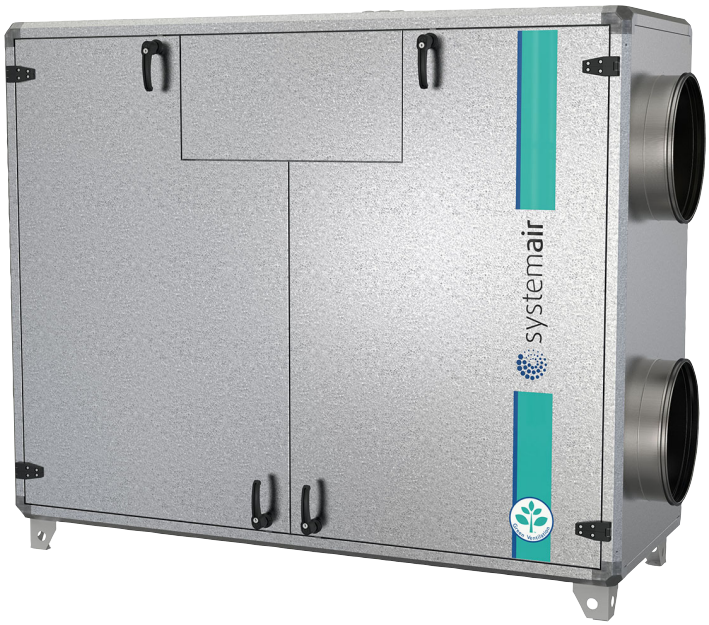
Topvex SC03-11

Compact Air Handling Unit



GB Installation instructions

Document in original language

207575-EN_GB
15-03-2016 A005

Contents

1 Declaration of Conformity

Manufacturer

Systemair Sverige AB
Industrivägen 3
SE-739 30 Skinnskatteberg SWEDEN
Office: +46 222 440 00 Fax: +46 222 440 99
www.systemair.com

hereby confirms that the following products:

Air handling units

Topvex SC03 EL	Topvex SC04 HW	Topvex SC08
Topvex SC03	Topvex SC06 EL	Topvex SC08 HW
Topvex SC03 HW	Topvex SC06	Topvex SC11 EL
Topvex SC04 EL	Topvex SC06 HW	Topvex SC11
Topvex SC04	Topvex SC08 EL	Topvex SC11 HW

(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 and regulations

Machinery Directive 2006/42/EC

Low Voltage Directive 2014/35/EU

EMC Directive 2014/30/EU

Ecodesign Directive 2009/125/EC
327/2011 Requirements for fans
1253/2014 Requirements for ventilation units

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 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN 60335-1	Household and similar electrical appliances – Safety Part 1: General requirements
EN 60335-2-40	Safety of household and similar electrical appliances - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
EN 50106:2007	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 60529	Degrees of protection provided by enclosures (IP Code)
EN 62233	Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure
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, 15-03-2016

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

- 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.
- Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.
- The units electrical connection to the mains supply must be preceded by an all pole circuit breaker with a minimum 3 mm gap.

⚠ 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
- 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 SC03-11 manufactured by Systemair AB. Topvex SC03-11 include the following model options:

- **Model:** SC03, SC04, SC06, SC08, SC11.
- **Heating coil: EL** (Electric), **HW** (Water coil) 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)

Water heating battery can be ordered as an accessory to units without re-heater.

