

Topvex SoftCooler SR09, SR11

Installation instructions

GB

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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:

Cooling unit

Topvex SoftCooler SR09
Topvex SoftCooler SR11

(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.
- Operation in the refrigerant circuit and handling refrigerants must be performed by certified personnel.



Warning

- 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 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.
- Skin contact with the refrigerant must be avoided. Use protective equipment such as protective goggles, gloves and suitable clothing's. Good ventilation must be arranged.
- If freezing injury a doctor must be seen.
- If skin contact the exposed part of the body must be carefully washed.
- If eye contact use eye wash or lukewarm water and wash for 20 minutes, visit a doctor.
- 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

3 Refrigerant Control/Reporting

Topvex SoftCooler SR comes pre-filled with refrigerants and belongs to the group "Piece units containing more than 3kg refrigerants per circuit". Before commissioning shall always a control report in respect of the installation be established by a cooling certified person. Leakage control with record keeping shall be done once per year. The installation of the Topvex SoftCooler SR is only duty to report if the property/enterprise where the installation occurs, all together after installation, has a total amount of refrigerants of 10 kg or more ("small Piece units" with refrigerants less than 3 kg, e.g. normal refrigerators/freezers does not includes). Reporting shall in occurring cases be done to major inspection authority (normally the municipal environmental office).

Different regulations can be valid in different countries. Check with your local government.

4 Product information

4.1 General

This installation manual concerns Topvex SoftCooler SR manufactured by Systemair AB. Topvex SoftCooler SR include the following model options:

- **Model:** SR09, SR11.
- **Right or left models:** R (Right) L (Left). The side of the supply air outlet when viewed from the access side.

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.

This instruction is a complement to “Topvex SR 09,11, TR 09-15 Installation instruction” (separate document) and should also be read prior to installation.

4.2 Technical data

4.2.1 Dimensions and weights Topvex SoftCooler SR09, SR11

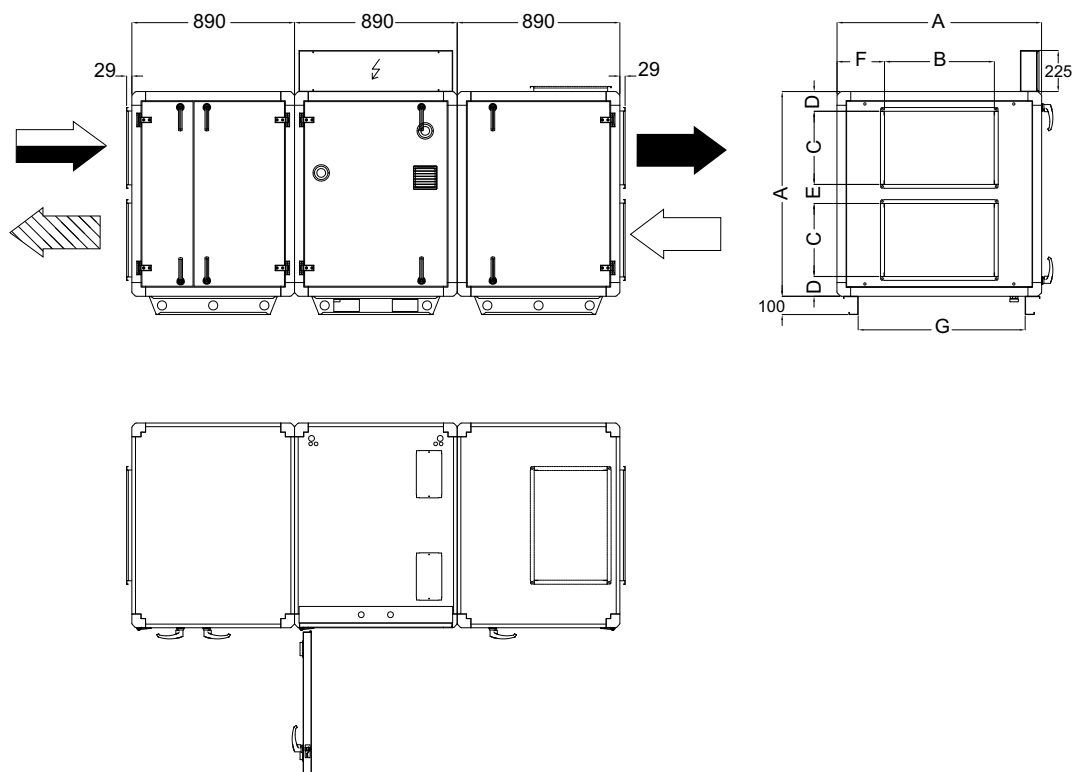


Fig. 1 Dimensions (mm) SR09, SR11 (Drawn as left hand unit)

