



MOTOR **EC** 

AIR HANDLING UNITS WITH HEAT RECOVERY



KOMFORT EC DE



EN OPERATION MANUAL

 **BLAUBERG**
Ventilatoren

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BLAUBERG Ventilatoren GmbH Company is happy to offer your attention a suspended heat recovery air handling unit KOMFORT EC DE.

INTRODUCTION

The present operation manual contains a technical description, technical data sheets, operation and mounting guidelines, safety precautions and warnings for safe and correct operation of the unit.

Read carefully and understand the operation manual, especially the safety requirements, before the unit mounting and start up.

Keep the operation manual available as long as you use the unit.

GENERAL

The heat recovery air handling unit KOMFORT EC DE is designed for efficient and energy saving ventilation of domestic and public premises.

The unit is not a ready to use product but a component part of central air conditioning and ventilation network.

The unit is designed for suspended mounting.

The unit is rated for indoor application at ambient temperature from +1 °C up to +40 °C and relative humidity not exceeding 80%.

Hazardous parts access and water ingress protection rating:

- Unit motors - IP 44;
- Assembled unit connected to air ducts - IP 22.

The unit design is regularly improved, so some models can slightly differ from those ones described in this service instruction.

SAFETY RULES

All operations related to the unit electrical connections, servicing and repair works are allowed only after the appliance is disconnected from power supply.

The appliance is rated as a Class I electrical appliance.

All mounting and servicing operations are allowed by duly qualified personnel.

Please follow the safety regulations and working instructions (DIN EN 50 110, IEC 364).

Make sure the impeller and the casing are not damaged before connecting the appliance to power mains. The casing internals must be free of any foreign objects which can damage the impeller blades.

The appliance maintenance and repair is allowed only after power cut-off and full stop of the rotating parts.

Misuse of the appliance or any unauthorized modification are not allowed.

The appliance is designed for connection to power mains in compliance with the technical data table.

The appliance is rated for permanent operation.

Take steps to prevent ingress of smoke, carbon monoxide and other combustion products into the room through open chimney flues or other fire-protection devices. Sufficient air supply must be provided for proper combustion and exhaust of gases through the chimney of fuel burning equipment to prevent back drafting. The maximum permitted pressure difference per living units is 4 Pa.



WARNING

The appliance is not allowed for use by children and persons with reduced physical, mental or sensory capacities, without proper practical experience or expertise, unless they are controlled or instructed on the product operation by the person(s) responsible for their safety. Supervise the children and do not let them play with the product.

The transported air must not contain any dust or other solid impurities, sticky substances or fibrous materials.

The appliance is not rated for operation in a flammable or explosive medium.

Fulfil the operation manual requirements to ensure a trouble-free and long service life of the appliance.

TRANSPORTATION AND STORAGE RULES

Transportation of the appliance is allowed by any vehicle provided the appliance is transported in the original package and is protected against weather and mechanical damages.

Use hoist machinery for handling and transportation to prevent possible mechanical damages of the appliance. Fulfil the requirements for transportation of the specified cargo type during cargo-handling operations.

Store the appliance in a dry and cool place in the original packing.

The storage environment must not be subjected to any aggressive and/or chemical evaporations, admixtures, foreign objects that may provoke corrosion and damage connection tightness.

Store the appliance in an environment with minimized risk of mechanical damages, temperature and humidity fluctuations.

Do not expose the appliance to the temperatures below +5 °C and above +40 °C.

Connection of the appliance to power mains is allowed after the appliance has been kept indoor for minimum two hours.

MANUFACTURER'S WARRANTY

The appliance complies with the requirements according to the EU norms and directives, to the relevant EU-Low Voltage Equipment Directives, EU-Directives on Electromagnetic Compatibility.

We hereby declare that the appliance complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. This certificate is issued following test carried out on samples of the product referred to above. Assessment of compliance of the product with the requirements relating to electromagnetic compatibility was based on the following standards.

The manufacturer hereby warrants normal operation of the appliance over the period of two years from the retail sale date provided observance of the installation and operation regulations.

In case of failure due to manufacturing fault during the warranty period the consumer has the right to exchange it.

The replacement is offered by the Seller.

If case of no confirmation of the sale date, the warranty period shall be calculated from the manufacturing date.

The manufacturer shall not be liable for any damage resulting from any misuse of or gross mechanical interference with the appliance.

The manufacturer is not responsible for the damages resulted due to the use of third party equipment or to third party equipment.



WARNING

Do not dispose in domestic waste. The appliance contains in part material that can be recycled and in part substances that should not end up as domestic waste. Dispose of the appliance once it has reached the end of its working life according to the regulations valid in your country.

DESIGN

The casing made of double-skinned aluzinc panels, internally filled with mineral wool layer of 20 or 25 mm for heat- and sound-insulation. The casing has fixing brackets with vibration absorbing connectors for easy installation. The spigots for connection to the air ducts are located at the side of the unit and are equipped with rubber seals for airtight connection to the air ducts. The service panel ensures easy access to the unit internals for service works including cleaning, filter replacement, etc.

The unit is equipped with high-efficient external rotor EC motors and centrifugal impellers with forward curved blades. The integrated EC motors have the best power consumption to air capacity ratio and meet the latest demands concerning energy saving and high-efficient ventilation. EC motors are featured with high performance, low noise level and totally controllable speed range. The impellers are dynamically balanced.

The KOMFORT EC DE400/700/1100 models are equipped with high-efficient counter-flow polystyrene heat exchangers with a large surface area. The KOMFORT EC DE2000/4000 models are equipped with high-efficient cross-flow aluminium heat exchangers with a large surface area. The air flows are fully separated within the heat exchanger. Odour and contaminants contained in the extract air are not transferred to the supply air flow. Heat recovery is based on utilization of heat energy contained in the extract air stream for heating up of supply air stream. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat energy losses in cold seasons. In summer the heat exchanger performs reverse and transfers accumulated cold from cool extract air stream to warm supply extract air stream. This contributes to better performance of the air conditioners in

ventilated premises. The electronic frost protection system based on bypass and heater is used to prevent the heat exchanger freezing in cold seasons. The bypass damper is opened and the heater is turned on automatically according to temperature sensor readings. Cold intake air passes by the heat exchanger and is warmed up to set temperature in the heat exchanger. Synchronously extract air that passes by the heat exchanger is used for its defrosting. After the freezing danger is over the bypass damper is closed, the heater is turned off and the unit reverts to the normal operation mode. The drain pan under the heat exchanger block is used for condensate collection and drainage.

The unit is equipped with an electric heater for operation during cold seasons at low outside temperature. The integrated electric heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only. Smooth heat output control ensures automatic supply air temperature maintaining. The unit is equipped with two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

The KOMFORT EC DE400/700/1100 model includes a built-in G4 (optionally F7) pocket supply filter and a G4 cassette extract filter for efficient air filtration. The KOMFORT EC DE2000/4000 model includes a built-in G4 supply and extract cassette filters for efficient air filtration.

The unit incorporates an integrated control system with a wall-mounted control panel and sensor display. The standard delivery set includes a 10 m cable for connection of the unit and the control panel.

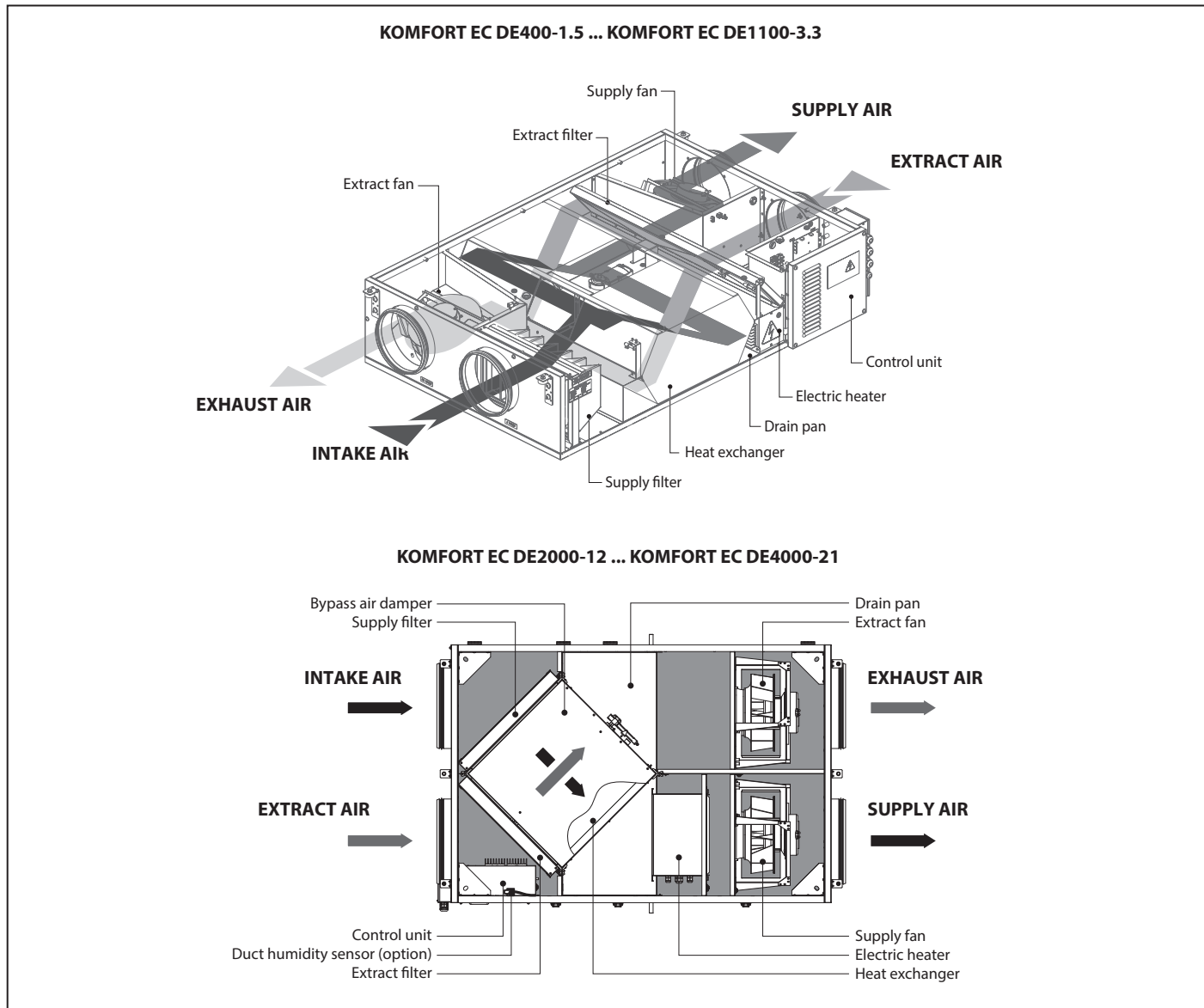


Fig. 1. Unit design and operating logic

For mounting facilitation and ensuring minimum maintenance distances to the KOMFORT EC DE400/700/1100 unit it is available both in left- and right-handed modifications.

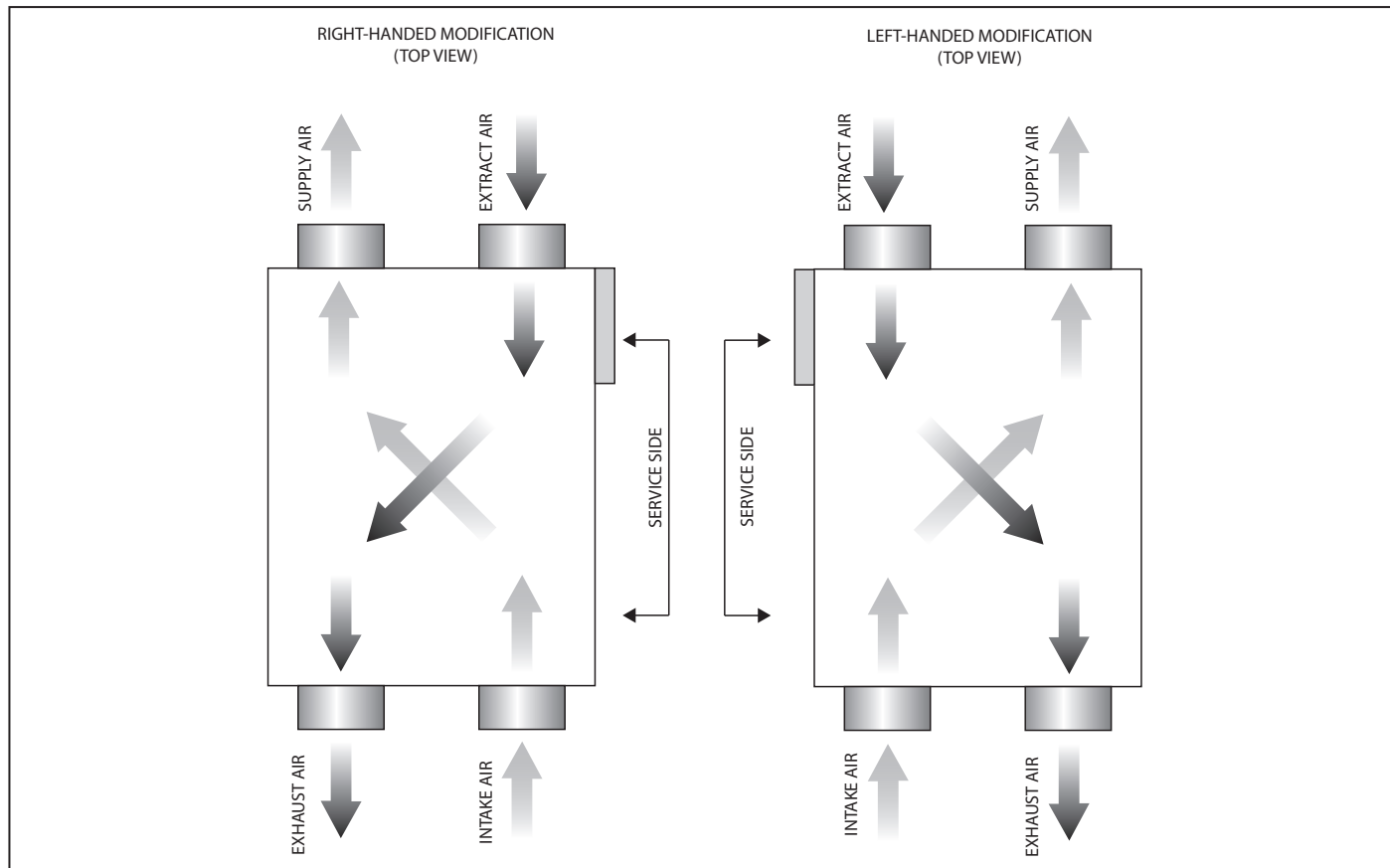


Fig. 2. KOMFORT EC DE400/700/1100 modifications

OPERATING LOGIC

Clean cold air from outside flows to the heat exchanger, where from it is moved to the room with the supply fan.

