Topvex SR 09, 11, TR 09-15

Compact Air Handling Unit

GB Installation instructions

Document in original language

207577-EN_GB
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Contents

1 Declaration of Conformity

Manufacturer

Systemair AB
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hereby confirms that the following products:

Air handling units

Topvex SR 09 EL	Topvex SR 09	Topvex SR 09 HWL/HWH
Topvex SR 11 EL	Topvex SR 11	Topvex SR 11 HWL/HWH
Topvex TR 09 EL	Topvex TR 09	Topvex TR 09 HWL/HWH
Topvex TR 12 EL	Topvex TR 12	Topvex TR 12 HWL/HWH
Topvex TR 15 EL	Topvex TR 15	Topvex TR 15 HWL/HWH

(The declaration applies only to product in the condition it was delivered in and installed in the facility in accordance with the included installation instructions. The insurance does not cover components that are added or actions carried out subsequently on the product)

Comply with all applicable requirements in the following directives

- **Machinery Directive 2006/42/EC**
- **Low Voltage Directive 2006/95/EC**
- **EMC Directive 2004/108/EC**

The following harmonized standards are applied in applicable parts:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 13857	Safety of machinery – Safety distances to prevent hazard zones being reached by upper or lower limbs
EN 60 335-1	Household and similar electrical appliances – Safety Part 1: 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	Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60 335-1 and EN 60967
EN 60 529	Degrees of protection provided by enclosures (IP Code)
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standards for residential, commercial and light-industrial environments

The complete technical documentation is available.

Skinnskatteberg, 2014-05-05

Mats Sándor
Technical Director

2 Warnings

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

⚠ Danger

- Make sure that the Mains 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

- Although the Mains supply to the unit has been disconnected there is still risk for injury due to rotating parts that have not come to a complete standstill.
- Beware of sharp edges during maintenance. Use protective clothing.
- The door handles are only intended to be used during the installation. These must be removed before the unit is put into operation to ensure the required level of safety for the unit.

  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
- The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.
- This product is not intended to be used by children or people with reduced physical or mental ability or lack of experience and knowledge, if no instruction concerning the use has been given by the person responsible for their safety or that this person is supervising the operation. Children should be supervised so that they can not play with the product.

⚠ Caution

- Duct connections/duct ends should be covered during storage and installation
- Do not connect tumble dryers to the ventilation system
- Take care not to damage the water battery when connecting water pipes to connectors. Use a spanner to tighten the connection.

3 Product information

3.1 General

This installation manual concerns air handling unit type Topvex SR 09, 11 and Topvex TR 09-15 manufactured by Systemair AB. The units include the following model options:

- **Model:** SR 09, SR 11, TR 09, TR 12, TR 15
- **Heating coil: EL** (Electric), **HWL** (Water coil, low power), **HWH** (Water coil, high power) or **None**.
- **Right or left models: R** (Right) **L** (Left). The side where the supply air is located when viewed from the access side.
- **Airflow control: CAV** (Constant Air Volume), **VAV** (Variable Air Volume = Constant duct pressure control)

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.

3.2 Technical data

3.2.1 Dimensions and weights Topvex SR 09, 11

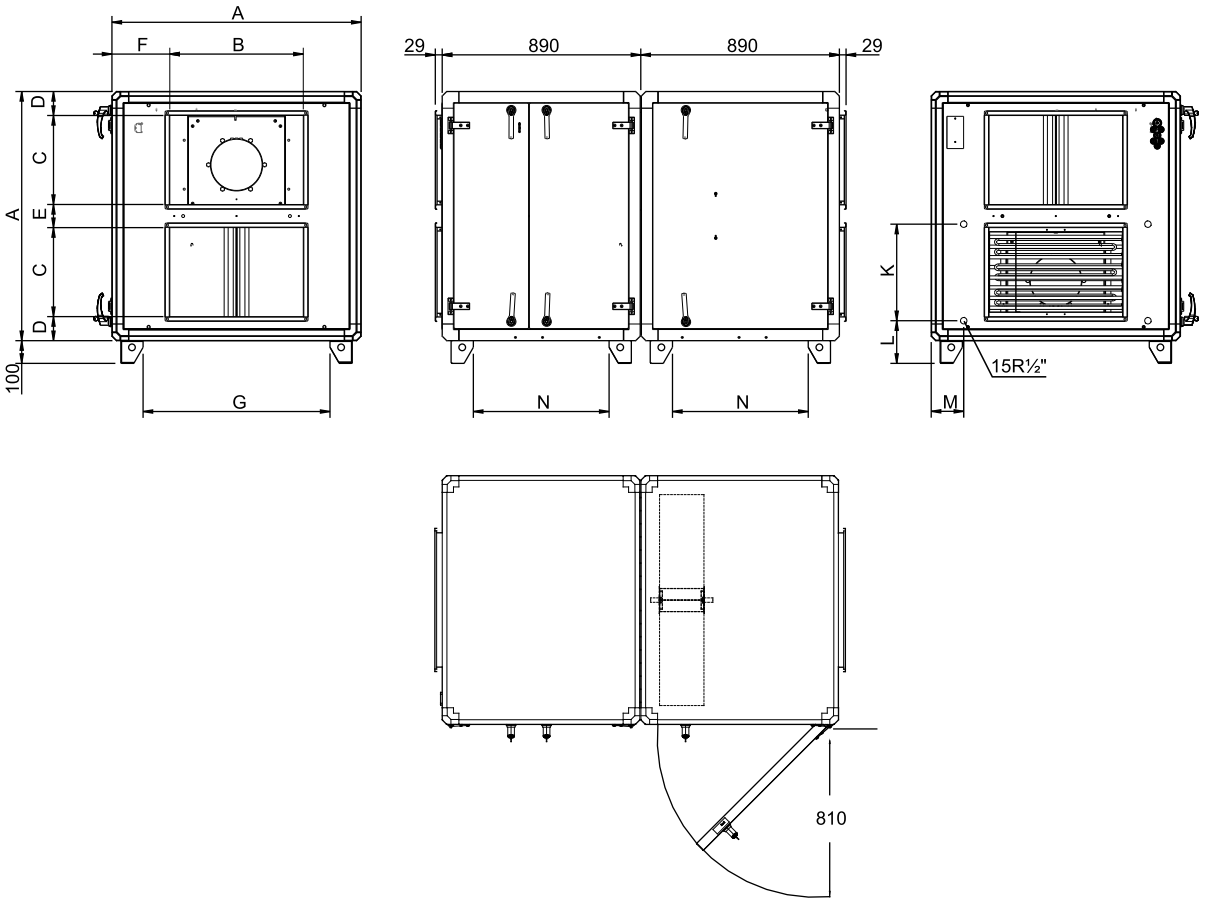


Fig. 1 Dimensions (mm)