Model	A	B	C	D	E	F	G	Weight, kg	Weight, TOT
SR09	1120	600	400	108	104	260	915	230	665
SR11	1230	800	400	135	165	215	1025	260	695

4.2.2 Technical data

Model	Voltage	Current (A)	Power (W)	Fuse, slow	Quantity of R410A, kg
Topvex SoftCooler SR09	400V 3N~, 50Hz	15	9230	20	4,1
Topvex SoftCooler SR11	400V 3N~, 50Hz	15	9230	20	4,8

4.3 Components

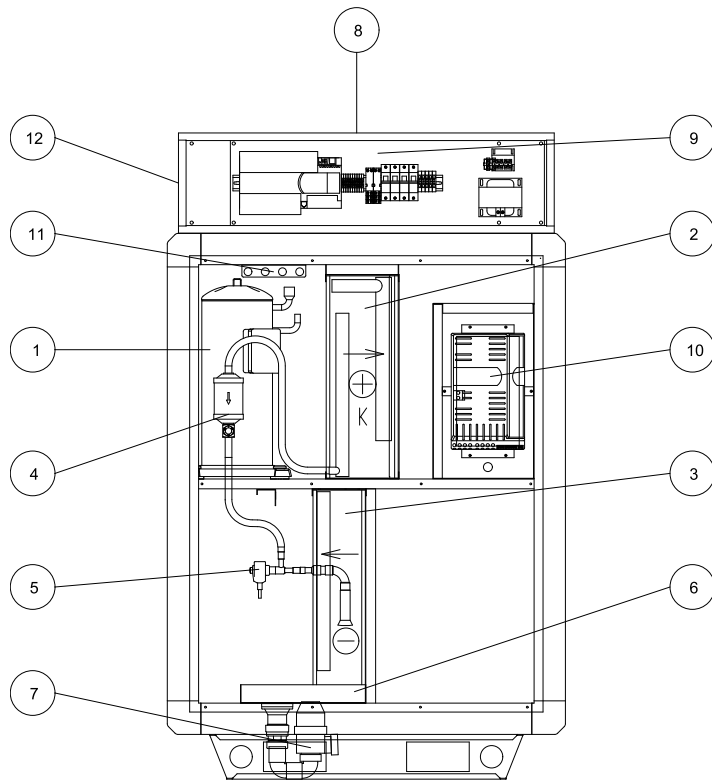


Fig. 2 Basic components in left hand unit

Position	Description
1.	Compressor
2.	Condenser coil
3.	Evaporator coil
4.	Filter drier with sight glas
5.	Electronic expansion valve
6.	Drip-tray with drain
7.	Water seal
8.	Cable grommet for external cabling
9.	El. cabinet
10.	Frequency converter
11.	Pressure/hot gas switches
12.	Measuring points refrigerant system high/low

