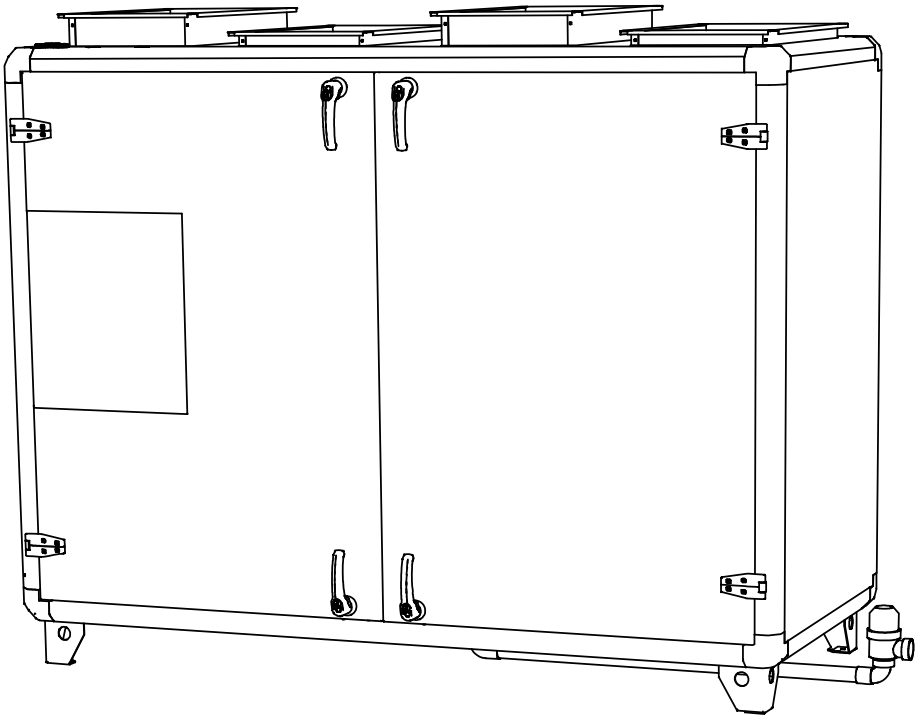
Topvex TX03, TX04, TX06
Compact Air Handling Unit



GB **Operation and Maintenance instructions**

Corrigo ver. no. 1.2-1-00

Introduction

Installation, operation and maintenance manual concerns air handling unit type Topvex TX, manufactured by Systemair AB. It consists of basic information and recommendations concerning the design, installation, start-up and operation, which shall be obeyed to ensure the 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 guidelines given in it and follow all safety requirements.

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Warning

In order to avoid electrical shock, fire or other damage that might occur in connection with faulty use and operation of the unit, it is important to consider the following:

- The system must be installed according to the mounting instructions
- Insulate mains supply before service or cleaning of components
- Tumble dryer must not be connected directly to the ventilation system
- Make sure the filter is mounted in its place before running the system
- Take care of sharp edges when removing parts for maintenance
- Maintenance must be performed according to the instructions.

Operation

General

Topvex unit with Electrical heater have 3 minutes of re-cooling after that it has been turned off.
N.B. If activating the fire alarm when the heater is on the fan stops immediate without re-cooling, this can cause the overheating protection to trip. See page 6 ***Alarms –Overview*** how to reset.

When changing a parameter in the control system it takes up to 1 minute for the change to be carried out.

Free cooling

The objective of the Free cooling function is to provide cool out door air if available during the night time when the unit is in OFF position to cool down the interior of the building. During this time the heat exchanger is by-passed.

NB the following is only valid if the free cooling function is set to **Active** in the program menu.
The fans are started at **Start Cooling Hour** if the following criteria are met **simultaneously:**
• all time channels are in **OFF** position and that the unit goes back to normal operation the following day (set operation time during the following 24 hours)
• the average outdoor temperature is higher than the out door temperature limit
• the actual outdoor temperature is lower than the outdoor temperature set upper limit
• the actual outdoor temperature is higher then the out door temperature set lower limit
• the actual outdoor temperature is lower than the actual room temperature
• the actual room temperature is higher than the set room temperature limit.

The fans are stopped at the **Stop Cooling Hour** or if the following conditions are met:
• the room temperature is lower than the set room temperature limit **or**
• the outdoor temperature exceeds the set outdoor temperature upper limit **or**
• the outdoor temperature is lower than the lowest set outdoor temperature limit.

The unit checks the night temperature (indoor and outdoor temperature) during 3 minutes at 12.00 PM when the fans are started so that the sensors can perform a temperature measurement. If above conditions are met the free cooling function is started, if not the unit goes back to OFF position.