Model	A	B	C	D	E	F
SR 09	1120	600	400	108	104	260
SR 11	1230	800	400	135	165	215

Model	G	K	L	M	N	Weight, kg
SR 09	840	434	195	145	610	320
SR 11	950	487	195	145	610	365

3.2.2 Dimensions and weight Topvex TR 09-15

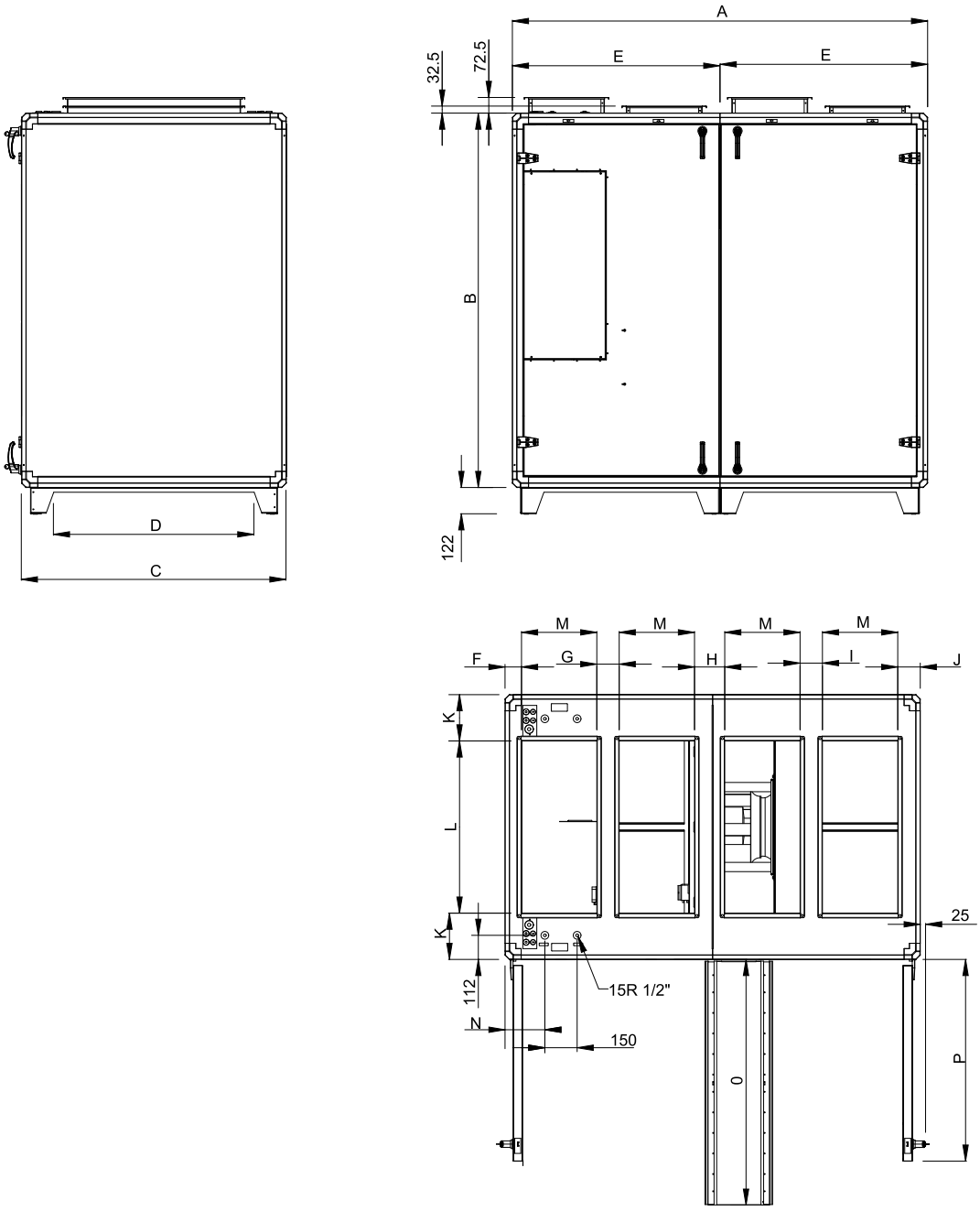


Fig. 2 Dimensions (mm)

Model	A	B	C	D	E	F	G	H	I
TR 09	1790	1630	1120	810	895	104	129	123	129
TR 12	1930	1740	1230	930	965	76	104	141	104
TR 15	1930	1980	1470	1180	965	76	104	141	104

Model	J	K	L	M	N	O	P	Weight, kg
TR 09	105	210	700	300	165	1030	870	505
TR 12	105	215	800	350	185	1140	940	580
TR 15	105	236	1000	350	185	1380	940	710

3.2.3 Electrical data Topvex SR 09, 11, Topvex TR 09-15

Model	Fans (W tot) 400 V 3N~	Fans (W tot.) 230V 3~	El Heating battery (kW tot.)	Fuse (mains) (A) for 400 V 3N~	Fuse (mains) (A) for 230 V 3~
SR 09 EL	3754	3754	12	3x35	3x50
SR 09 (None, HWL/HWH)	3754	3754	–	3x10	3x16
SR 11 EL	6130	6130	15	3x35	3x63
SR 11 (None, HWL/HWH)	6130	6130	–	3x16	3x20

Model	Fans (W tot) 400 V 3N~	Fans (W tot.) 230V 3~	El Heating battery (kW tot.)	Fuse (mains) (A) for 400 V 3N~	Fuse (mains) (A) for 230 V 3~
TR 09 EL	3780	3780	9	3x25	3x40
TR 09 (None, HWL/HWH)	3780	3780	–	3x10	3x10
TR 12 EL	3574	3574	12	3x35	3x50
TR 12 (None, HWL/HWH)	3574	3574	–	3x10	3x16
TR 15 EL	6760	6760	15	3x35	3x63
TR 15 (None, HWL/HWH)	6760	6760	–	3x16	3x20

3.3 Transport and Storage

The Topvex SR/TR 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 in one piece containing all necessary components, wrapped in plastic on a pallet for easy transportation.