4.4 Electrical cabinet

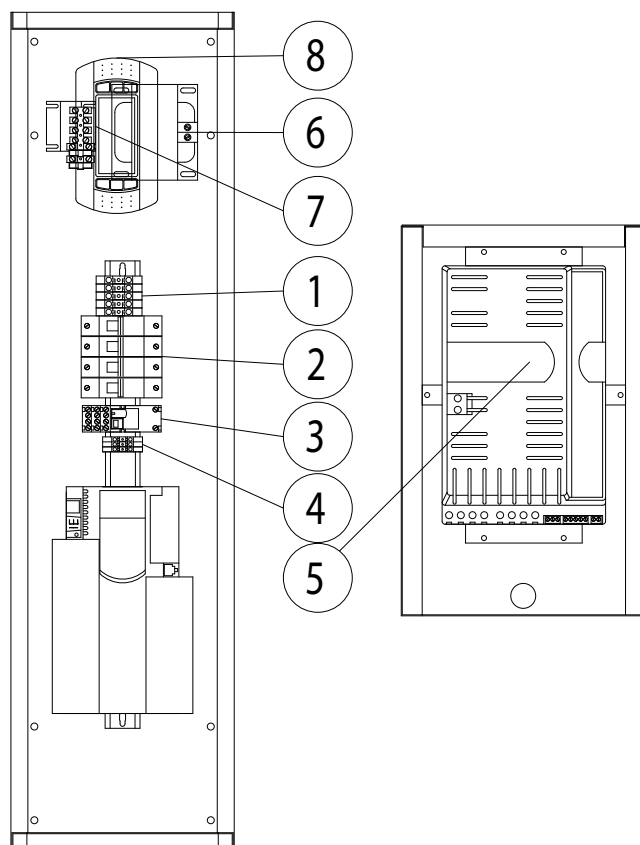


Fig. 3 Electrical cabinet

Position	Description
1.	Terminal block, mains supply
2.	Circuit breaker (MCB) oil heater
3.	Relays
4.	Terminal block, internal/external connections
5.	Frequency converter
6.	DC choke
7.	24V transformer
8.	LCD display

5 Transport and storage

The Topvex SoftCooler should be stored and transported in such a way that it is protected against physical damage that can harm panels, handles 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 SoftCooler use a forklift, but once installed on the floor avoid transfer, the feet can be damaged due to lateral loading.



Warning

- The unit is heavy. Be careful during transport and mounting. Risk of injury through pinching. Use protective clothing.
- Be careful so the unit doesn't tip over.

6 Installation

6.1 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.

6.2 Where/how to install

Topvex SoftCooler are meant for indoor installation. Place the unit on a **horizontal flat surface**. It's important that the unit is completely levelled before it is put into operation.

The electronic components should not be exposed to lower temperature than 0° C and higher than +50° C.

The following max. temperatures applies for an interference-free operation of the Topvex SoftCooler:

- Outside air max. +33 °C
- Extract air max. +28 °C.
- Ambient temperature max. +28 °C.

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). General maintenance includes among other things inspection and cleaning of the drip tray and flange coils.

A floor drain must be available in the room so that the condensation water can be drained off (chapter 6.4.1.2)

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.

6.3 Installing the unit

6.3.1 Installation

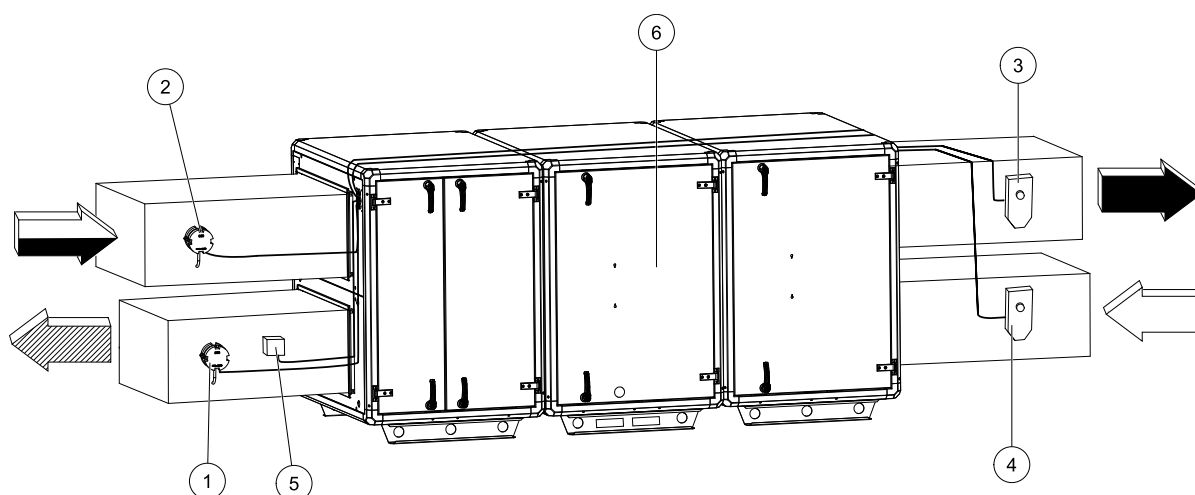


Fig. 4 Installation, left hand unit

Position	Description
	Supply
	Exhaust
	Outdoor
	Extract
1.	VAV pressure transmitter supply air (accessories)
2.	VAV pressure transmitter extract air (accessories)
3.	Damper and motor exhaust air (accessories)
4.	Damper and motor outside air (accessories)
5.	Sensor supply air
6.	Topvex SoftCooler SR