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 SC03-SC04

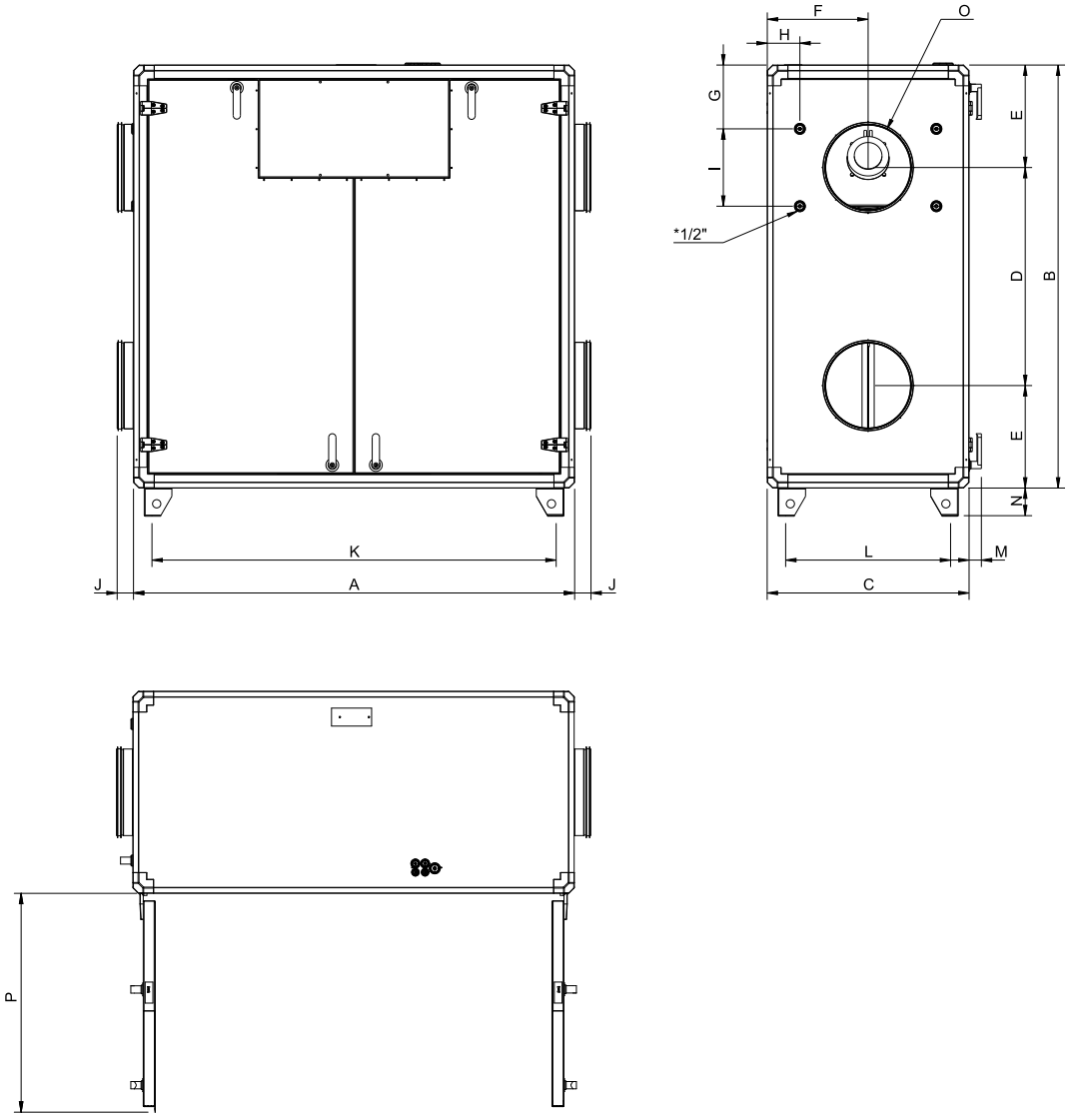


Fig. 1 Dimensions (mm) SC03-SC04 (Drawn as left hand unit)

Model	A	B	C	D	E	F	G	H	P
SC03	1597	1531	730	790	371	365	231	118	792
SC04	1941	1531	730	790	371	365	181	118	965

Model	I	J	K	L	M	N	O	Weight, kg
SC03	280	59	1463	597	45	100	315	280
SC04	380	80	1814	597	45	100	400	330

* male

3.2.2 Dimensions and weight Topvex SC06

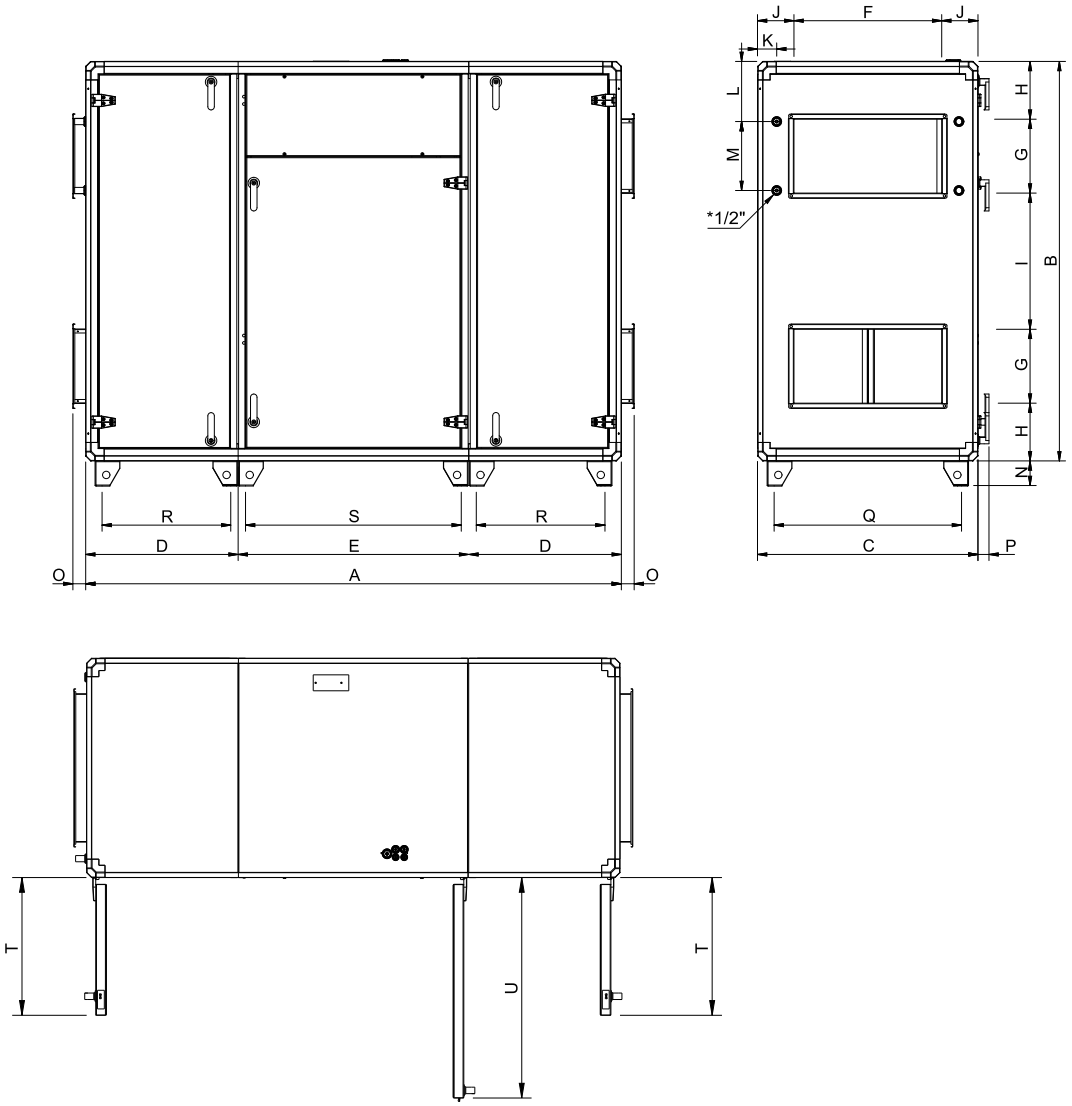


Fig. 2 Dimensions (mm) SC06 (Drawn as left hand unit)