When transporting the Topvex SR/TR units use a forklift placed on the gable of the unit.

⚠ Warning

The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.

4 Installation

4.1 Unpacking

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

4.2 Where/how to install

Topvex SR/TR are meant for indoor installation. Topvex SR 09, 11 can be installed outside if weather protected. Place the unit on a **horizontal flat surface**. It's important that the unit is completely levelled before it is put into operation.

Place the unit preferably in a separate room (e.g. storage, laundry room, attic or similar). The electronic components should not be exposed to lower temperature than 0°C and higher than +50°C.

If the unit is installed in a cold place it is important that the unit is not shut-off by the main switch. As long as the main voltage is on the electrical cabinet will be kept warm also in cold climates. Although the unit is turned off by the control system the current is on.

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 (figure 1 and figure 2).

Avoid placing the appliance against a wall, as low frequency noise can cause vibrations in the wall even if the fan noise-level is acceptable. If this is not possible it is recommended to carefully insulate the wall.

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.

4.3 Deviding the Topvex air handling units

On delivery the two halves of the Topvex appliance are mounted together. If necessary they can be devided for easy transport to the site of installation figure 3 and figure 4.

4.3.1 How to split the Topvex SR unit

Remove the heat exchanger, supply air fan and the extract air filter

A. Loosen the cable connectors in the wall

B. The two halves of the application are joined using 4 M10 screws, one in each corner

C. It is possible dismount the gables by removing 6 MRX M6 screws with PH2 bits tool

Reassemble in the reverse order.

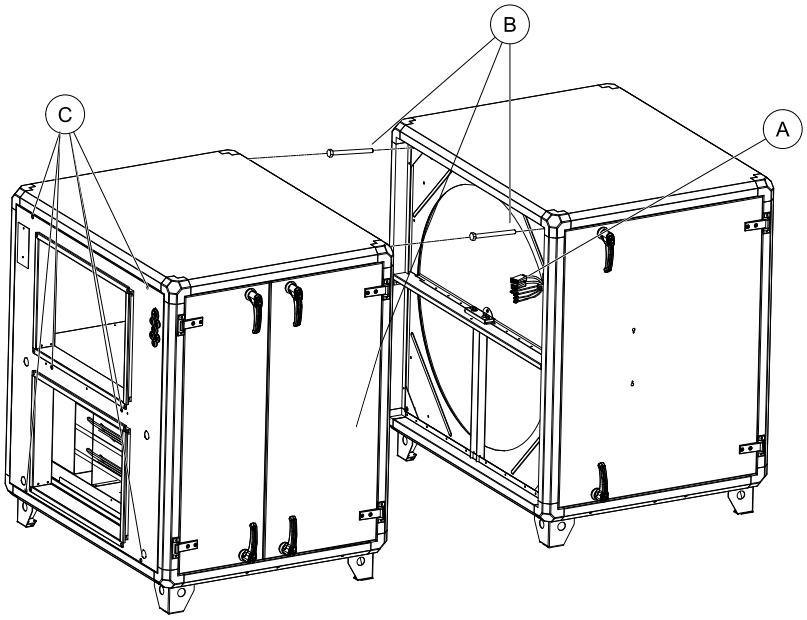


Fig. 3 Left hand version

Note:

When reassembling the pieces make sure they are connected correctly – see cable markings on the side of the cables.

