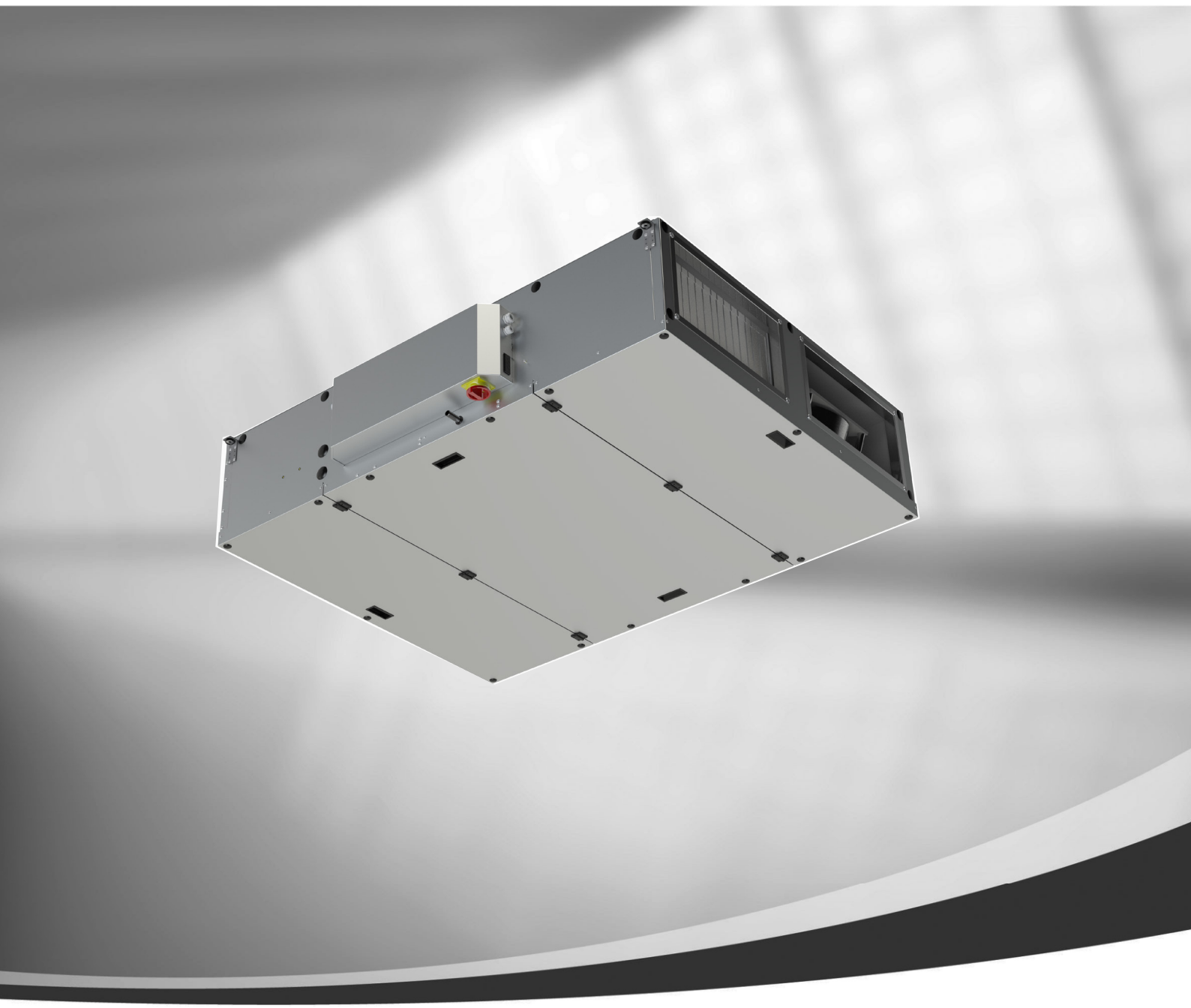
# VSC
# Compact Air Handling Unit

## Installation instructions

GB

Document in original language



4-118-0324 V1 (1/2)

systemair

# Contents

# 1 Warnings

The following admonitions will be presented in the different sections of the document:

**⚠ Danger**

- Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ Warning**

- Indicates a potentially hazardous situation that may result in minor or moderate injuries.

**⚠ Caution**

- Indicates a risk of damaging the product or prevent optimal operation.

**Important**

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision
- or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

# 2 Product information

## 2.1 General

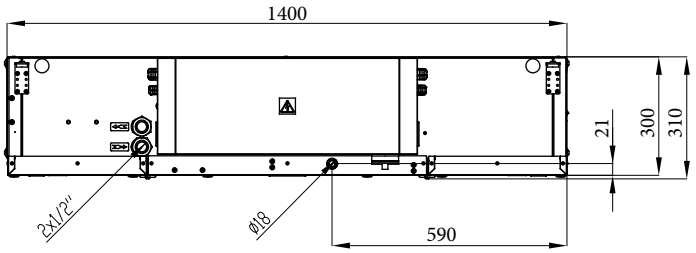
This installation manual concerns air handling unit type Topvex FC manufactured by Systemair Sverige AB. The units include the following model options:

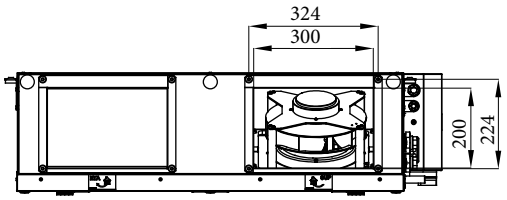
- Model: VSC 700, VSC 1500, VSC 2000
- Heating coil: EL (Electric), HW (Water coil) or None.

