

# Topvex SX/C, Topvex TX/C Air Handling Unit

Operation and Maintenance Instructions

GB

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# 1 Warnings

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



## Danger

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



## Warning

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



## Caution

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

## Important

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

## 2 Product description

### 2.1 Internal components

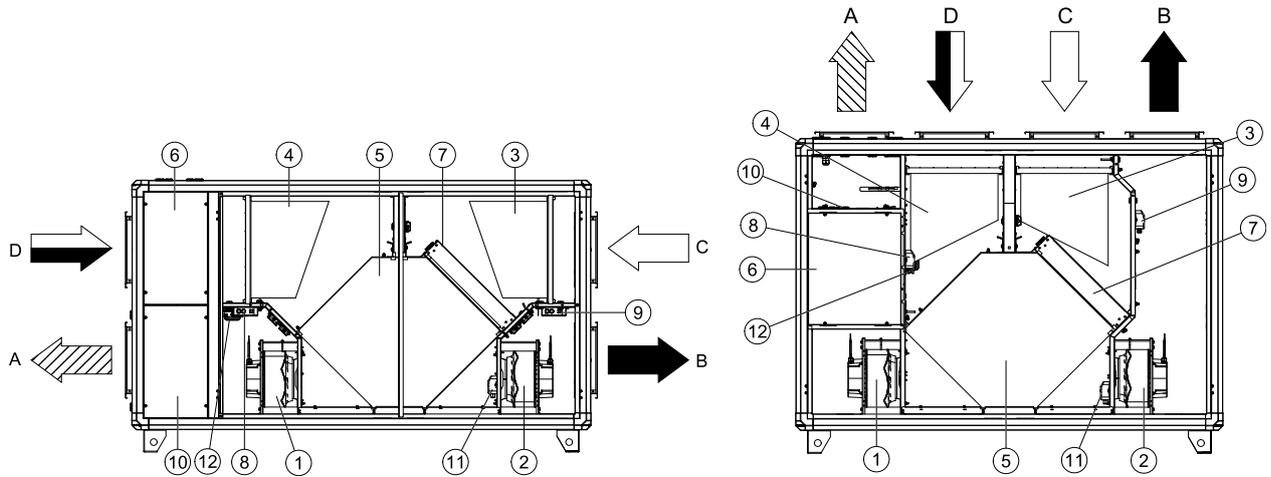


Fig. 1

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	Electrical connection box	
7	Damper by-pass outdoor air	
8	Pressure transmitter supply air fan/extract air filter	
9	Pressure transmitter extract air fan/supply air filter	
10	Re-heater battery	
11	Pressure transmitter defrosting exchanger	
12	Air flow sensor <sup>1</sup>	

<sup>1</sup> Only valid for units with electrical re-heater battery

## 2.2 Description of internal components

### 2.2.1 Supply and extract air fans

The fans have external rotor motors of EC type which are steplessly controlled individually by setting the control signal to a fixed value. It is possible to program the speed in 2 steps (normal/reduced) depending on the programming of the week schedule. The motor bearings are life time lubricated and maintenance free. It is possible to remove the fans for cleaning, see chapter 3 for more information.

### 2.2.2 Pressure sensor fans/filters

Two pressure sensors are installed (figure 1), each of the sensors has two functions. One function is to measure the differential pressure over the inlet cone of the fan impellers to maintain the airflow at constant level (CAV function as standard). The other function, is to measure the differential pressure over the supply and extract air filters so that when the pressure drop reaches the set value, an alarm is triggered in the main regulator, which indicates that the filter needs to be replaced.

### 2.2.3 Supply and extract air filters

The filters are of bag filter type with filter quality ePM1 60% (F7) for the supply air filter and ePM10 60% (M5) for the extract air filter. The filters need to be replaced when polluted. New sets of filters can be acquired from your installer or wholesaler.

### 2.2.4 Heat exchanger

Topvex SX/C, TX/C models are equipped with a counter flow heat exchanger and a by-pass damper. The operation of the by-pass damper is automatic and depends on the set temperature or if deicing is in operation.

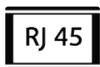
For defrosting a pressure transmitter is installed which measure the differential pressure over the heat exchanger.

### 2.2.5 Switch module

A switch module with HMI and 2 TCP/IP connections is mounted in the heat recovery units. Connection is made through the panel outlet in the air handling unit (see figure 2).



#### Note:



24V HMI connection dedicated for the display. The connection is only for HMI and no other connections is permitted.