4.3.2 How to split the Topvex TR unit

Remove the heat exchanger, extract fan and the extract air filter

A. Remove the plate

B. Loose the cable connectors

C. Remove the 7 M10 screws that join the two halves of the appliance

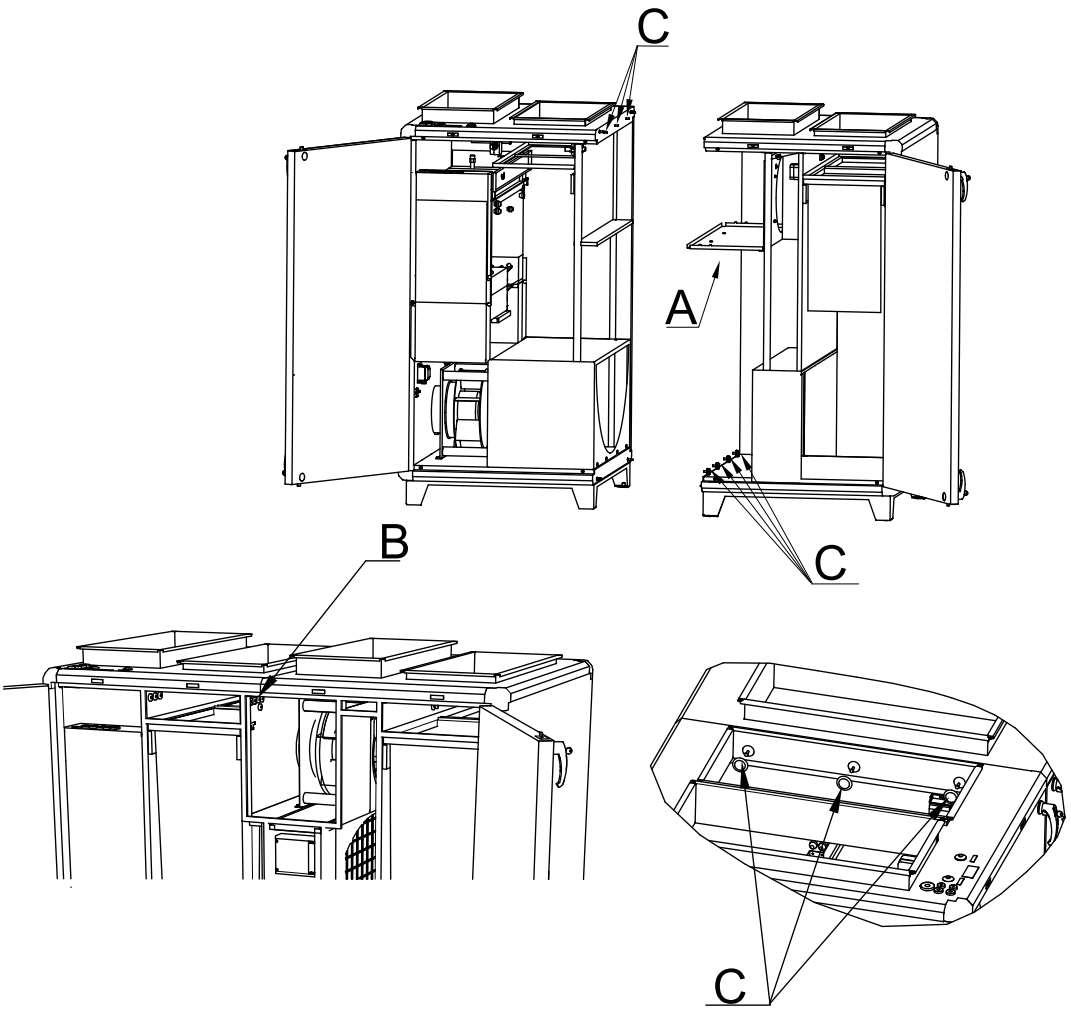


Fig. 4 Left hand version

4.4 Installing the unit

The unit must be installed in the following position (figure 5 and figure 6).

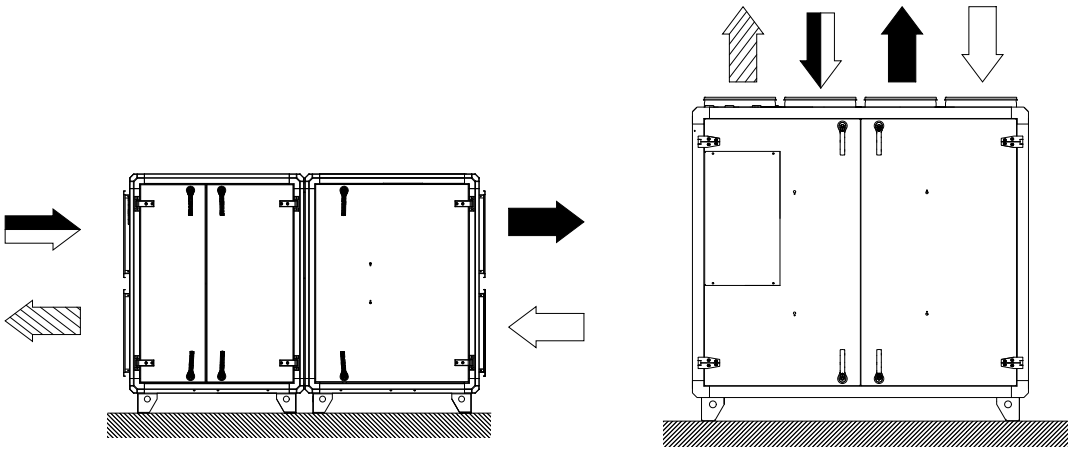


Fig. 5 Installation position (left hand unit)

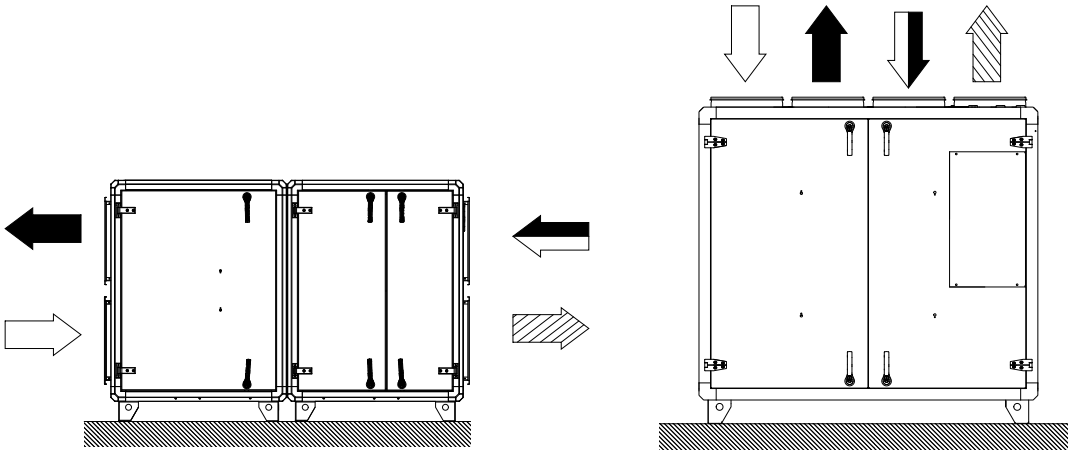


Fig. 6 Installation position (right hand)

Table 1: Symbol description

Symbol	Description
	Supply air
	Exhaust air
	Outdoor air
	Extract air

4.4.1 Installation procedure

1

Prepare the surface where the unit is to be mounted. Make sure that the surface is flat, levelled and that it supports the weight of the unit. Perform the installation in accordance with local rules and regulations.

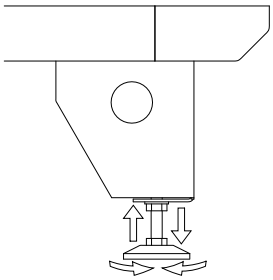
2

Lift the unit in place.

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

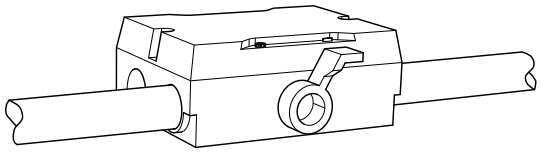
3

Level the unit with help of the enclosed mounting feet



4

Connect the unit electrically to the mains through the all pole circuit breaker (safety switch), which is enclosed inside the unit on delivery. The wiring is led through the gable of the unit (Topvex SR 09, 11) or through the top of the unit casing (Topvex TR 09-15) directly to the electrical connection box.



See enclosed wiring diagram, and chapter , table (table 2) for more information.