6.3.2 Installation procedure

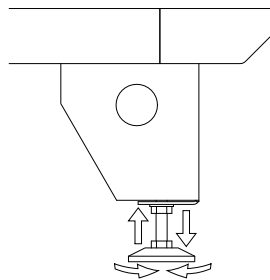
- 1 Prepare the surface where the unit is to be mounted. Make sure that the surface is flat, levelled and that it supports the weight of the unit. Perform the installation in accordance with local rules and regulations.
- 2 Lift the unit in place.



Warning

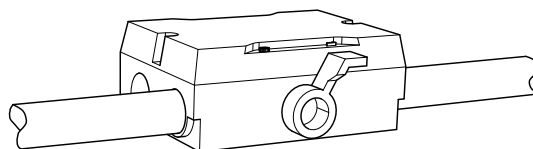
Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.

- 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 between the safety switch and the unit is led through the top of the unit casing directly to the electrical connection box.

See enclosed wiring diagram, and chapter 6.4.2.1, table 1 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.

6.4 Dividing the Topvex SR air handling unit

Before the installation of Topvex SoftCooler SR the Topvex SR has to be divided (figure 5).

How to split the 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 unit are joined using 4 M10 screws, one in each corner

C. Control section

D. Heat recovery section

E. It is possible to dismount the gables by removing 6 MRX M6 screws with TH2 bits tool

Reassemble in the reverse order.

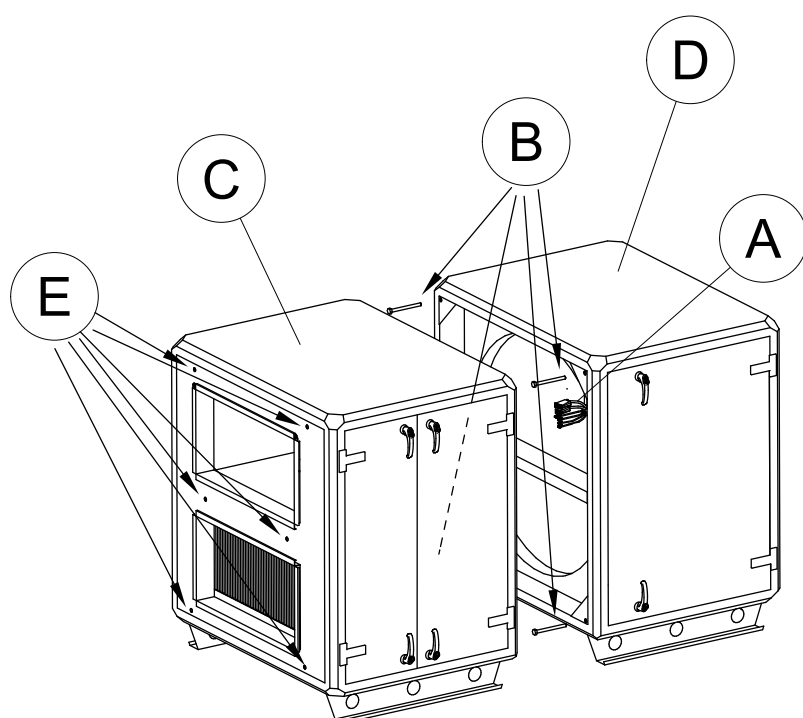


Fig. 5 Left hand version



Note:

