be operated, but the efficiency will be reduced if the filter is not replaced. Operation time (6, 9 or 12 months) between filter changes can be set on the control panel (see installation instructions). From factory, operation time is set to 9 months. Reset operation time after having changed the filter (see “Maintenance”).

Summer operation

When supply air temperature exceeds set temperature, the rotor will stop and there will be no heat recovery (summer operation). If the extract air temperature becomes lower than the outdoor temperature (for example: if the building has cooling/air conditioning installed), the unit will automatically switch to recovery (of the chilled indoor air). The extract air will then cool down the inlet air in the exchanger. Lamp 12, **(fig. 2)** lights when the rotor is not in operation.

Manual summer operation

Even if the outdoor air temperature is low, the room temperature could be higher than wanted, due to sunshine (spring and autumn). Lower room temperature can be obtained by setting the supply air temperature to step 0 (none of the lamps 6, 7 or 8 are illuminated), and at the same time increase the airflow to MAX.

To avoid that the ventilation unit remain in "manual summer operation" when heat recovery is required, automatic reset to normal operation will happen when supply air temperature becomes lower than 5°C.

Kitchen extraction

VR 250 ECH/B is designed for connection to a cooker hood.

Note! The cooker hood must be equipped with a damper leaving no opening in closed position (without opening for basic ventilation).

During forced ventilation from the cooker (when cooking) the damper in the cooker hood is opened from switch K, **(fig.2)**. At the same time the fans will automatically change to MAX fan speed. Extract from the cooker is led directly through the extract fan, and not through the heat exchanger. The capacity of the extract fan is then primarily used for extract from the cooker, but a minor airflow is maintained through the extract louvers. The opening time for the cooker hood damper can be set from 5 to 60 minutes. The damper closes automatically according to chosen time, or manually by turning switch K to H. The bypass damper in the unit will close automatically and the extract fan will switch to normal ventilation (NORM).

Note! When extract from the cooker is used the extract air will bypass the heat exchanger, and set supply air temperature is obtained by means of electrical heater battery in the unit. Automatic closing of the damper in the cooker hood ensures energy efficient use of the ventilation system.