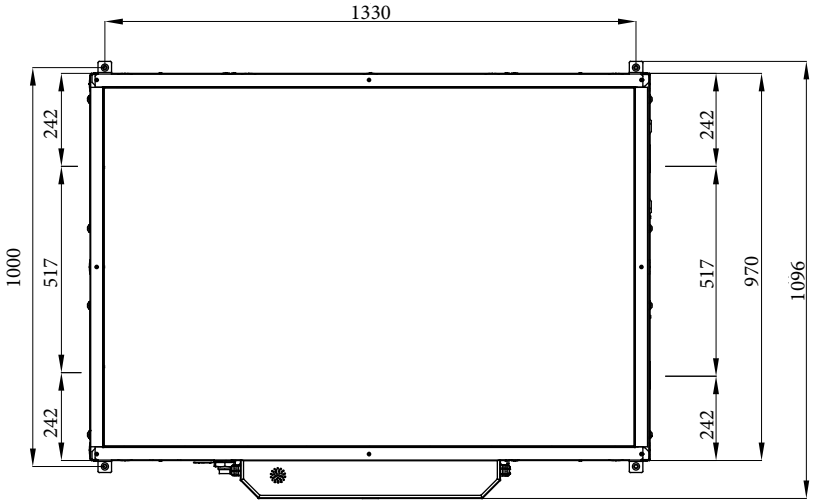
This manual consists of basic information and recommendations concerning the design, installation, start-up and operation, to ensure a proper fail-free operation of the unit.
The key to proper and safe operating of the unit is to read this manual thoroughly, use the unit according to given guidelines and follow all safety requirements.

# 2.2 Technical data

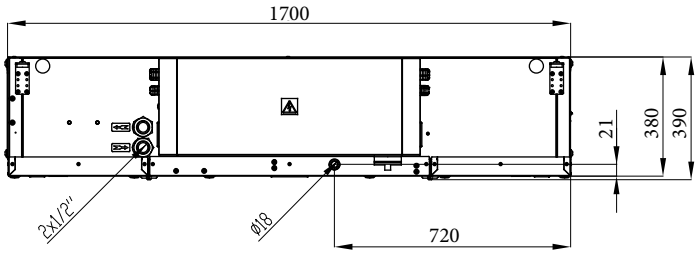
## 2.2.1 Dimensions and weight

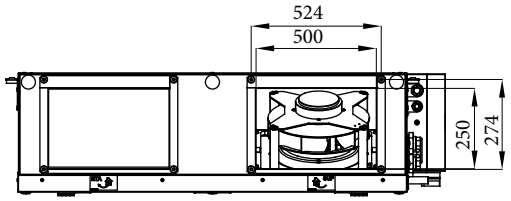


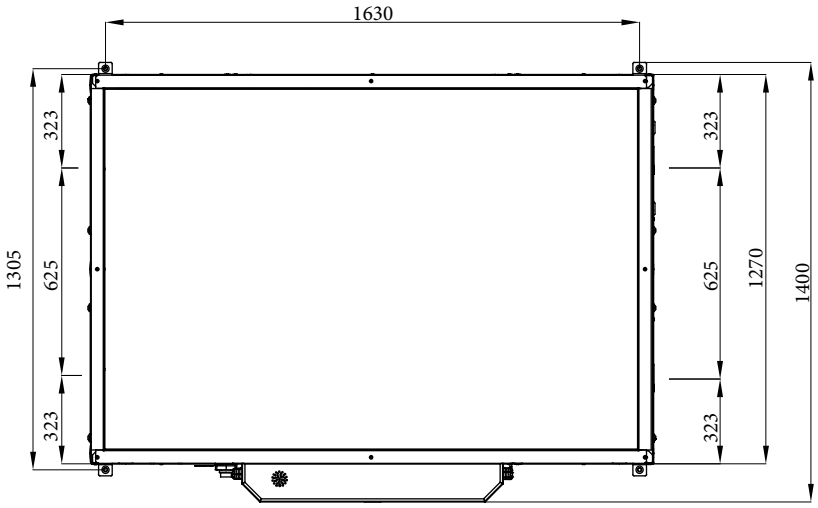



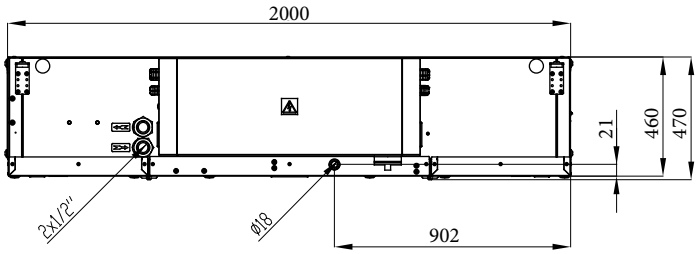

| Model | Weight, kg |
|---|---|
| VSC 700 | 90 |
| VSC 700 EL | 95 |
| VSC 700 HW | 95 |

