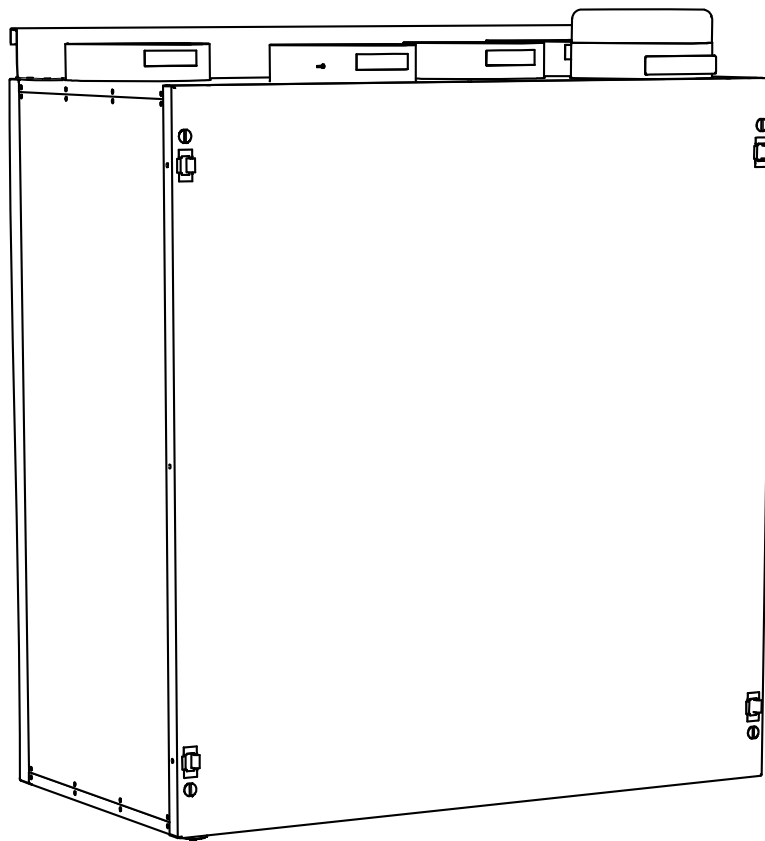


# VR 300 ECV/B (1000W/500W)

Air Handling Unit



**GB** Installation description



## Manufacturer

Our products are manufactured in compliance with applicable international standards and regulations.



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The manufacturer hereby confirms that the following products:

Air handling units  
**VR 300 ECV/B**

Comply with the following EC-directives:

### EC Declaration of Conformity

as defined by the EC Low Voltage Directive 2006/95/EC

**The following harmonized standards are in use:**

EN 60 335-1

Electric domestic products and similar – safety-general requirements.

EN 60 335-2-40

Safety of household and similar electrical appliances - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers.

EN 50 106:2007 Electric domestic products and similar-Safety-Instructions for control of manufacture.

### EC Declaration of Conformity

as defined by EC's EMC-directive 2004/108/EC

**The following harmonized standards are in use:**

EN 61000-6-3 Electromagnetic compatibility (EMC) part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments

EN 61000-6-2 Electromagnetic compatibility (EMC) – Part 6-2: Generic standards - Immunity for industrial environments

Complete technical documentation is available.

Skinnskatteberg, 08-04-2010



**Mats Sándor**  
Technical Manager

## Introduction

Installation, operation and maintenance manual concerns air handling unit type VR 300 ECV/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.

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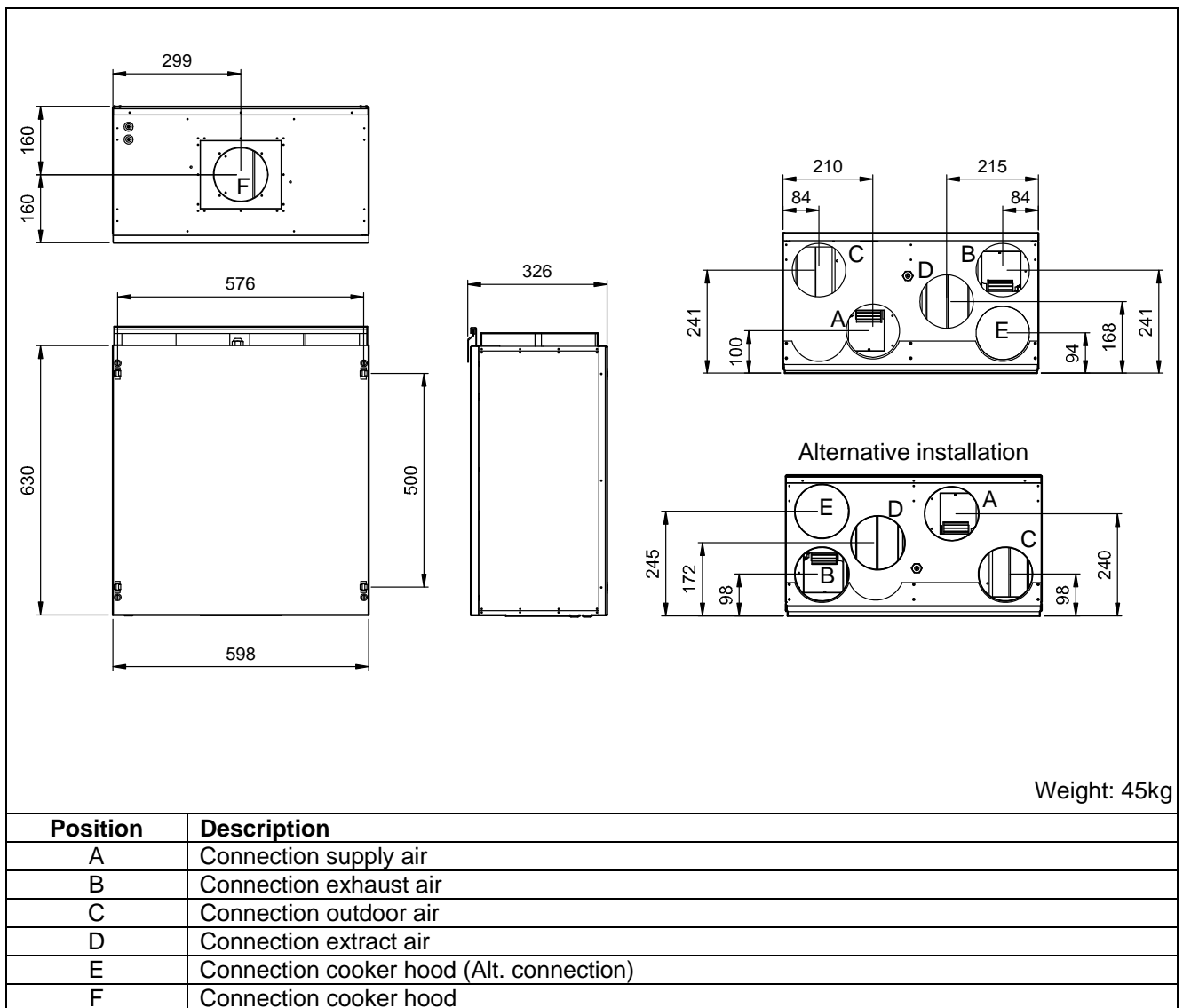
## Safety information