Defrost function, general description

The need for defrosting of the heat exchanger block is determined by the outdoor temperature. There are three possibilities for defrosting based on if you want to keep a balanced airflow or if you can accept an unbalanced airflow during the defrost cycle. The unit can be programmed for how aggressive the defrosting needs to be based on the estimated indoor humidity level. See table 1 below for explanations of the different settable levels.

1. **Reduction of the supply airflow** (Unbalanced airflow):
   Reduces the supply airflow up to 20% to allow the higher extract airflow to defrost the heat exchanger. Starts, if activated, at a preset outdoor temperature and stays active as long as the outdoor temperature stays below the set point. During this time the supply air fan operates at a constant reduced speed
   By even lower outdoor temperatures a stop defrosting sequence is started.

2. **By-pass of the supply airflow** (Balanced airflow):
   Starts, if activated, when the outdoor temperature drops to a preset level, and keeps below that level a preset number of minutes, the by-pass damper inside the unit opens to help reduce the flow of the cold outdoor air through the heat exchanger block. As this cycle is initiated the set supply air temperature is lowered 4K. If the set supply air temperature after the re-heater battery still can't be maintained both the supply air and exhaust air fan speeds are reduced in order to maintain a balanced indoor ventilation condition. If this is not enough to keep the set supply air temperature a stop defrosting sequence will start that stops the supply air fan under a preset number of minutes.

3. **Stop defrosting** (Unbalanced airflow) **(Default)**:
   Starts when the outdoor temperature drops below the preset stop defrosting temperature or the set supply air temperature during by-pass defrosting can't be kept. Is active a preset number of minutes based on the set defrost level (table 1). Stop defrosting is also automatically activated as necessary if none of the above options are chosen.

Defrost levels

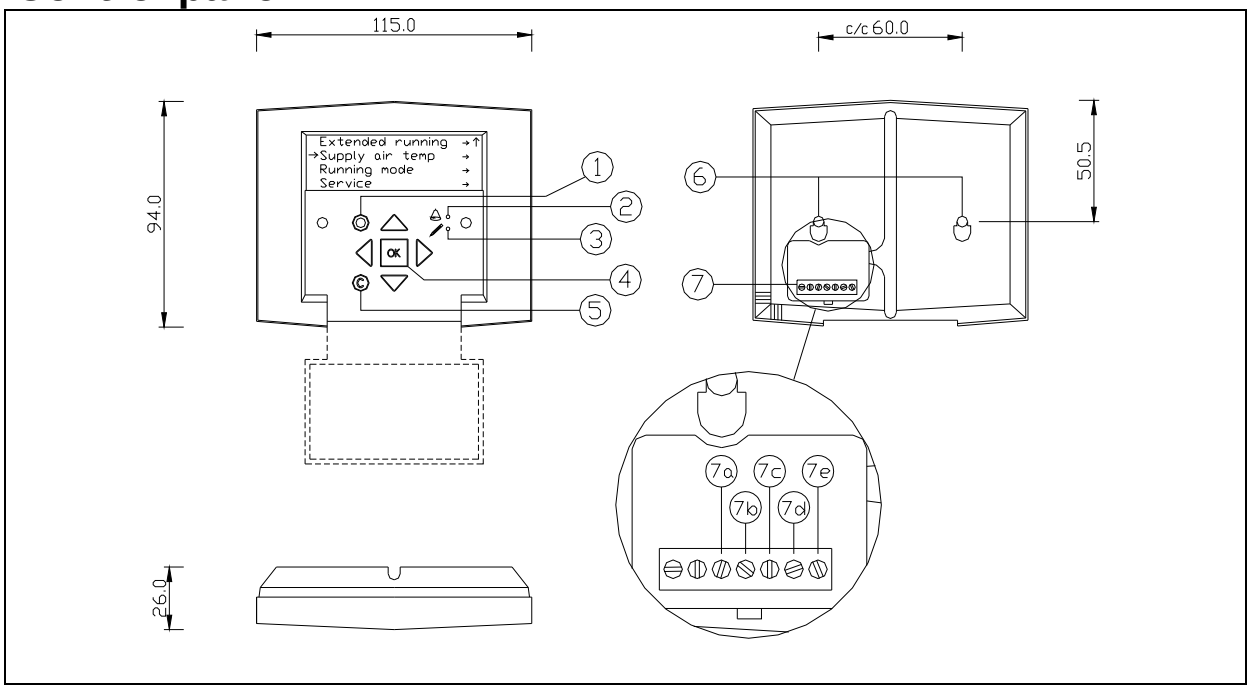
Defrost level	Indoor humidity level*	Description
1	Minimum <20%	Office with small amount of plants. Low physical activities. Industrial building with processes that use no water.
2	Low 30%-40%	Office with normal amount of plants. Medium physical activities.
3	Medium 40%-60%	Day care centre. High physical activities
4	High 60%-80%	Newly constructed buildings that need to dry out.
5	Extreme >80%	Greenhouse

Table 1.
***Relative humidity in extract air during cold season

Shortcut to set the menu language

Press the OK button while switching on the mains supply.
Press the OK button. Choose language with the UP/DOWN buttons. Confirm the choice with the OK button.
Press the LEFT button to go back in the menus.
The language can also be change in the ***Language*** menu, (see *Control unit, manual* page 11).