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

> **⚠ Danger**
>
> - Make sure that the Mains 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.

4.4.2 The rotors vertical position (Topvex SR 09, 11)

To achieve optimal sealing against the rotor's brush strip and the chassits frame, check and if necessary adjust the rotors vertical position when the unit is installed. Remove the filter for easy access.

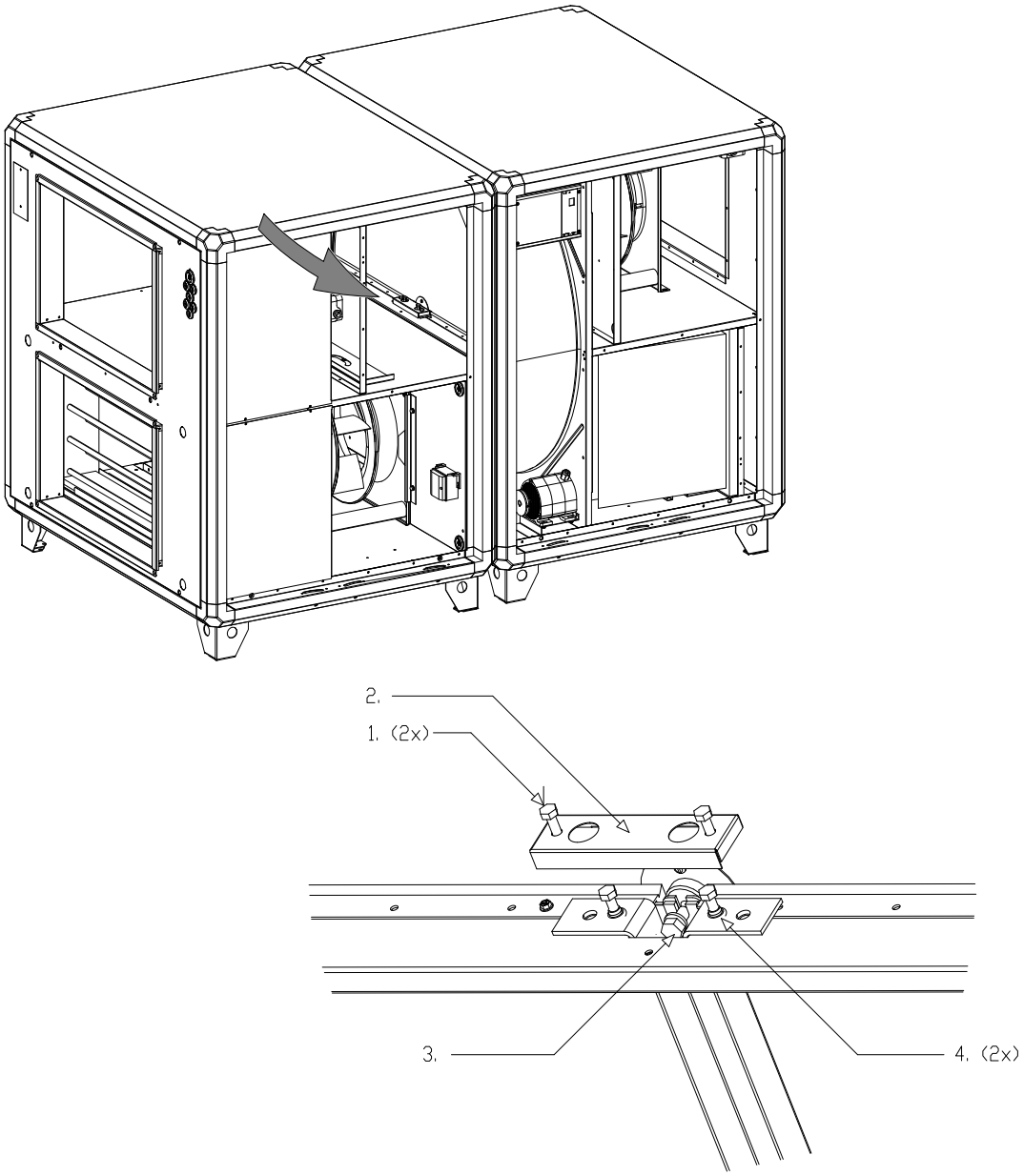


Fig. 7 Rotor position (left hand unit)

Adjustment:

1. Loosen the two screws
2. Remove the cover
3. Adjust the rotors height by loosening the locking screw to the axel of the rotor
4. Adjust the rotor vertical position by adjusting the two screws on the rotor bracket
5. After adjustment, tighten the locking screw to the rotor axel (3), mount the cover (2) and fasten the screws (1).

4.5 Supply air sensor (Topvex SR 09, 11)

The supply air sensor is fitted in the duct ca. 3 m after the unit in the supply air duct (figure 8). See table 2 to which terminals the sensor needs to be connected in the electrical connection box. Other temperature sensors are built in to the unit from factory. The supply air sensor is enclosed in the unit package on delivery.

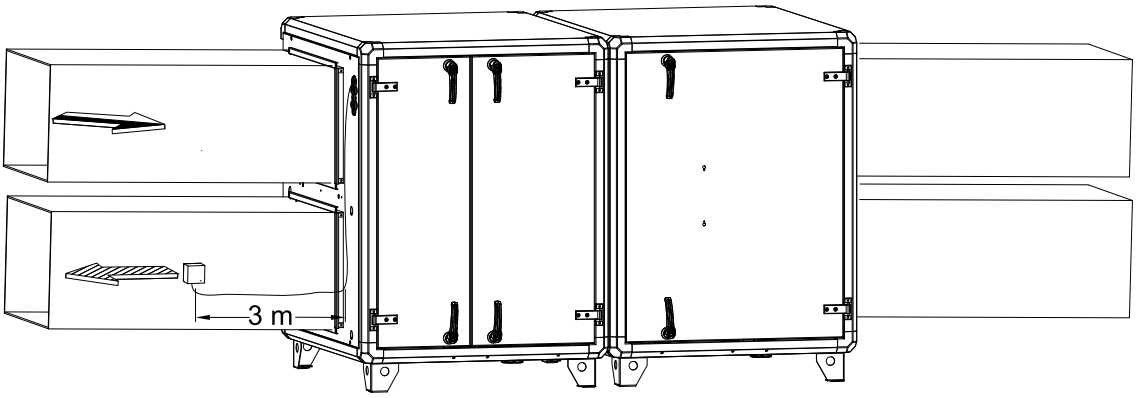


Fig. 8 Installed supply air sensor (left hand connected unit)

4.6 Installation of VAV models

If the unit is delivered as a VAV (Variable Air Volume) unit the pressure transmitters controlling the fan speeds are delivered loosely with the unit. The pressure transmitters need to be mounted in the supply and extract air ducts (figure 9) and connected according to table 2.