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!

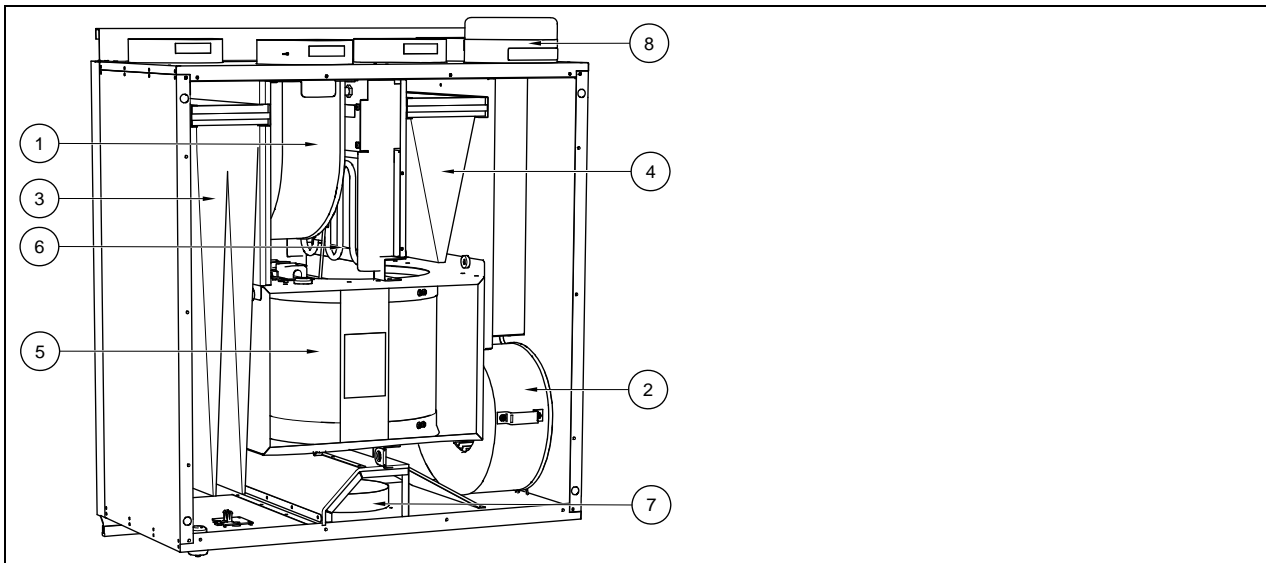
- **The Installation must be performed according to the installation instructions**
- **The unit is heavy, be careful when lifting and mounting the unit**
- **Beware of sharp edges when mounting and during maintenance. Use protective gloves!**
- **Tumble dryer must not be connected directly to the ventilation 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.**