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

6.4.1 Assembly the Topvex SoftCooler SR

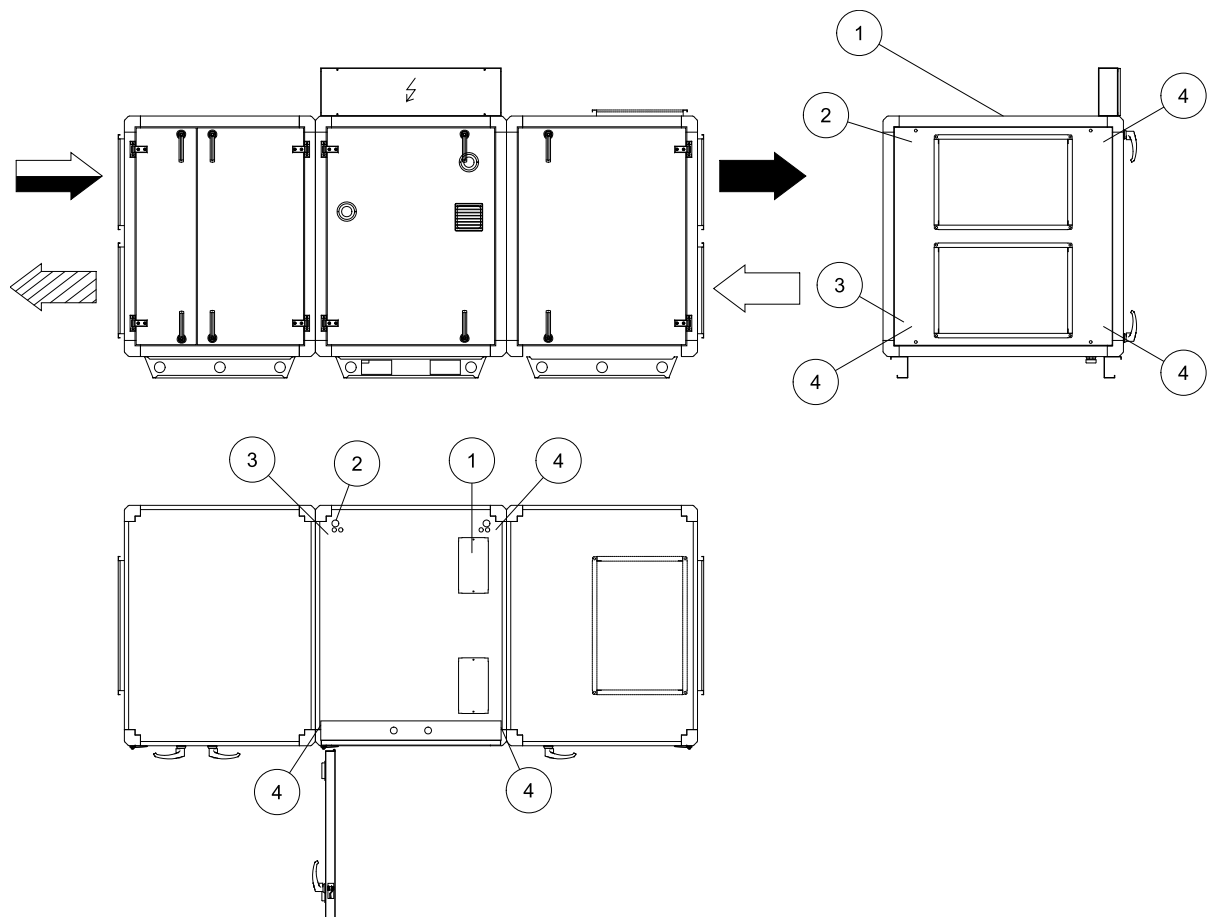


Fig. 6 Left hand unit (right hand units are mirrored)

Make sure that the sealing stripes and faces in-between the units halves are undamaged. Place the SoftCooler between the two air handling units parts and carefully push them completely together. The SoftCooler is joined to the air handling parts by 4 M10 screws, one in each corner.

1. Remove the cover plate on top of Softcooler to access the inner upper mounting screw on the SoftCooler side that faces the rotary heat exchanger.
2. Remove the exhaust air filter to access the inner upper mounting screw on the Softcooler side that faces the exhaust air filter.
3. Remove the supply air fan to access the inner upper screw on the Softcooler side that faces the supply air fan.
4. When all 4 screws are in place remount the supply air fan, the exhaust air filter and the cover plate on top of the unit.

6.4.1.1 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

6.4.1.2 Condensation drain



Warning

The unit is not to be taken into operation before the included condensation drain and water seal are connected from the Topvex SoftCooler to the floor drain.

The drain is to be connected to the drain connection under the drip-tray. The drip-tray is located in the bottom of the Topvex SoftCooler.

Use the included plastic connection pipe which is to be cut to the correct height "H" according to the below figure. See the below table for the relation of height "H" and maximum under pressure in the unit.