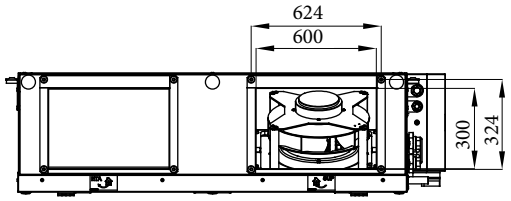


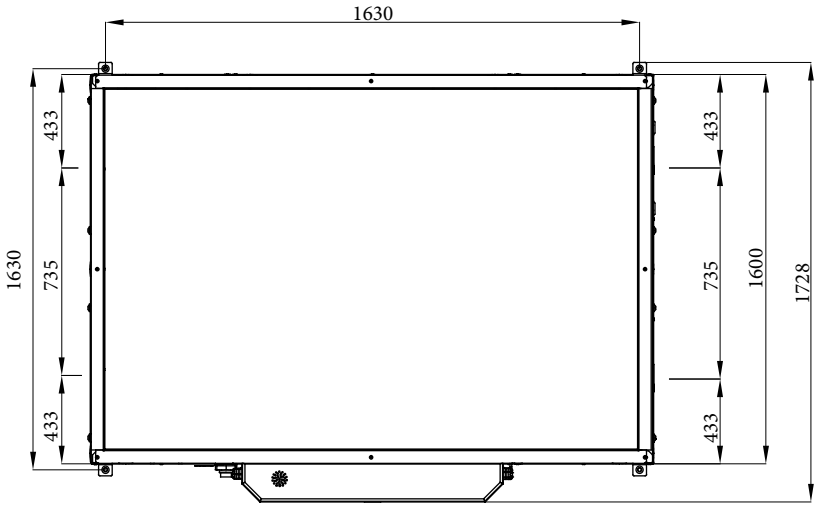




| Model | Weight, kg |
|---|---|
| VSC 1500 | 165 |
| VSC 1500 EL | 170 |
| VSC 1500 HW | 170 |

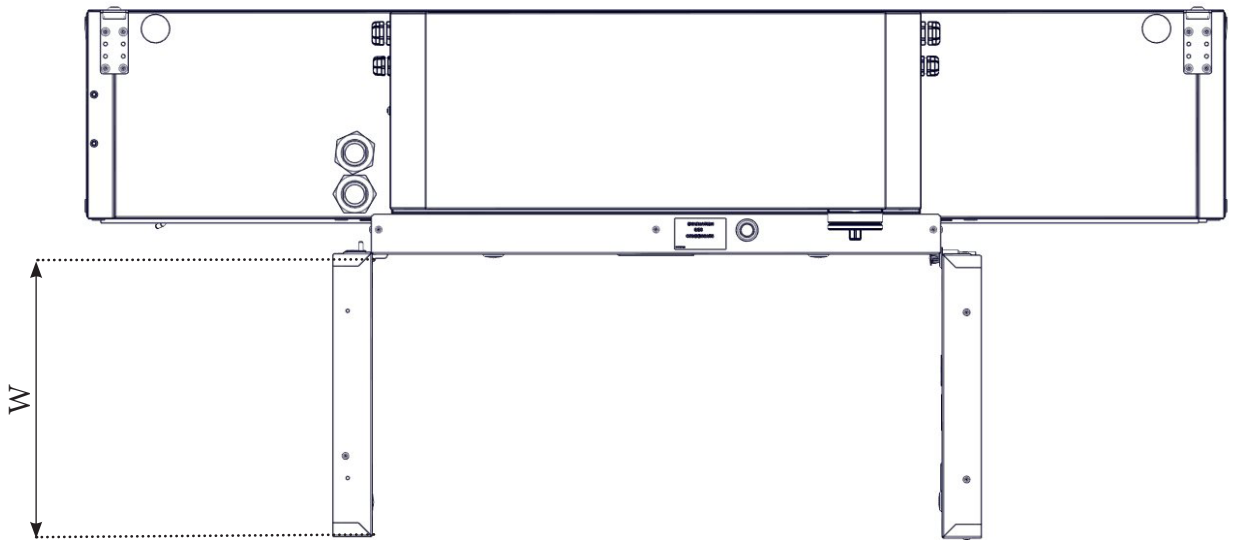



| Model | Weight, kg |
|---|---|
| VSC 2000 | 240 |
| VSC 2000 EL | 245 |
| VSC 2000 HW | 245 |

## 2.2.2 Space required




| Model | W (mm) |
|---|---|
| VSC 700 | 350 |
| VSC 1500 | 450 |
| VSC 2000 | 550 |

## 2.2.3 Electrical data VSC

| Model | Fans (W tot.) 230V 1~ | El Heating battery (kW tot.) | Fuse (mains) (A) for 230V 1~ and 400V 3~ |
|---|---|---|---|
| VSC 700 EL | 330 | 1,4 | 16 |
| VSC 700 None, HW | 330 | - | 10 |
| VSC 1500 EL | 910 | 2,7 | 25 |
| VSC 1500 None, HW | 910 | - | 10 |
| VSC 2000 EL | 1000 | 4,8 | 3x16 |
| VSC 2000 None, HW | 1000 | - | 10 |

# 2.3 Transport and storage

VSC 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.

At delivery the unit is fastened to the pallet with 4pcs screws. Unscrew the srews from the pallet.
When transporting the VSC units use a forklift.