Model	A	B	C	D	E	F	G	H	I	J	K	L
SC06	2175	1622	895	619	937	600	300	235	551	147	78	244

Model	M	M	O	P	Q	R	S	T	U	Weight, kg
SC06	280	100	52	45	761	523	876	562	900	470

***** male

3.2.3 Dimensions and weight Topvex SC08-SC11

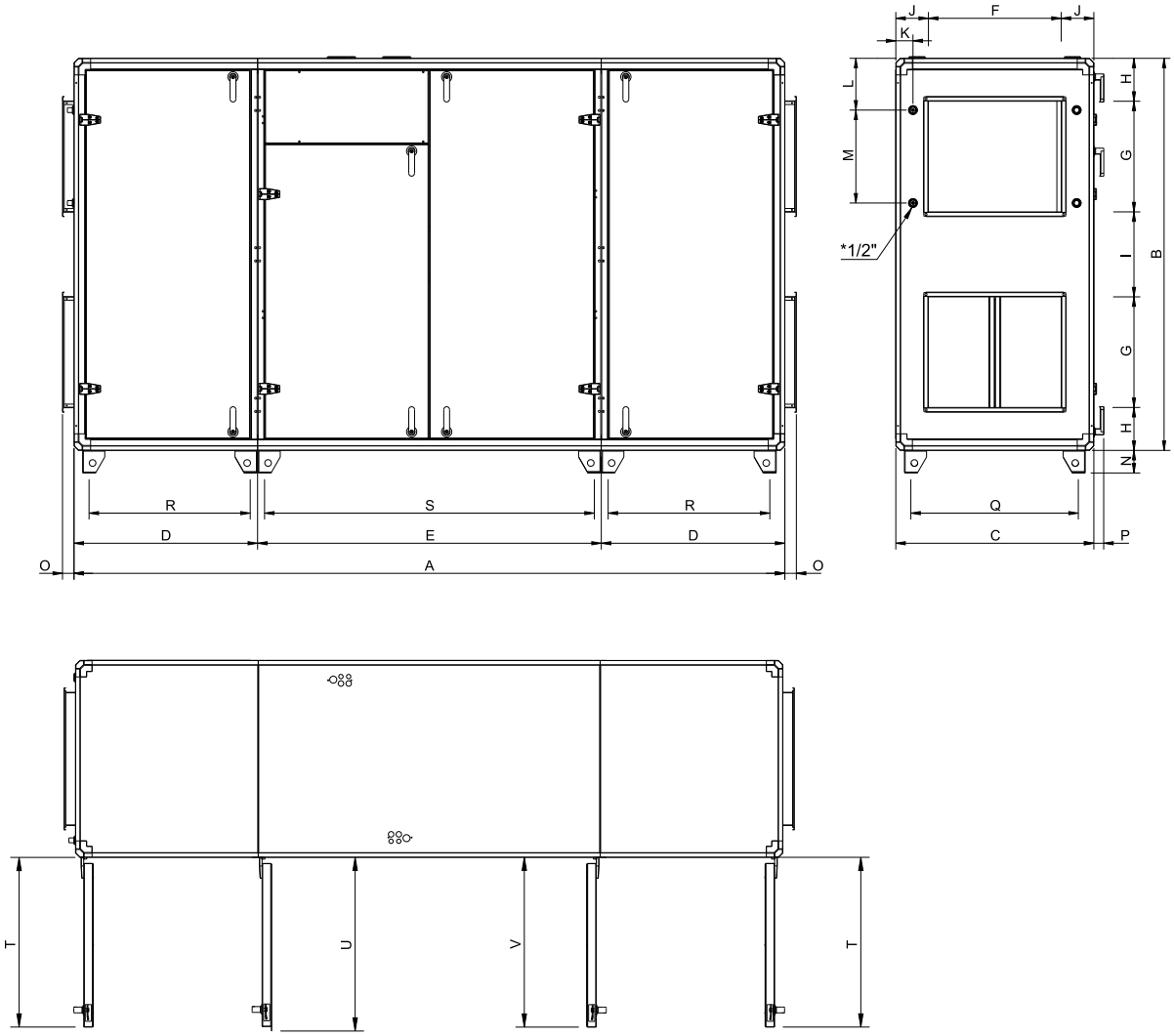


Fig. 3 Dimensions (mm) SC08-SC11 (Drawn as left hand unit)

Model	A	B	C	D	E	F	G	H	I	J	K	L
SC08	2650	1771	895	751	1139	600	400	195	583	147	78	215
SC11	3211	1771	895	829	1552	600	500	195	384	147	78	234

Model	M	M	O	P	Q	R	S	T	U	V	Weight, kg
SC08	360	100	52	45	761	653	1076	770	790	360	565
SC11	420	100	52	45	761	733	1492	770	790	770	683

***** male

3.2.4 Electrical data

Table 1: Power Consumption

Model	Fans (W tot.) 400 V 3N~	El Heating battery (kW tot.)	Fuse (mains) (A) for 230V 1~ and 400 V 3N~
SC03 EL	1012	5	3x16
SC03 (None, HW)	1012	–	10
SC04 EL	1526	7.5	3x20
SC04 (None, HW)	1526	–	10
SC06 EL	2032	12	3x25
SC06 (None, HW)	2032	–	3x10
SC08 EL	3788	15	3x32
SC08 (None, HW)	3788	–	3x10
SC11 EL	6264	22.5	3x50
SC11 (None, HW)	6264	–	3x13

3.3 Transport and storage

The Topvex SC03-11 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 with all necessary components, wrapped in plastic on a pallet for easy transportation.