## Dimensions and weight



**Fig.1**

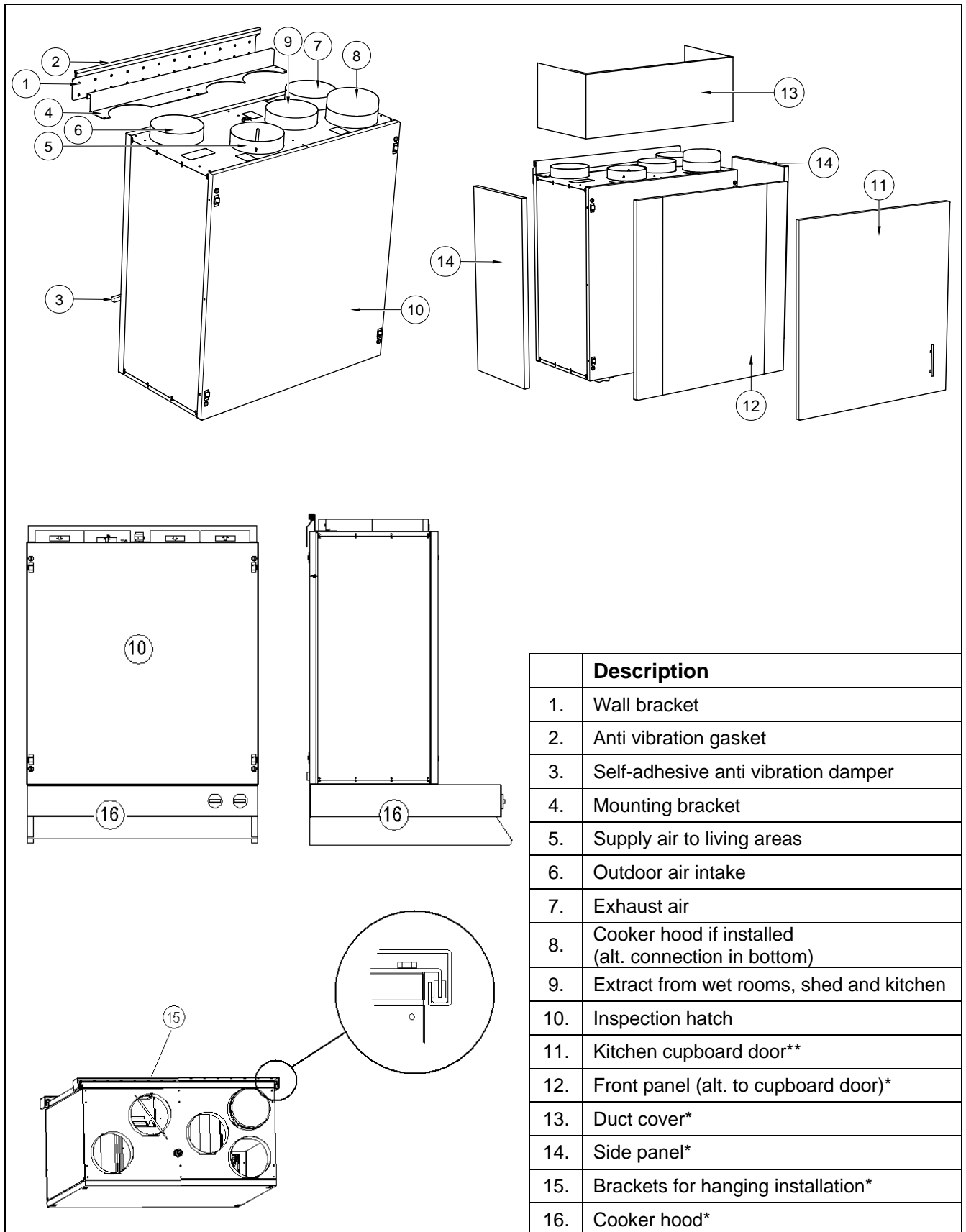
## Component description VR 300 ECV/B (internal)



Pos.	Description
1.	Fan supply air
2.	Fan extract air
3.	Filter supply air
4.	Filter extract air
5.	Heat exchanger
6.	Electrical re-heater battery
7.	Extract air connection for cooker hood
8.	Alt. extract air connection for cooker hood

**Fig.2**

## Component description VR 300 ECV/B (external)



	Description
1.	Wall bracket
2.	Anti vibration gasket
3.	Self-adhesive anti vibration damper
4.	Mounting bracket
5.	Supply air to living areas
6.	Outdoor air intake
7.	Exhaust air
8.	Cooker hood if installed (alt. connection in bottom)
9.	Extract from wet rooms, shed and kitchen
10.	Inspection hatch
11.	Kitchen cupboard door**
12.	Front panel (alt. to cupboard door)*
13.	Duct cover*
14.	Side panel*
15.	Brackets for hanging installation*
16.	Cooker hood*

**Fig. 3** \*Accessory (not included)

\*\*not included (not available from Systemair)

## Transport and storage

VR 300 ECV/B is delivered in one piece on a pallet for easy transportation using a forklift. The unit should be stored and transported in such a way that it is protected against physical damage that can harm panels, handles, display etc. It should be covered so that dust, rain and snow cannot enter and damage the unit and its components. The appliance is delivered complete with all necessary components, wrapped in plastic on a pallet for easy transportation.

## Where/how to install

- 1) First choose installation position for the unit, considering that duct runs should be as simple as possible.
- 2) If necessary the inspection hatches must be exchanged so that the hatch equipped with fixing clips for front door panel (pos.10, **fig.3**) becomes the unit front. The hatch with fixing clips has improved noise insulation, and this operation is therefore required even if front door panel is not to be mounted.
- 3) Install the mounting bracket (pos.4, **fig.3**) on top of the unit by means of provided screws and fix self-adhesive anti vibration seal (pos.3, **fig.3**) on the lower part of the unit's back side.
- 4) Install the wall bracket (pos.1, **fig.3**) with anti vibration pad. Bottom side of bracket should be 40mm below top of unit position, alternatively 590mm from the bottom position. Check that the anti vibration seal (pos.2, **fig.3**) is undamaged.
- 5) Lift the unit into position and make sure that there is no direct contact between unit and building construction.

The unit should preferably be installed in a separate room (e.g. storeroom, laundry room or similar). Duct from cooker hood can be connected to bypass duct (pos.7 **fig.3**) in top or bottom of the unit. As an alternative, a cooker hood can be connected directly under the unit. The unit is designed for installation on the wall, but can also be installed horizontally, i.e. hanging (separate instructions enclosed with brackets for hanging installation) or lying. If installed lying, remember to mount necessary anti vibration pads under the unit. The unit is equipped with large inspection hatches on both sides, and is laterally reversible for flexible and simple connection to duct system.

When choosing the installation position, consideration must be taken that the unit requires regular maintenance. Make sure that the inspection doors are available for maintenance/service. Leave free space for removing of inspection doors and main components inside the unit. If the unit is installed on a light wall construction towards a living room (e.g. bedroom), we recommend that the wall is insulated/ designed so that transfer of noise is avoided.

Recommended installation location for the outdoor air intake is the northern or eastern side of the building and with a distance to openings for discharge of stale ventilation air, kitchen ventilator, central vacuum system, waist water drainage and other pollution sources like exhaust from traffic etc. Stale discharge air should ideally be led via a roof unit to outside and with a good distance to any outdoor air intake, windows etc.

