Systemair AB reserves the rights to alter their products without notice.
This also applies to products already ordered, as long as it does not affect the previously agreed specifications.
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1 **Warnings**

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

<table>
<thead>
<tr>
<th><strong>Danger</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Warning</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Indicates a potentially hazardous situation that may result in minor or moderate injuries.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Caution</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Indicates a risk of damaging the product or prevent optimal operation.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Important</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- 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.</td>
<td></td>
</tr>
<tr>
<td>- Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.</td>
<td></td>
</tr>
</tbody>
</table>
Table 1 Component descriptions EL and HW units

<table>
<thead>
<tr>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fan supply air</td>
</tr>
<tr>
<td>2</td>
<td>Fan extract air</td>
</tr>
<tr>
<td>3</td>
<td>Filter extract air</td>
</tr>
<tr>
<td>4</td>
<td>Filter outdoor air</td>
</tr>
<tr>
<td>5</td>
<td>Heat exchanger</td>
</tr>
<tr>
<td>6</td>
<td>Rotor motor</td>
</tr>
<tr>
<td>7</td>
<td>Rotor belt</td>
</tr>
<tr>
<td>8</td>
<td>Re-heater battery, electric or water coil</td>
</tr>
<tr>
<td>9</td>
<td>Reset button, manual over heat protection (only units with electrical heater)</td>
</tr>
<tr>
<td>10</td>
<td>Pressure sensor supply air fan/extract air filter</td>
</tr>
<tr>
<td>11</td>
<td>Pressure sensor extract air fan/supply air filter</td>
</tr>
<tr>
<td>12</td>
<td>Rotation guard for heat exchanger</td>
</tr>
<tr>
<td>13</td>
<td>Electrical connection box</td>
</tr>
<tr>
<td>14</td>
<td>Mounting brackets</td>
</tr>
<tr>
<td>15</td>
<td>Rotor control (location depending on size of unit)</td>
</tr>
<tr>
<td>16</td>
<td>Air flow sensor (^1)</td>
</tr>
</tbody>
</table>

\(^1\) Only valid for units with electrical re-heater battery
2.1 Description of internal components

2.1.1 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.

2.1.2 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.

2.1.3 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.

2.1.4 Heat exchanger
Topvex FR models are equipped with a highly efficient, belt driven, rotating heat exchanger. Required supply air temperature is therefore normally maintained without adding additional heat. The operation of the heat exchanger is automatic and depends on the set temperature.

The heat exchanger is removable for cleaning and maintenance (chapter 3).

2.1.5 Rotor motor
The rotor motor drives the exchanger rotor with an infinitely rpm as long as there is a heat demand. The motor is controlled by an analogue 0-10 V control signal (pos.6 figure 1).

2.1.6 Rotation guard
A sensor registers the rotation of the heat exchanger rotor. It’s connected to the main regulator which gives an alarm if the rotor stops while there is a heat demand (pos. 12 figure 1).
2.1.7 **Switch module**
A switch module with HMI and 2 TCP/IP connections is mounted in the heat recovery units (see figure 2).

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

2.1.8 **Temperature sensor**
4 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
- Efficiency temperature sensor
The supply air sensor is loosely delivered with the unit and needs to be installed in the supply air duct externally from the unit. See Installation instructions for more information.

2.1.9 **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.

2.1.10 **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. 8 figure 1). 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 desired supply/extract or room air temperature 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.
2.2 Internal components electrical connection box

**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.

Topvex FR03–11 are equipped with a built in regulator and internal wiring (figure 2).

<table>
<thead>
<tr>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control unit CU283W-4</td>
</tr>
<tr>
<td>2</td>
<td>Transformer 230/24V AC</td>
</tr>
<tr>
<td>3</td>
<td>Terminals for internal and external components</td>
</tr>
<tr>
<td>4</td>
<td>Terminals for internal wiring</td>
</tr>
<tr>
<td>5</td>
<td>Terminals for mains power supply to the unit</td>
</tr>
<tr>
<td>6</td>
<td>Contactor (K2) On/Off Pump control water (HW units only, not present in EL-units)</td>
</tr>
<tr>
<td>7</td>
<td>Automatic fuse</td>
</tr>
<tr>
<td>8</td>
<td>Automatic fuse for heater</td>
</tr>
<tr>
<td>9</td>
<td>Contactor (K3) EL heater</td>
</tr>
<tr>
<td>10</td>
<td>TTC EL heater control</td>
</tr>
<tr>
<td>11</td>
<td>Switch module</td>
</tr>
</tbody>
</table>

Fig. 2 Electric components
Pos 10 shows location of TTC in FR03 and FR06-FR11
2.3 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.
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.

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.

<table>
<thead>
<tr>
<th>Type of maintenance</th>
<th>Once a year</th>
<th>When necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning the heat exchanger.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cleaning the fans.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cleaning extract louvres and supply air diffusers.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cleaning the outdoor air intake.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cleaning the duct system.</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

1 Or in accordance with local rules and regulations
3.3 Maintenance instructions

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.

The filters are taken out according to below procedure:

1. Release the filter frame by pulling the filter support bars.

2. Tilt the support bars to the back.

3. It is now possible to fold the filter and frame backwards. This is especially important if there is lack of space in front of the unit and the sliding door kit is used. The filter can now be taken out of the unit.

4. Insert the new filter and fasten it against the inlet seal with the filter support bars. Make sure the filter is fitted tight all around the frame.
3.3.2 Checking the heat exchanger

After a long time of use dust may build up in the exchanger (pos. 5, figure 1) and block the airflow. It is important to clean the exchanger regularly to maintain high efficiency. The heat exchanger in the Topvex FR03–11 can be taken out of the unit. Wash in hot soapy water or use pressure air. Do not use detergent containing ammonia.

Note:
Make sure that the rotor motor is not exposed to moisture.

3.3.3 Dismounting the heat exchanger block on ceiling mounted units

Caution
The exchanger block is heavy, make sure to use proper lifting device or sufficient number of persons to lift the heat exchanger out of the unit

1. Loosen all screws completely holding the heat exchanger block.
2. Remove the heat exchanger block completely by lifting it straight up.

Table 2 Weight of heat exchanger block

<table>
<thead>
<tr>
<th>Model</th>
<th>Weight of heat exchanger block (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR03</td>
<td>31</td>
</tr>
<tr>
<td>FR06</td>
<td>43</td>
</tr>
<tr>
<td>FR08</td>
<td>55</td>
</tr>
<tr>
<td>FR11</td>
<td>71</td>
</tr>
</tbody>
</table>
3.3.4 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 (pos. 1 and 2, figure 1). This will reduce the efficiency.

The fans can be dismounted by loosening the 4 screws on the fan casing (figure 3). Topvex FR06–11 have a fan support bracket that needs to be removed by loosening 4 screws. The fans may be cleaned with a cloth or a soft brush. Do not use water. White spirit can be used to remove accumulations which are otherwise difficult to remove. Allow drying properly before remounting.

![Fig. 3 Dismounting the fans](image)

3.3.5 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.

3.3.6 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.

3.3.7 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).
3.3.8 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 tongues 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.”
### 3.4 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
4 Service

Before calling your service representative, make a note of the specification and production number from the type label (figure 4).

<table>
<thead>
<tr>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item number</td>
</tr>
<tr>
<td>2</td>
<td>Production order number</td>
</tr>
<tr>
<td>3</td>
<td>Consecutive number</td>
</tr>
<tr>
<td>4</td>
<td>Production date</td>
</tr>
<tr>
<td>5</td>
<td>Product code (product specification)</td>
</tr>
</tbody>
</table>

Fig. 4 Type label