### 2.2.6 Temperature sensor

5 temperature sensors (PT1000) are included in the unit from factory. The sensors are as follows:

- Supply air sensor
- Extract air temperature sensor
- Outdoor air temperature sensor
- Exhaust air temperature sensor
- Efficiency temperature sensor

### 2.2.7 Water heating battery

In units with built in water heating battery the hot water coil is located next to the supply air connection. The hot water coil can be either HWL (hot water coil, low power) or HWH (hot water coil, high power). The coil material is copper piping with a frame of galvanized sheet steel and aluminium fins. The coil is equipped with venting and immersion sensor for frost protection.

### 2.2.8 Electrical heater

In units with built in electrical heater the heating rods are located after the supply air fan in the airflow direction. The material is stainless steel. The electrical heating battery has both automatic and manual overheating protection. The manual overheat protection is reset by pushing the red button on top of the electrical heater frame (pos. 10 figure 2). The power demand of the electric heating coil is controlled by the main regulator, which controls the heat steplessly by a TTC triac control according to the selected control function that is set in the control panel.



### Danger

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

## 2.2.9 Free cooling description

This function is used during the warm period to save energy by using cold outdoor air, e.g. during night time, to cool down the building and thereby reducing the need for cooling during the day time.



### Note:

The following is only valid if the free cooling function is activated in the program menu.

Free cooling is only activated when the following starting conditions are met.

Starting conditions:

- Less than 4 days have passed since the unit was last in running mode
- The outdoor temperature during the previous running period exceeded a set limit (+22°C)
- It is between 00:00 and 07:00:00 in the day (settable)
- The timer outputs for normal speed, Extended running normal and External stop are Off
- A time channel will be On sometime during the recently started 24 hours.

The unit checks the night temperature (indoor and outdoor temperature) during 3 minutes at the set starting hour 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.

If the outdoor sensor is not located in the outdoor air inlet duct and a room sensor has been selected, the unit will not start free cooling as long as all the temperatures are not within the start and stop temperature intervals.

Stop conditions:

- Outdoor temp above the set max value (+18°C) or below the set min value (condensation risk, +10°C)
- The room temp/extract air temp is below the set stop value (+18°C)
- One of the timer outputs for normal speed, External stop or Extended running normal is On
- The time has past 07:00:00.

If any stop conditions is fulfilled after three minutes, the unit will stop again. Otherwise, operation will continue until a stop condition is fulfilled.

When free cooling is active, the fans run at normal speed or the set value for pressure/flow control and the digital output free cooling is active. The outputs block heating, cooling and heat exchanger. After free cooling has been activated, the heating output is blocked for 60 minutes (configurable time). When using free cooling, an offset to normal fan control setpoint is adjustable.

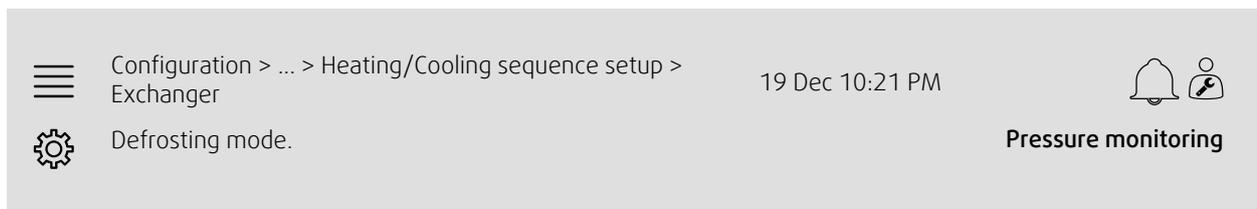
## 2.2.10 Defrost function

By measuring the pressure difference over the exchangers extract/exhaust side the need for defrosting can be detected. The differential pressure transmitter is auto calibrated by the system to obtain the correct pressure in relation to the airflow. Manual calibration is possible, e. g. after cleaning of exchanger. Defrosting is possible with by-pass or stop defrosting.

### By-pass and stop defrosting settings in NaviPad

Log in with service mode using password 0612.

Activate by-pass function by selecting "Pressure monitoring" in navigation path "Configuration > Functions > Function activation > Heating cooling sequence setup > Exchanger.



Select On on "Bypass" and/or "Stop defrosting" in the "Configuration > ... > Temperature control > Defrosting pressure monitoring" menu.



Defrosting is stopped when the desired, adjustable decrease in pressure over the heat exchanger is obtained. If differential pressure increase over max value, fan stop defrosting will start. After defrosting the unit will re-start. If the pressure does not decrease, the air handling unit is stopped and an alarm is shown in the display. Make sure that the ice is melted before restarting the unit.