Control panel



	Description		Description
1.	Alarm button	**7.**	Connection block
2.	Alarm LED	**7a.**	Yellow cable
3.	Write enable LED	**7b.**	Orange cable
4.	OK button	**7c.**	Red cable
5.	Clearing button	**7d.**	Brown cable
6.	Mounting holes	**7e.**	Black cable

Fig.1

How to operate

The menus in the Corrigo E controller are organized in a horizontal tree structure. The UP/DOWN-buttons are used to move between menus at the present menu level. The RIGHT/LEFT buttons are used to move between menu levels. When changing parameters the UP/DOWN buttons are used to increase or decrease the value of the parameter and the RIGHT/LEFT buttons to move between digits within the parameter.

- The OK button is used to confirm the choice of a parameter setting.
- The C button is used to abort an initiated parameter change and restore the original value.
- The ALARM button is used to access the alarm list.

Changing parameters

In some menus there are parameters that can be set. This will be indicated by the LED ✎ flashing. To change a parameter, first press the OK button, the LED ✎ changes to a steady light. A cursor will appear at the first settable value. If you wish to change the value, do so by pressing the UP/DOWN buttons. In numbers containing several digits you can move between the digits using the LEFT/RIGHT-buttons.

When the desired value is displayed press OK. Settings outside the intervals is not registered, preset values counts. If there are further settable values displayed the cursor will automatically move to the next one. To pass a value without changing it, press RIGHT.

To abort a change and return to the initial setting, press and hold the C-button until the cursor disappears.

Navigating the menus

The start display (the display normally shown) is at the root of the menu tree.

Pressing DOWN ▼ will move you through the menu choices, in this the lowest level. UP ▲ will move you back through the choices.

To enter a higher menu level, use UP or DOWN to place the display marker opposite the menu you wish to access and press RIGHT ►.
If you have sufficient log on privileges the display will change to the menu you have chosen.

At each level there may be several new menus through which you may move using the UP/DOWN buttons. Sometimes there are further sub menus linked to a menu or menu item. This is indicated by an arrow symbol at the right-hand edge of the display. To choose one, use RIGHT ► again. To back down to a lower menu level, use LEFT ◄.