When the unit is installed over the cooker, a kitchen cupboard door (pos.11, **fig.3**) can be mounted to cover the unit front, by means of the provided clip-in receptacle and stud (re. installation instructions on mounting template).

White painted or Stainless, insulated front cover (alternative to kitchen cupboard door) (pos.12, **fig.3**), white side panels (where unit side is visible) (pos.14, **fig.3**) and white painted duct cover (pos.13, **fig.3**) between ceiling and unit (H=295mm) can be supplied as additional equipment.



## Ducting

### General

Air to and from the unit is led through a duct system. To ensure a long life and satisfactory cleaning possibilities, ducts made of galvanised steel (Spiro) are highly recommended.

Short pieces (max. 1m) of flexible aluminium ducting can be used for connection of the unit to roof unit/wall grill.

To obtain high efficiency, low energy consumption and required airflow, the duct system should be commissioned for low air speeds and a low pressure drop.

### NOTE!

- **If the VR 300 ECV/B is not connected to a cooker hood, the connector (pos.7, fig. 3) on the unit must remain plugged**
- **Do not connect tumble dryer to the ventilation system. Use separate duct from the dryer to the outdoors**
- **Duct connections/duct ends should be covered during storage and installation.**
- **Grill for discharge/roof unit must also be installed according to building regulations in force.**

## Duct connections

Secure all joints between ducting and Tee-pieces, duct connectors, reducers etc. by means of special tape or 3 pcs. Self-drilling screws per joint. "Telescopic joint" on Villavent Zoom duct must be taped (fig.4).

## Silencers

To avoid fan noise being transferred to rooms, install sound attenuators (pos.1, **fig.5**) on connectors for inlet air and extract air on the unit. (L = 1,0m). Not from cooker hood.

To avoid noise being transferred between rooms via the duct system and also to reduce noise from the duct system itself, installation of sound attenuators before every inlet diffuser is recommended.

## Flexible ducting

Flexible ducting (pos. 2, **fig. 5**) to be used only for connections between the unit and roof unit/grill for outdoor air intake.

## Condensation/heat insulation.

Outdoor air duct and discharge ducts must always be well insulated against condensation (**fig.6**). Correct insulation installation on ducts connected to the unit is especially important. All ducting installed in cold rooms/areas must be well insulated. Use insulating covering (minimum 100 mm mineral wool) with plastic diffusion barrier. In areas with extremely low outdoor temperatures during the winter, additional insulation must be installed. Total insulation thickness must be at least 150 mm.

**NOTE! If the unit is installed in a cold place make sure that all joints are covered with insulation, and tape well.**

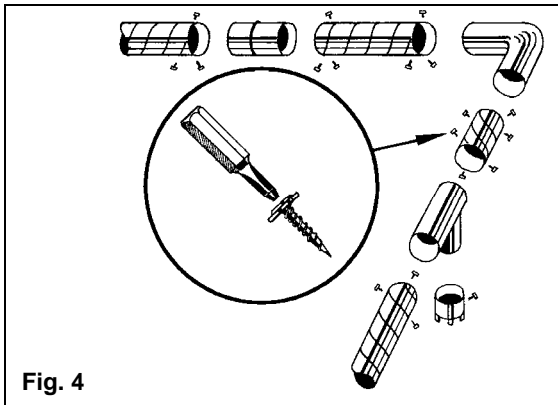


Fig. 4

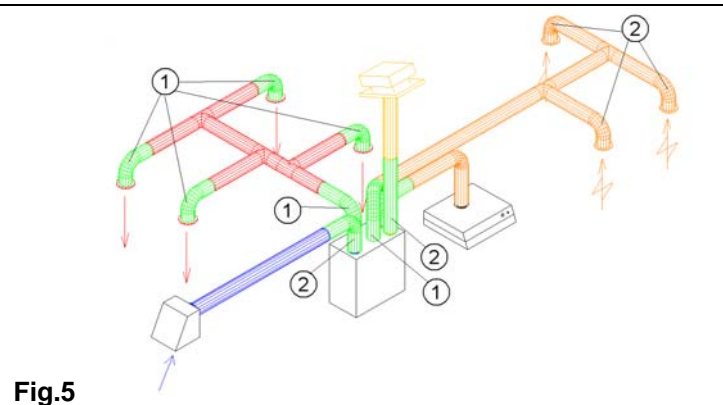


Fig.5

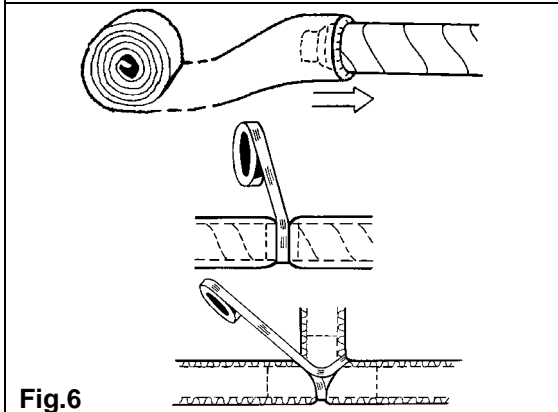


Fig.6

## Diffusers/valves

### Inlet diffusers & extract valves (Fig. 7)

Mount inlet diffusers in all living rooms, dining areas and bedrooms. Extract valves to be installed in bathrooms, laundry room, WC and kitchen. Note: Even if the cooker hood is connected to the unit, a separate extract valve must be installed in the kitchen.

In the VR 300 ECV/B the extract air from the cooker is led directly to the extract fan, bypassing the heat exchanger. In order to obtain heat recovery from the basic ventilation, the extract valve in the kitchen must be connected to pos.9, **fig.3.** together with extract from the wet rooms.