### 2.3 Internal components electrical connection box

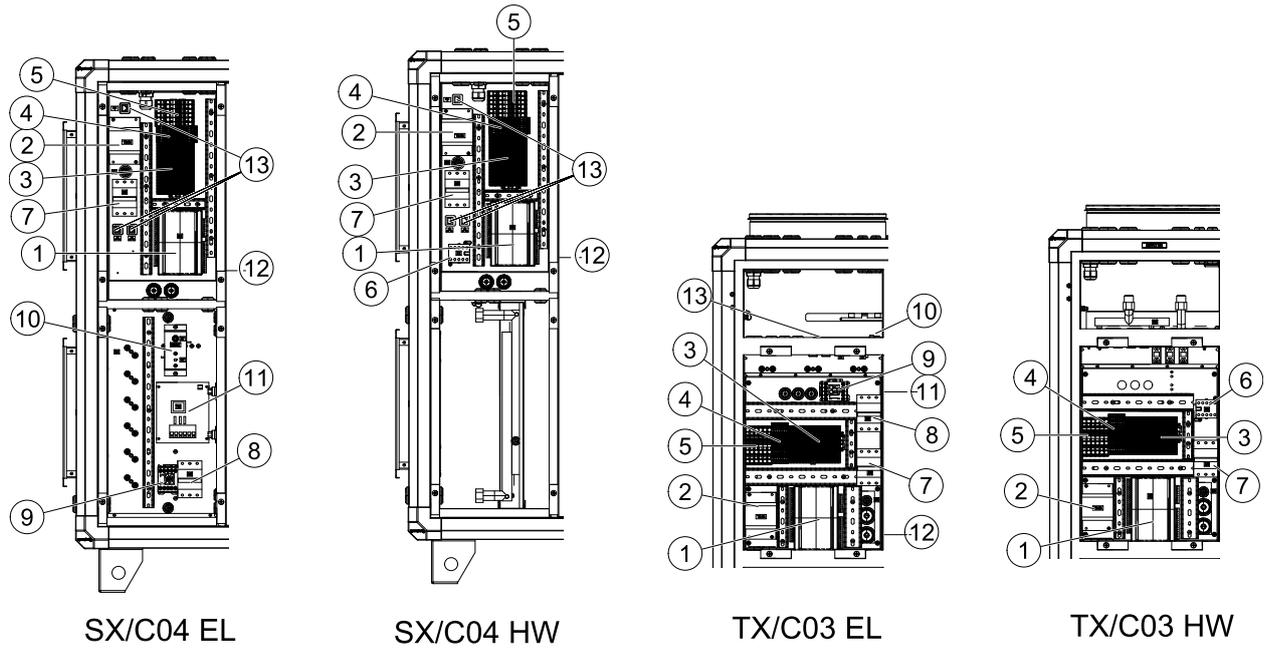


Fig. 2

Position	Description
1	Control unit CU283W-4
2	Transformer 230/24V AC
3	Terminals for internal and external components
4	Terminals for internal wiring
5	Terminals for mains power supply to the unit
6	Contactors (K2) On/Off Pump control water (HW units only, not present in EL-units)
7	Automatic fuse
8	Automatic fuse for heater (EL units only)
9	Contactors (K3) EL heater (EL units only)
10	Manual over heat protection reset (EL units only)
11	TTC EI heater control (EL units only)
12	Switch module
13	Panel outlet

## 3 Maintenance

### 3.1 Important



#### Danger

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



#### Warning

- Although the mains power 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 mounting and maintenance. Use protective clothing.
- Beware of hot surface on the heating battery during maintenance and service.

### 3.2 Maintenance intervals

The table below shows recommended maintenance intervals for the unit and the installation. To ensure a long operation lifetime for the unit it is important to perform maintenance according to below recommendations and that they are performed according to the operation and maintenance instructions. A thorough and recurrent maintenance is a must for a valid guarantee.

Type of maintenance	Once a year	When necessary
Cleaning the heat exchanger.	X	
Cleaning the fans.	X	
Cleaning extract louvres and supply air diffusers.		X
Cleaning the outdoor air intake.	X	
Cleaning the duct system.		X <sup>1</sup>