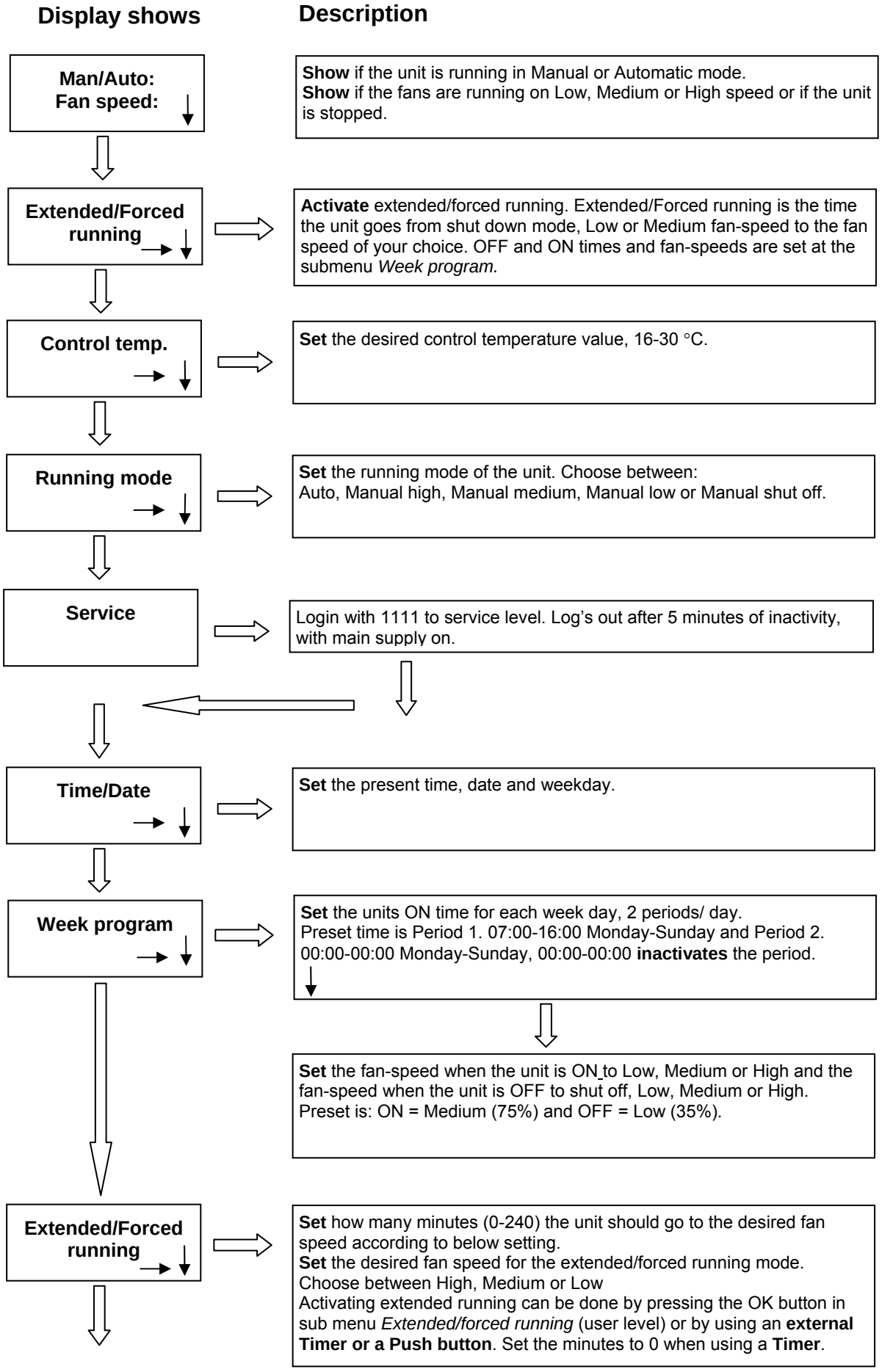
Alarms

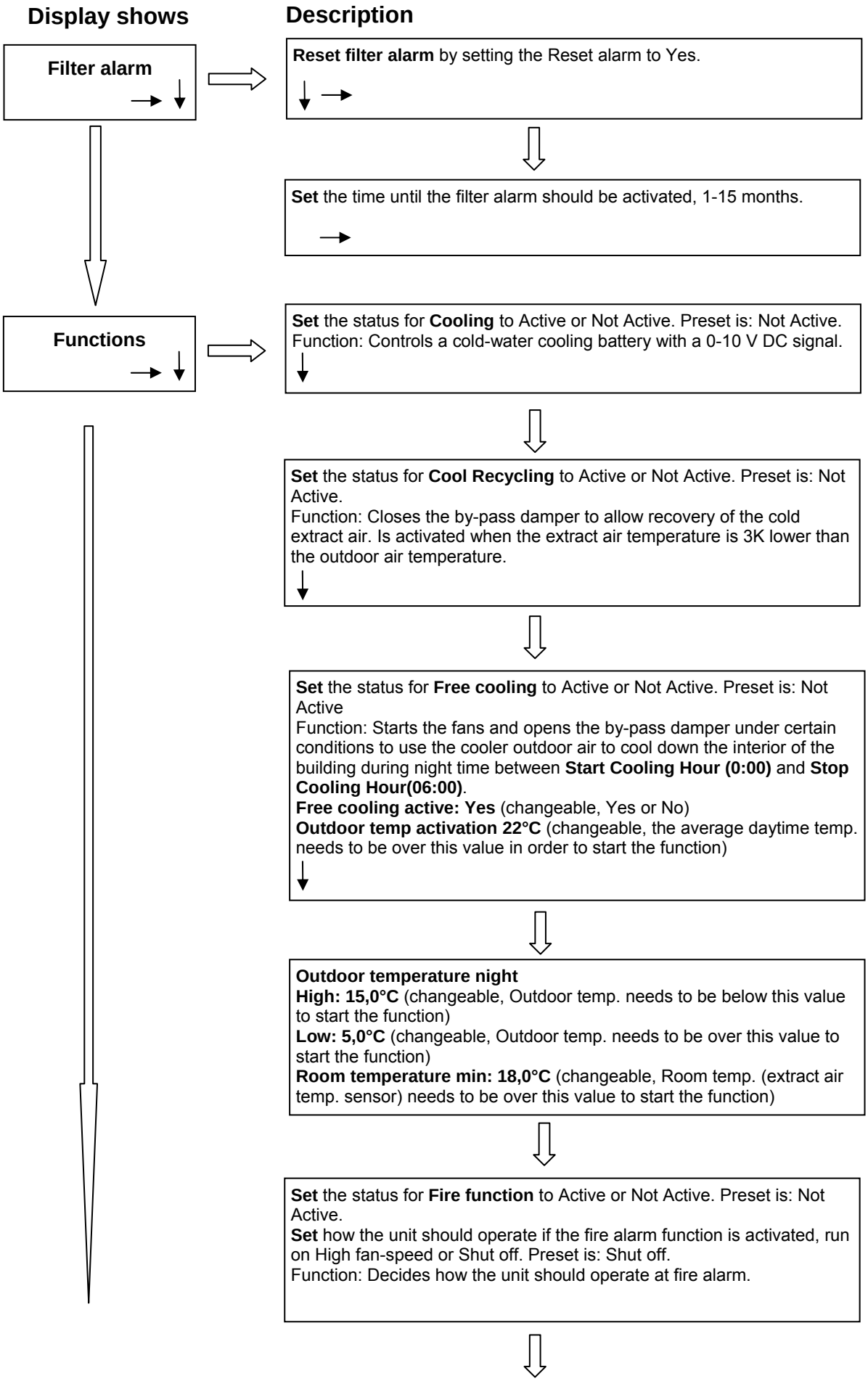
Alarm button (pos.1 in fig. 1) opens the alarm queue. Press this button and active and non-acknowledged alarms will be displayed in the menu window. The LED for alarms (pos.2 in fig. 1) is blinking if there are non-acknowledged alarms and steady if the alarms are still active but have been acknowledged. If there are multiple alarms use UP/DOWN buttons to move between them. An alarm can be acknowledged or blocked by using OK and UP/DOWN buttons. To abort and go back to start menu select Cancel and press LEFT button.