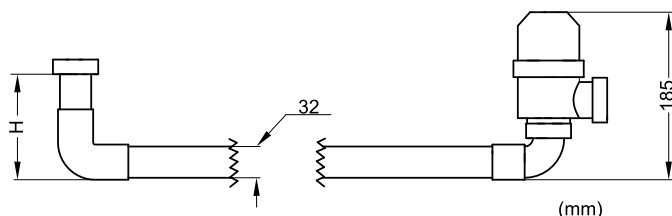


Fig. 7 Dimension and assembly

H (mm)	Max. Negative pressure (Pa)
85	500
110 ¹	750
135	1000

¹ Normal conditions

To lead the water from the water seal outlet to the floor drain an extra pipe, not included with the Topvex SoftCooler, is needed. Connect this pipe and make sure that the slope is at a minimum 1:200 to the floor drain and also that the complete drain installation are in a frost free space.

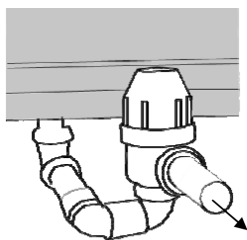


Fig. 8 Pipe to floor drain

6.4.2 Electrical connection



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.
- Operation in the refrigerant cycle and handling refrigerants must be performed by certified personnel.

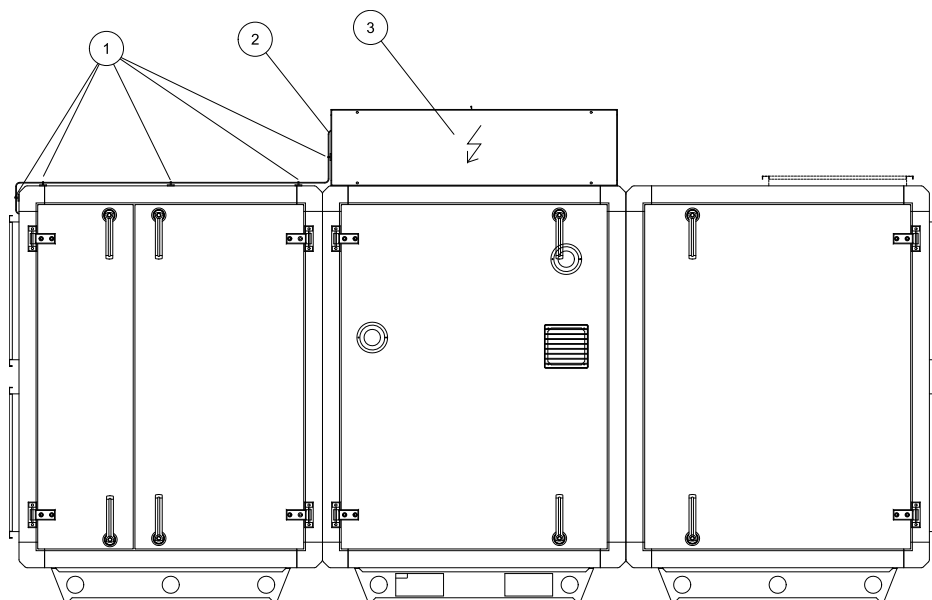
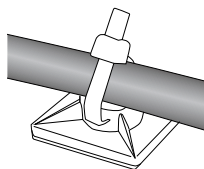


Fig. 9 Electrical connection, left hand unit

1

Cable fastener



2

Control cable

3

Power supply

1. Wire the prepared control cable from the Topvex SoftCooler electrical connection box to the Topvex SR electrical cabinet (in the supply air part).

Use the prepared grommet to enter the cabinet and secure the cable along its way on top of the unit using the self adhesive cable fasteners.

2. Connect the wires to the terminal block in the electrical cabinet according to labeling on the wires and electrical wiring diagram. See also chapter 6.4.2.1 Internal electrical connections.

3. Connect the cooler unit electrically to the mains (400V 3~, 50 Hz) through the all pole circuit breaker (safety switch) which is enclosed inside the unit at delivery. The power cable is led directly into the Topvex SoftCooler electrical connection box. Dimension the wire and fuses according to the electrical data (figure 4.2.2)


4. Do the electrical connections for the Topvex SR air handling unit according to the installation instruction that follows that unit.