Warm stale air is extracted from the room with the exhaust fan and is moved to the heat exchanger, where it transfers its heat energy to the intake air. After that it is exhausted outside.

Heat energy of warm and humid extract air is transferred to the cold intake air. The air flows are fully separated within the heat exchanger.

Heat recovery minimizes heat losses caused as compared to traditional window ventilation and saves energy.

In summer the heat exchanger performs reverse and transfers cold air from the cooled extract air for warming up intake air. This contributes to better performance of the air conditioner in ventilated premises.

DELIVERY SET

- ✓ Air handling unit - 1 item;
- ✓ Operation manual - 1 item;
- ✓ Wall-mounted control panel - 1 item;
- ✓ Packing - 1 item.



WARNING

Make sure the unit has no visible transport damages while accepting the goods. Check the ordered and the delivered goods for compliance.

TECHNICAL DATA

Table 1. Technical data

Parameters	KOMFORT EC DE400-1.5	KOMFORT EC DE700-2	KOMFORT EC DE1100-3.3	KOMFORT EC DE2000-12	KOMFORT EC DE4000-21
Supply voltage [V / 50-60 Hz]	1~ 230			3~ 400	
Fan power [W]	0,2	0,27	0,4	0,84	1,98
Fan current [A]	1,62	1,6	2,26	5	3,4
Electric heater power [kW]	1,5	2,0	3,3	12,0	21,0
Electric heater current [A]	6,5	8,7	14,3	17,4	30,0
Unit power [kW]	1,7	2,27	3,7	12,84	23,0
Unit current [A]	8,12	10,3	16,56	22,4	33,4
Max. air capacity [m³/h]	400	700	1100	2000	4000
RPM	3560	3060	2780	2920	2580
Sound pressure level at 3 m distance [dB(A)]	48	53	52	58	59
Transported air temperature [°C]	-25 up to +40	-25 up to +60		-25 up to +40	-25 up to +50
Casing material	aluzinc				
Insulation	20 mm mineral wool			25 mm mineral wool	
Extract filter	cassette G4				
Supply filter	pocket G4 (F7)*			cassette G4	
Connected air duct diameter [mm]	160	200	250	315	400
Weight [kg]	67	75	95	190	290
Heat recovery efficiency [%]	up to 90			up to 75	
Heat exchanger type	counter-flow			cross-flow	
Heat exchanger material	polystyrene			aluminum	
* option					

Table 2. Accessories

Model	Replaceable G4 pocket filter	Replaceable F7 pocket filter	Replaceable G4 cassette filter	Duct humidity sensor
KOMFORT EC DE400-1.5	FPT-EC DE400 G4	FPT-EC DE400 F7	FP-EC DE400 G4	FS1
KOMFORT EC DE700-2	FPT-EC DE700 G4	FPT-EC DE700 F7	FP-EC DE700 G4	
KOMFORT EC DE1100-3.3	FPT-EC DE1100 G4	FPT-EC DE1100 F7	FP-EC DE1100 G4	
KOMFORT EC DE2000-12	-	-	FP-EC DE2000 G4	
KOMFORT EC DE4000-21	-	-	FP-EC DE4000 G4	

Table 3. Overall dimensions

Model	Dimensions [mm]											Figure no.
	D	B	B1	B2	B3	B4	H	H1	L	L1	L2	
KOMFORT EC DE400-1.5	160	485	415	596	132,5	220	285	130	1238	1286	948	3
KOMFORT EC DE700-2	199	827	711	-	294	345	283	120	1238	1286	-	4
KOMFORT EC DE1100-3.3	249	1350	1215	607,5	430	655	317	143	1346	1395	-	4
KOMFORT EC DE2000-12	314	1050	915	457,5	247	575	750	375	1360	1408	-	5
KOMFORT EC DE4000-21	399	1265	1130	565	297	632,5	830	415	1595	1643	-	5

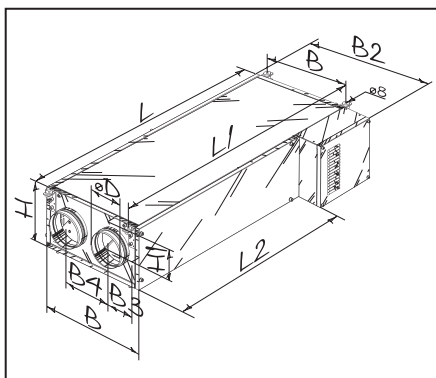


Fig. 3

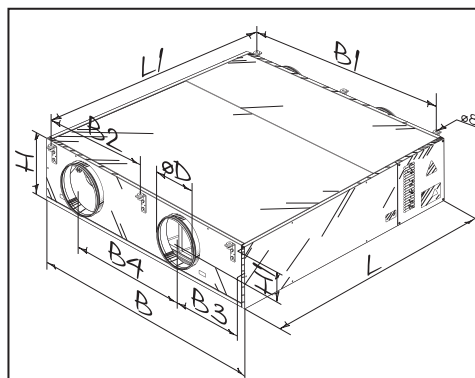


Fig. 4

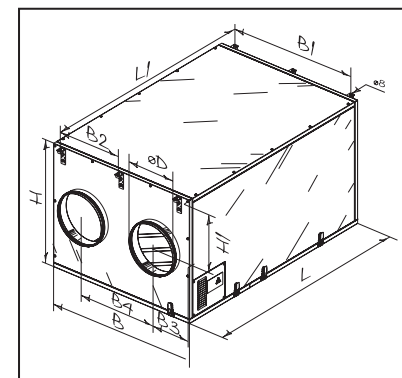


Fig. 5

MOUNTING

**WARNING!****Safety precautions**

The unit must be mounted to a rigid and stable structure.

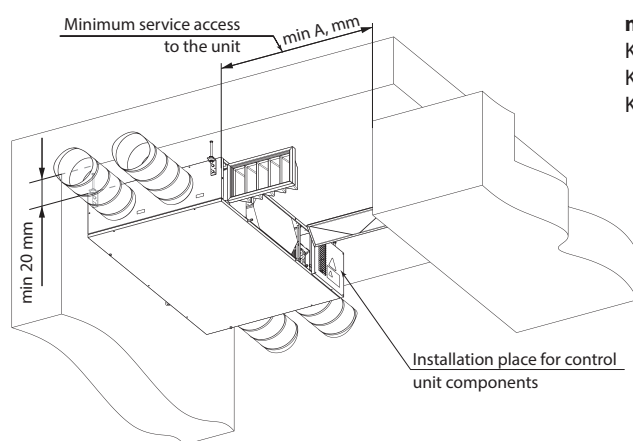
The unit must be suspended using anchor bolts. Before starting mounting check that the mounting structure has sufficient loading capacity for the unit weight.

The unit mounting is allowed only after power cut-off and full stop of the rotating parts.

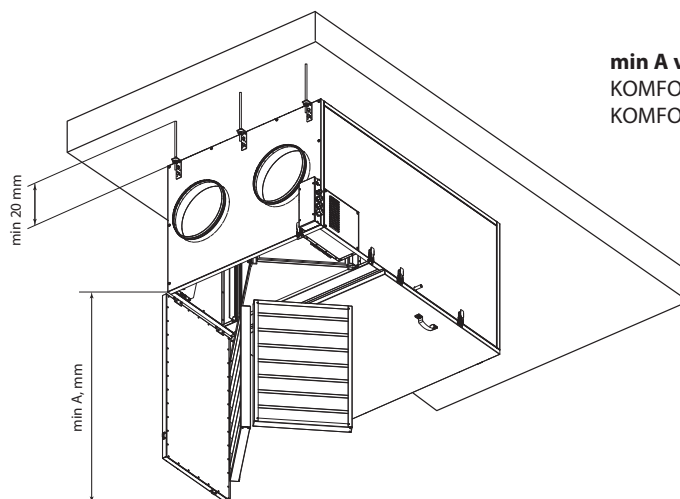
Forbidden:

- Do not operate the unit beyond the determined temperatures, in aggressive and in explosive medias.
- Do not connect clothes dryer or other similar equipment to the ventilation system.
- Do not use the unit for air/dust mixture handling.

While mounting the unit consider the need to ensure sufficient service access to the unit, Fig. 6.

KOMFORT EC DE400-1.5 ... KOMFORT EC DE1100-3.3**min A value:**

KOMFORT EC DE400-1.5 – 500 mm;
KOMFORT EC DE700-2 – 850 mm;
KOMFORT EC DE1100-3.3 – 800 mm.

KOMFORT EC DE2000-12 ... KOMFORT EC DE4000-21**min A value:**

KOMFORT EC DE2000-12 – 1050 mm;
KOMFORT EC DE4000-21 – 1265 mm.

Fig. 6. Minimum service access to the unit

The unit is suspended using threaded rods and threaded dowels. The unit must be mounted on the even surface to avoid the unit casing distortion and operation disturbances. The installation place must have connection to the sewage drain system.

While planning the ductwork layout avoid too long air duct sections, numerous bends and reducers because it may reduce air flow.

The mounted air ducts must not be deformed.

While planning the ductwork layout avoid too long air duct sections, numerous bends and reducers because it may reduce air flow.

The mounted air ducts must not be deformed.

Provide airtight connection of the air ducts to the unit spigots and fittings. Install straight air ducts on both sides of the unit to minimize aerodynamic resistance caused by air flow turbulence, the minimum air duct section length is equal to 1 time air duct diameter on the inlet side and 3 time air

duct diameters on the outlet side.

In case of insufficient length or no air ducts cover the unit spigots with a protecting grille or any other protecting device with maximum mesh width 12.5 mm to prevent ingress of foreign objects inside the unit and prevent contact with fans of the unit.

Prior to starting mounting make sure the mounting surface has sufficient load capacity matching the unit weight. Otherwise reinforce the installation place with beams.

Use threaded rods of sufficient length to avoid possible resonance with a mounting surface.

If the connection point of the spiral seam air duct to the unit is supposed to be a source of noise generation, replace a spiral seam air duct with a flexible air duct. The flexible anti-vibration connectors (specially ordered accessories) may be also useful.

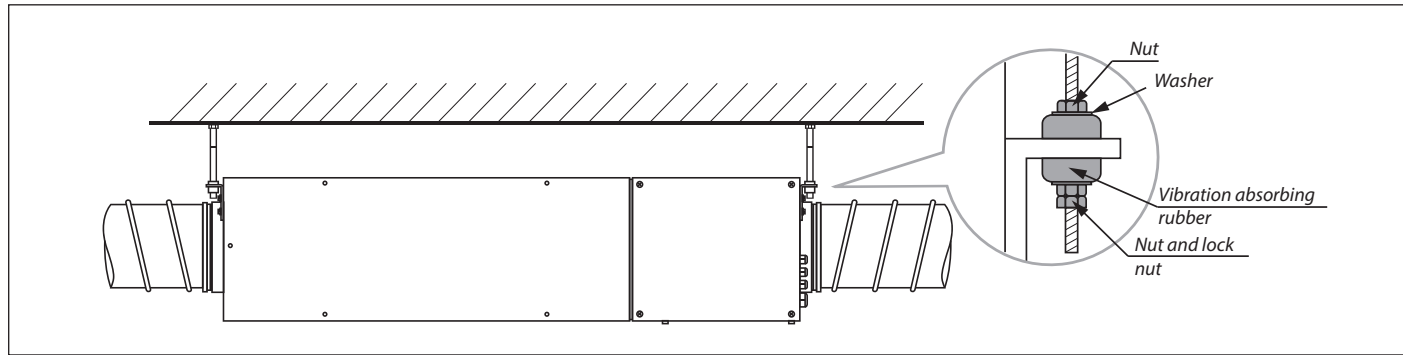


Fig. 7. Mounting

CONDENSATE DRAIN

The drain pan is equipped with drain pipes for condensate removal outside the unit.