When transporting the Topvex SC03-11 units use a forklift placed on the gable of the unit. For size SC06-SC11 the units are delivered in parts on the pallet.

⚠ 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.

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 SC03-11 are meant for indoor installation. Topvex SC03-11 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.

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.

For size SC06-SC11 the units are delivered in parts on the pallet. For mounting procedure see figure 4 and figure 5. Connect the power supply for the electrical heating battery to the TTC (pos. 1). The cables are marked TTC L1 OUT, TTC L2 OUT and TTC L3 OUT. Attach the fast couplings to the electric wires. Connect the tubes for the pressure guard filter. Push the units together and fasten the assembly fitting (pos. 2) with a hex key. Make sure that there is enough space behind the unit to tighten the bolts.

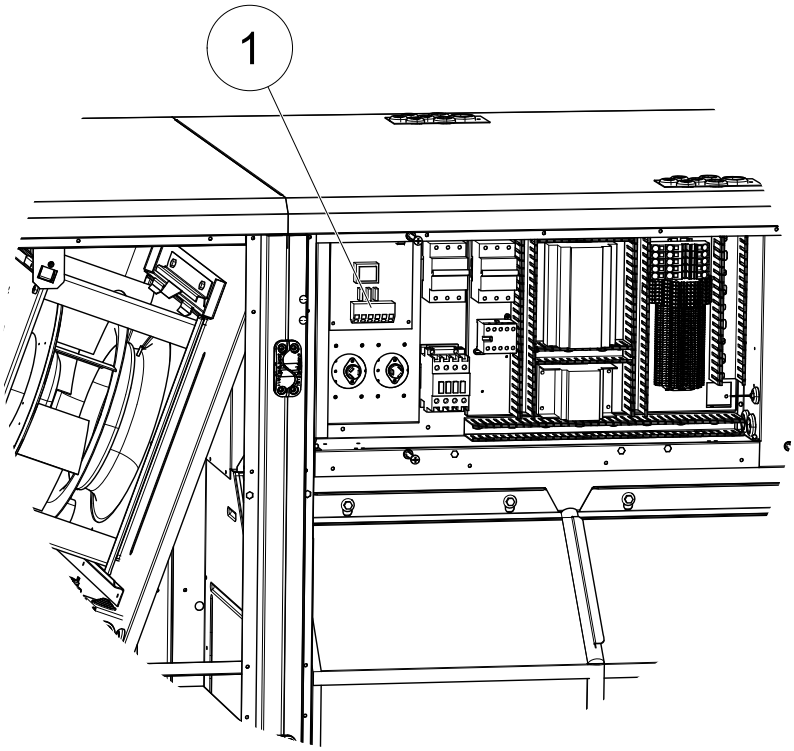


Fig. 4

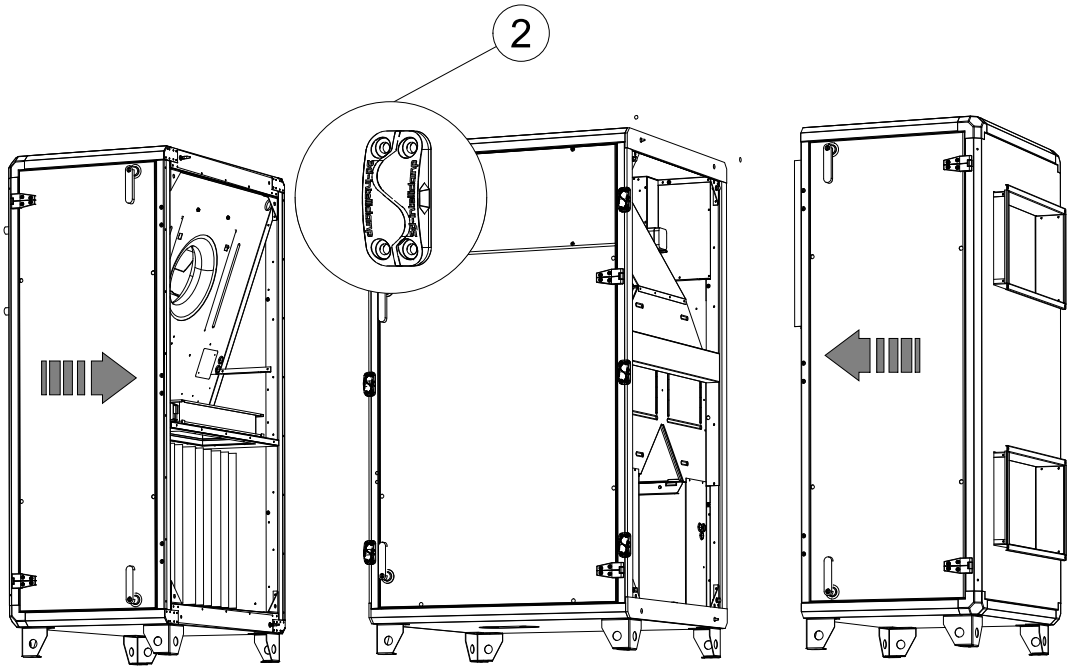


Fig. 5

4.3 Condensation drain

The unit must be connected to the condensation drain, which is enclosed upon delivery. The drainage needs to be connected on the exhaust air side of the heat exchanger at the bottom of the unit figure 6. If the unit is to be used for cool recovery the normally plugged drainage outlet needs to be connected as well to a separate tube and water lock (accessories).