6.4.2.1 External/Internal connections

See also the enclosed wiring diagram.

Mains supply is the only external connection that should be connected to the Topvex SoftCooler.

Table 1 External connections

Terminal block		Description	Remark
	PE	Ground	400V 3N~, 50Hz supplied via safety switch
N	N	Earthed neutral (supply voltage)	
L1	L1	Phase (supply voltage)	
L2	L2	Phase (supply voltage)	
L3	L3	Phase (supply voltage)	

The already prepared operating cable in Topvex SoftCooler is to be drawn to the electrical cabinet in the supply part of the Topvex air handling unit and connected to the terminal blocks with the same numbers as the cable markings.

Table 2 Internal connections

Terminal block		Description	Remark
G	G		24V AC
4	DI ref		Referens
10	DO ref		Referens
15	DO	A signal from control unit E28 for starting "DX cooling step1" indicates a cooling demand. The signal controls relay R1 that is then starting the compressor.	24V AC, 0.5A
74	DI	Alarm indication cooling (Run Error P1-Cooling).	NO
90	AO ref		Reference
94	AO	Control signal from control unit E28 for cooling. Controls the frequency converter "FC".	0-10V DC

7 Function Description

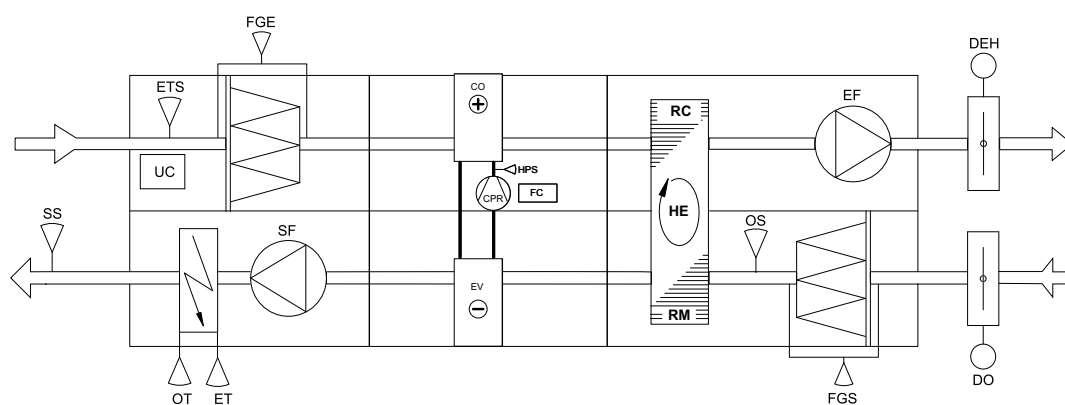


Fig. 10 Left hand unit

Position	Description
EF	Extract air fan
SF	Supply air fan
SS	Temp. sensor supply air
OS	Temp. sensor outdoor air
ETS	Temp. sensor extract air
UC	Controller E28
RC	Rotor control
RM	Rotor motor

Position	Description
HE	Exchanger
DO	Damper outdoor air (accessory)
DEH	Damper exhaust air (accessory)
FC	Frequency converter
CPR	Compressor
EV	Evaporator
CO	Condenser
HPS	Condenser pressure sensor
OT/ET	Overheating/Max. temp switches
FGS/FGE	Air filter pressure switches

7.1 General

Control unit E28 (UC) senses the temperature via the extract temperature sensor (ETS) and then keep the set extract temperature by sequence controlling the compressor (CPR), heat exchanger (HE) and hot water- /electrical heater (HWL/H, ELH). The temperature sensor in the supply air (SS) is min. and max. limiting the supply air temperature.

7.2 Power control

The compressor (CPR) are step-less controlled between, in the frequency converter (FC), set minimum and maximum frequency.

7.3 Power limitation

The programmable controller is continuously sensing the condensing pressure via the high pressure sensor (HPS) and gradually slows down the speed of the compressor (CPR), if the pressure exceeds the set limitation value. This is done to avoid a high pressure alarm.



Note:

This instruction contains functions for the Topvex SoftCooler SR, for a complete description of functions see "SR 09,11, TR 09-15 Installation instruction".