Connect the drain pipe, the U-trap (not included into the delivery set) and a sewage system with metal, plastic or rubber drain hoses, fig. 8.

While laying the hoses provide the slope downward min. 3%.

Fill the system with water prior to connecting it to power supply. The U-trap must always be filled with water.

Before starting the unit fill the drain system with water and keep the

U-trap always filled with water. Provide free drainage for the condensed water, otherwise it is accumulated inside the unit which may result in the equipment damage and condensate outflow to the room.

The condensate drain system is suitable for indoor frost-free application with the ambient temperature above 0°C!

If the expected ambient temperature is below 0°C provide heating for the drain system.

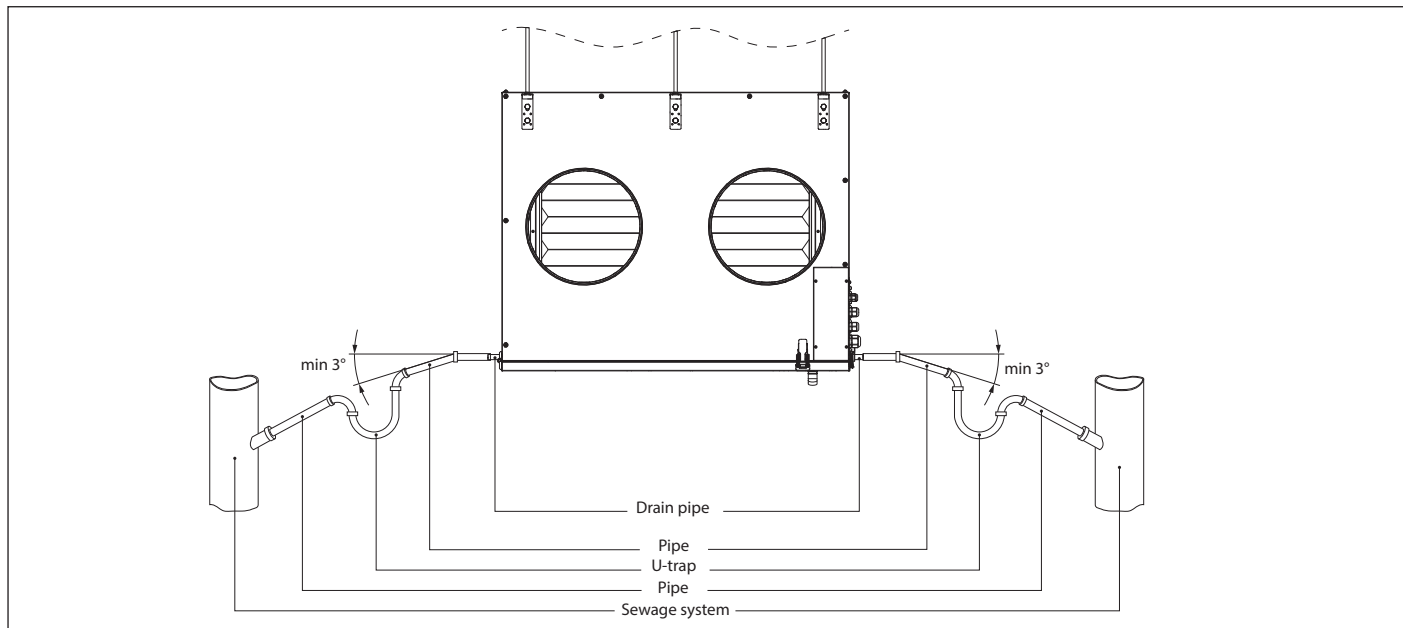


Fig. 8. Condensate drainage



WARNING

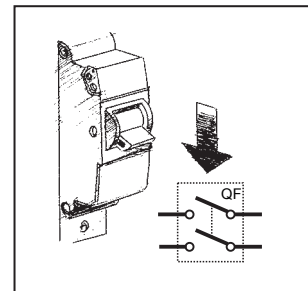
In case of several unit mounting connect each unit to an individual U-trap. Direct condensate discharge with no connection to the drain system is not allowed.

CONNECTION TO POWER MAINS

WARNING

Read the operation manual prior to any electric installations. Connection of the unit to power mains is allowed by a qualified electrician only.
 The rated electrical parameter are stated on the rating plate. No modifications of internal connections are allowed and will result in void warranty.
 Connect the unit only to power mains with valid electric standards.
 Follow the respective electric standards, safety rules (DIN VDE 0100), TAB der EVUs. The house cabling system must be equipped with an automatic switch at the external input. Connect the unit to power mains through the automatic switch. The contact gap on all poles at least 3 mm (VDE 0700 T1 7.12.2 / EN 60335-1).
 The automatic switch trip current must be not below the rated current consumption, refer Table 1. Install the automatic switch to ensure prompt access.

Cut power supply to the unit off by turning the automatic electric switch QF to OFF position prior to any operations.
 Take steps to prevent activation of the automatic switch before finishing all the operations.



The **KOMFORT EC DE400-1.5 ... DE1100-3.3** units are rated for connection to single-phase alternating current power mains 230 V / 50-60 Hz via a pre-wired power cable with a euro plug.

The control unit compartment includes a terminal block with connected wires from the sensor control panel. The wiring diagram is shown in fig. 9 and the functional diagram is shown in fig. 10.

The **KOMFORT EC DE2000-12 ... EC DE4000-21** units are rated for connection to three-phase alternating current power mains 400 V / 50-60 Hz via insulated, durable and heat-resistant conductors (cables, wires) with a matching cross section, in any case not below 4 mm².

The referred conductor cross section is for reference only. While selecting the conductors with respective cross section consider the wire type, the maximum permissible conductor heating temperature, its insulation, length and layout. Use copper wires only! The wiring

diagram is shown in fig. 11 and the functional diagram is shown in fig. 12. The unit must be grounded in compliance with the valid electrical standards of the user country!

Connect all the control and power conductors in compliance with the terminal marking and polarity.

The rating plate with a terminal designation is placed inside of the terminal box.

The terminal clamp marking corresponds to the marking on the wiring diagram.

Route the conductors to the terminal box through the electric lead-in on the unit panel to preserve the electrical protection class.