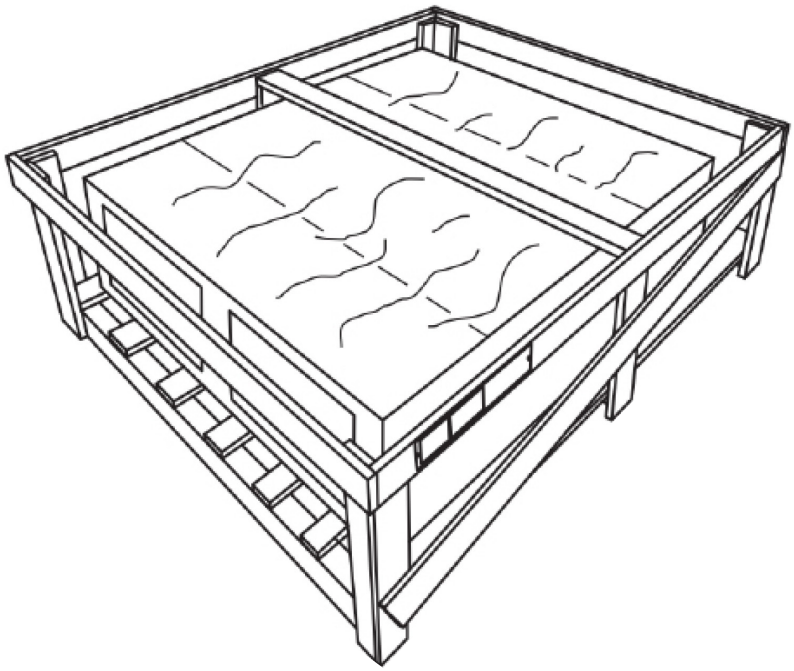


Fig. 1

**NOTE:**
Necessary parts like control panel, supply air sensor, handles, drainage pipe with drain trap are placed loosely inside the unit. The unit must not be put into operation before the enclosed parts are removed and installed properly.

## ⚠ Warning

- The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.
- Be careful so the unit don‘t tip over.

# 3 Installation

VCS is designed for installation above suspended ceilings.

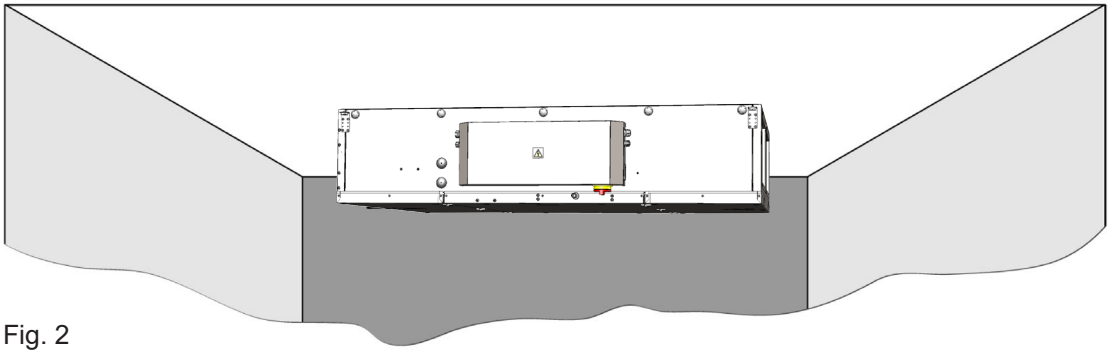


Fig. 2

## 3.1 Unpacking

Verify that all ordered equipment are delivered before starting the installation. Any deviation from the ordered equipment must be reported to the supplier of Systemair products.

## 3.2 Where/how to install

VSC are meant for indoor installation. The electronic components should not be exposed to lower temperature than 0° C and higher than +50° C.
VSC must always be installed horizontally with the inspection doors downwards.
When choosing the location it should be kept in mind that the unit requires maintenance regularly and that the inspection doors should be easily accessible. Leave free space for opening the doors and for taking out the main components (chapter 2.2.2.)

**NOTE:**
If there is not sufficient space to open the inspection doors, it is possible to mount rails and use existing doors as sliding doors (accessory) chapter 4.6.

The outdoor air intake of the building should if possible be put in the northern or eastern side of the building and away from other exhaust outlets like kitchen fan outcasts or laundry room outlets.

## ⚠ Warning

- The unit must be duct connected or in some other way provided with protection so that it is not possible to come in contact with the fans through the duct connections

# 3.3 Condensation drain

The unit must be connected to the condensation drain.
See table 1 how the height “H” corresponds to different maximum negative pressures.
If the unit is mounted in a tight area that makes it difficult to have the appropriate height, a pump is available as an accessory.

**Note**:
When installed in a non heated place the drain pipe and trap needs to be insulated well to prevent the water from freezing.