Maintenance

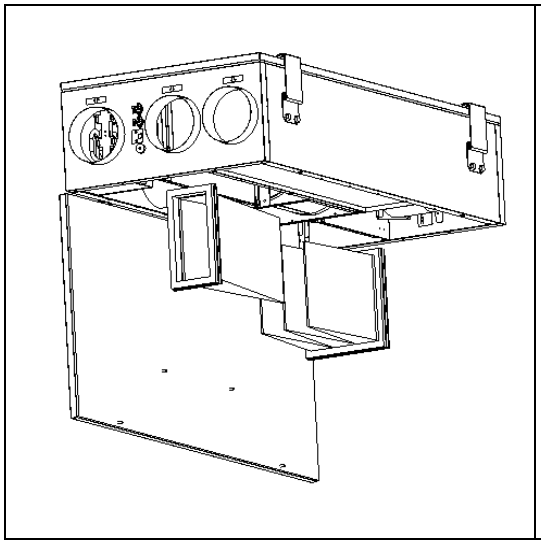


Fig. 3

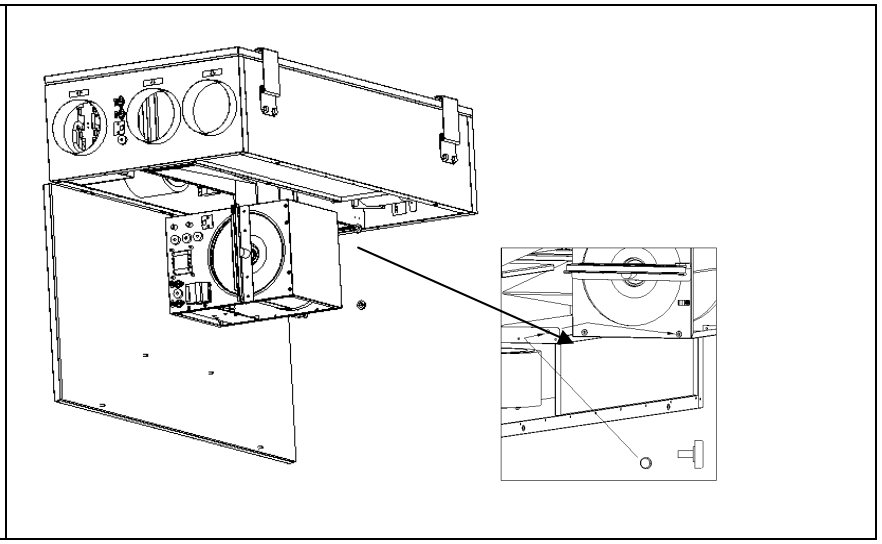


Fig. 4

Maintenance of the VR 250 ECH/B should normally be performed 3 - 6 times a year. Apart from general cleaning the following should be observed:

Changing extract/inlet filter

Changing extract/inlet filter (lamp signal on control panel) 1 - 2 times per year or as necessary **(Fig. 3)** The bag filters cannot be cleaned and must be changed as necessary. (Contact your supplier for new filter).

Operation time between filter changes must be re-set after filter change. Press button 13 **(fig. 2)** for approx. 5 seconds. Yellow lamp (14) and one of the green lamps (6, 7 or 8, depending on chosen operation time) will flash for a few seconds.

Each time a filter change is performed it is recommended to check the driving belt for the heat exchanger rotor. Check that the belt is undamaged and tight. Test that the drive belt wheel moves when the rotor is moved by hand. If the belt needs to be replaced contact your installer.

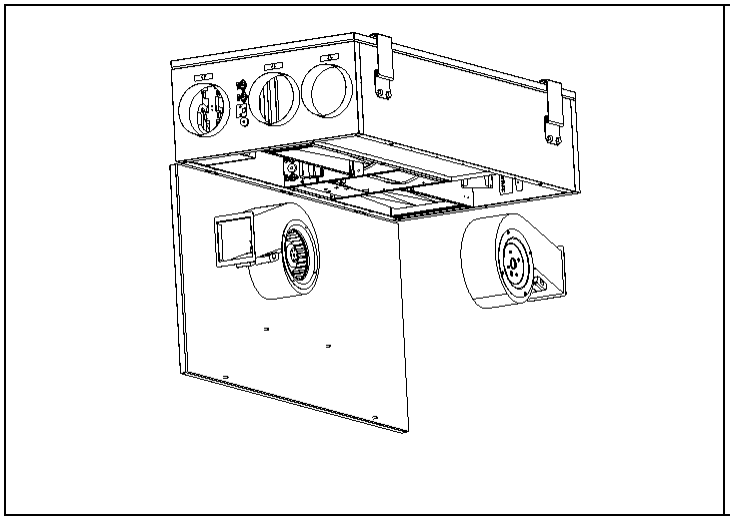


Fig. 5

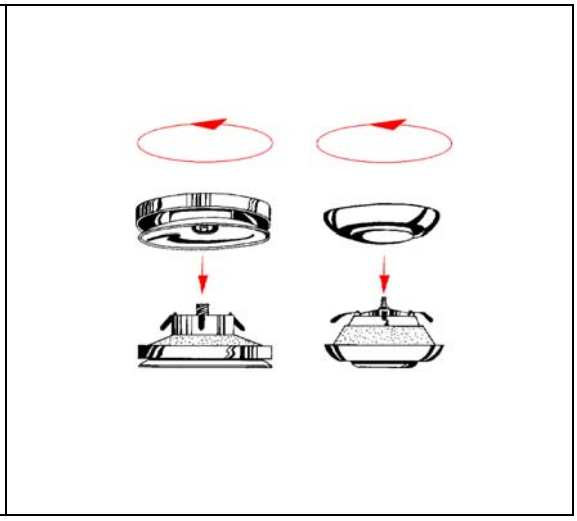


Fig. 6

Changing operation time between filter changes

Depending on the condition of the filter, you might need to change the operation time for the filter. See Installation instructions - "Commissioning".

Checking the heat exchanger /Rotor belt

Checking the heat exchanger (every 3 years) **(fig. 4)**
Even if the required maintenance in items 1 and 2 is carried out, dust will build up in the exchanger block. It is therefore of vital importance for the upkeep of a high efficiency that the exchanger block is removed from the unit and cleaned periodically. Wash in hot soapy water. Do not use detergent containing ammonia.