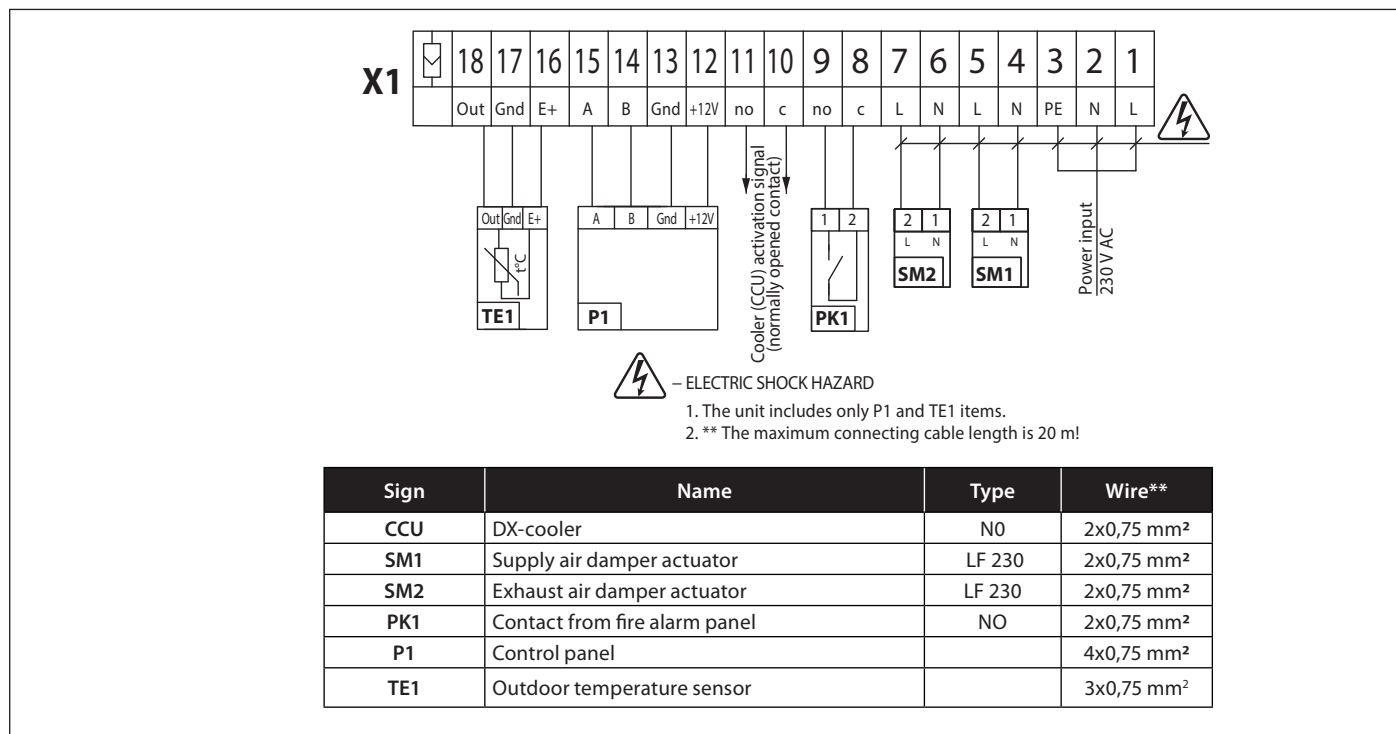


Fig. 9. KOMFORT EC DE400-1.5 ... EC DE1100-3.3 wiring diagram

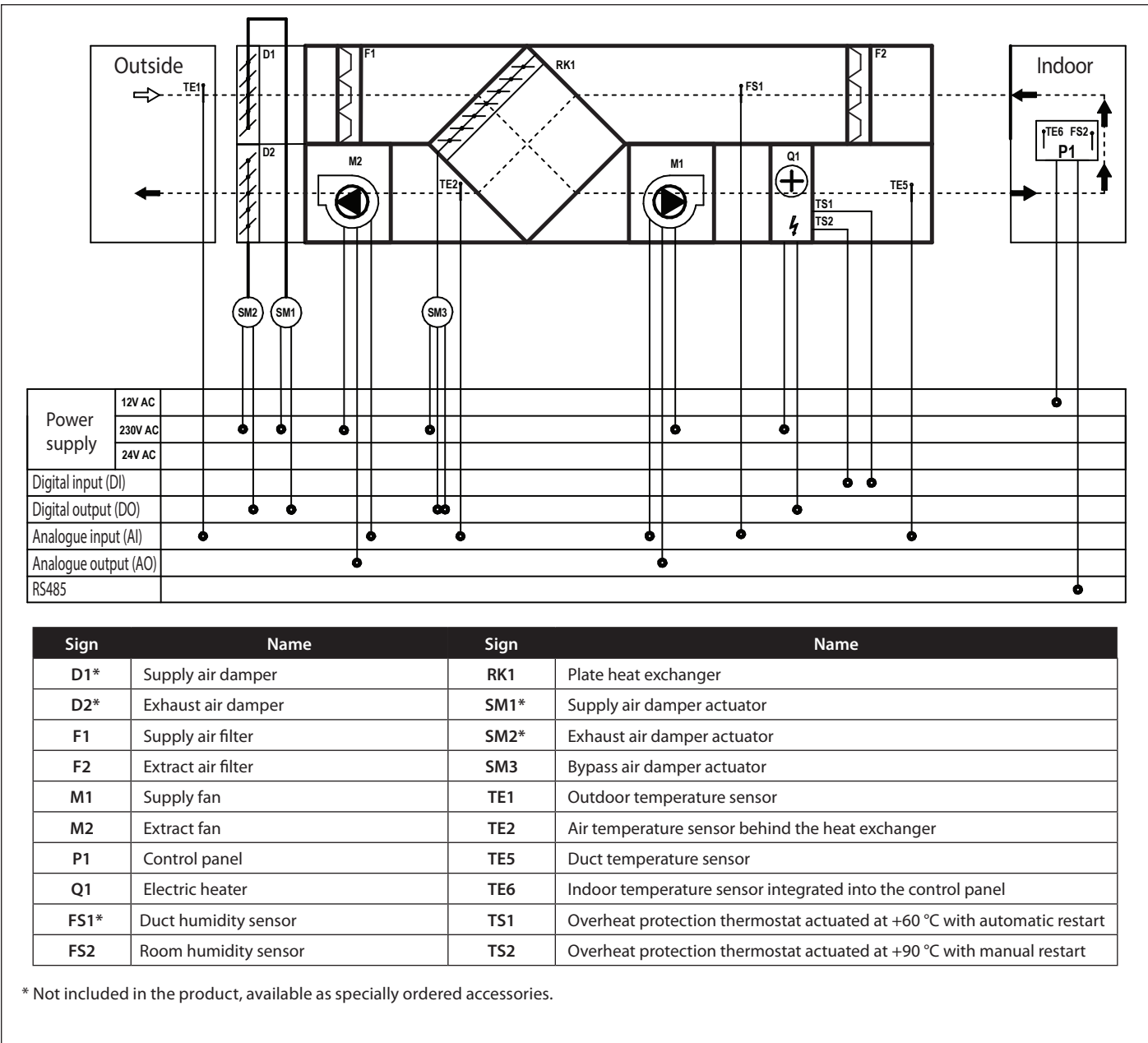


Fig. 10. KOMFORT EC DE400-1.5 ... EC DE1100-3.3 functional diagram

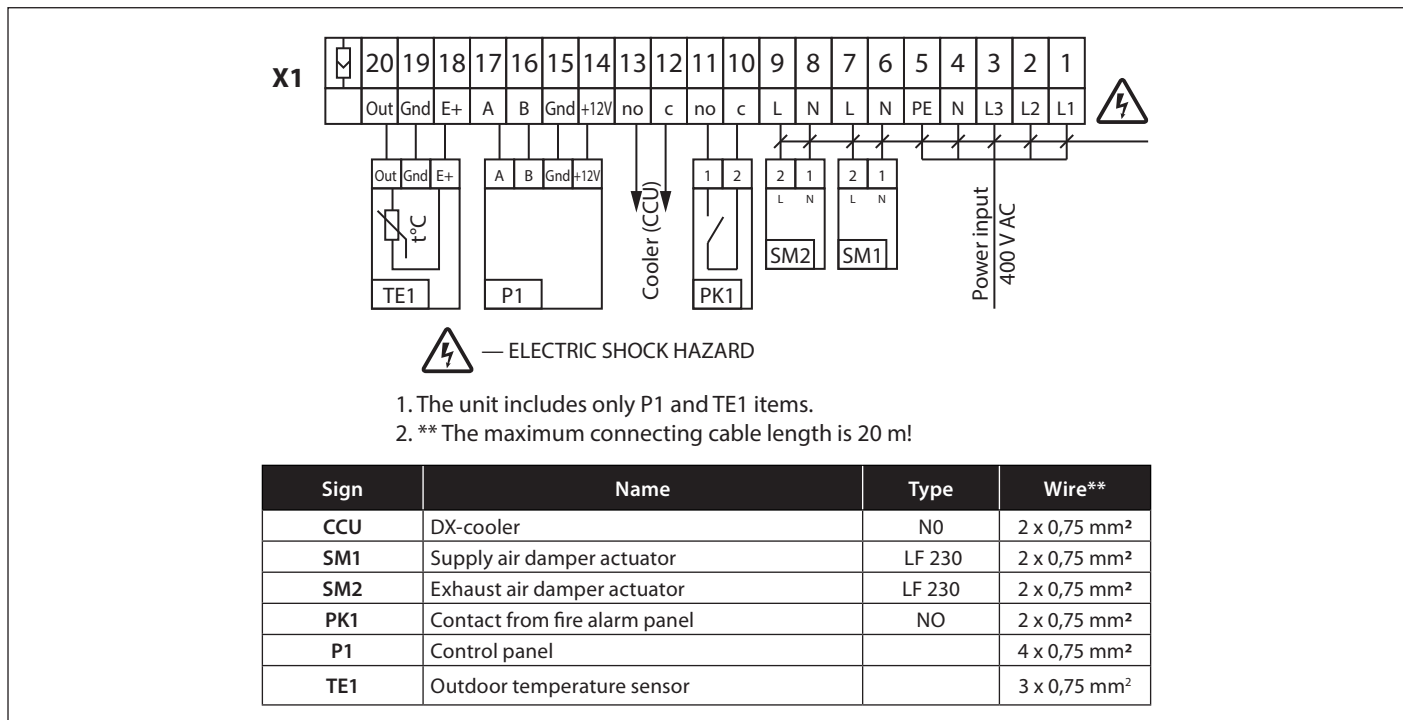


Fig. 11. KOMFORT EC DE2000-12 ... EC DE4000-21 wiring diagram

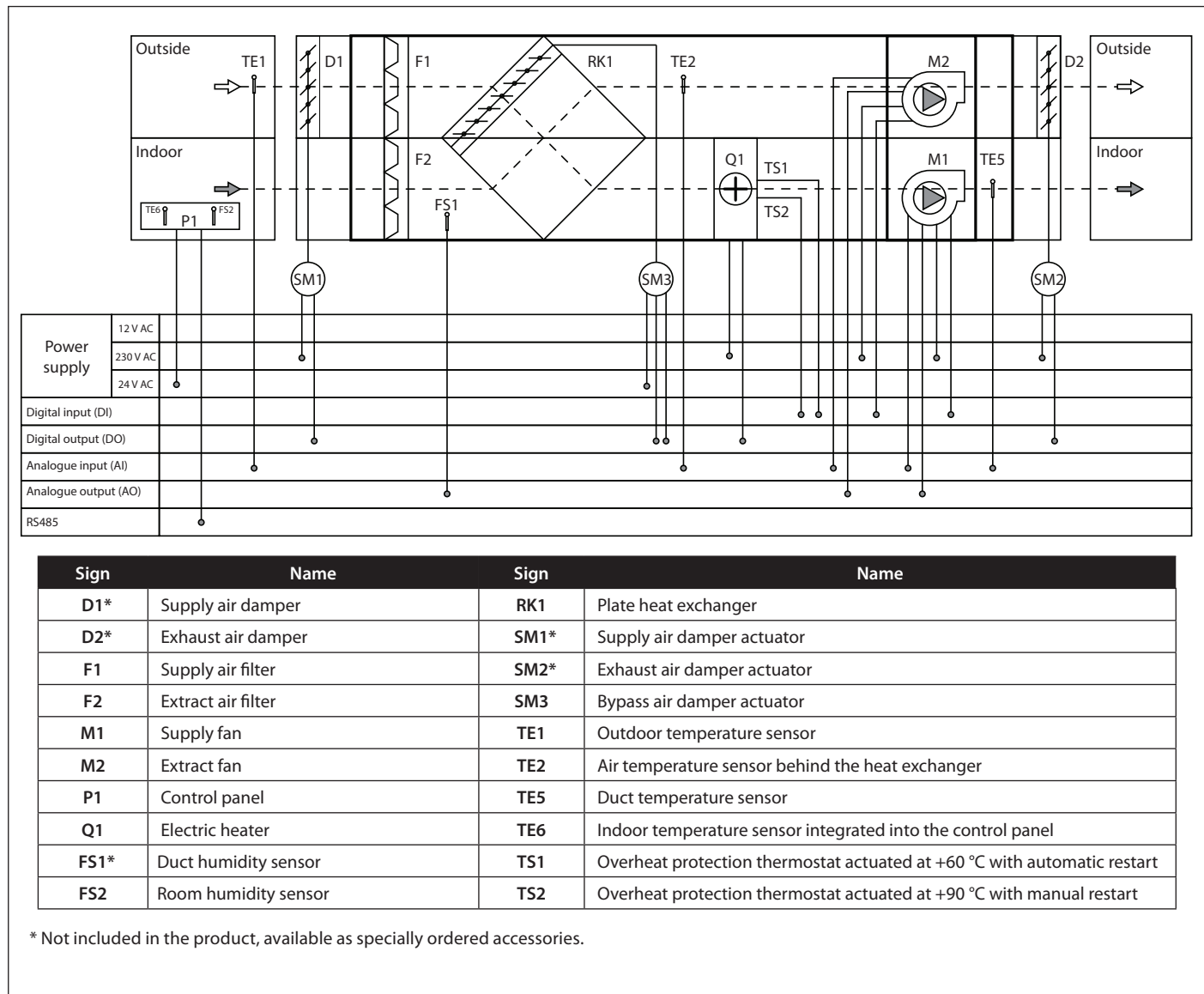


Fig. 10. KOMFORT EC DE2000-12 ... EC DE4000-21 wiring diagram

OUTER TEMPERATURE SENSOR MOUNTING AND CONNECTION

The unit is supplied with an outdoor temperature sensor.

The outdoor temperature sensor mounting is as follows, fig. 13:

1. Remove two screws that retain the sensor cover.
2. Take off the sensor cover.
3. Install the sensor on the outer wall. The installation place must not be

subjected to direct solar light.

4. Install the sensor cover back.

5. Connect the sensor to the X1 terminal block in compliance with the electric wiring diagram, fig. 9 and fig. 11.

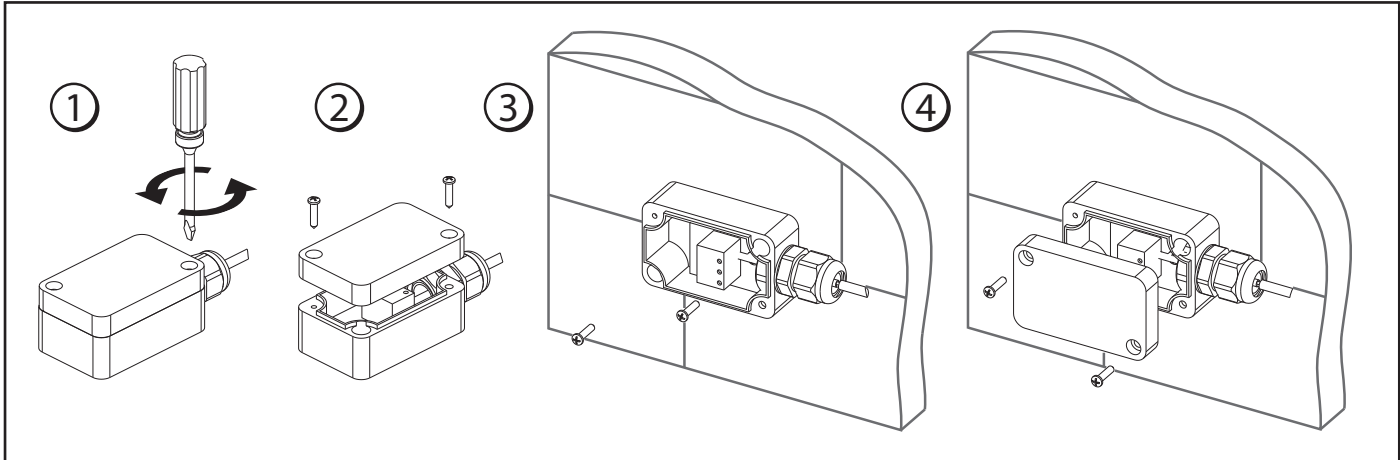
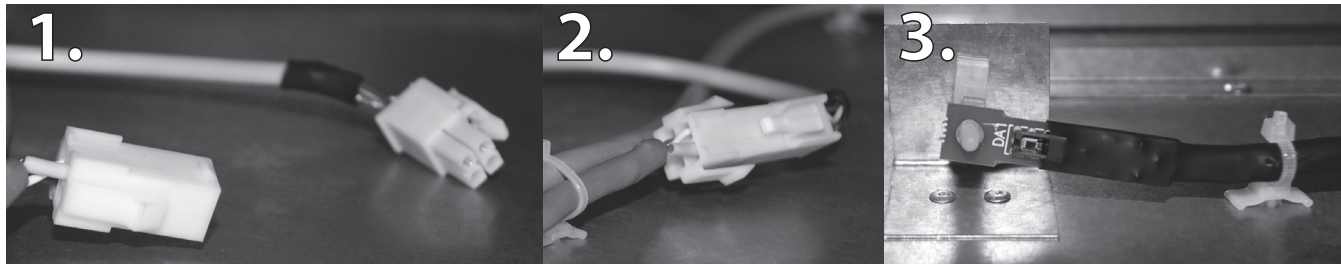


Fig. 13. Outdoor temperature sensor mounting

HUMIDITY E SENSOR MOUNTING AND CONNECTION

The FS1 duct humidity sensor is a specially ordered accessory. Connect the contact socket of the humidity sensor to the contact socket located inside of the heat recovery unit.

After that fix the sensor using the clamp and the holder in the air duct upstream of the heat exchanger.



CONTROL PANEL MOUNTING

The units have integrated control system with a wall-mounted control panel and a sensor display. The standard delivery set includes a 10 m cable for connection of the unit and the control panel. The control panel technical

data are shown in table 4.

Table 4. Control panel technical data

Parameter	Value
Ambient temperature [°C]	+5 up to +40
Relative humidity [%]	5 up to 80 (no condensation)
Cable cross section [mm ²]	0.25 up to 0.35
Material	plastic
Cable length [m]	up to 15
Ingress protection rating	IP20

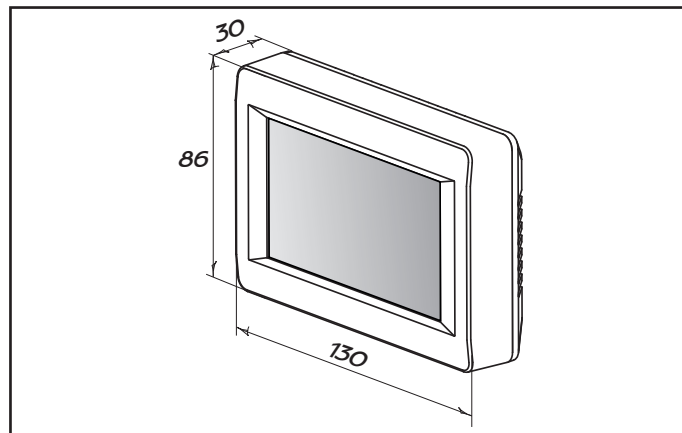


Fig. 14. Control panel overall dimensions

For the control panel wiring diagram refer to fig. 15. The room temperature sensor is integrated into the control panel, for that reason the control panel must be installed in a temperature balanced place, at least 1 m away from the heating equipment, doors and windows.