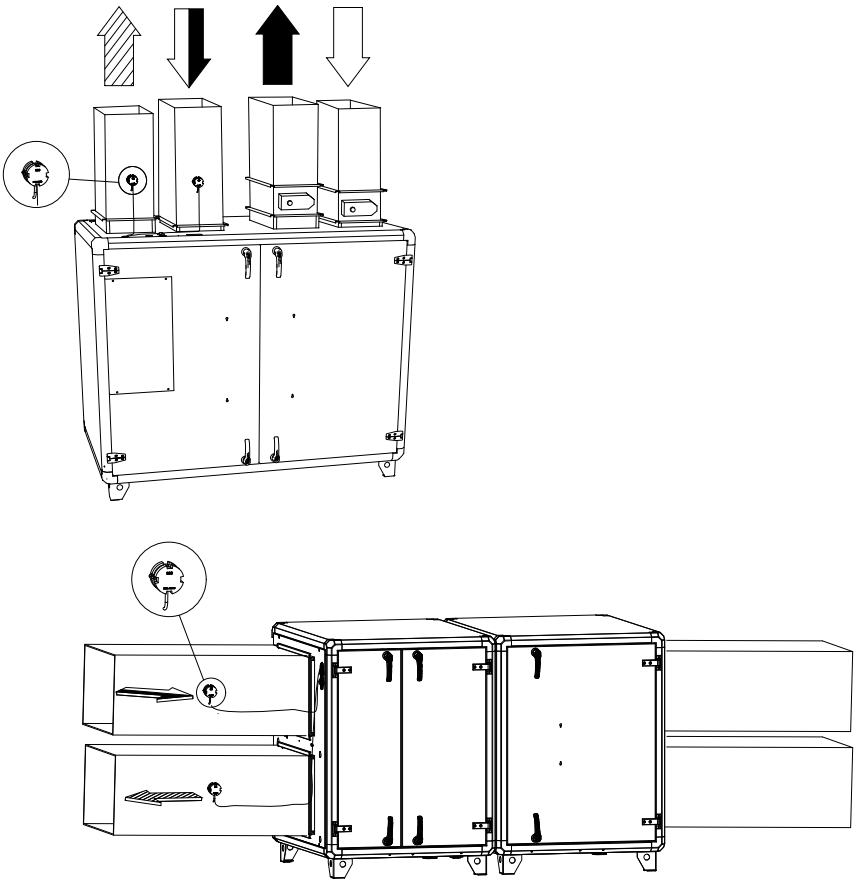


Fig. 9 VAV installation

4.7 Connections

4.7.1 Ducting

4.7.1.1 Air connections principles

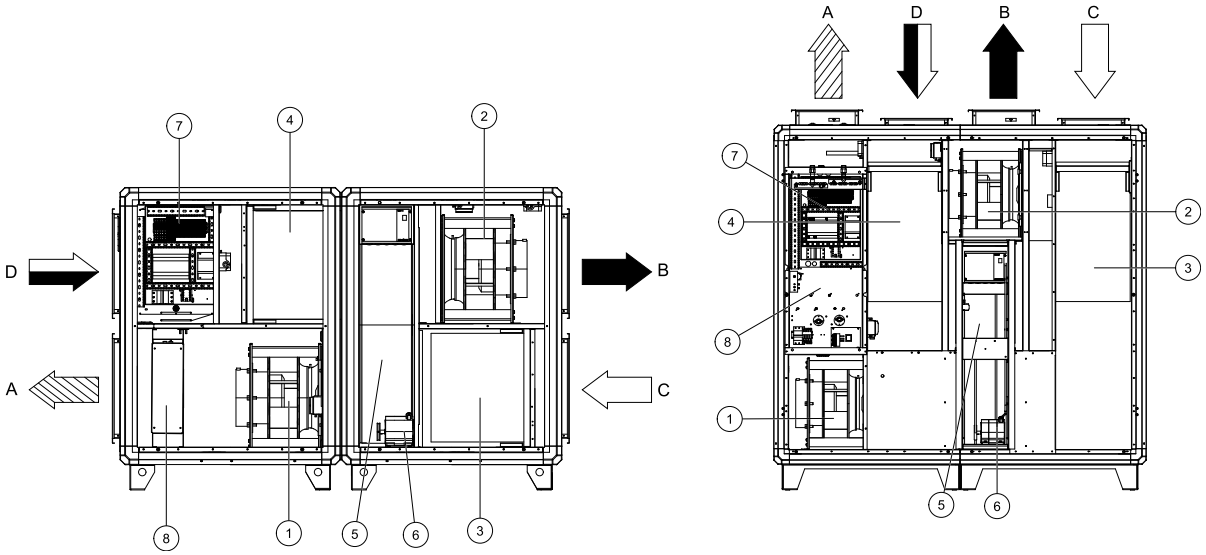


Fig. 10 Connections and basic components in left hand connected units

Position	Description	Symbol
A	Connection supply air	
B	Connection exhaust air	
C	Connection outdoor air	
D	Connection extract air	
1	Fan supply air	
2	Fan extract air	
3	Filter supply air	
4	Filter extract air	
5	Heat exchanger	
6	Rotor motor	
7	Electrical connection box	
8	Re-heater battery	

4.7.1.2 Condensation and Heat Insulation

Outdoor air duct and discharge ducts must always be well insulated against condensation. Correct insulation installation 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

4.7.1.3 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.

4.7.2 Electric Connections

All electric connections are made in the electrical connection box which can be found in the front of the unit (figure 11). The hatch is removed by unscrewing four screws (figure 11).

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 (table 2).