Use the enclosed connection tube, which needs to be cut down to the appropriate height. See table 2 how the height “H” corresponds to different maximum negative pressures. See figure 7 for dimensions and assembly.

Note:

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

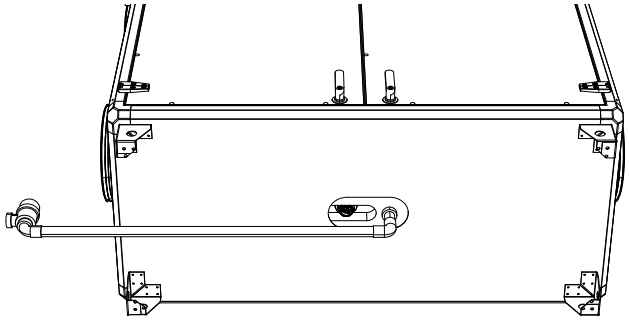


Fig. 6 Drainage connection

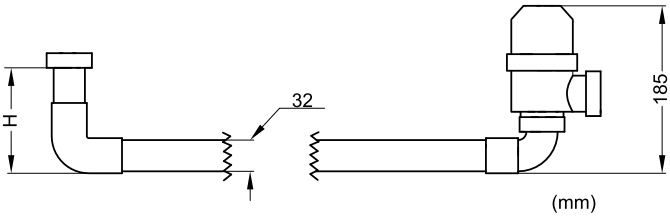


Fig. 7 Dimension and assembly

Table 2:

H (mm)	Max. Negative pressure (Pa)
65	300
95[1]	600
135	1000

1. *Normal conditions*

4.4 Installing the Unit

The unit must be installed in the following position.

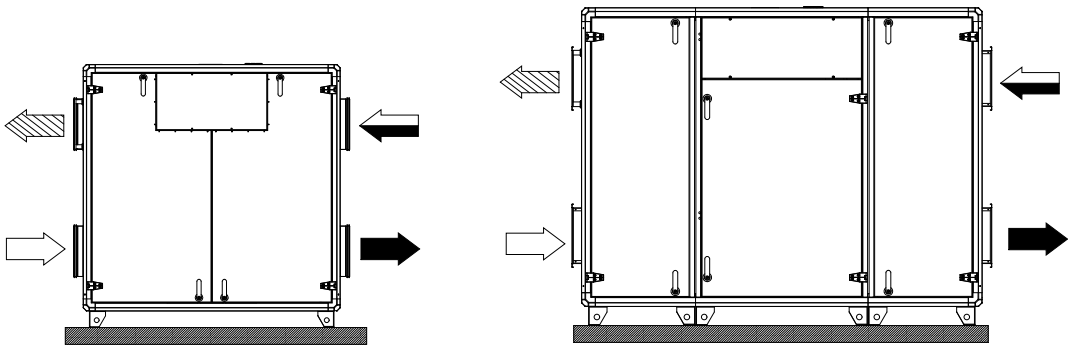


Fig. 8 Installation position (left hand unit)

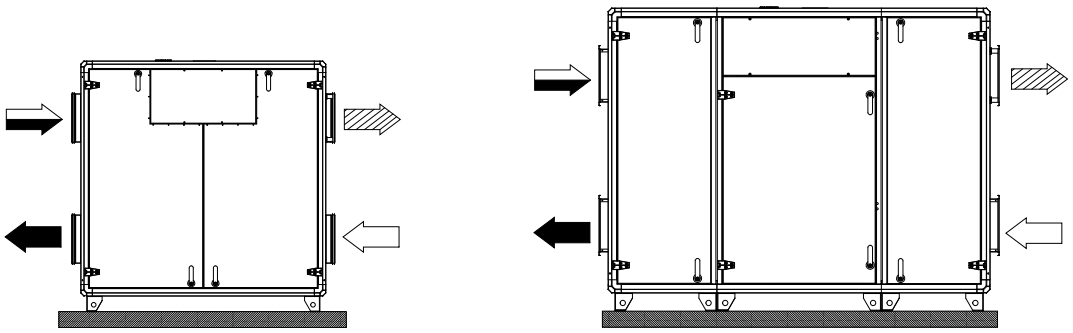


Fig. 9 Installation position (right hand unit)

Table 3: 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.

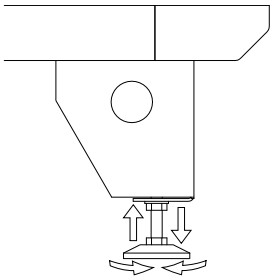
2

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.

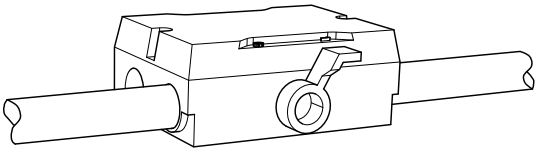
3

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 top of the unit.



See enclosed wiring diagram, and below table 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.

4.5 Supply air sensor

The supply air sensor is fitted in the duct ca. 3 m after the unit in the supply air duct (figure 10). See table 4 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.