Fix the control panel to the wall using the screws and connect it to the air handling unit using a supplied four-wire connecting cable. The

recommended cross section of the connecting cable is shown in table 5. The recommended minimum control panel voltage is 11 V.

The control panel is supplied assembled and pre-wired to the unit. In case of need to re-assemble the control panel please follow the assembly order shown in fig. 15.



WARNING

Do not lay the cable in close proximity parallel to the cable from the control panel! Do not coil the cable from the control panel in loops while laying it.

Table 5. Recommended cross section of the connecting cable between the control panel and the air handling unit

Parameter	Value	
Cable cross section	≥ 0,12 mm ²	≥ 0,25 mm ²
Cable length	up to 15 m	up to 50 m

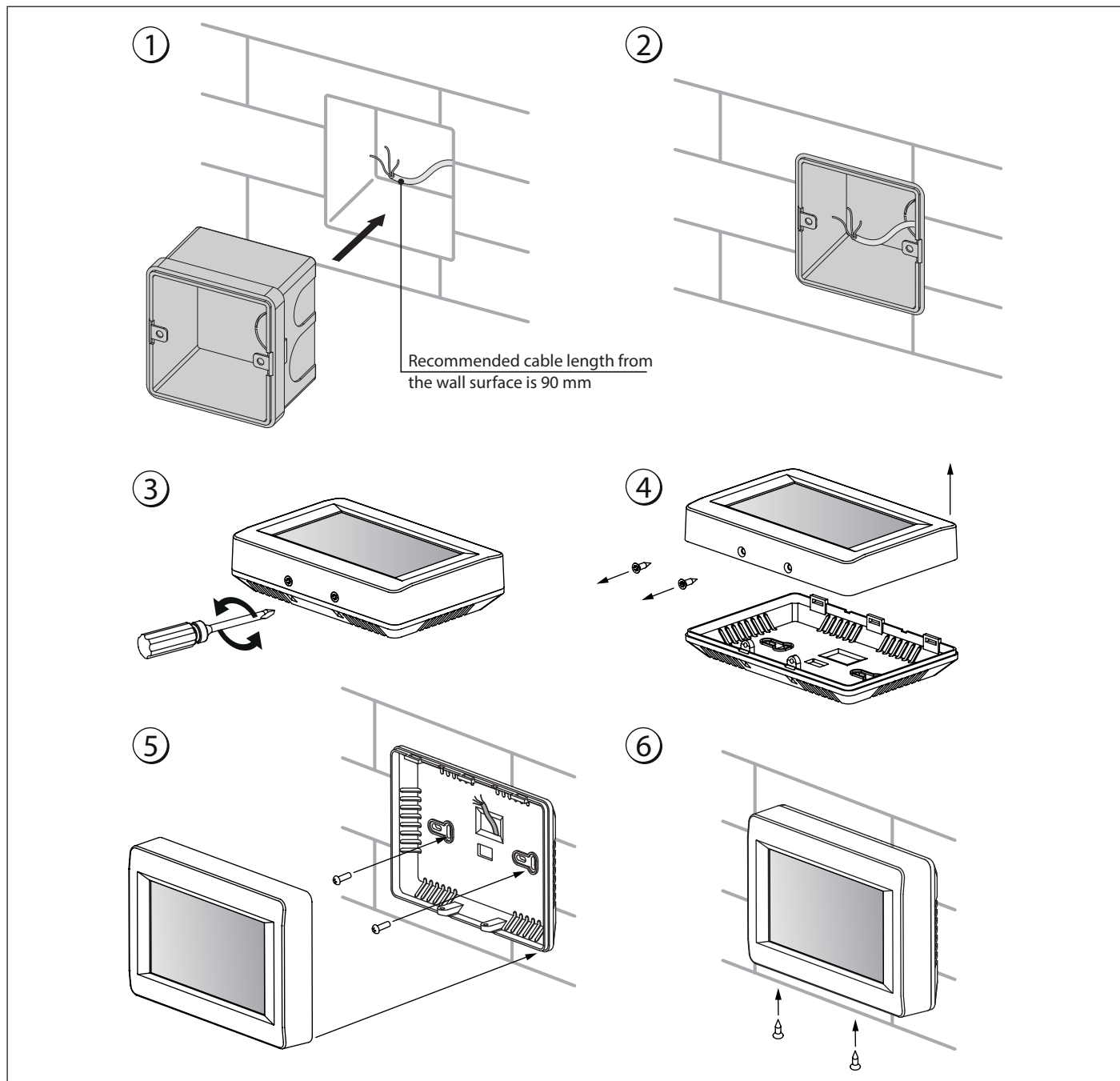


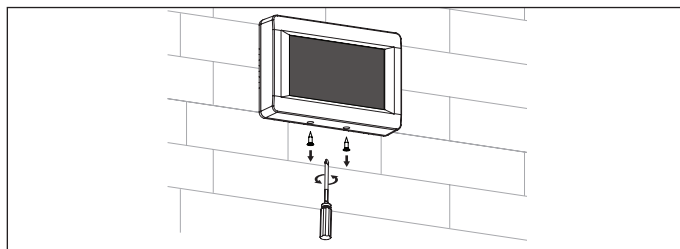
Fig. 15. Control panel mounting

The control panel includes a lithium cell CR1220 with a limited time resource.

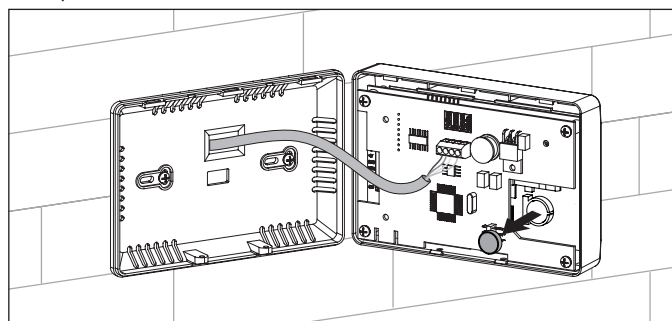
The battery keeps the internal clock running while the unit is disconnected from power mains. If the unit is disconnected from power supply and the battery is low, the clock stops and the day and time settings are reset. This leads to incorrect date and time indication when the unit is on and, as a result, to incorrect scheduled operation of the unit. In this case, the battery should be replaced. To replace the battery use a new battery only.

Cell replacement:

1. Disconnect the air handling unit from power supply.
2. Remove the two screws in the bottom of the service panel.



3. Remove the casing cover to enable access to the upper circuit board. Replace the cell.



4. Assemble the control panel in the reverse order. If the wires from the terminal block on the upper circuit board are disconnected, be sure to connect those correct.

Wrong connection of the wires may result in the equipment malfunction.

5. Connect the air handling unit to power mains and set date and time on the control panel.

UNIT CONTROL

General description of the automatic control system.

The unit is controlled from the wall-mounted control panel with a sensor display, fig. 16.



Fig. 16. Control panel

Table 6. Operation and parameter setup of the unit

Function	Indication
<p>1 Main menu</p> <p>The main menu contains the date, time, current humidity, temperature and set air flow.</p> <p>MENU - access to the user menu, see clause 5.</p> <p>AUTO - scheduled operation activation/deactivation.</p> <p>TEMPERATURE - displaying current indoor temperature. After pressing of this button the temperature setting menu is opened, see clause 4.</p> <p>ON/OFF - turning air handling unit ON/ turning air handling unit OFF or Standby mode activation.</p> <p>TIMER - turning timer on/off.</p> <p>AIR FLOW - displaying current fan speed. The fan speed setting menu is accessible through this button, see clause 3.</p> <p>The display shows the network connection status indicator:</p> <p> – the unit is connected to network.</p> <p> – the unit is disconnected from network.</p>	
<p>2 Unit Activation and Deactivation</p> <p>The unit is activated with ON button .</p> <p>Press OFF for the unit deactivation or Standby mode activation. The indicator changes its colour from red to green as the unit is turned ON. In the Standby mode the unit operates at the first speed and set temperature, see clause 12.</p>	

Table 6. Operation and parameter setup of the unit (continued)








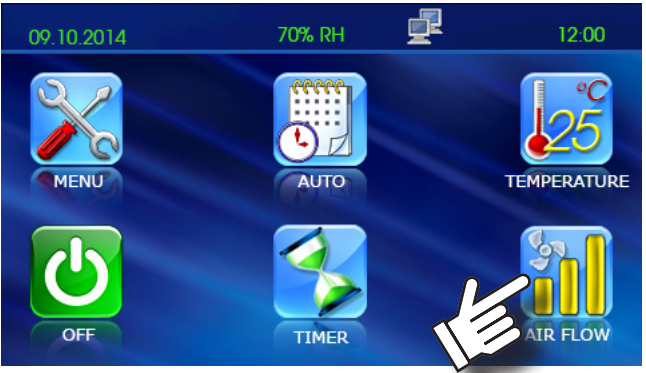




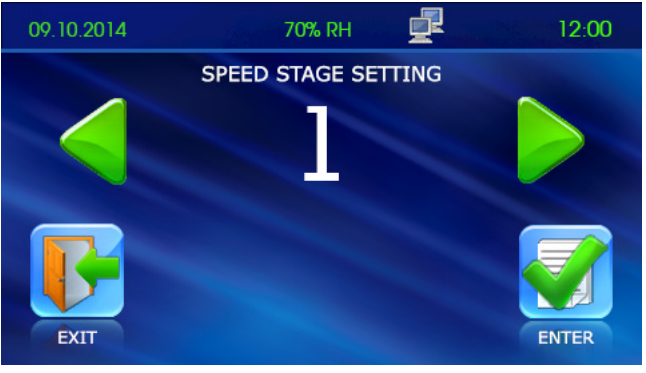



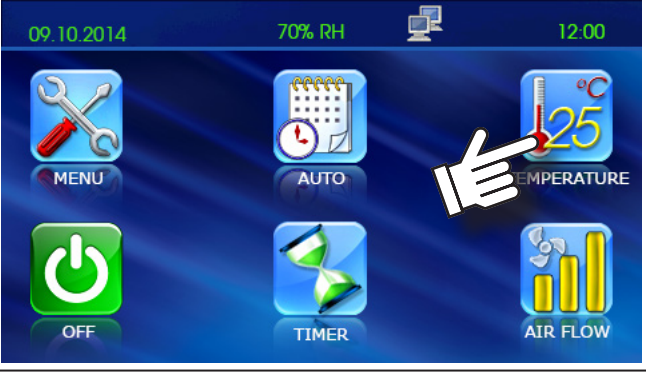




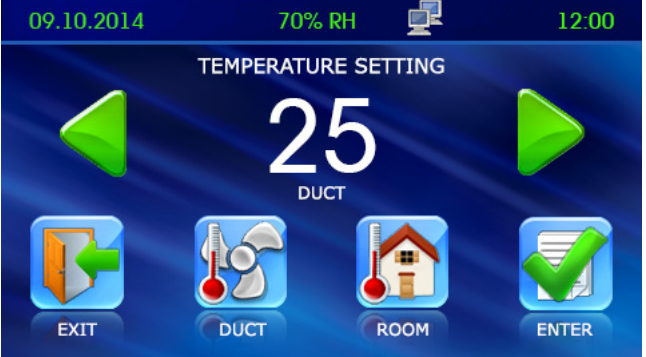
Function	Indication
<p>3 Fan speed changeover</p> <p><input type="checkbox"/> Setting fan speed:</p> <p>Press the AIR FLOW button . The unit has four speed stages:</p> <p> - first speed stage;  - second speed stage;  - third speed stage;  - humidity control mode. The fan speed depends on set humidity point. Humidity threshold is set in the engineering menu, see clause 14.</p> <p><input type="checkbox"/> If the AUTO  or TIMER  mode is activated the current air flow value is displayed in real time operation no matter of the set air flow value.</p>	
<p><input type="checkbox"/> Set the required speed using the buttons  and .</p> <p><input type="checkbox"/> Press ENTER .</p> <p><input type="checkbox"/> To return to main menu without saving changes press EXIT .</p>	
<p>4 Temperature setting</p> <p>Temperature setting:</p> <p><input type="checkbox"/> press the TEMPERATURE button .</p> <p><input type="checkbox"/> Select the set temperature type:</p> <p>DUCT  (temperature in the air duct); ROOM  (temperature in the room).</p>	
<p><input type="checkbox"/> Set the required temperature using  and  buttons.</p> <p><input type="checkbox"/> Press ENTER .</p> <p><input type="checkbox"/> To return to main menu without saving changes press EXIT .</p>	

Table 6. Operation and parameter setup of the unit (continued)


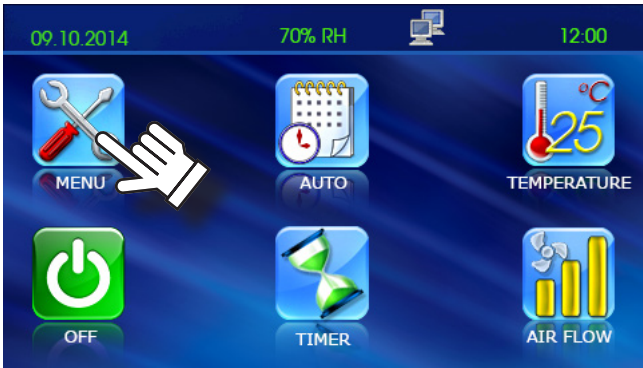
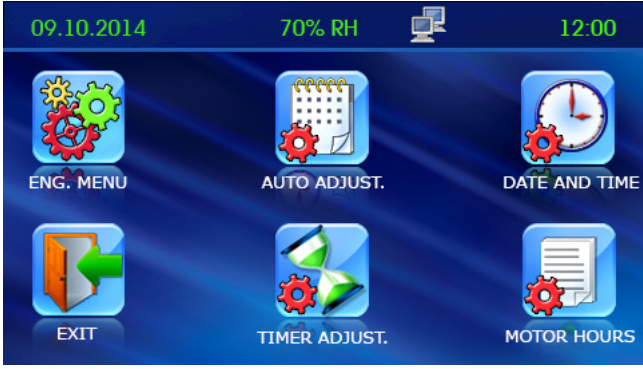