8 Commissioning protocol

Company:
Responsible:

8.1 General

Customer:	Date:	Installation:
Object/unit:	Item no:	Installation address:
Model/size	Serial no:	Designation:


8.2 Installation protocol

Moment	Done	Note
Control report cooling concerning installation established. (Application shall in some cases be done, see chapter 3, Refrigerant Control/Reporting).	<input type="checkbox"/>	
All unit parts undamaged.	<input type="checkbox"/>	
Installation carried out according to instructions (see chapter 6.4.1, Assembly the Topvex SoftCooler.	<input type="checkbox"/>	

Moment	Done	Note
Condensation drain connected (see chapter 6.4.1.2, Condensation drain).	<input type="checkbox"/>	
Mains supply connected via the Safety switch (see chapter 6.4.2, Electrical connection).	<input type="checkbox"/>	
Internal operating cable connected (see chapter 6.4.2.1, External/Internal connections).	<input type="checkbox"/>	
Supply and extract airflow adjusted	<input type="checkbox"/>	

8.3 Preparing control unit E28

To receive correct functions the following settings must be done in the control unit E28. Log in into the control unit E28 (3333) before taking action. As an alternative can the settings be done with the PC-software tool "Corrigo E-tool Ventilation" then download the configuration file (.vtc) from the Systemair online catalogue (www.systemair.com).


Moment	Done	Note
Select the menu Configuration-Input/Output: • Select DI • Browse to DI4, select. Change the setting to P1-Cooling	<input type="checkbox"/>	 Note: Note: DI4 cannot be used for extended run when Topvex SoftCooler is used.
Select the menu Configuration-Control function: • Check that the setting is Extract air control or Room control	<input type="checkbox"/>	
Select the menu Configuration Cooling: • Set DX Set Limit for supply air control on active: to 0.0°C.	<input type="checkbox"/>	
Select Configuration step controllers/step contr. cooling: • Activation levels (then scroll down) • Select Chiller groups: 1 Set Min in/out connecting time: 1 sec	<input type="checkbox"/>	
Select the menu Configuration Cooling recovery: Set Cooling recovery to position No	<input type="checkbox"/>	

8.4 Before compressor start

To avoid damage on the compressor the oil in the compressor crankcase must be heated before the first start.

Moment	Done	Note
Stop the Supply- and extract fan (via the Topvex air handling units safety switch)	<input type="checkbox"/>	
Turn on the mains supply for the Topvex SoftCooler via the safety switch, make sure that the voltage is on (the display in the frequency converter lights up) Wait for minimum 2 hours so that the oil will reach about +30° C!	<input type="checkbox"/>	

8.5 Control cooling operation

Moment	Done	Note
Start the Supply- and extract fan (via the Topvex air handling units safety switch). Run the unit on dimensioning airflows.	<input type="checkbox"/>	Supply air _____ m ³ /h Extract air _____ m ³ /h
Start the compressor by establishing a 100% cooling demand: <ul style="list-style-type: none"> • Log in to the control unit E28 (2222) • Select menu Hand/Auto • Select Cooler type/coil Set Cooler to Manual output 100.0	<input type="checkbox"/>	
Run the compressor for at least 10 minutes. Then read the Extract-, Outdoor-, Supply and Exhaust air temperature via the display of the control unit E28 (in the menu Temperature).	<input type="checkbox"/>	Outdoor air temperature _____ °C Supply air temperature _____ °C Extract air temperature _____ °C Exhaust air temperature _____ °C
Let the compressor run. Measure the hotgas- and liquid line temperature with a strap-on temperature detector.	<input type="checkbox"/>	Hotgas temperature _____ °C Liquid line temperature _____ °C
Keep the compressor running. Read the below values via the display of the frequency converter, see section "Frequency converter, quick guide", in Operating and Maintenance Instructions. First set the parameter for reading, then let the door of the Topvex SoftCooler be closed for at least 5 minutes before reading: <ul style="list-style-type: none"> • Output frequency (Param d001) • Output current (Param d002) • Condenser pressure (Param d004) 	<input type="checkbox"/>	Output frequency _____ Hz Output current _____ Hz Condenser pressure _____ bar
 Note: Important! Restore the cooling operation to "Auto": <ul style="list-style-type: none"> • Log in to the control unit E28 (2222) • Select menu Hand/Auto • Select Cooler type/coil • Set Cooler to Auto 	<input type="checkbox"/>	

Notes:



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