

DOMEKT S VERSO STANDARD S

INSTALLATION AND USER MANUAL



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INSTALLATION MANUAL

1. INTRODUCTION

This Installation Manual is intended for professionals, qualified to install Domekt S and Verso Standard S air handling units. Qualified professionals are people with sufficient professional experience and knowledge of ventilation systems and installation thereof, knowledge of electrical safety requirements and having ability to perform works without endangering themselves or others.

See the KOMFOVENT website for user manuals.

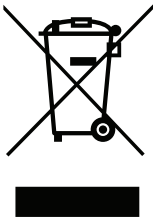
1.1. Safety Requirements

To avoid misunderstandings, read this Instruction Manual carefully before installing air-handling unit.

Only a qualified professional in accordance with the manufacturer's instructions and applicable legal acts and safety requirements may install air-handling units. An air handling unit is an electrical-mechanical device that contains electrical and moving parts, therefore, disregarding instructions of this manual will void the manufacturer's warranty and may also cause direct damage to property or human health.

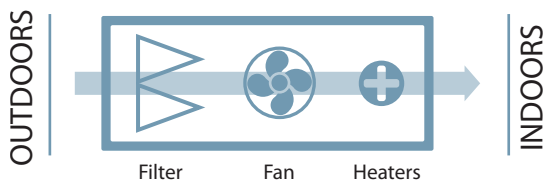


- Before starting any tasks, make sure that the unit is unplugged from the mains.
- Use caution when performing works near internal or external heaters as their surfaces may be hot.
- Do not connect the unit to the mains unless all the external assemblies are installed completely.
- Do not connect the unit to the mains in case of any visible damage incurred during transportation.
- Do not leave foreign objects and tools inside the unit.
- It is forbidden to operate air-handling units in areas with potentially explosive atmospheres.
- Use appropriate safety equipment (gloves, goggles) when performing installation or repair works.



This symbol indicates that this product may not be disposed of with your household waste as specified in WEEE Directive (2002/96/EC) and national laws. This product should be handed over to a designated collection point or to an authorised collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a negative impact on the environment and human health due to potentially hazardous substances that are generally associated with electrical and electronic equipment. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for further recycling, contact your city authorities, waste management organisations, approved WEEE scheme or your household waste disposal service.

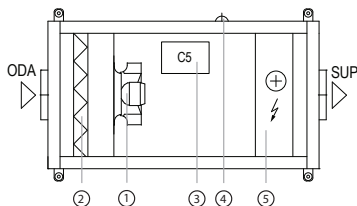
An air-handling unit is a device designed to ensure good ventilation in the premises. Air handling unit supplies filtered fresh air from outside. Domekt S and Verso Standard S – air handling units without heat exchangers, intended solely for air supply to the premises. Fresh outdoor air is heated/cooled to desired temperature with heating/cooling devices installed in the unit or air ducts.



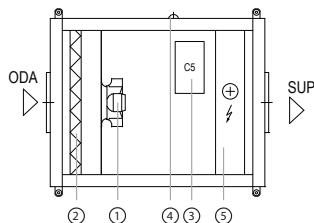
1.2. Unit components

Below are the principal diagrams of air handling units, including the marking of assemblies of the unit and the arrangement of the duct connections.

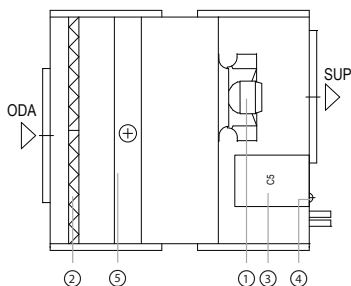
DOMEKT S 650 F / 800 F



DOMEKT S 1000 F, VERSO S 1300 F / 2100 F



VERSO S 3000 F



ODA – outdoor intake air



SUP – air supplied to the premise

* Depending on the order.

- 1 – supply air fan
- 2 – outdoor air filter
- 3 – C5 controller main board
- 4 – Lead-in wire
- 5* – electric heater / water heater

2. UNIT TRANSPORTATION AND STORAGE

Equipment must be transported and stored in the original packaging. During transportation, equipment must be properly secured and further protected against possible mechanical damage, rain or snow.

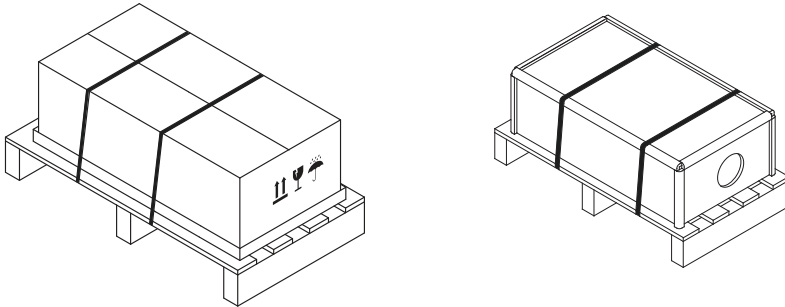


Fig. 1. Examples of equipment packaging

Forklift truck or crane can be used for loading or unloading. For the crane operation, special lashes or ropes must be used to securing them in the designated areas. Ensure that lifting lashes or ropes do not crush or otherwise damage the housing of the unit. We recommend using special belt supports. When lifting and transporting the equipment with a forklift, the forks must be long enough to prevent the unit from being overturned or mechanically damaging its bottom side. Air handling units are heavy, therefore, be careful during lifting, moving or transportation. Use personal protective equipment. Even small units should be transported on a forklift, a trolley or carried by multiple persons.