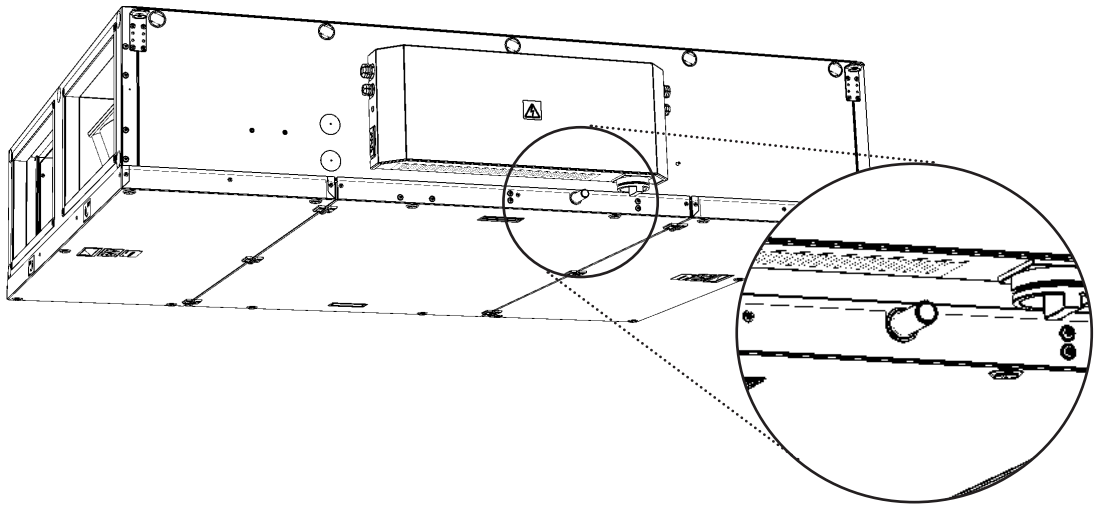


Fig. 3

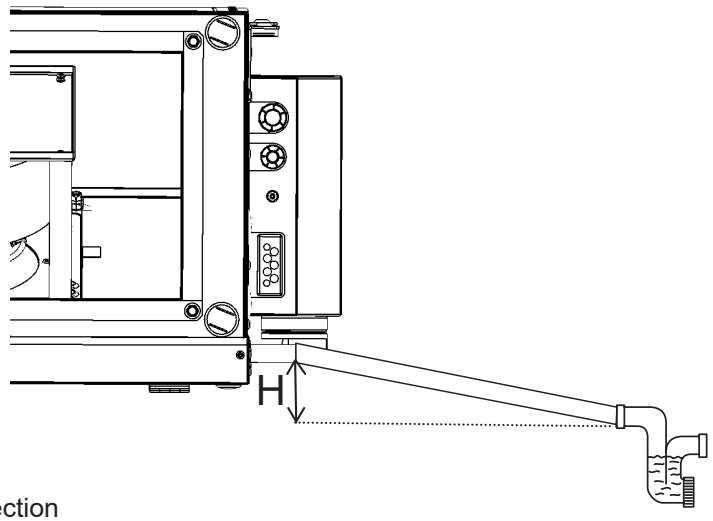



Fig. 4 - Drainage connection

Table 1

| H (mm) | Max. Negative pressure (Pa) |
|---|---|
| 65 | 300 |
| 95 | 600 |
| 135 | 1000 |

NOTE: It is recommended to use a ball trap siphon

## 3.4 Installing the unit

The units are designed for ceiling installation

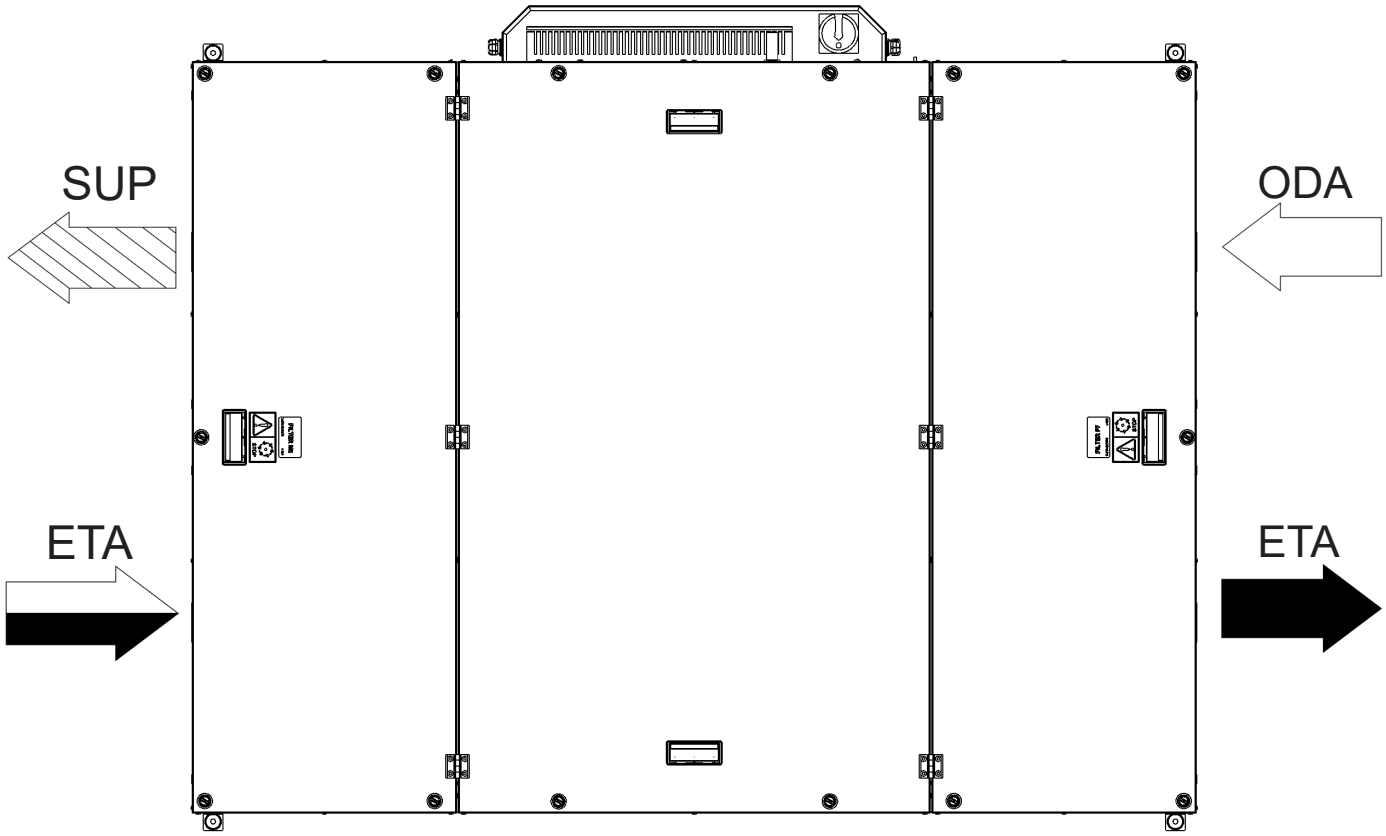



Fig. 5

**Table 2 Symbol description**

| Symbol | Description |
|---|---|
| | Supply air |
| | Exhaust air |
| | Outdoor air |
| | Extract air |