Alarms –Overview

Alarm fan motor	DI1	Thermal contact in the fan motor tripped. Reset in Control panel.
Overheat.	DI2	Thermal contact in the electric heater tripped (auto. reset: 60°C, manual reset: 110°C). Manual reset is done by pressing the red button, marked RESET, on top of the connection box .
Fire alarm	DI5	External fire alarm contact tripped. Reset in Control panel.
Filter to be changed	-	Set time has expired. Reset in Control panel.
Alarm frost protect	-	Outlet water below 8°C (temp. not changeable). Hot water heater. Reset in Control panel.
Sensor error inlet	-	Supply air sensor interruption.
Sensor error exhaust		Extract air sensor interruption.
Sensor error outtemp.		Outdoor air sensor interruption.
Alarm output all alarms	DO5	Gives a signal (24V AC) whenever there is an A or B-alarm.
Internal backup battery error	-	Shows “Internal battery error” in the display

Control unit, manual




Display shows
Description
Filter alarm
Reset filter alarm by setting the Reset alarm to Yes.
Set the time until the filter alarm should be activated, 1-15 months.
Functions
Set the status for Cooling to Active or Not Active. Preset is: Not Active.
Function: Controls a cold-water cooling battery with a 0-10 V DC signal.
Set the status for Cool Recycling to Active or Not Active. Preset is: Not Active.
Function: Closes the by-pass damper to allow recovery of the cold extract air. Is activated when the extract air temperature is 3K lower than the outdoor air temperature.
Set the status for Free cooling to Active or Not Active. Preset is: Not Active
Function: Starts the fans and opens the by-pass damper under certain conditions to use the cooler outdoor air to cool down the interior of the building during night time between Start Cooling Hour (0:00) and Stop Cooling Hour(06:00).
Free cooling active: Yes (changeable, Yes or No)
Outdoor temp activation 22°C (changeable, the average daytime temp. needs to be over this value in order to start the function)
Outdoor temperature night
High: 15,0°C (changeable, Outdoor temp. needs to be below this value to start the function)
Low: 5,0°C (changeable, Outdoor temp. needs to be over this value to start the function)
Room temperature min: 18,0°C (changeable, Room temp. (extract air temp. sensor) needs to be over this value to start the function)
Set the status for Fire function to Active or Not Active. Preset is: Not Active.
Set how the unit should operate if the fire alarm function is activated, run on High fan-speed or Shut off. Preset is: Shut off.
Function: Decides how the unit should operate at fire alarm.

Display shows | **Description**

Set the **Air control** mode to:
- Supply.
- Supply & Outdoor compensation.

  →

  Set how much the control temp. should be compensated when the out door temperature is –20°C and +15°C (the compensation will be linear between these two points).
  E.g. At –20 : 5°C.
  E.g. At +15 : -2°C.
  Control temp. = 18°C.
  Outdoor temperature –20°C gives a Control temp. of 23°C (18+5).
  Outdoor temperature +15°C gives a Control temp. of 16°C (18-2).
- Extract.

  →

  Set the permitted maximum and minimum supply air temperature.