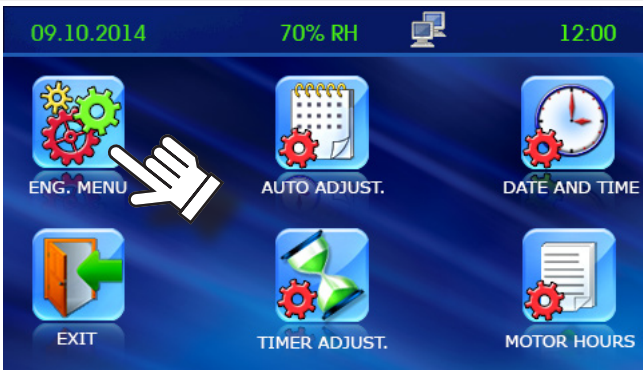




Function	Indication
<p>5 User menu</p> <p><input type="checkbox"/> To enter the User menu press MENU  in the Main menu.</p>	
<p><input type="checkbox"/> The User menu contains basic menu items and functions for parameter setup:</p> <p>ENG. MENU: access to engineering menu. The menu is password-protected.</p> <p>AUTO ADJUST.: setting scheduled operation.</p> <p>DATE AND TIME: setting date and time.</p> <p>TIMER ADJUST.: setting time and speed operation on timer basis.</p> <p>MOTOR HOURS: setting filter replacement periodicity.</p> <p>EXIT: return to main menu.</p>	
<p>6 Engineering menu</p> <p>To enter the Engineering menu press ENG. MENU  in the User menu.</p>	
<p><input type="checkbox"/> The Engineering menu is accessible after entering the password. The default setting is 1111.</p> <p><input type="checkbox"/> Press OK.</p> <p><input type="checkbox"/> To change the password use RESET . Press RESET to clear the field.</p> <p><input type="checkbox"/> To return to User menu press EXIT .</p> <p><input type="checkbox"/> If you do not remember the new password, press and hold RESET  until you hear a long sound signal of 20 clicks lasting for 20 seconds, see clause 11, Password reset. The default password 1111 is set.</p>	

Table 6. Operation and parameter setup of the unit (continued)





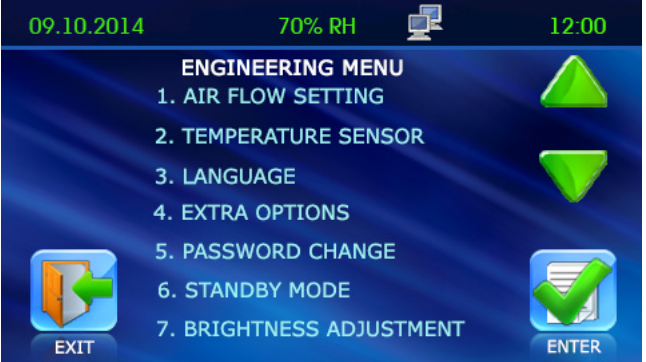
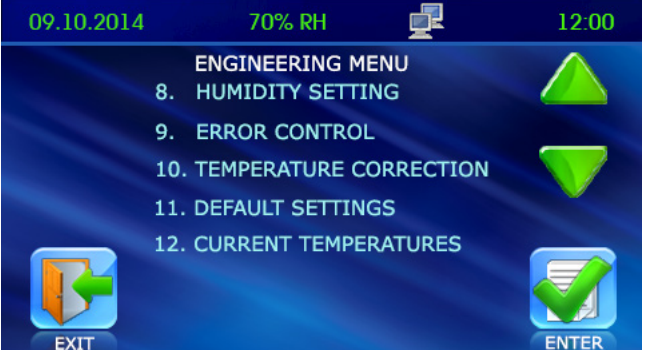




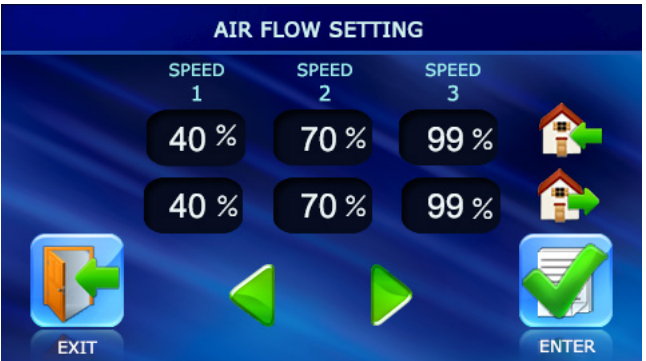



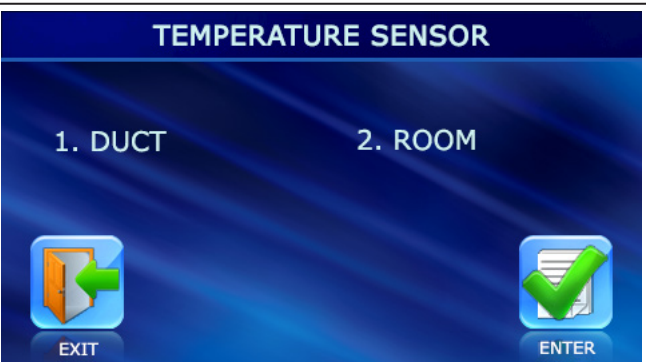
Function	Indication
<p><input type="checkbox"/> For navigating in the engineering menu use the following buttons:</p> <p> - moving upwards in the list.</p> <p> - moving downwards in the list.</p> <p> - select the value in the parameter list.</p> <p> - return to user menu.</p>	 
<p>7 Setting air flow for speed stages</p> <p><input type="checkbox"/> Select the AIR FLOW SETTING item in the Engineering menu and press ENTER </p> <p><input type="checkbox"/> Select the edited speed value. The value is enclosed in a rectangle.</p> <p><input type="checkbox"/> Use  or  buttons to set air flow value for each fan speed stage.</p> <p><input type="checkbox"/> The air flow value is set as a percentage of the maximum capacity of each fan.</p> <p><input type="checkbox"/> To return to the Engineering menu without saving changes press EXIT </p>	
<p>8 Temperature sensor</p> <p><input type="checkbox"/> To select a temperature sensor type in the Engineering menu list select the TEMPERATURE SENSOR parameter and press the ENTER button </p> <p><input type="checkbox"/> Select a required temperature sensor type.</p> <p><input type="checkbox"/> Press ENTER </p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT </p>	

Table 6. Operation and parameter setup of the unit (continued)


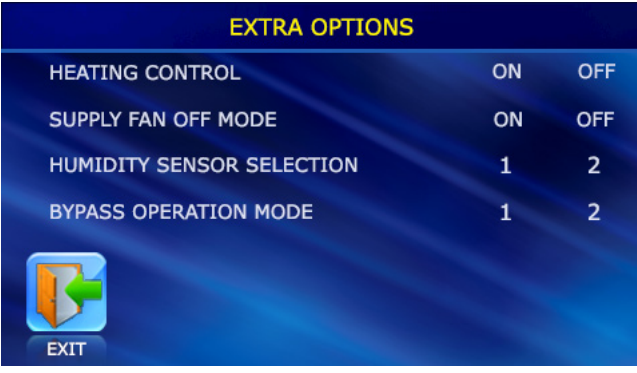


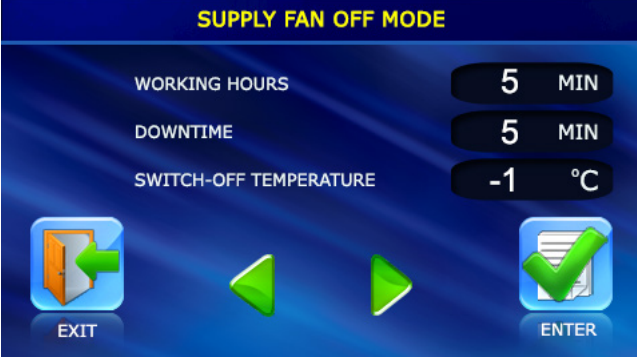
Function	Indication
<p>9 Language selection</p> <p><input type="checkbox"/> For language selection in the control panel menu choose the LANGUAGE option in the Engineering menu and press ENTER</p> <p><input type="checkbox"/> Select a required language in the list.</p> <p><input type="checkbox"/> Press ENTER</p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT</p>	
<p>10 Extra options</p> <p><input type="checkbox"/> Select the EXTRA OPTIONS item in the Engineering menu and press ENTER</p> <p><input type="checkbox"/> The SUPPLY FAN OFF MODE is used for the heat exchanger freezing protection and is activated only if the heating function is disabled.</p> <p><input type="checkbox"/> To activate the heat exchanger freezing protection function by means of the supply fan deactivation select the OFF option in the HEATING CONTROL entry. The function setup is accessible by selecting the ON option in the SUPPLY FAN OFF MODE.</p> <p><input type="checkbox"/> To select a humidity sensor type in the Engineering menu list set 1 for the duct sensor or 2 for the room sensor in the menu item HUMIDITY SENSOR SELECTION.</p> <p><input type="checkbox"/> To select the bypass operation mode set 1 for the standard operation mode to prevent the heat exchanger freezing. Set 2 to enable bypass opening in the ventilation mode in the BYPASS OPERATION MODE.</p> <p><input type="checkbox"/> To get to Engineering menu and save changes press EXIT</p>	
<p><input type="checkbox"/> Setting ON in the entry SUPPLY FAN OFF MODE will change the programme to deactivation mode of the supply fan.</p> <p><input type="checkbox"/> Press a corresponding field to select one of the items as WORKING HOURS, DOWNTIME, SWITCH-OFF TEMPERATURE (the temperature is set according to the outdoor temperature sensor readings defined in the range from 0 °C to -30 °C).</p> <p><input type="checkbox"/> Use the buttons  or  to set a required value.</p> <p><input type="checkbox"/> Press ENTER to confirm the set parameters</p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT</p>	
<p>11 Password reset</p> <p><input type="checkbox"/> Select PASSWORD CHANGE item in the Engineering menu and press ENTER</p> <p><input type="checkbox"/> Then enter the new password to access to Engineering menu.</p> <p><input type="checkbox"/> Press OK.</p> <p><input type="checkbox"/> To edit the password press RESET. The field ENTER NEW PASSWORD will be cleared.</p> <p><input type="checkbox"/> To return to Engineering menu press EXIT</p>	

Table 6. Operation and parameter setup of the unit (continued)








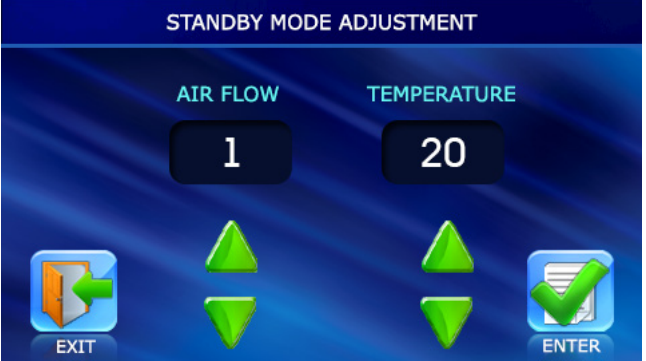





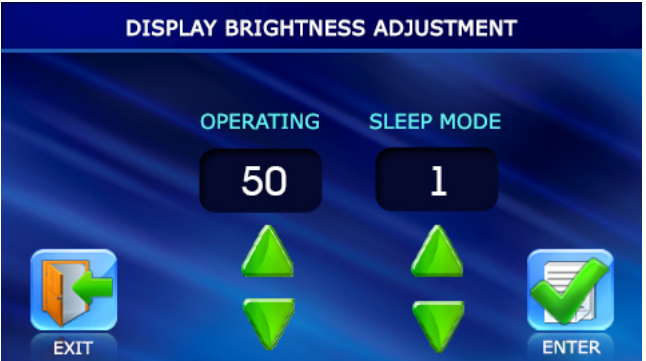











Function	Indication
<p>12 Standby Mode Settings</p> <p><input type="checkbox"/> Select the STANDBY MODE item in the Engineering menu and press ENTER </p> <p><input type="checkbox"/> Use  or  to select 0 or 1 in AIR FLOW window:</p> <ul style="list-style-type: none"> • 0 - for deactivation of the unit. • 1 - for activation of the Standby mode. In the Standby mode the unit operates at the first speed at temperature set by  or  buttons in TEMPERATURE window. <p><input type="checkbox"/> Press ENTER </p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT </p>	
<p>13 Display brightness adjustment</p> <p><input type="checkbox"/> Select the BRIGHTNESS ADJUSTMENT item in the Engineering menu and press ENTER </p> <p><input type="checkbox"/> Use  or  to set brightness for the operation conditions and sleep mode. The control panel changes into the sleep mode 30 seconds after the last pressing.</p> <p><input type="checkbox"/> Press ENTER </p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT </p>	
<p>14 Humidity setting</p> <p><input type="checkbox"/> Select the HUMIDITY SETTING item in the Engineering menu and press ENTER </p> <p><input type="checkbox"/> Select the humidity sensor type for humidity control:</p> <ul style="list-style-type: none"> • DUCT  (duct humidity sensor is a specially ordered accessory and is not included into the basic complete set); • ROOM humidity sensor  <p><input type="checkbox"/> Set the required humidity point using  or </p> <p><input type="checkbox"/> Press ENTER </p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT </p> <p><input type="checkbox"/> In the humidity control mode the minimum air flow matches the air flow at the first speed.</p>	
<p>15 Error control</p> <p>Select the ERROR CONTROL item and press ENTER  to review the last registered error.</p> <p><input type="checkbox"/> The display shows the error date and code.</p> <p><input type="checkbox"/> Press EXIT  to return to the Engineering menu.</p> <p><input type="checkbox"/> The error list is stated in the table 7.</p>	