The belt that drives the exchanger rotor should be controlled on a regular basis. It is recommended to do this whenever it is time to change filters. Check that the belt is whole and without any visible damage and that it is tight enough to move the heat exchanger wheel (check by turning the exchanger wheel by hand and see if the belt pulley on the rotor motor moves as well. If the belt needs to be replaced contact your installer.
Note! Ensure that the rotor motor is not exposed to moisture.

Checking the fans

Checking the fans (every 3 years) **(fig. 5)**
Even if the required maintenance, such as cleaning/changing of filters is carried out, dust and grease will slowly build up inside the fans. This will reduce the efficiency. As necessary the fans can be pulled out for cleaning with a soft brush. Do not use water. White spirit can be used to remove obstinate settlements. Allow to dry properly before remounting.

Cleaning extract louvers and inlet diffusers

Cleaning extract louvers and inlet diffusers (as necessary) **(fig. 6)**
The system supplies fresh air to your home and extracts the used indoor air via the duct system and diffusers/louvers. Diffusers and louvers are mounted in ceilings/walls in bedrooms, living room, wet rooms, WC etc. Remove diffusers and louvers and wash in hot soapy water as required. (Diffusers/louvers must not be exchanged).

Checking the fresh air intake

Checking the fresh air intake (twice a year) **fig. 7**
Leaves and pollution could plug up the air intake grille and reduce the capacity. Check the air intake grille at least twice a year, and clean as necessary.

Checking the duct system

Checking the duct system (every 5 years) **(fig. 8)**
Dust and grease settlements will, even if required maintenance such as cleaning/changing of filters is being carried out, build up in the duct system. This will reduce the efficiency of the installation. The duct runs should therefore be cleaned/changed when necessary. Steel ducts can be cleaned by pulling a brush soaked in hot soapy water, through the duct via diffuser/louver openings or special inspection hatches in the duct system (if fitted).

Note! In addition, the roof unit must be checked once a year, and cleaned as necessary **(fig. 9)**.
For use and maintenance of cooker hood, see separate instructions.

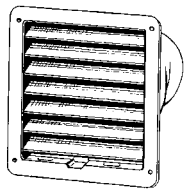


Fig. 7

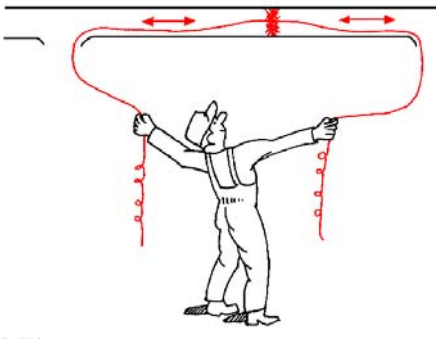


Fig. 8

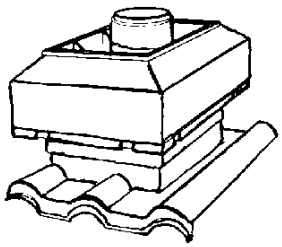


Fig. 9

Troubleshooting

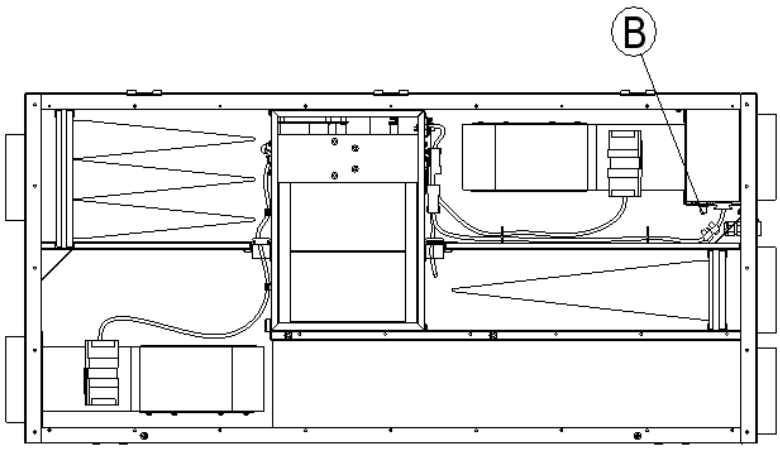


Fig. 10

Should problems occur, please check or correct the items below before calling your service representative.