Set the **Fan speed control** for the supply air fan **(SAF)** in % of maximum fan speed. Choose between: 0% to 100%.
All fan speeds LOW, MEDIUM & HIGH can be set in this interval

Set the **Fan speed control** for the exhaust air fan **(EAF)** in % of maximum fan speed. Choose between: 0% to 100%.
All fan speeds LOW, MEDIUM & HIGH can be set in this interval

Defrost function
Set the **By-pass function** to **"Yes"** or **"No"** (preset is **"No"**)
Function: (enables the use of the by-pass damper for defrosting. The set supply air temperature is reduced 4K during defrost cycle. Reduction of both supply air fan and extract air fan speed up to 20% if supply air temperature does not reach reduced set point. If necessary the supply air fan is stopped completely during the defrosting cycle (stop defrosting)).
Set the **Reduced supply air** to **"Yes"** or **"No"** (preset is **"No"**)
Function: Reduces the supply air fan speed up to 20% whenever there is a frost risk of the plate heat exchanger.
Set the defrost level between 1 and 5 (preset is 3)
Function: Level 1 to 5 are depending on the estimated indoor relative humidity level. See table 1 on page 4 for a description of the different levels.

Automatic summer/wintertime changeover
Choose between "Yes" and "No", preset is "Yes".

In-/Outputs →↓

Show the Analogue inputs.
AI1: Show the actual temperature of the supply air.
AI2: Show the actual temperature of the exhaust air.
AI3 applies only to HW units.
AI3: Show the actual temperature of the return water in the hot water battery (frost protection).
AI4: Show the actual outdoor temperature

↓ →

Display shows **Description**

Show the status and settings of the digital inputs.
DI1: Fan alarm. Connected to the thermal contact in the fan motor. Stops the fan and disconnect the electrical heater when the alarm is activated.
DI2: applies only to EL units.
DI2: Overheating of the electrical heater. Connected to the thermal contact in the heater. Disconnects the heater when the alarm is activated.
DI3: Timer/P.B. Starts the Extended running when an external contact, Timer or Push button, closes. Only when the unit is running in Off mode.
DI4: Not in use
DI5: Is only shown when the Fire function is activated.
DI5: Fire alarm. Connects to an external fire central. Stops the unit or changes the fan speed to High if the alarm is activated.

Show and Set the Analogue outputs.
AO1: Heating battery, Electric or hot-water. Show the output signal, 0-10V. Set the status to: Auto, Manual or Off. In Manual status it is possible to set the output signal within a range from 0 to10V, more than 2V activates the electrical re-heater (on/off function).
AO2 is shown only when the cooling function is activated.
AO2: Cooling battery, cold-water. Show the output signal, 0-10V. Set the status to: Auto, Off or Manual. In Manual status it is possible to set the output signal within a range from 0 to10V.
AO3: Control signal, 0-10V, to the extract air fan, Set Auto, Man or Off
AO4: Control signal, 0-10V, to the supply air fan, Set Auto, Man or Off
AO5: Control signal, 0-10V, to the by-pass damper, Set Auto, Man or Off

Show and Set the digital outputs, output 24V AC.
DO1: Damper motor on/off. Opens the damper when the unit is started
DO2: Not in use
DO3: Not in use
DO4: Not in use
DO5: Alarm output. Show the status.

Version

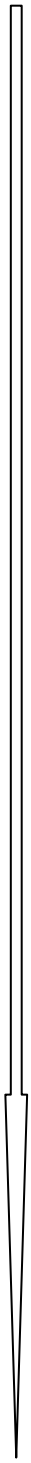
Show the program version
Present version **1.2-1-00**

Configuration

(Enter into the configuration menu using code **8642**)
1. AHU type (Preset from factory is Topvex-X), **should normally not be changed**

Fan speed control SAF (Supply air fan)
High: 100% (changeable 0-100%)
Medium: 75% (changeable 0-100%)
Low: 35% (changeable 0-100%)

Display shows **Description**



Fan speed control EAF (Extract air fan)
High: 100% (changeable 0-100%)
Medium: 75% (changeable 0-100%)
Low: 35% (changeable 0-100%)

2. Type of heater (choose correct type of re-heater)

3. Control parameters
P-band: 30°C (changeable)
I-Time: 100s (changeable)

By-pass damper
P-band: 30°C (changeable)
I-Time: 100s (changeable)

4. Display unit type (E DSP preset)

5. Modbus Comm. (Not Active or Active, Preset is Not Active)
Modbus: Active

Modbus address: 7 (changeable)
Speed: 9600 bps (changeable)
Two stop bits: Yes (changeable)
Parity: No (changeable)

6. Address:
PLA: 254
ELA: 30

Language ⇒ **Set** the menu language.
Note: A short cut to the menu language is by pressing the OK button at the same time as the main voltage is switched on.

Change codeword ⇒ **Set** a new code for Service level.

Maintenance

Maintenance of the Topvex TX should normally be carried out 3 – 4 times a year. Apart from general cleaning the following should be observed:

Changing Supply/Extract air filter

Indicated as “filter to be changed” in the control panel, 1-2 times per year or when necessary **(fig. 2)**
The bag filter cannot be cleaned and must be changed when necessary. New filters can be ordered from Systemair. Operation time between filter changes must be reset after filter change (see page 8, *Filter alarm*). To change the alarm activating time see page 8, *Filter alarm*.
Initial pressure drop over the filter (Clean filters) is approx. 70 Pa and the final pressure drop is approx. 220 Pa.