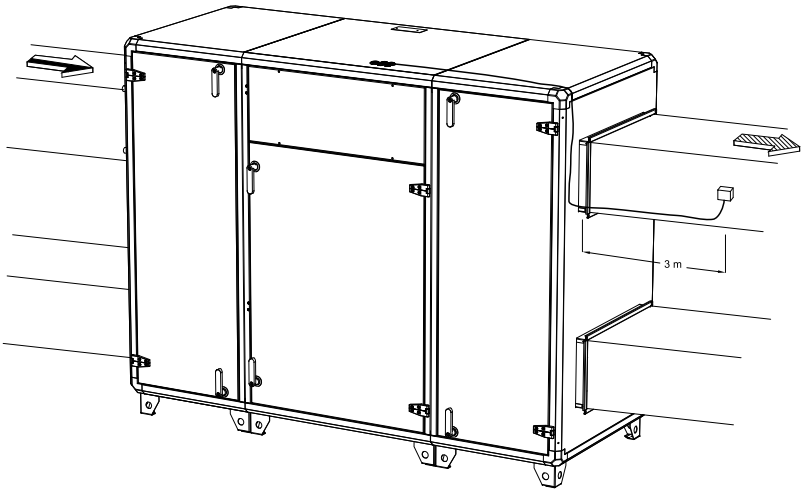


Fig. 10 Installed supply air sensor (right hand connected unit)

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 11) and connected to terminals 40–42 (table 4).

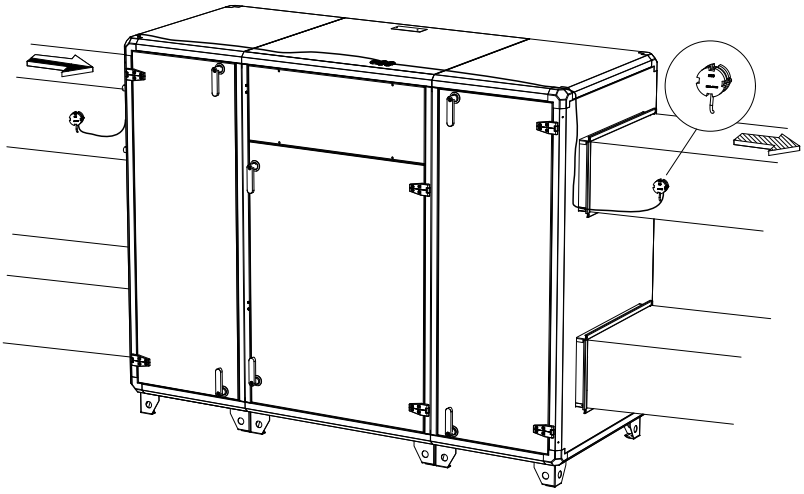


Fig. 11 VAV installation

4.7 Connections

4.7.1 Ducting

4.7.1.1 Air connections principles

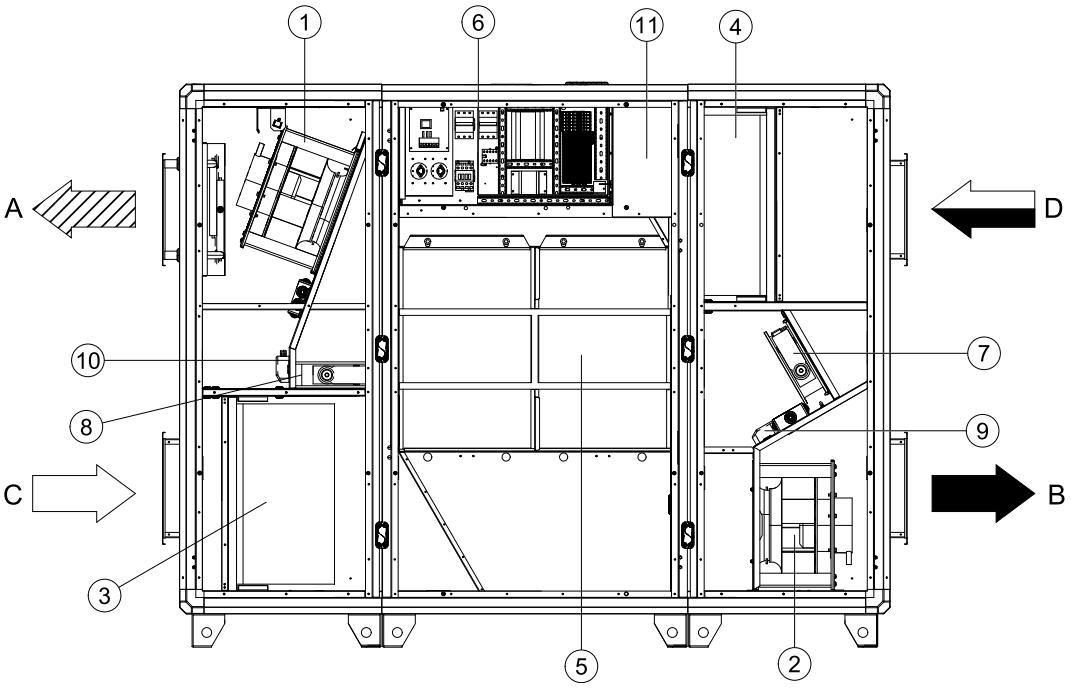


Fig. 12 Connections and basic components in left hand connected units

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	Electric compartment	
7	Damper bypass extract air	
8	Damper bypass outdoor air	
9	Pressure sensor extract air filer/extract air fan	
10	Pressure sensor supply air fan/supply air filter	
11	Pressure sensor defrosting exchanger	

4.7.1.2 Condensation and Heat Insulation

Outdoor air duct and exhaust 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. The hatch is removed by unscrewing four screws figure 13.