**Note! The cooker hood must be equipped with a damper leaving no opening in closed position (without opening for basic ventilation). Bung, provided with the cooker hood models adaptable to the unit, must be mounted.**

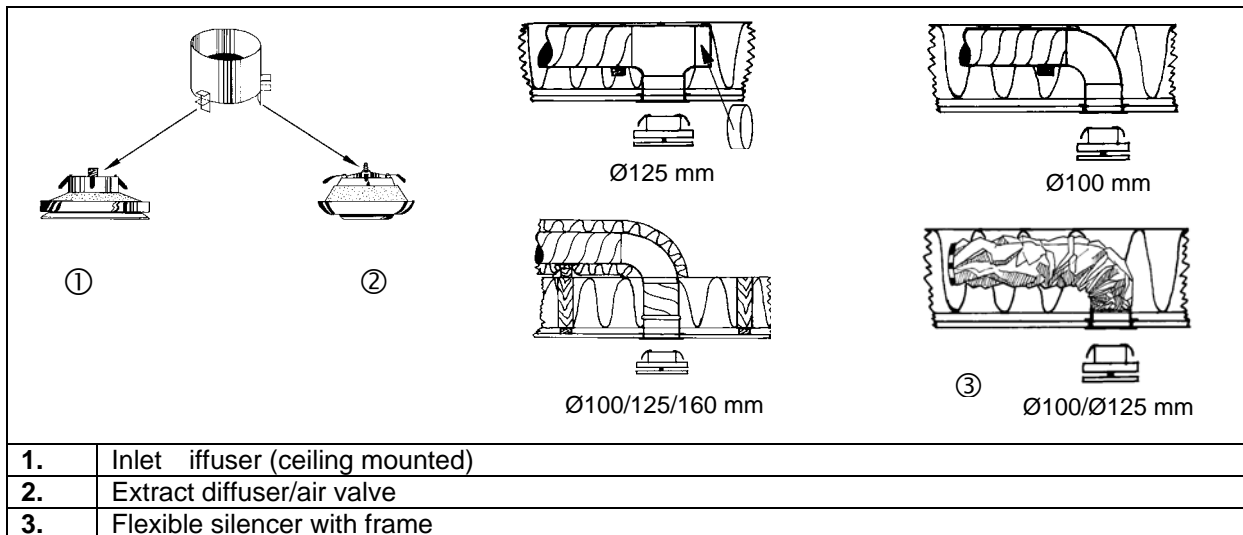
Extract valves can be ceiling- or wall mounted. Inlet diffuser should be mounted in the ceiling. Make sure that the air stream from inlet diffusers has a free passage.

Air stream from inlet diffuser mounted on the wall (where the ceiling is horizontal), must have throw length, so that the air is supplied to the room alongside the ceiling. Air supply through extract valves will ensure an air stream with throw length, and extract louvers can therefore be used as inlet diffusers when mounted in the wall close to the ceiling. Use frames to ease the removing of diffusers for cleaning.

For basic setting of inlet diffusers, open core of the diffuser 5-7 turns from closed position. Lock by means of centre nut. For basic setting of extract louvers, open core of the diffuser 10 turns from closed position. Lock by means of centre nut.

### Setting of air volume

For adjustment of air volumes to each separate room, setting on diffusers/valves are to be made in accordance with calculations made during designing of the ventilation system or during commissioning of the system (special measuring equipment required).



**Fig.7**

### Air circulation between rooms

To obtain a satisfactory air circulation, a small gap should exist around the doors between rooms with inlet diffusers (living rooms and bedrooms) and rooms with extract points (bathroom, WC, kitchen, laundry rooms etc.). Install doors with slot in the frame, doors without doorsill or slots/vents in doors/wall (min. 70 cm<sup>2</sup> free area per extract diffuser)(**fig.8**).

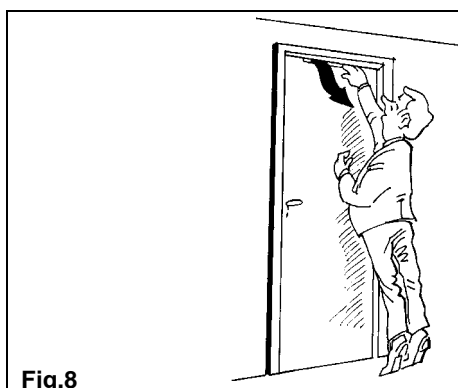
### Fireplace, kitchen ventilator, tumble dryer etc.

Balanced ventilation is obtained where the VR 300 ECV/B is installed. There will normally be no under pressure in the building, and therefore no risk for back draught from fireplace or chimney.

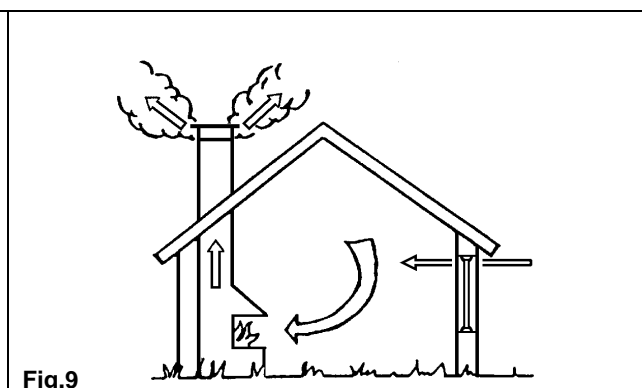
An open fireplace requires an air supply of 150 – 300 m<sup>3</sup>/h (40 – 80 l/s) for maximum functionality and efficiency. This equals 300 cm<sup>2</sup> ventilation slots per fireplace. Supply air duct directly to the fireplace would be the optimal solution, but 2 pcs. 16x16 cm closing vents in outer wall is a good alternative (**Fig.9**).