Table 6. Operation and parameter setup of the unit (continued)





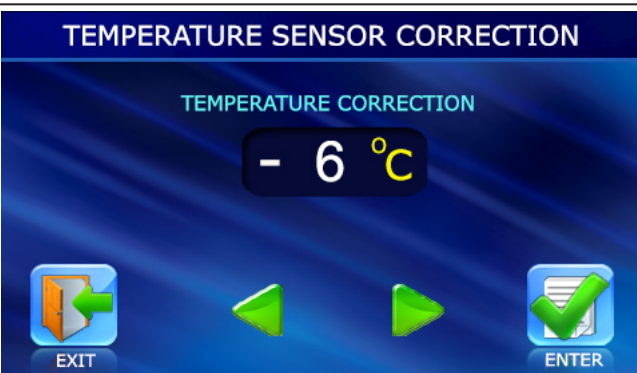



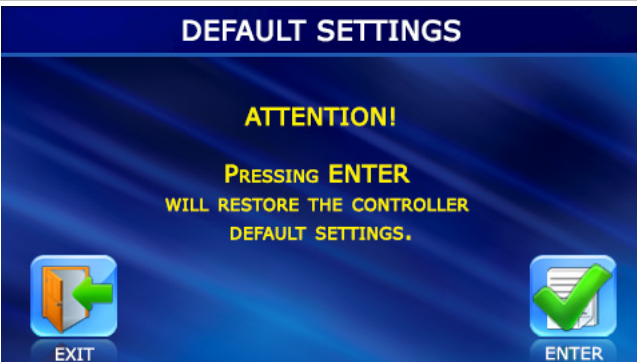


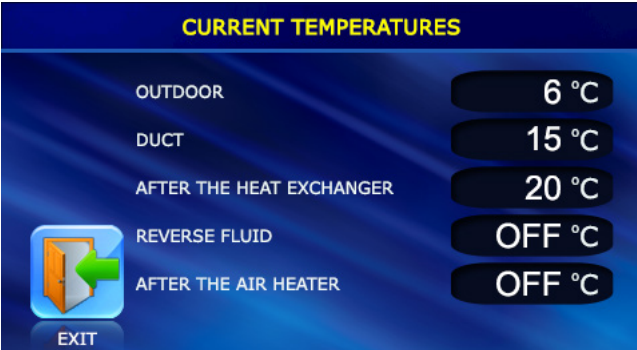


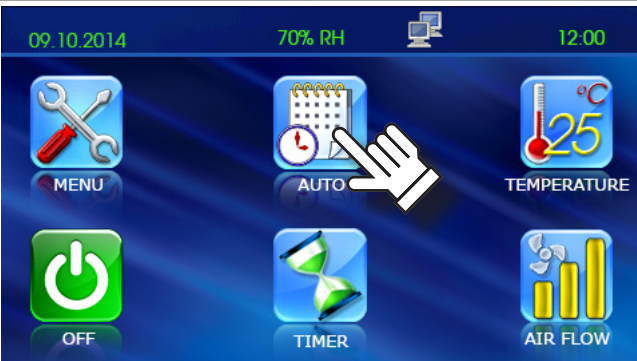
Function	Indication
<p>16 Adjustment of the temperature sensor integrated into the control panel</p> <p><input type="checkbox"/> To adjust the readings of the temperature sensor which is integrated into the Engineering menu select the TEMPERATURE CORRECTION and press ENTER </p> <p><input type="checkbox"/> Use  or  to set the temperature correction factor for the room temperature sensor in the control panel.</p> <p><input type="checkbox"/> The temperature correction setting for the temperature sensor is -6 °C.</p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT </p>	
<p>17 Default settings</p> <p><input type="checkbox"/> Select the DEFAULT SETTINGS point in the Engineering menu to reset the controller settings to default settings and press ENTER </p> <p><input type="checkbox"/> Press ENTER  to confirm the reset.</p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT </p> <p><input type="checkbox"/> The default settings are stated in the table 8.</p>	
<p>18 Displaying current temperatures</p> <p><input type="checkbox"/> To review current temperatures in the Engineering menu select the CURRENT TEMPERATURES item and press ENTER </p> <p><input type="checkbox"/> The display shows the current temperature. If any temperature sensor of the ventilation unit is missing its configuration value is displayed as OFF.</p> <p><input type="checkbox"/> To return to the Engineering menu press EXIT </p>	
<p>19 AUTO mode (scheduled operation)</p> <p>The AUTO mode is designed to program the scheduled operation to operate in definite time periods with set speed. The unit is in the Standby mode between the operating periods.</p> <p><input type="checkbox"/> Press AUTO  in the main list to activate the AUTO mode.</p> <p>Activation of the AUTO mode is confirmed with a tick — </p>	

Table 6. Operation and parameter setup of the unit (continued)








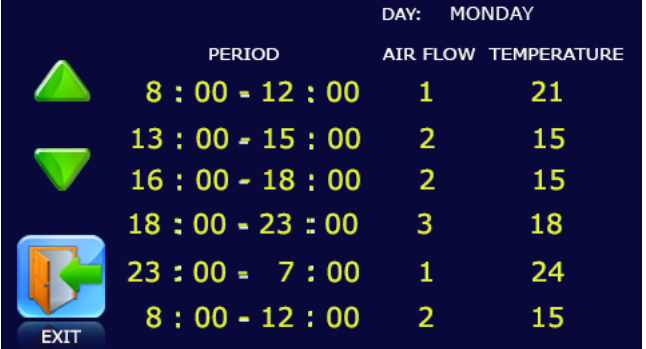






















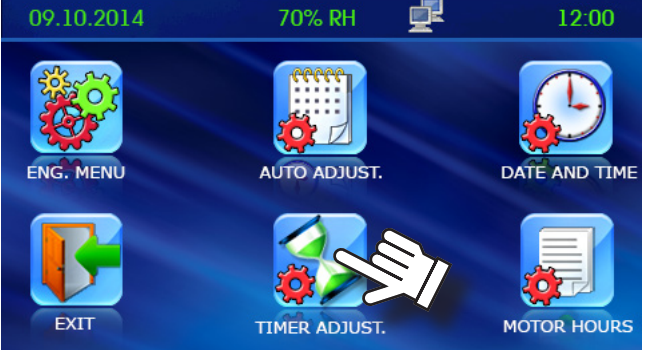






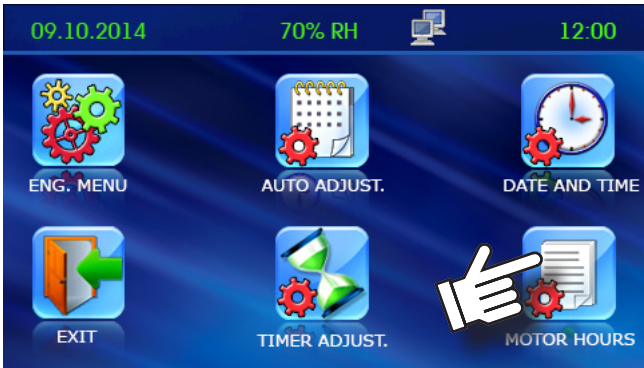





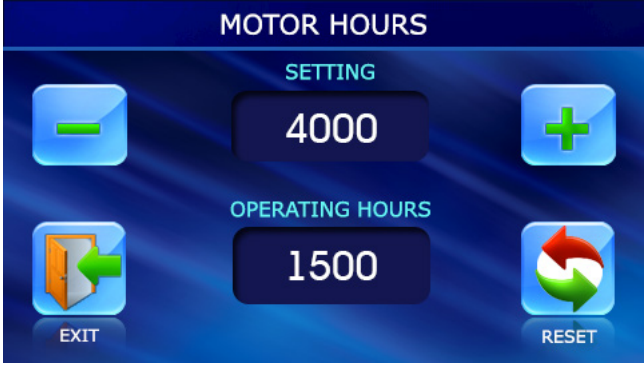

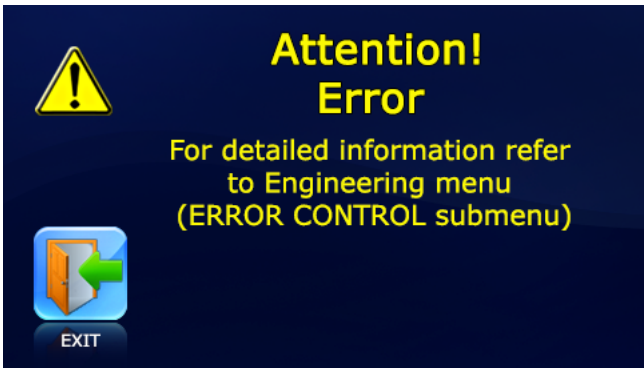
Function	Indication																												
<p><input type="checkbox"/> To set the AUTO mode enter the User menu and press AUTO ADJUST.</p>  <p><input type="checkbox"/> In the active TIMER mode the AUTO mode may not be activated as it has lower priority.</p>																													
<p><input type="checkbox"/> Select the week day to set the AUTO mode. The current week day will be automatically set during entering the menu. Press the field DAY to change the weekday.</p>  or  <p><input type="checkbox"/> Use  or  to set time, air flow and temperature for a current day.</p> <p><input type="checkbox"/> Depending on the Standby mode settings, the unit remains in the Standby mode or turns off between the operating periods.</p> <p><input type="checkbox"/> To return to Engineering menu and save changes press EXIT .</p>	 <table border="1" data-bbox="894 662 1536 1011"> <thead> <tr> <th></th> <th>PERIOD</th> <th>AIR FLOW</th> <th>TEMPERATURE</th> </tr> </thead> <tbody> <tr> <td></td> <td>8 : 00 - 12 : 00</td> <td>1</td> <td>21</td> </tr> <tr> <td></td> <td>13 : 00 - 15 : 00</td> <td>2</td> <td>15</td> </tr> <tr> <td></td> <td>16 : 00 - 18 : 00</td> <td>2</td> <td>15</td> </tr> <tr> <td></td> <td>18 : 00 - 23 : 00</td> <td>3</td> <td>18</td> </tr> <tr> <td></td> <td>23 : 00 - 7 : 00</td> <td>1</td> <td>24</td> </tr> <tr> <td></td> <td>8 : 00 - 12 : 00</td> <td>2</td> <td>15</td> </tr> </tbody> </table>		PERIOD	AIR FLOW	TEMPERATURE		8 : 00 - 12 : 00	1	21		13 : 00 - 15 : 00	2	15		16 : 00 - 18 : 00	2	15		18 : 00 - 23 : 00	3	18		23 : 00 - 7 : 00	1	24		8 : 00 - 12 : 00	2	15
	PERIOD	AIR FLOW	TEMPERATURE																										
	8 : 00 - 12 : 00	1	21																										
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	16 : 00 - 18 : 00	2	15																										
	18 : 00 - 23 : 00	3	18																										
	23 : 00 - 7 : 00	1	24																										
	8 : 00 - 12 : 00	2	15																										
<p>20 Timer</p>																													
<p><input type="checkbox"/> Press TIMER  to activate the timer in the main menu.</p>																													
<p><input type="checkbox"/> Enter the User menu and press TIMER ADJUST.  to set the timer.</p> <p>Activation of the TIMER function is confirmed with a tick — </p> <p><input type="checkbox"/> If the AUTO and TIMER functions are activated synchronously, TIMER function will operate as it supersedes the AUTO function.</p> <p><input type="checkbox"/> The timer may <u>not be activated</u> in the active humidity control mode.</p>																													
<p>Use  or  to set time, air flow and temperature.</p> <p><input type="checkbox"/> Press ENTER  to confirm the set parameters.</p> <p><input type="checkbox"/> To return to Engineering menu without saving changes press EXIT .</p>	 <table border="1" data-bbox="894 1830 1536 2179"> <thead> <tr> <th colspan="4">PERIOD</th> </tr> <tr> <th>HOURS</th> <th>MINUTES</th> <th>AIR FLOW</th> <th>TEMPERATURE</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>: 00</td> <td>2</td> <td>20</td> </tr> </tbody> </table>	PERIOD				HOURS	MINUTES	AIR FLOW	TEMPERATURE	01	: 00	2	20																
PERIOD																													
HOURS	MINUTES	AIR FLOW	TEMPERATURE																										
01	: 00	2	20																										

Table 6. Operation and parameter setup of the unit (continued)

Function	Indication
<p>21 Motor hours</p> <p>The MOTOR HOURS function is used for cleaning or replacement of the filters. Upon expiry of the set time period the control panel shows the filter cleaning or replacement indicator once per day.</p> <p><input type="checkbox"/> To set the MOTOR HOURS function enter the user menu and press</p> <p>MOTOR HOURS </p>	 
<p><input type="checkbox"/> Set the filter replacement periodicity in hours using  or </p> <p><input type="checkbox"/> The OPERATING HOURS window shows the time elapsed from the filter installation.</p> <p><input type="checkbox"/> After the filter replacement press RESET </p> <p><input type="checkbox"/> To return to Engineering menu press EXIT </p>	
<p>22 Errors</p> <p>In case of any operation disorders of the unit the control panel displays a corresponding message.</p> <p><input type="checkbox"/> To enter the error list press EXIT </p> <p><input type="checkbox"/> The ERROR LIST is also accessible from the engineering menu (ERROR CONTROL submenu).</p> <p><input type="checkbox"/> The possible errors are listed in the table.</p> <p><input type="checkbox"/> The error message is repeated each 30 seconds until a system alarm is eliminated.</p> <p>To reset an alarm turn the unit on and off after the alarm elimination.</p>	

ERROR CODE DESCRIPTION

Table 7. Error code description

Error code	Description
TE1	Malfunction of the outdoor temperature sensor.
TE2	Malfunction of the temperature sensor for the heat exchanger freezing protection.
TE5	Malfunction of the duct temperature sensor.
TE6	Malfunction of the duct humidity sensor.
MIN	Malfunction of the supply fan.
MEX	Malfunction of the extract fan.
ERP	Communication error with the control panel.
DI1	Trigging of the overheat protection thermostat 60.
DI2	Actuation of the smoke detector.
DI3	Trigging of the overheat protection thermostat 90.