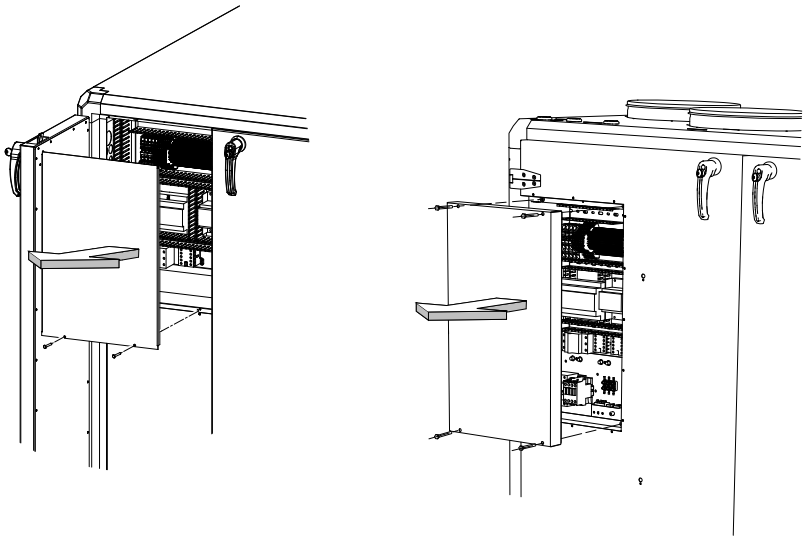


Fig. 11 Opening the electrical connection box

⚠ Danger

- Make sure that the Mains 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.

4.7.2.1 Electrical connection box, Components

Topvex SR/TR are equipped with a built in regulator and internal wiring (figure 12).

The figure shows the electrical connection box for the Topvex TR 09-15 units. The connection box for the Topvex SR 09, 11 has the same layout and components with the difference that the electrical heater is situated in a separate compartment.

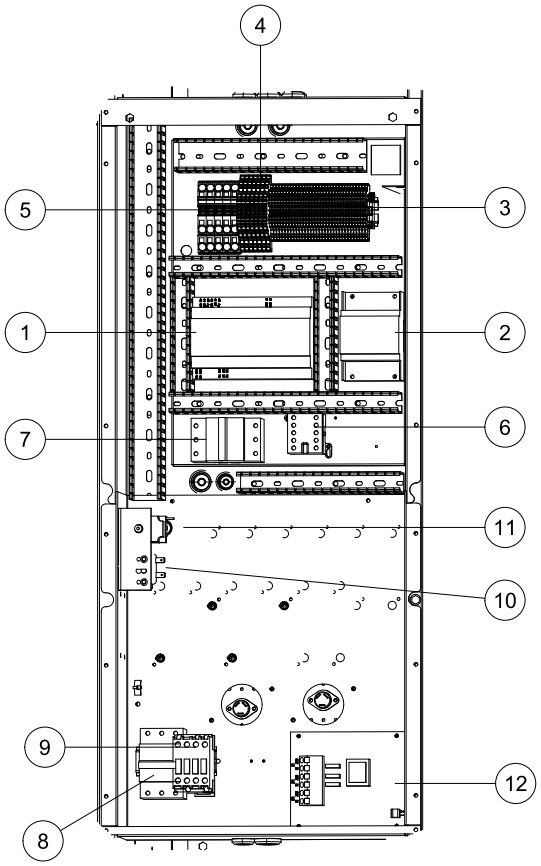


Fig. 12 Electric components

Position	description
1	Regulator E-28
2	Transformer 230/24V AC
3	Terminals for internal and external components
4	Terminals for internal wiring
5	Terminals for mains supply to the unit
6	Contactor (K2) On/Off Pump control water (HW units only, not used in EL-units)
7	Automatic fuse
8	Automatic fuse for EL heater
9	Contactor (K3) EL heater
10	Automatic over heat protection (EL units)
11	Manual over heat protection reset (EL units)
12	TTC EL heater control (EL units)

4.7.2.2 Topvex SR 09, 11, TR 09-15 External Connections

Table 2: Connections to external functions

Terminal block		Description	Remark
	PE	Ground	
N	N	Earthed neutral (supply voltage)	
L1	L1	Phase (supply voltage)	Used for phase 230V 1~ if the unit has this mains supply 400V 3~/230V 3~
L2	L2	Phase (supply voltage)	400V 3~/230V 3~
L3	L3	Phase (supply voltage)	400V 3~/230V 3~
1	G	Mains supply (Water valve actuator)	24V AC
2	G0	Reference (Water valve actuator mains supply)	24V AC
10	DO ref	DO reference	G (24V AC)
12[1]	DO 2	Outdoor/Exhaust air damper	24V AC Max. 2,0 A continuous load
WP	L1	Circulation pump hot water system	230V AC
14[1]	DO 4	Cooling pump	24V AC
15[1]	DO 5	DX Cooling step 1	24V AC
16[1]	DO 6	DX Cooling step 2	24V AC
17[1]	DO 7	Alarm output for DO signals	24V AC
30	AI Ref	Supply air sensor reference	neutral
31	AI 1	Sensor supply air	
40	Agnd	UI reference	neutral
41[2]	UAI 1/(UDI 1)	Pressure transmitter extract air	
42[2]	UAI 2/(UDI 2)	Pressure transmitter supply air	
44	UAI 3/(UDI 3)	Frost protection sensor water heating battery	Use terminal 40 as reference
4[3]	DI ref	Extended running/Fire alarm reference	+ 24V DC
50/60	B	Exo-line B	Modbus, Exo-line connection
51/61	A	Exo-line A	Modbus, Exo-line connection
52/62	N	Exo-line N	Modbus, Exo-line connection
53/63	E	Exo-line E	Exo-line connection
74[3]	DI 4	Extended running	Normally open contact Use terminal 4 as reference
75[3]	DI 5	Fire alarm	Normally open contact Use terminal 4 as reference

Connections to external functions cont'd

Terminal block		Description	Remark
76[3]	DI 6	External stop	Normally open contact Use terminal 4 as reference
90	Agnd	AO Reference	neutral
93	AO 3	Control signal valve actuator, Water Heating	0–10V DC
94	AO 4	Control signal valve actuator, Cooling	0–10V DC

1. *Maximum current load for all DO combined: 8A*
2. *Connection to external pressure sensor in case of pressure controlled unit (VAV)*
3. *These inputs may only be wired to voltage free contacts*

4.7.2.3 BMS Connection

BMS Connection

Communication possibilities for controller E283 WEB.