<sup>1</sup> Or in accordance with local rules and regulations

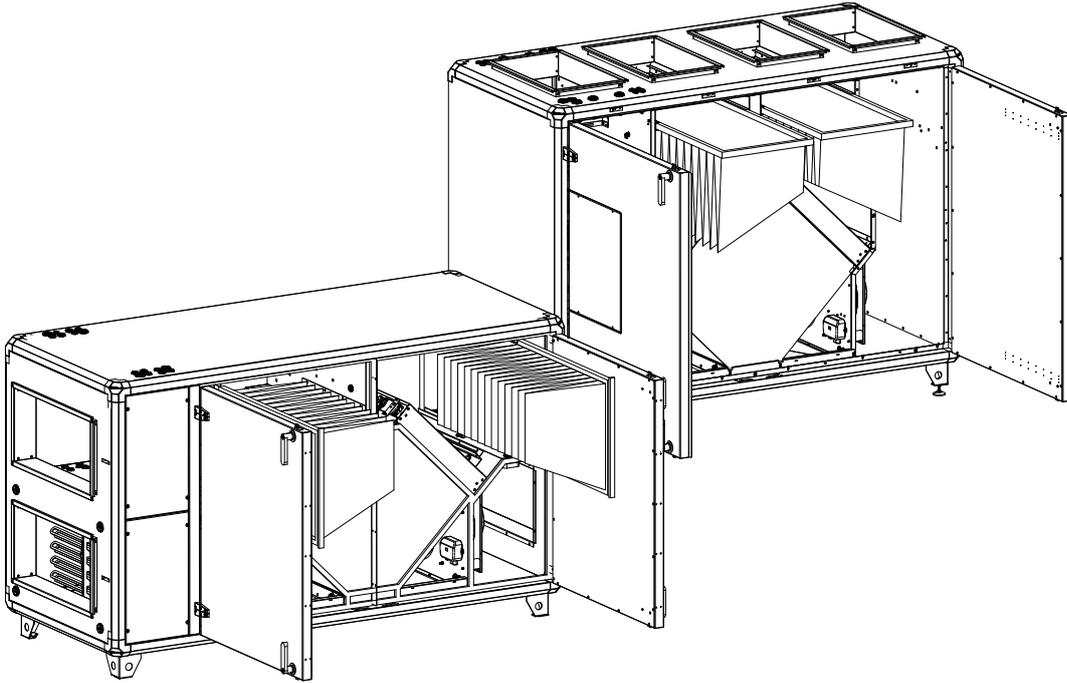
### 3.3 Maintenance instruction

#### 3.3.1 Changing supply/extract air filter

The bag filter cannot be cleaned and must be changed when necessary. New filters can be ordered from Systemair. Operation time between filter changes depends on the air pollution at the installation site. A differential pressure switch indicates when it's time to change the filters. This will trigger an alarm in the control panel.

When this occurs do the following:

1. Replace the filters with new ones as described below.
2. Press on the alarm symbol  on the control panel.
3. Choose `Filter alarm` and press acknowledge.



#### 3.3.2 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. Wash in hot soapy water or use pressure air. Do not use detergent containing ammonia.



#### Caution

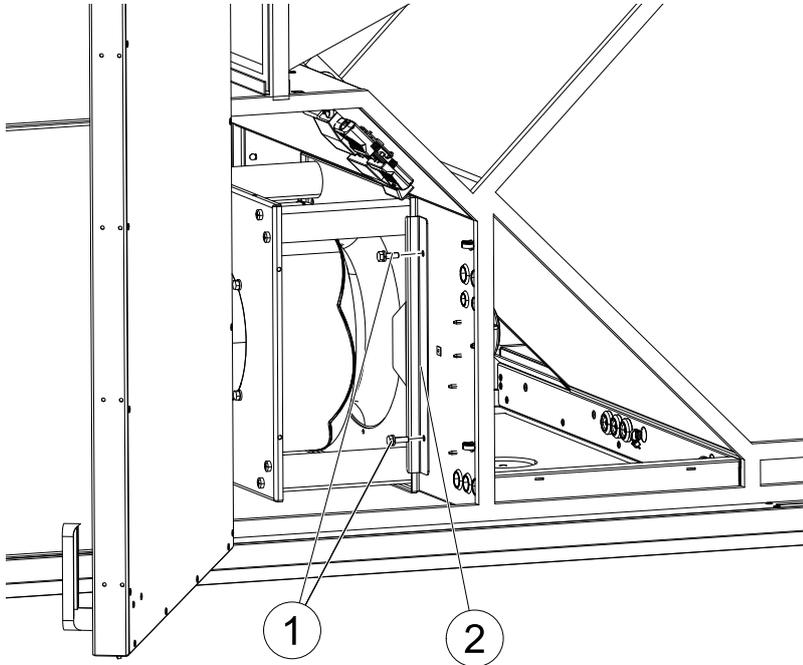
- The heat exchanger is sensitive for impacts. Handle with care.