DEFAULT SETTING

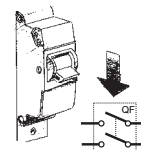
Table 8. Default settings

Parameter		By default
Air flow		1
Temperature	Duct	+ 25 °C
	Room	+ 20 °C
Air flow setting	Air supply	speed 1 - 40%, speed 2 - 70%, speed 3 - 99%
	Air extract	speed 1 - 40%, speed 2 - 70%, speed 3 - 99%
Temperature sensor		Duct
Extra options	Heating control	Off
	Supply fan off mode	Off
	Humidity sensor selection	2
	BYPASS operation mode	1
Supply fan off mode	Working hours	20 minutes
	Downtime	5 minutes
	Switch-off temperature	+ 3 °C
Standby mode setting	Air flow	1
	Temperature	+ 20 °C
Display brightness adjustment	Operating	50
	Sleep	1
Humidity setting	Duct	50 %
	Room	50 %
Temperature sensor correction		- 6 °C
Timer settings	Hours	01
	Minutes	00
	Air flow	1
	Temperature	+ 20 °C
Motor hours	Setting	4000 hrs

TECHNICAL MAINTENANCE

WARNING!

Cut power supply to the unit off by turning the automatic electric switch QF to OFF position prior to any maintenance operations.
Take steps to prevent re-activation of the automatic switch.



Regular technical supervision and maintenance of the unit are required to ensure the product long service life and non-stop operation.

Disconnect the unit from power mains prior to any maintenance operations.

Warning! Consider the unit sharp edges! Fulfil maintenance operations in work gloves!

The recommended unit maintenance periodicity is 3-4 times per year. The unit technical maintenance includes regular cleaning and other works:

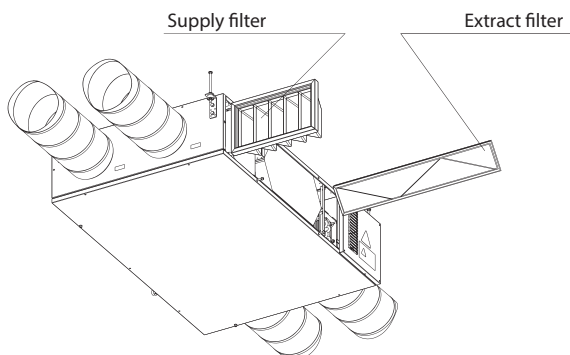
1. Filter maintenance (3-4 times per year).

Dirty filters increase air resistance and decrease supply air. Clean the filters with a vacuum cleaner or flush those with water. After two consecutive cleanings the filter must be replaced. Install dry filters only! Contact a local distributor for the filters stated above in the section «Technical data».

Dirty filters are not considered as a warranty case! Replace immediately humid and mouldy filters!

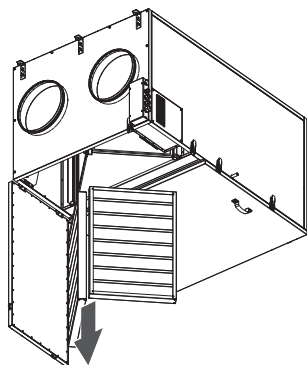
Filter removal for **KOMFORT EC DE400-1.5 ... EC DE1100-3.3:**

1. Remove the side service panel.
2. Pull the filters until they slide off the guides. Install the filters in the reverse order.



Filter removal for **KOMFORT EC DE2000-12 ... EC DE4000-21:**

1. Lift the latches.
2. Open the service panel carefully supporting it with hand.
3. Remove the filters from the unit.



2. Heat exchanger maintenance (once per year).

The heat exchanger must be regularly cleaned to maintain high heat recovery efficiency even in case of the regular filter cleaning. Clean the heat exchanger with warm detergent solution. Remove the heat exchanger from the unit and flush it with warm detergent solution. Install the dry heat exchanger back to the unit.

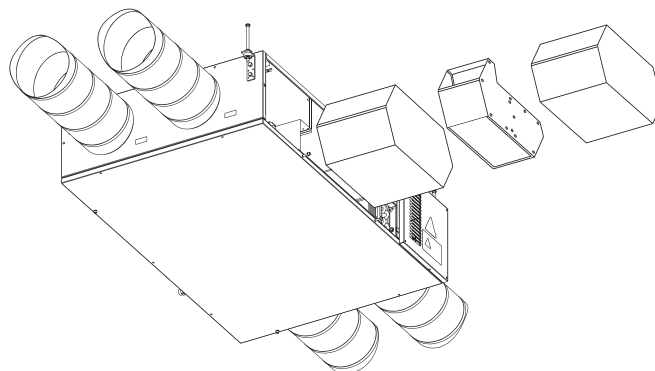
Heat exchanger removal for **KOMFORT EC DE400-1.5 ... EC DE1100-3.3:**

1. Remove the service panel.
2. Pull the heat exchanger and remove it from the unit.

3. Disconnect the contact socket on the bypass wall and remove the bypass.

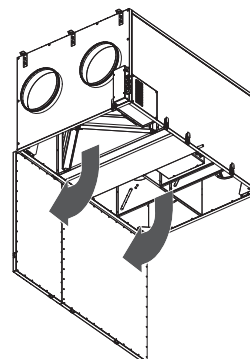
4. Remove the second heat exchanger in the same way (applicable for KOMFORT EC DE400-1.5 and KOMFORT EC DE1100-3.3).

Assemble the parts in the reverse order.

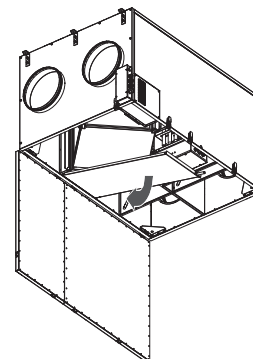


Heat exchanger removal for **KOMFORT EC DE2000-12 ... EC DE4000-21:**

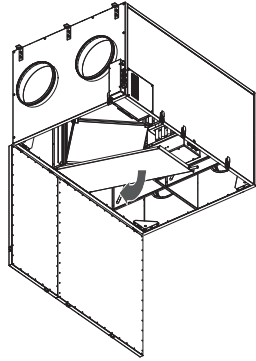
1. Lift the latches and open the service panel.
2. Open the service panels carefully supporting those with hand.



3. Remove the four screws and take off the drain pan.



4. Remove the nine screws that retain the heat exchanger and remove the heat exchanger from the unit. Remove the heat exchanger with care.



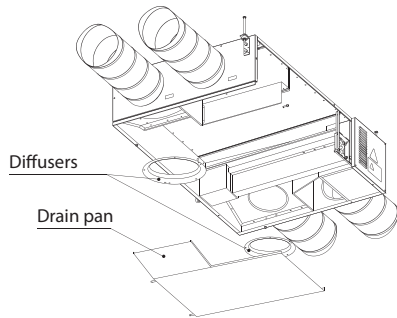
3. Fan maintenance (once per year).

The regular filter cleaning may not completely prevent the dust ingress into the unit, which results in the unit capacity decrease.

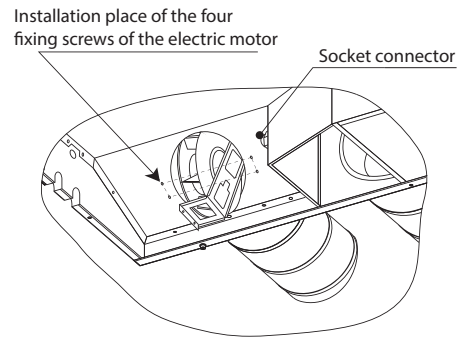
Clean the fan with a soft cloth or a brush. Cleaning with water, abrasive detergents, sharp object or chemicals is not allowed.

Access to the unit fans in **KOMFORT EC DE400-1.5 ... EC DE1100-3.3:**

1. Remove the bottom panel.
2. Disconnect the drain hoses and take off the drain pan.
3. Remove the screws and take off the intake diffusers.



4. Remove the fixing screws of the motor fixing bracket.
5. Shift the motor deeper into the unit through the fan intake opening and disconnect the socket connector.
6. Turn the motor as shown in the figure and then remove it from the unit.



4. Condensate drain system maintenance (once per year).

Extract air particles may accumulate in the condensate drain system and cause its clogging. Pour a drain pan under the unit with water to check free water flow. Clean a U-trap and the drain system if required.

5. Supply grille maintenance (twice per year).

Check the supply grille and remove foreign objects to maintain free air intake.

6. Air ducts maintenance (once in 5 years).

The regular unit maintenance in compliance with the above rules may not completely prevent dust ingress into the air ducts which may result in air flow decrease. The air duct maintenance involves their periodical cleaning or replacement.

7. Exhaust and intake diffuser maintenance (as required).

Remove the exhaust and the intake diffuser and flush those with warm detergent solution. Check the ductworks connections periodically.

TROUBLESHOOTING AND FAULT HANDLING

Table 9. Alarm list and troubleshooting

Fault	Possible reason	Troubleshooting
The fan does not start when the unit is on.	No power supply or wrong connection to power mains.	Connect the unit to power mains. Troubleshoot the connection error.
	Jammed motor, soiled impeller blades.	Remove the motor jam, clean the impeller blades.
Automatic switch tripping	Short circuit in power grid.	Turn the unit off and contact the unit seller for troubleshooting.
Low air flow	Too low set speed.	Set higher speed.
	The filters and the fans are soiled, the heat exchanger is soiled.	Clean or replace the filters, fans and heat exchanger.
	The air dampers, the supply diffusers or the exhaust grilles are closed or soiled.	Open and clean the air dampers, the supply diffusers, the exhaust grilles to ensure free air flow.
Low supply air temperature	The extract filter is soiled.	Clean or replace the extract filter.
	The heat exchanger is iced.	Check the heat exchanger condition. Shutdown the unit if required and turn it on after the freezing danger is no longer imminent.
	Faulty electric heater.	Contact the service center.
Noise, vibration	The impeller is soiled.	Clean the impeller.
	The screw connection is loose.	Tighten the screws.
	No flexible anti-vibration connectors.	Install the flexible anti-vibration connectors.
Condensate leakage	The drain system is clogged, damaged or wrong installed.	Clean the condensate drain system. Check the drain hose slope. Make sure the U-trap is filled with water and the drain system is frost-protected.

ACCEPTANCE CERTIFICATE

The air handling unit with heat recovery

KOMFORT EC DE400-1.5		KOMFORT EC DE2000-12	
KOMFORT EC DE700-2		KOMFORT EC DE4000-21	
KOMFORT EC DE1100-3.3			

is recognizes as serviceable.

The unit complies with the requirements according to the EU norms and directives, to the relevant EU-Low Voltage Equipment Directives, EU-Directives on Electromagnetic Compatibility.
 We hereby declare that the following product complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

This certificate is issued following test carried out on samples of the product referred to above.

Approval mark _____ Manufacturing date _____

CONNECTION CERTIFICATE

The air handling unit with heat recovery

KOMFORT EC DE400-1.5		KOMFORT EC DE2000-12	
KOMFORT EC DE700-2		KOMFORT EC DE4000-21	
KOMFORT EC DE1100-3.3			

is connected to power mains in compliance with the operation manual requirements by the professional:

Company _____
 Name _____
 Date _____ Signature _____

WARRANTY CARD

KOMFORT EC DE400-1.5		KOMFORT EC DE2000-12	
KOMFORT EC DE700-2		KOMFORT EC DE4000-21	
KOMFORT EC DE1100-3.3			

SELLER

SALES DATE

REPRESENTATIVE IN EU

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