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 .

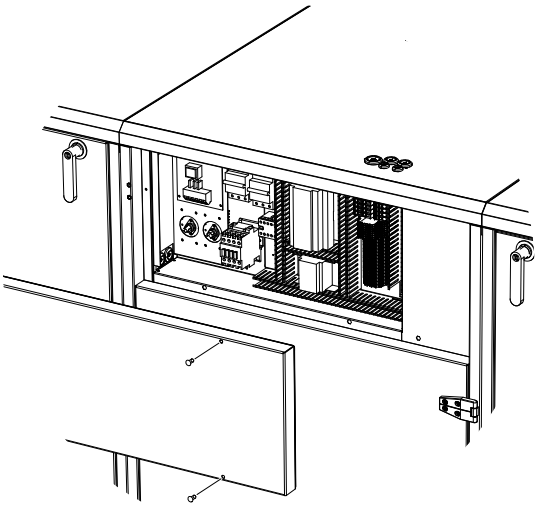


Fig. 13 Opening the electrical connection box

⚠ 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 SC03-11 are equipped with a built in regulator and internal wiring.

The figure shows the electrical connection box for the Topvex SC03-11 units.

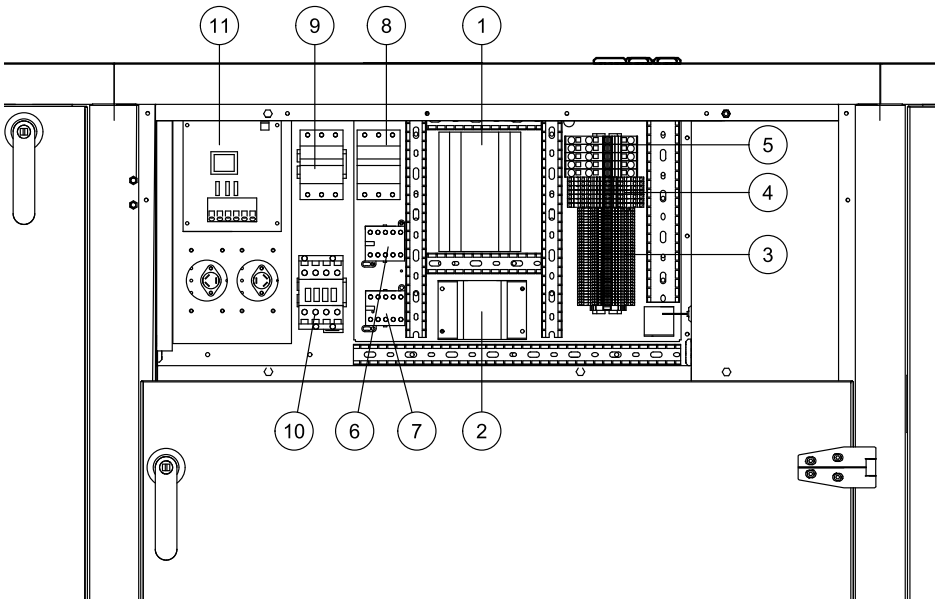


Fig. 14 Electric components

Position	Description
1	Regulator E-283 WEB
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 (K1)
7	Contactor (K2) On/Off Pump control water (HW units only, not present in EL-units)
8	Automatic fuse
9	Automatic fuse for heater
10	Contactor (K3) EL heater
11	TTC El heater control

4.7.2.2 Topvex External Connections

Table 4: Connections to external functions

Terminal block		Description	Remark
	PE	Ground	
N	N	Earthed neutral (supply voltage)	Used for phase 230V 1~ and 400V 3~
L1	L1	Phase (Main supply voltage)	Used for phase 230V 1~ if the unit has this mains supply 400V 3~/230V 3~
L2	L2	Phase (Main supply voltage)	400V 3~/230V 3~
L3	L3	Phase (Main supply voltage)	400V 3~/230V 3~
1	G	Auxiliary supply (Pressure transmitter. Water valve actuators)	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 temperature sensor reference	neutral
31	AI 1	Temperature 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
P1:50/P2:60	B	Exo-line B	Modbus, Exo-line connection
P:151/P2:61	A	Exo-line A	Modbus, Exo-line connection
P1:52/P2:62	N	Exo-line N	Modbus, 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(BACnet): 50-51-52 or 60-61-62
- RS485(Exoline): 50-51-52-53 or 60-61-62-63
- TCP/IP Exoline
- TCP/IP Modbus
- TCP/IP WEB
- TCP/IP BACnet