### 3.3.3 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 by loosening the 2 bolts (pos 1) on the rail (pos 2) and disconnecting the fast couplings to the electric wires. Depending on the accessories installed, remove the tubing next to the fast couplings for the extract air fan or both the extract air fan and supply air fan.

Clean the fans 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.



### 3.3.4 Checking the hot water heating battery

After long periods of operation (usually several years) dust may have deposited on the surface of the battery. This may reduce batteries capacity. The battery can be cleaned with a pressure washer with misting jets, or with compressed air. Cleaning should be carried out carefully so as not to damage the batteries aluminium fins. Once a year the battery water circuit needs to be vented to maintain the batteries capacity.

### 3.3.5 Checking the electrical heating battery

After long period of time dust and pollutants can build up on the heating rods. This can cause unpleasant odors and in the worst case fire. Clean with compressed air, vacuum or brush. The automatic safety function needs to be tested and verified.

### 3.3.6 Cleaning the extract louvres and inlet diffusers

The system supplies treated outdoor air to the building and extracts the used indoor air via the duct system and diffusers/louvres. Diffusers and louvres are mounted in ceilings/walls in bedroom, living room, wet rooms, WC etc. Remove diffusers and louvres and wash in hot soapy water if required. Diffusers/ louvres 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.

### 3.3.7 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.

### 3.3.8 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/louvre openings or special inspection hatches in the duct system (if fitted).

### 3.3.9 Changing the internal battery



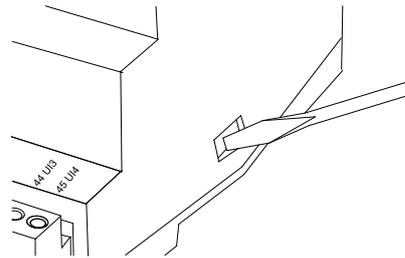
#### Note:

This procedure requires knowledge of proper ESD protection; i.e. an earthed wristband must be used!

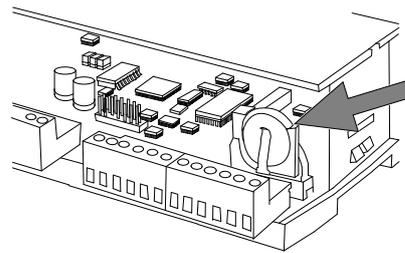
When the alarm "Internal Battery" is activated and the battery LED lights up red, the battery for backup of program memory and real-time clock has become too weak. The battery is replaced as described below. A backup capacitor saves the memory and keeps the clock running for at least 10 minutes after the power supply is removed. Therefore, if the battery replacement takes less than 10 minutes, there will be no need to reload the program, and the clock will continue to run normally.

The replacement battery must be of the type CR2032.

- 1 Remove the cover by pressing down the locking torques at the edge of the cover using a small screwdriver, and at the same time pulling the edges outwards.



- 2 Grip the battery firmly with your fingers and lift it upwards until it rises from its holder. Press the new battery firmly down into place. Note that to preserve correct polarity, the battery can only be inserted the "right way round".



## 4 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 if there are any alarm messages
- Check that the fuses are not defect (figure 2)
- Check the settings in the control panel (times, week schedule, auto/manual operation etc.)

### 2. Reduced airflow

- Check the settings for medium and low fan speed
- Check that the outdoor/exhaust air damper (if used) opens
- Check if filters need changing
- Check if diffusers and louvres need cleaning
- Check diffuser/louvre openings
- Check if fans and exchanger block need cleaning
- Check if the roof unit or air intake is clogged
- Check ducts for visible damage and/or build up of dust/pollution

### 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, on the electrical heater (figure 2).
- 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).

### 4. Noise/vibrations

- Check that the unit is completely levelled
- Clean the fan impellers
- Check that the screws holding the fans are tightened properly

## 5 Service

Before calling your service representative, make a note of the specification and production number from the type label (figure 3)

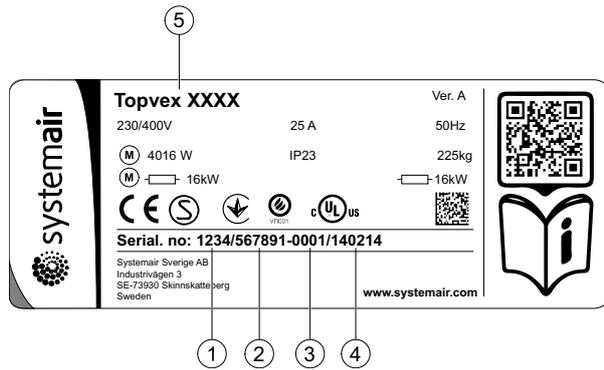


Fig. 3 Type label

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









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