When cooker hood is connected to the VR 300 ECV/B, the airflow will automatically be increased when kitchen extract is in use. A minor under pressure in the building could occur. This can be solved by slightly opening a window or by leaving a vent in the wall open while cooking.

16x16 cm vents could be installed for air supply to tumble dryer and kitchen ventilator (one for each). These should preferably be installed in the same room. An open window will also give the required air supply to fireplace, kitchen ventilator and tumble dryer.



**Fig.8**

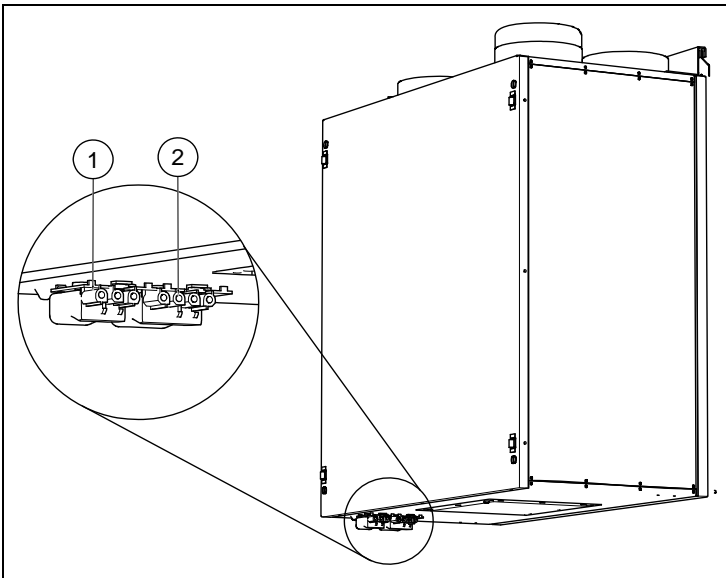


**Fig.9**

## Electrical connection

### The unit

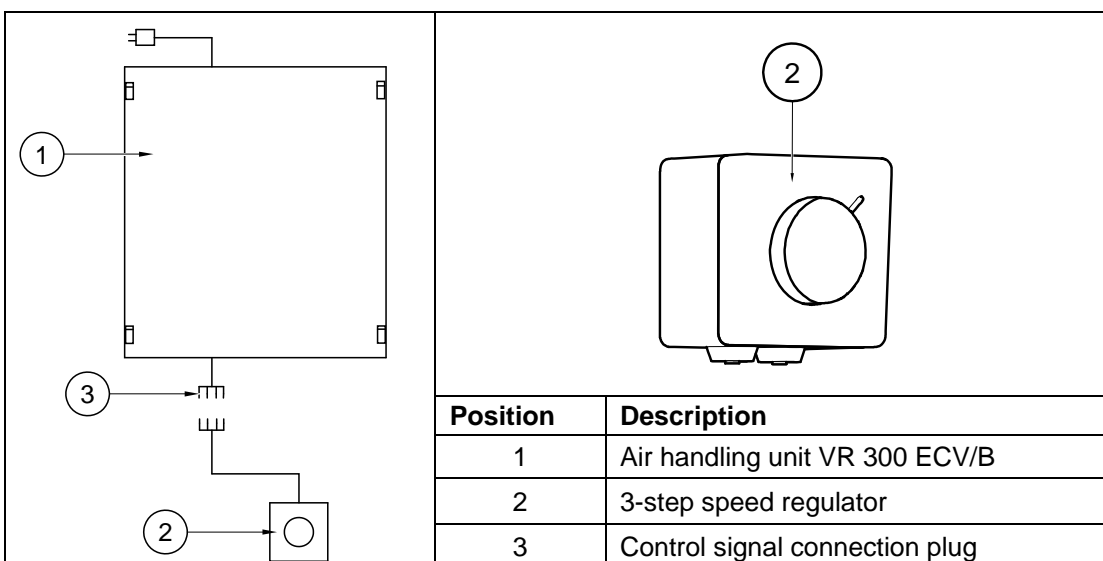
The VR 300 ECV/B units are supplied with apx. 1m cable and plug for 10A, 230V, single phased earthed connection. The electrical connection to the cooker hood is done through connection plugs (**fig. 10**) situated on the bottom plate of the unit. The 3 pole connection plug (pos. 1, **fig. 10**) is used for the mains supply of the cooker hood light and the 4 pole connection plug is used for the speed control signal. In case a cooker hood is not used and the speed control is done by an external speed regulator the 3 pole connection plug (pos 1, **fig. 10**) is not used. See also the wiring diagram, which is enclosed with the unit.



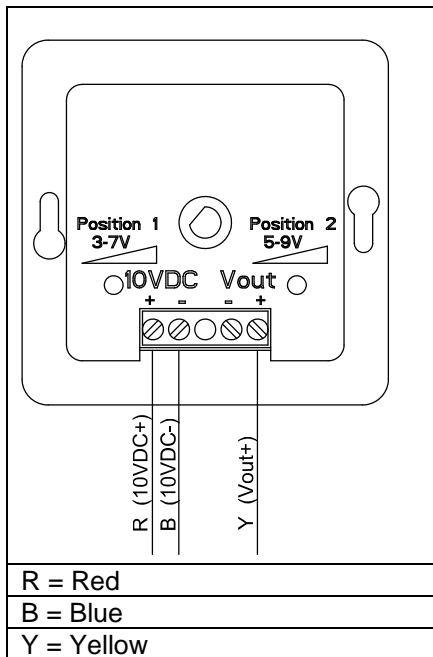
**Fig. 10**

### Speed control

The VR 300 ECV/B (pos 1, **fig. 11**) can alternatively be controlled from a wall mounted 3 step speed regulator (pos 2, **fig. 11**) or from a cooker hood where the speed control is integrated in cooker hood front. If a separate 3-step speed regulator is used a 3-wire cable needs to be connected to the speed regulator (**fig.12**) At the end of that cable a 4 pole male plug, type Ensto NAC41SH.W can be applied in order to fit the corresponding connector (Ensto NAC42SH.W) on the VR 300 ECV/B. Make sure that the cable colors correspond to each other when the two connectors are joined. Check the enclosed wiring diagram for more detailed information.