## 3.4.1 Installation procedure

The units are designed for ceiling installation

**⚠ Warning**

- Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.

**⚠ Warning**

- The units electrical connection to the mains power supply must be preceded by an all pole circuit breaker with a minimum 3 mm gap.

**⚠ Danger**

- Make sure that the mains power supply to the unit is disconnected before performing any maintenance or electrical work!
- All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

1)
Prepare the surface where the unit is to be mounted. Make sure that the surface is flat, levelled and that it carries the weight of the unit. Perform the installation in accordance with local rules and regulations. Install the unit with 0-3° lean towards drainage connections.

2)
Lift the unit in place.

3)
Connect the unit electrically to the mains power supply through the all pole circuit breaker (safety switch). Led the wiring directly to the electrical connection box. Be careful not to cut the wiring.

## 3.5 Connections

### 3.5.1 Ducting

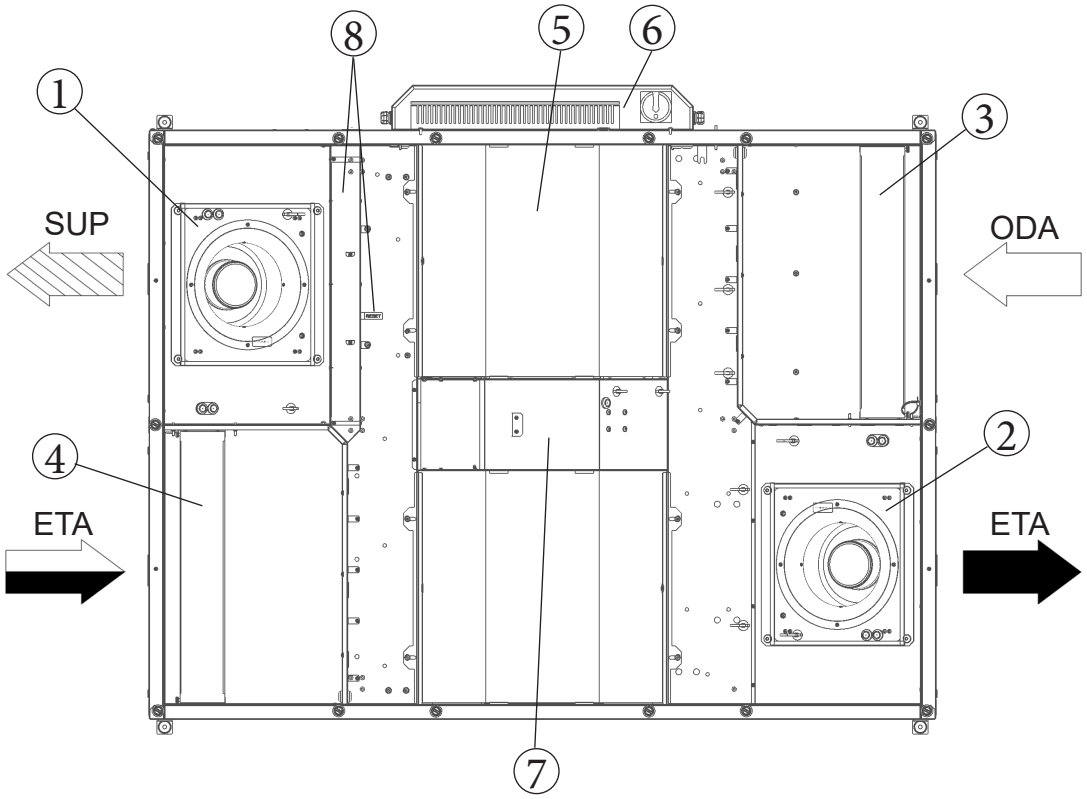



**Fig. 6 Connections and basic components**

| Position | Description | Symbol |
|---|---|---|
| A | Connection supply air (SUP) | |
| B | Connection exhaust air (EHA) | |
| C | Connection outdoor air (ODA) | |
| D | Connection extract air (ETA) | |
| 1 | Fan supply air | |
| 2 | Fan extract air | |
| 3 | Filter supply air | |
| 4 | Filter extract air | |
| 5 | Heat exchanger | |
| 6 | Electrical connection box | |
| 7 | Damper by-pass outdoor air | |
| 8 | Re-heater battery with manual everheat protection | |

## 3.5.2 Condensation and heat insulation

on ducts connected to the unit is especially important. All ducts 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.

**⚠ Caution**

- If the unit is installed in a cold place make sure that all joints are covered with insulation, and tape well
- Duct connections/duct ends should be covered during storage and installation
- Do not connect tumble dryers to the ventilation system

## 3.5.3 Silencers

To avoid fan noise being transferred via the duct system, silencers should be installed both on supply and extract air.