1. **Fan(s) do not start**
   Check that all fuses and plugs are connected (mains supply and fan plugs).

2. **Reduced airflow**
   a. Check setting of airflow on control panel.
   b. Change filter required?
   c. Cleaning of diffusers/louvers required?
   d. Cleaning of fans/exchanger block required?
   e. Is roof unit/air intake clogged?
   f. Duct system. Check visible duct runs for damage and/or build-up of dust/pollution.
   g. Check diffuser/louver openings.

3. **The unit cannot be controlled (control functions are stuck)**
   Reset control functions by pulling out the plug for 20-30 seconds.

4. **Cold supply air**
   a. Check set supply air temperature on the control panel
   b. Check if fire thermostat is still alert. If necessary, reset by pressing the red button **"B" (fig.10)** in the unit.
   c. Check if the extract filter needs changing
   d. Exchanger block does not rotate (defect rotor belt?)
      Possible cause:
      - Defect drive belt for the rotating heat exchanger (ensure that the drive belt is whole and without any visible damage)
      - Defect rotor motor for operation of the rotating heat exchanger (can be controlled by pulling the plug of the unit for 10 seconds after which the units is restarted. The rotor motor should then restart
      - Defect bearings in the heat exchanger rotor (test by rotating the exchanger wheel by hand. It should rotate freely)
      - The belt pulley on the rotor motor has come loose (check by rotating the exchanger wheel by hand and see if the pulley rotates on the motor axis).

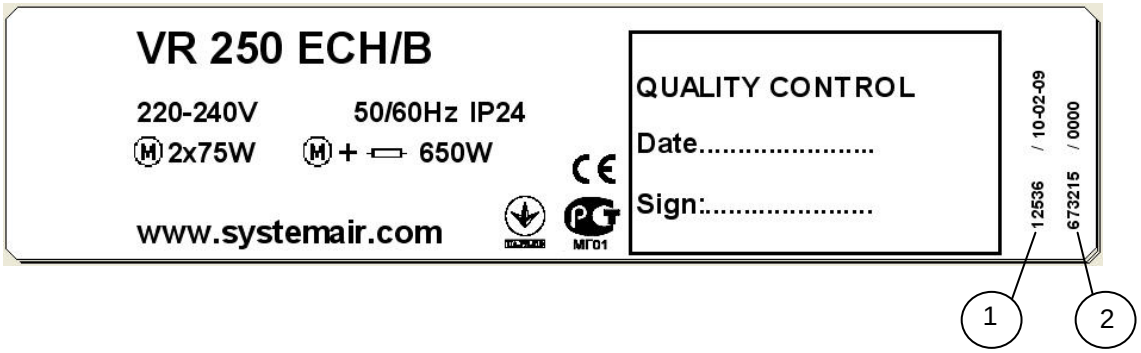
5. **Noise/vibrations**
   a. Clean fan impellers.
   b. Pull the fans out and check that screws holding the fans are tightened.

6. Alarms

Lamps flash/go out as follows:	**Lamps 1=Flashing 0=Off**					
Lamp no: See page 4	**6**	**7**	**8**	**11**	**12**	**14**
Short circuit or breach in sensor(s)	1	1	1			1
Unintended rotor stop (belt breakage, defective motor)				1		1
Missing zero crossing detector					1	1
Voltage too low (< 210 V). Lamps 6, 7 and 8 are flashing in accordance with set inlet air temperatures (see Operation)	(1)	(1)	(1)			1
The re-heater battery is switched off due to overheating	1		1			1
The re-heater battery is switched off by the fire thermostat	0	0	0			0

Service

Before calling your service representative, make a note of **the item no.(pos 1, fig11) and production number (pos. 2, fig. 11) from the type label, which can be found behind the inspection hatch**.



Systemair AB
Industrivägen 3
739 30 Skinnskatteberg, Sweden
Phone +46 222 440 00
Fax +46 222 440 99

206610 (16-11-2010)