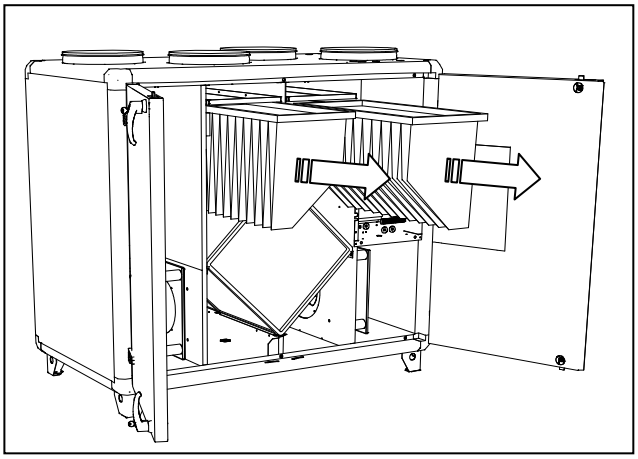


Fig. 2

Checking the heat exchanger

After a long time of use dust may build up in the exchanger and block the airflow. It is important to clean the exchanger regularly (once a year) to maintain high efficiency. The heat exchanger can be taken out of the unit for maintenance **(fig.3)**. Wash in hot soapy water or use pressure air. Do not use detergent containing ammonia.

Note! The exchanger block is heavy. To take out the plate heat exchanger is normally a job for two persons.

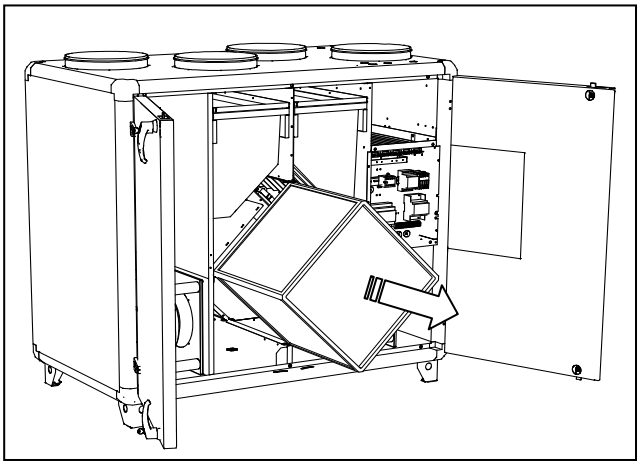


Fig. 3

Checking the fans

Even if the required maintenance, such as change of filters, is carried out dust and grease may slowly build up inside the fans. This will reduce the efficiency.
The fans are easily taken out from the unit **(fig 4**) and may be cleaned with a cloth or a soft brush with a recommended interval of once per year. Do not use water. White spirit can be used to remove obstinate settlements. Allow drying properly before remounting.

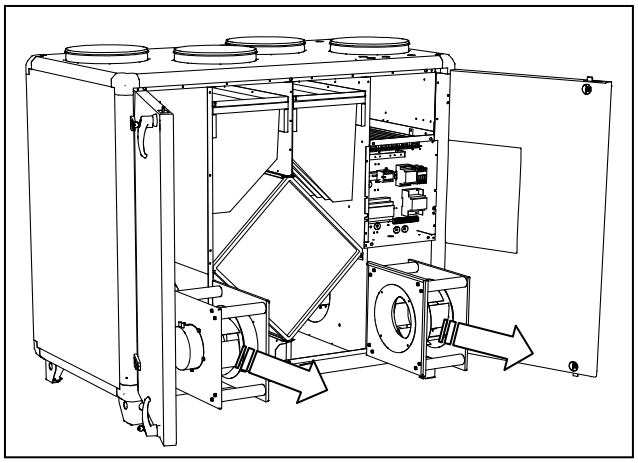


Fig. 4

Cleaning extract louvers and inlet diffusers

The system supplies treated outdoor air to the building and extracts the used indoor air via the duct system and diffusers/louvers. Diffusers and louvers are mounted in ceilings/walls in bedroom, living room, wet rooms, WC etc. Remove diffusers and louvers and wash in hot soapy water if required. Diffusers/ louvers must be put back with their original settings and positions in order not to unbalance the system.
The cleaning of these parts is done when necessary.

Checking the outdoor air intake

Leaves and pollution could plug up the air intake grille and reduce the unit's capacity. Check the air intake grille at least twice a year and clean if necessary.

Checking the duct system

Dust and grease settlements may build up in the duct system even if filters are changed regularly. This will reduce the efficiency of the installation. The ducts should therefore be cleaned/changed when necessary.
Steel ducts can be cleaned by pulling a brush, soaked in hot soapy water through the duct via diffuser/louver openings or special inspection hatches in the duct system (if fitted).