**Fig. 11**



**Fig. 12**

### Connection to cooker hood

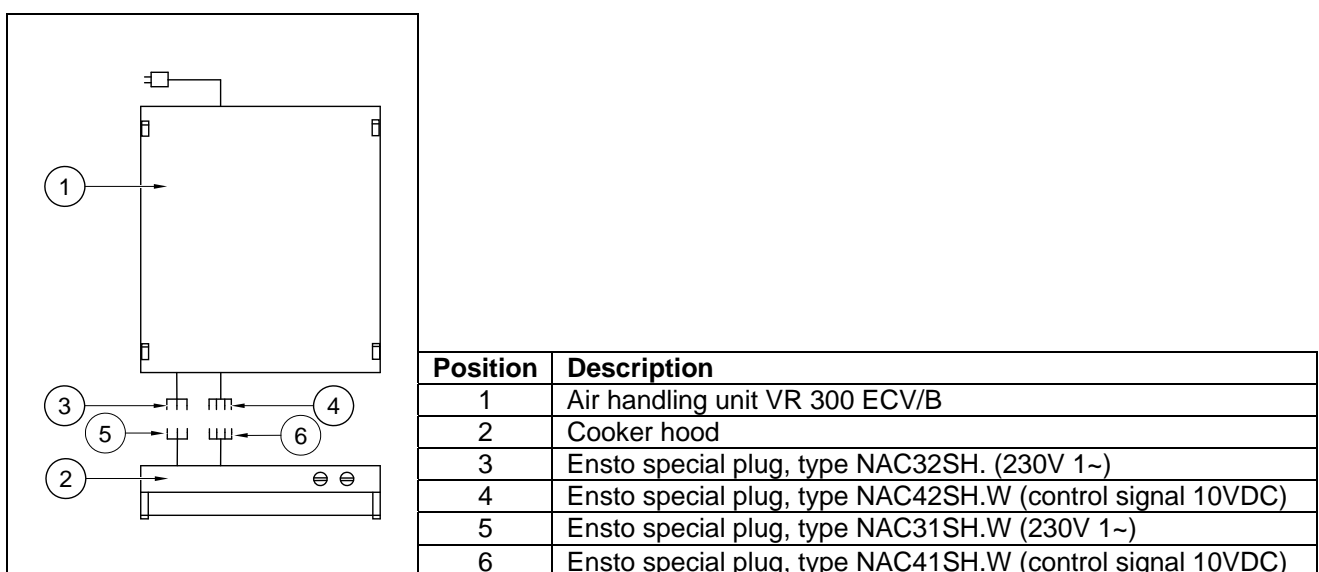
The VR 300 ECV/B is designed for connection to, and for operation from, special cooker hood. When mounting the cooker hood underneath the ventilation unit the special plugs on the cooker hood are connected to the corresponding plugs on the ventilation unit (**fig.13**).

For remote installation of the cooker hood, use fixed wiring by means of 2 pcs PFXPplastic cable 3x1,5 mm<sup>2</sup> + earth or equal.

- On the side of the cooker hood mount Ensto special plugs respectively type NAC31SH.W (3-pole) and NAC41SH.W on the cables.
- On the ventilation unit side mount Ensto special plugs NAC32SH.W and NAC42SH.W on the cables.

(As an alternative to Ensto plugs, standard junction box can be applied).

Check the enclosed wiring diagram for more detailed information.



**Fig.13**

## Commissioning

The speed of the supply air fan of VR 300 ECV/B can be adjusted by turning a knob situated inside the unit next to the supply air fan (pos.5, **fig.14**). The knob, a step-less potentiometer, makes it possible to lower the supply air fan speed down to 75% of the speed of the extract air fan, thereby ensuring the proper balance in the unit and building.