- RS485(Modbus): 50-51-52 or 60-61-62
- RS485(Exoline): 50-51-52-53 or 60-61-62-63
- TCP/IP Exoline
- TCP/IP WEB
- BACnet/IP

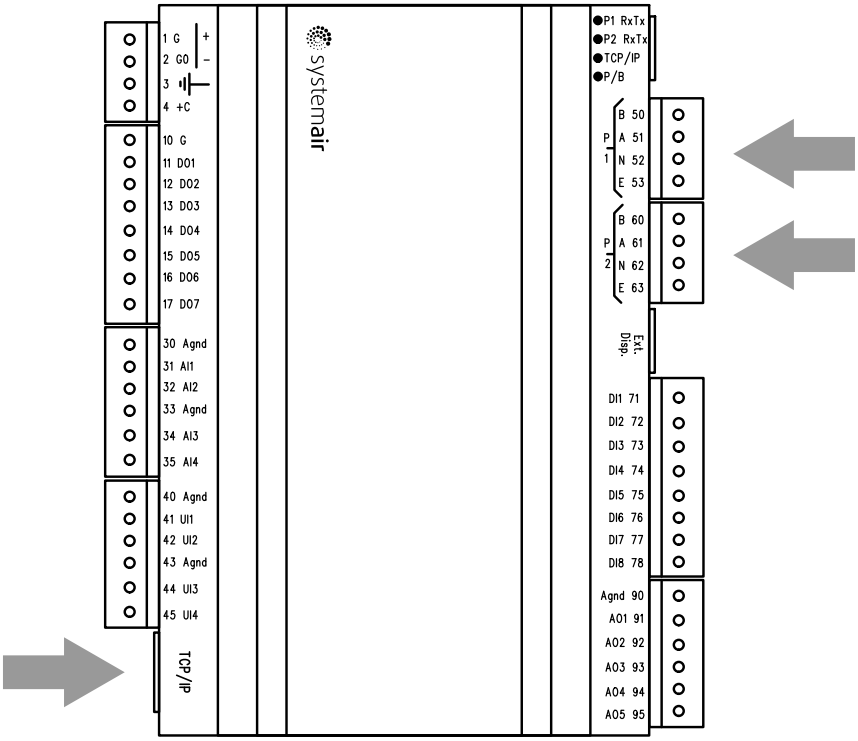


Fig. 13 BMS connection on the controller

4.8 Installing the Control Panel

4.8.1 Dimensions

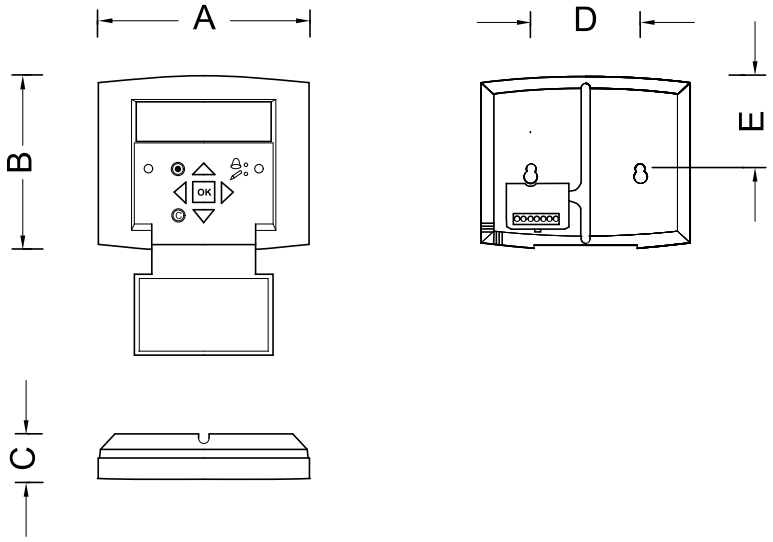


Fig. 14 Control panel dimensions

Position	Dimensions (mm)
A	115.0
B	94.0
C	26.0
D	c/c 60.0
E	50.5

4.8.2 General information

The control panel is delivered connected to the Corrigo control unit situated in the electrical connection box. Cable length is 10 m. In case the control panel needs to be detached from the signal cable it is possible to loosen the wires on the back of the control panel (figure 15).

A set of self-adhesive magnet strips are included in the package to facilitate installation on a metal surface.

4.8.3 Installation

1

Find an appropriate place to install the control panel. Maximum length between control panel and unit is 100 m.

2

If needed, drill two holes in the wall to hang the control panel (center to center: 60 mm) (pos.1, figure 15).

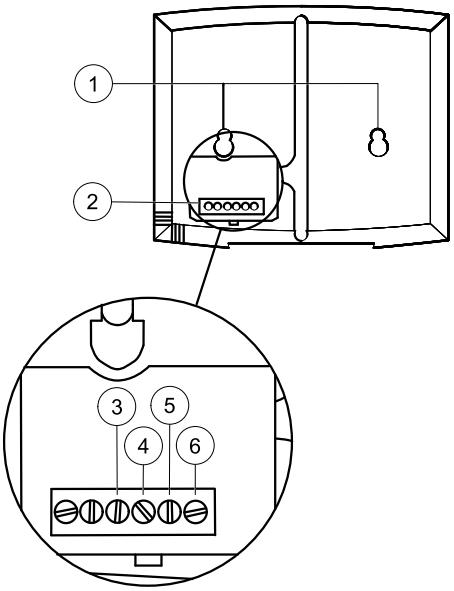


Fig. 15 Control panel wire connections

Position	Description
1	Mounting holes
2	Connection block
3	Connection to brown cable
4	Connection to yellow cable
5	Connection to white cable
6	Connection to black cable

4.9 Additional Equipment

For information concerning additional external equipment such as valve actuators, motorized dampers, E-tool, roof units, wall grilles etc. see technical catalogue and their enclosed instructions.

For electrical connections of external components see enclosed wiring chart.

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

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