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

## 3.5.4 Electrical connections, components

**⚠ Danger**

- Make sure that the mains power supply to the unit is disconnected before performing any maintenance or electrical work!
- All electrical connections must be carried out by an authorized installer and in accordance with local rules and regulations.

**⚠ Warning**

- The units electrical connection to the mains power supply must be preceded by an all pole circuit breaker with a minimum 3 mm gap.

All electrical connections are made in the electrical connection box which can be found on the long side of the unit.
The hatch is removed by unscrewing one screw (figure 7).
The unit must not be put into operation before all the electrical safety precautions have been read and understood.
See the enclosed wiring diagram for internal and external wiring.
All external connections to possible accessories are made to terminals inside the electrical connection box (chapter 3.5.5).

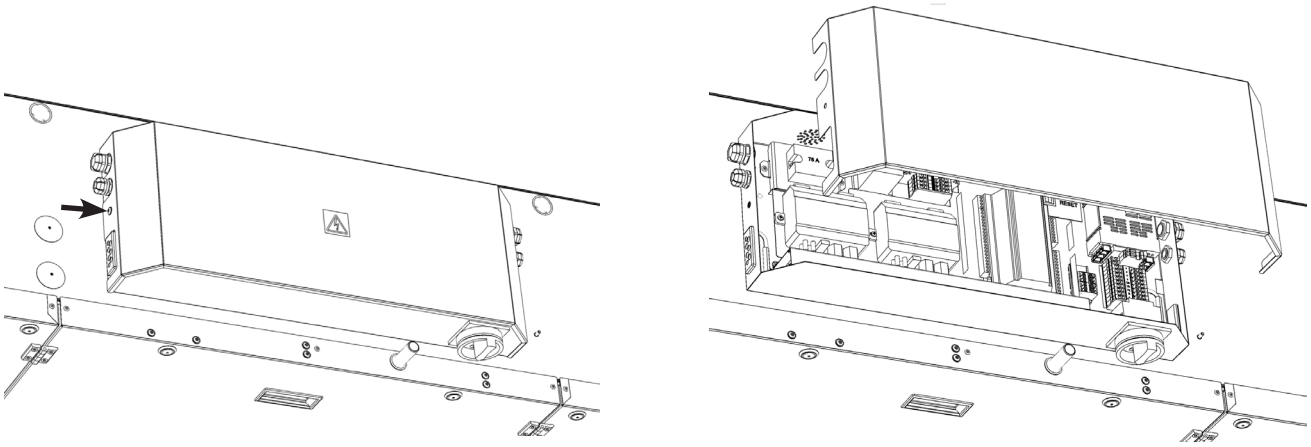


**Fig. 7**

VSC units are equipped with a built in regulator.