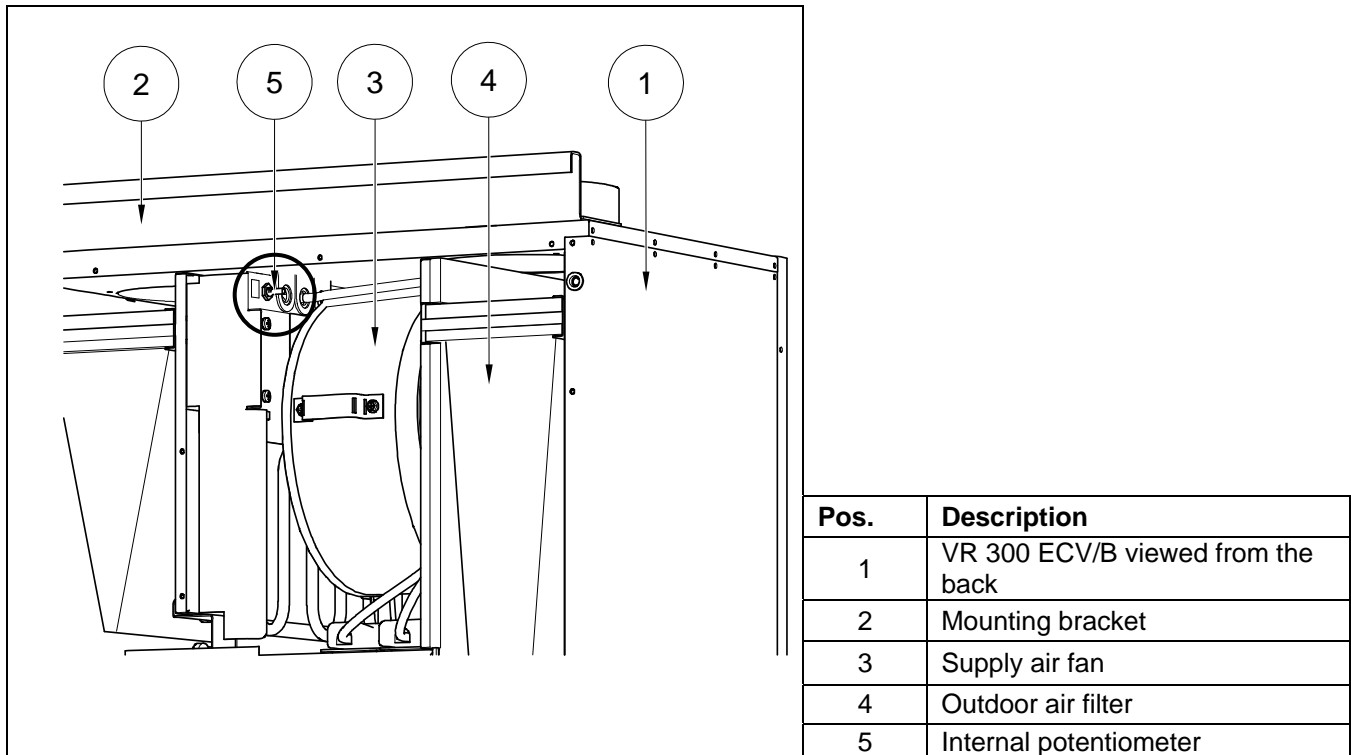


Fig.14

## Checklist

When the installation is finished, check that:

**NB!** If start-up of the system is delayed, the duct system must be protected (by means of bungs) so that air circulation is prevented. This is to avoid condensation and damage in the ventilation unit.

1. the unit is installed in accordance with instructions.
2. sound attenuators are installed and that the duct system is correctly connected to the unit.
3. there is no noise from the unit or from diffusers and louvers.
4. outdoor air intake and discharge is installed so that short circuit of the air streams is avoided.
5. outdoor air intake is positioned with sufficient distance to pollution source (kitchen ventilator exhaust, central vacuum system exhaust or similar).
6. control functions are operating (see user and maintenance instructions, "Operation").
7. The cooker hood (if installed) is equipped with a damper leaving no opening in closed position (without opening for basic ventilation).

## Before starting the system

1. Choose required airflow at normal and min. fan speed as follows:  
Set the normal and min. fan speed of the ventilation unit from potentiometers in the back of the speed regulator (**fig. 12**) or cooker hood (see instructions for cooker hood). The potentiometers are set by using a screw driver. Turning the potentiometer results in different control voltages to the fans (see **table 1**). To get an idea of the airflow corresponding to each voltage output see **fig. 15** showing a fan performance diagram displaying performance curves for supply air and extract air.

Speed setting	Voltage range
Min. speed	3-7 V
Norm. speed	5-9 V

Table 1

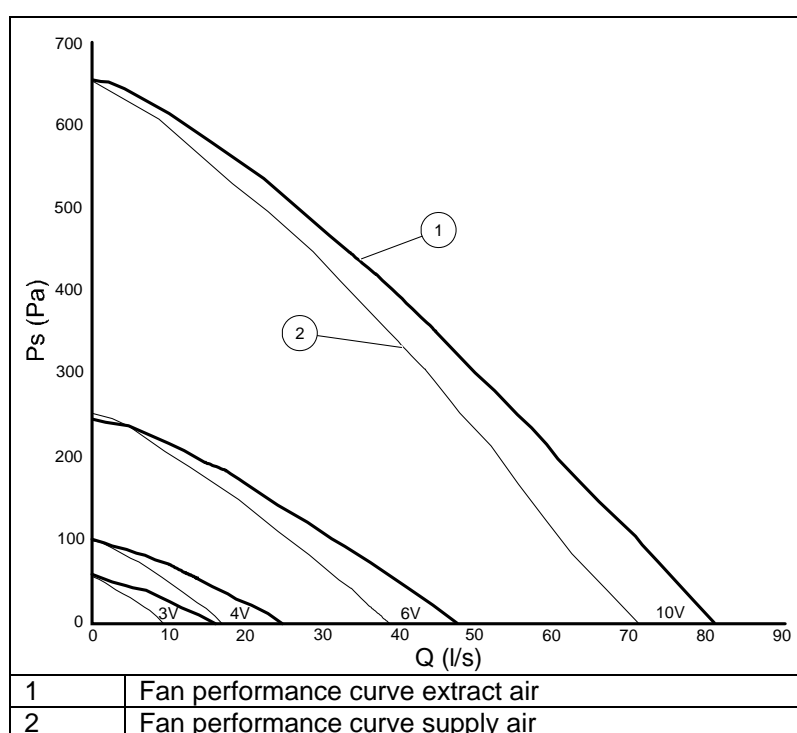


Fig. 15

2. Adjust diffusers and air valves in accordance with commissioning or basic setting (see "Diffusers/air valves"). Make sure that sector shutter in the inlet diffusers are set so that the air stream is not led towards obstructions like visible joist, wall etc.
3. Choose desired supply air temperature, (see User and maintenance instructions; "Operation").

## Additional accessories

For more information about silencers, diffusers/air valves, roof units, wall grilles etc. see technical catalogue and installation respective instructions.

Systemair AB reserves the right to make changes and improvements to the contents of this manual  
without prior notice





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206552 (01-07-2010)