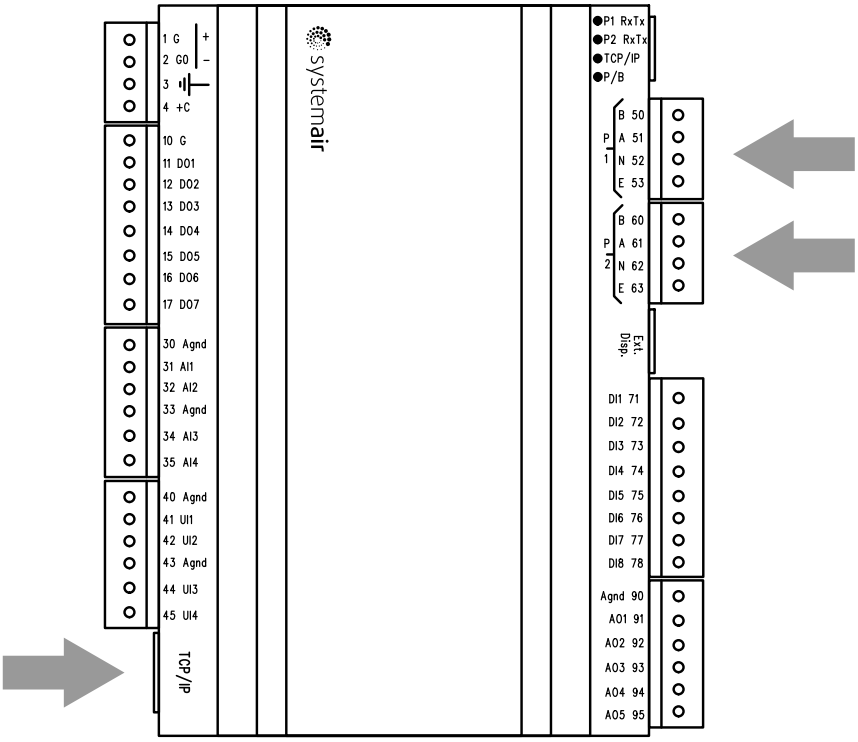


Fig. 15 BMS connection on the controller

4.8 Installing the Control Panel

4.8.1 Dimensions

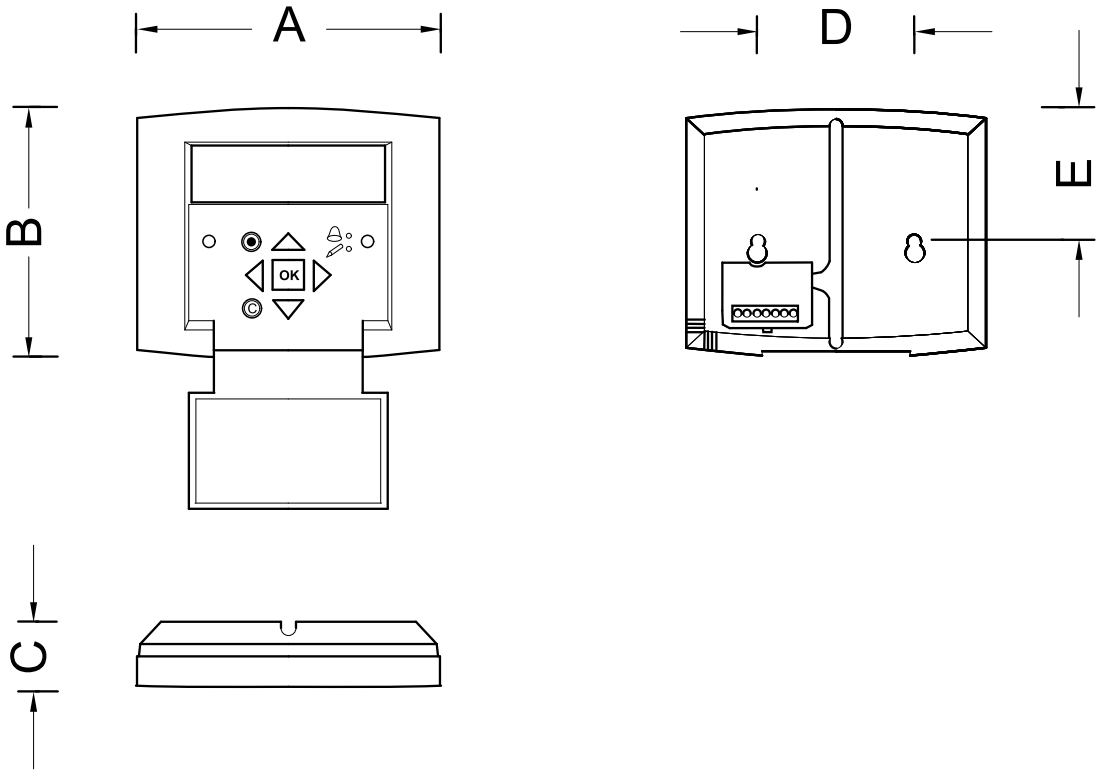


Fig. 16 Control panel dimensions

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.

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 17).

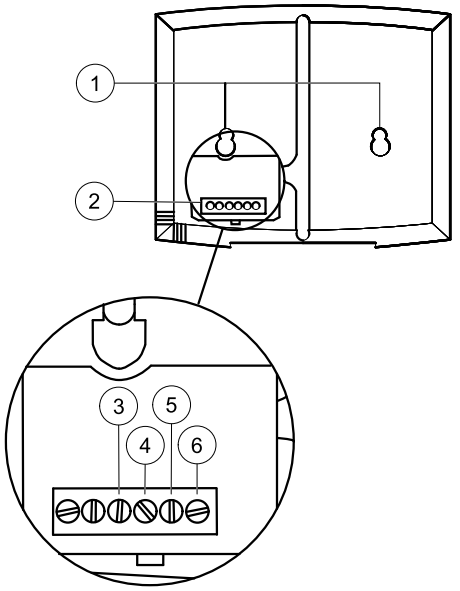


Fig. 17 Control panel wire connections

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

For electrical connections of external components see enclosed wiring chart.

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

Systemair Sverige AB
Industrivägen 3
SE-739 30 Skinnskatteberg, Sweden

Phone +46 222 440 00

Fax +46 222 440 99

www.systemair.com

207575