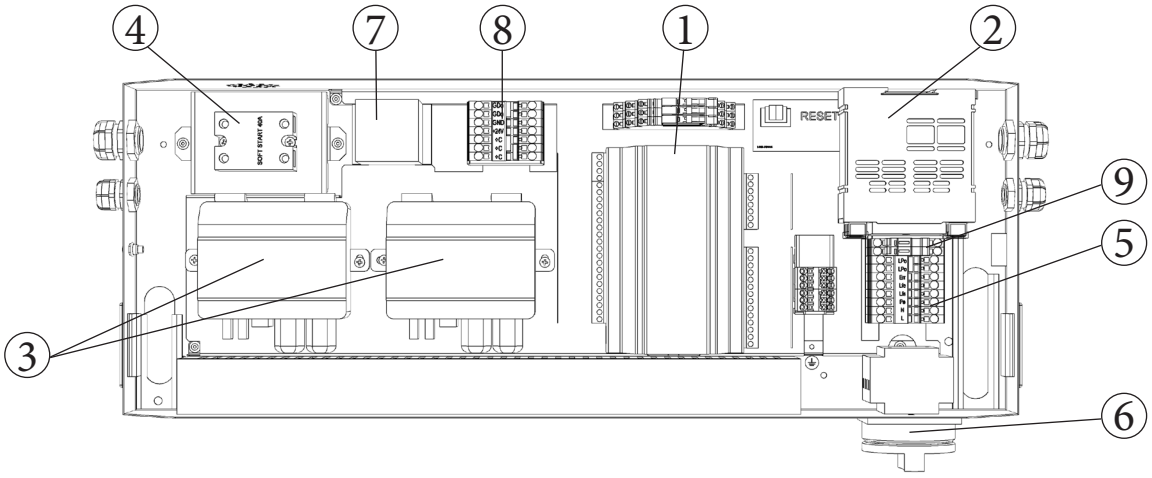



**Fig. 8 Electric components**

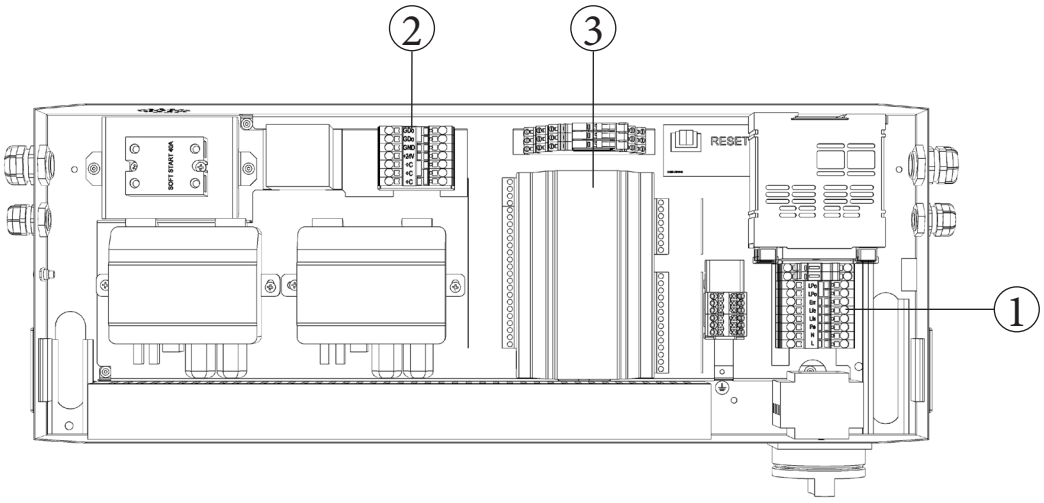
| Position | Description |
|---|---|
| 1 | Regulator E-28 |
| 2 | Transformer 230/24V DC |
| 3 | Pressure transmiters (Fans, Filters) |
| 4 | SSR relay - EL heater |
| 5 | Terminals for mains supply to the unit and air dumpers control |
| 6 | Main switch |
| 7 | Safety contactor |
| 8 | Terminals for external components |
| 9 | Fans fuses |

## 3.5.5 External connections

Connections to external functions:

| Terminal block | | Description | Remark |
|---|---|---|---|
| **Main terminals - 1** | | | |
| PE | PE | Ground | |
| N | N | Earthed neutral (mains power supply) | Used for phase 230V 1~ and 400V 3~ |
| L1 | L1 | Phase (mains power supply) | Used for phase 230V 1~ if the unit has this mains 400V 3~ |
| L2 | L2 | Phase (mains power supply) | 400V 3~ |
| L3 | L3 | Phase (mains power supply) | 400V 3~ |
| Lfs | Lfs | Damper supply (230V output) | 230V output |
| Lfe | Lfe | Damper exhaust (230V output) | 230V output |
| Err | 14 - DO4 | Error output (230V) | 230V Output |
| Lout | Lout | Phase for accessories (230V output) | 230V output (2A) |
| **Terminals for external components - 2** | | | |
| +C | 4 - +C | Terminals for external control inputs | External control, Fire, Occupancy |
| 0-10V VALVE * | 93 - A03 | Control signal valve actuator, Water Heating | 0-10V DC |
| +24V | +24V | Power supply for accesories (AQS, actuators) | 24V DC |
| GND | GND | Ground terminal (AQS, actuators) | GND |
| GDo | 10 - GDo | Terminal for internal components | GDo |
| **Regulator E-28 - 3** | | | |
| DI1 | 71 - DI1 | External control contact | NC contact |
| DI2 | 72 - DI2 | Fire contact | NC contact |
| DI3 | 73 - DI3 | Occupancy contact | NC contact |

* Avalible only for VSC 700 HW, VSC 1500 HW, VSC 2000 HW

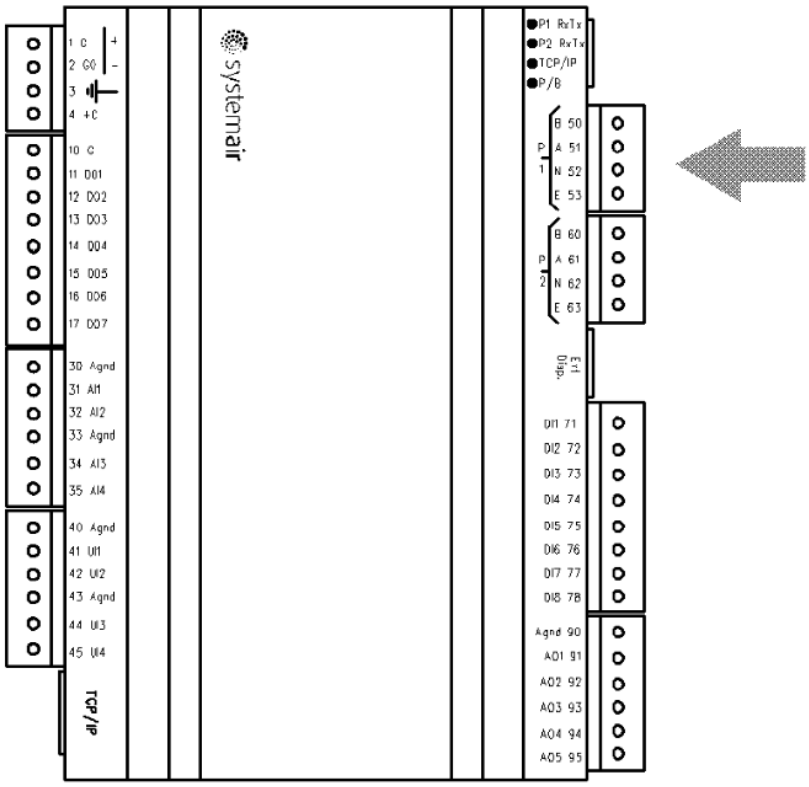


## 3.5.6 BMS Connection

Communication possibilities for control unit.

- RS485(Modbus): 50-51-52
- RS485(BACnet): 50-51-52
- RS485(Exoline): 50-51-52-53
- TCP/IP Exoline
- TCP/IP Modbus
- TCP/IP WEB
- TCP/IP BACnet

RS 485 connection:



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