NB! Possible roof cowls must be checked once a year and cleaned when necessary.

Troubleshooting

Should problems occur, please check or correct the following before contacting your service representative. Always check if there are any alarms active in the control panel.

1. Fan(s) do not start

- Check that the fuses are not defect
- Check the settings in the control panel (times, week schedule, auto/manual operation etc.)
- Check if there are any alarm messages

2. Reduced airflow

- Check the settings of Medium and Low fan speed
- Check that the Outdoor/Exhaust air damper (if used) opens
- Change of filters required?
- Cleaning of diffusers/louvers required?
- Cleaning of fans/exchanger block required?
- Is the roof unit/air intake clogged?
- Check ducts for visible damage and/or build up of dust/pollution
- Check diffuser/louver openings.

3. Cold supply air

- Check the control temperature on the control panel
- Check if the overheating thermostat has tripped. If necessary press the red button, marked RESET, on top of the electric heater connection box, see fig. 7 on page 13 in the *installation description*.
- Check if the extract filter must be changed
- Check if the fans have stopped due to overheating. If so the thermal contact might have tripped (shows as "*Fan alarm*" in the control panel). If necessary reset (see page 6 *Alarms-overview*)

4. Noise/vibrations

- Clean the fan impellers
- Pull the two fans out and check that the 2 screws holding the fans are tightened.

Service

Before calling your service representative, make a note of the specification and production number from the type label **(fig. 5).**

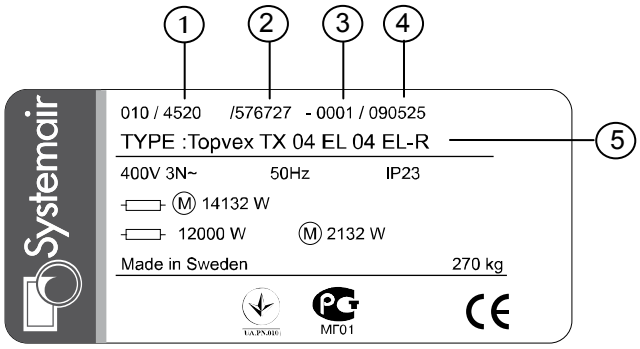


Fig. 5

Code explanation

1: Item number
2: Production order number
3: Consecutive number
4: Production date
5: Product code (product specification)

Commissioning record

Company

Responsible

Customer	Date	Installation
Object/Unit	Item no.	Installation address
Model/size	Series no.	

Filter replaces interval set. ☐

Present time and date set. ☐

Week scheduler settings
Preset On-time is:
Period 1. 07:00-16:00 Monday-Sunday, Medium fan-speed.
Period 2. 00:00-00:00 Monday-Sunday. 00:00-00:00 inactivates the period.
Preset Off mode is:
Remaining time: Low fan-speed.

Weekday	Period	Running times (On)
Monday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___
Tuesday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___
Wednesday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___
Thursday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___
Friday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___
Saturday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___
Sunday	1	___ : ___ - ___ : ___
	2	___ : ___ - ___ : ___

Running mode On: Low ☐, Medium ☐, High ☐
Running mode Off (remaining time): Shut off ☐, Low ☐, Medium☐, High☐

Function	Preset value	Set value
Temperature		
Control function Temp.	Supply ☒ Supply outdoor ☐ Exhaust ☐	Supply ☐ Supply outdoor ☐ Exhaust ☐
Control Temp.	18,0 °C	____ °C
Outdoor compensating		
Outdoor temp. -20,0 °C	Compensation: 20,0 °C	____ °C
+15,0 °C	Compensation: 0,0 °C	____ °C
Min. supply set point	12,0 °C	____ °C
Max. supply set point	30,0 °C	____ °C
Air flow		
Fan speed Low	35% of max. Fan speed	____ %
Fan speed Medium	75% of max. Fan speed	____ %
Fan speed Maximum	100% of max. Fan speed	____ %
Extended/Forced running		
Running time	240 Minutes *)	____ Minutes *)
Filter alarm		
Replaces interval	6 Months	____ Months
Cooling		
Status	Not active	Active ☐
Cool Recycling		
Status	Not active	Active ☐
Free Cooling		
Status	Not active	Active ☐
Outdoor temp activation:	22°C	____ °C
Outdoor temp night:	High: 15°C Low: 5°C	High:____ °C Low:____ °C
Room temp min:	18°C	____ °C
Fire function		
Status	Not active	Active ☐
Running mode at activated fire alarm	Unit shut off	High fan speed ☐
Defrost function		
By-pass status	Not active	Active ☐
Reduced supply airflow status	Not active	Active ☐
Defrost level	3	Set defrost level ____

*) Set the minutes to 0 when using an external Timer.

Notes

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