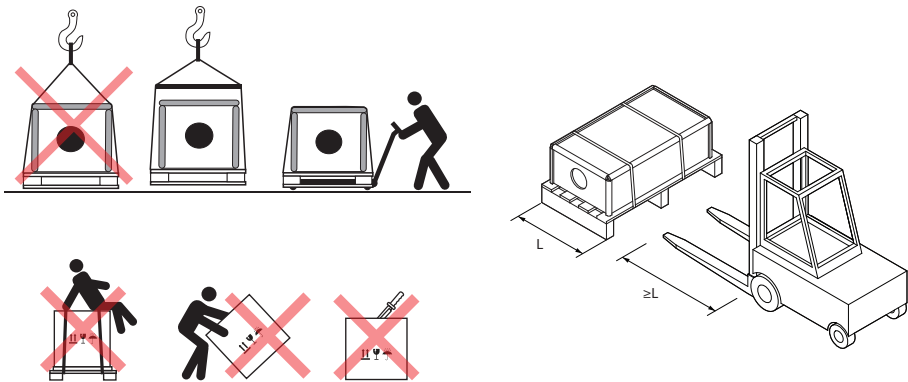


Fig. 2. Examples of transportation by crane, forklift and trolley

After delivery of the air handling unit, carefully inspect its packaging for damage. If mechanical or other damage is visible (e.g., wet cardboard packaging), notify the carrier immediately. If the damage is significant, do not accept the unit. Inform the selling company or the representative of UAB KOMFOVENT within three business days about any damage detected during delivery.¹

Units should be stored in a clean, dry room at a temperature of 0–40°C. When selecting a storage location, make sure the unit is not accidentally damaged, that other heavy objects are not loaded on top and dust or moisture does not get inside the unit.



- Air handling units are heavy, therefore care must be taken during lifting, carrying or moving operations. Use personal protection equipment, do not stand under a suspended unit or a part thereof.
- Only an employee qualified to operate a forklift truck or crane and familiar with the principles of cargo lifting and safety requirements, must perform unloading or lifting operations.
- It must be ensured that the casing is not crushed or otherwise damaged by straps or ropes during lifting operations. Use of special supporting structures (traverses) is recommended.
- When lifting the unit or section thereof, note that their center of gravity may differ from the geometric center of the load.
- Mounting of separate air handling units in stacks is not allowed unless it's construction design is intended for such installation.
- Before installation AHU must be stored in clean and dry premises in their original packaging. If the unit is installed but not yet in use, all connection openings must be tightly closed and the unit must be additionally protected against environmental influences (dust, rain, cold, etc.).

¹ UAB KOMFOVENT is not responsible for losses caused by the carrier during transportation and unloading.

3. MECHANICAL INSTALLATION

3.1. Requirements for Mounting Location

Domekt S and Verso Standard S air handling units are designed for ventilation of premises where a standard air temperature and humidity must be maintained. These air handling units are not intended for air flows containing solid particles. Standard equipment air handling units are intended for indoor installation. Air handling units are designed for ambient temperatures from -30 °C to +40 °C.



- Domekt S and Verso Standard S units are not intended for operation in areas with potentially explosive atmospheres. Air handling units are not designed for ventilation and dehumidification of wet areas (pools, saunas, car washes, etc.).
- If the AHU is installed in a room with high humidity level, condensate may form on the walls of the unit at low outdoor temperatures.

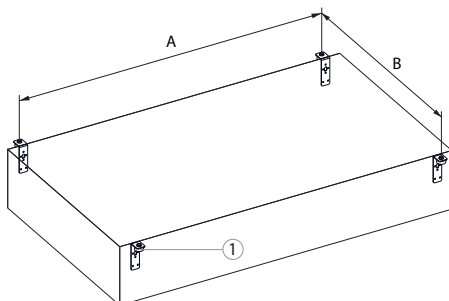
Domekt S and Verso Standard S units are usually attached to the ceiling, floor slab or other horizontal structures with the doors down. For this purpose, their housing has special brackets with integrated vibration absorbers. The brackets should be screwed to the supporting structure of the floor slab with threaded rods or anchor bolts.

Some Domekt S and Verso Standard S units can be wall mounted or placed on the floor.

Unit	Heater type				
Domekt S 650 F	HE	+	-	-	-
Domekt S 800 F	HE	+	-	-	-
	HW	+	+	+	+
Domekt S 1000 F	HE	+	-	-	-
	HW	+	+	+	+
Verso S 1300 F	HE	+	-	-	-
	HW	+	+	+	+
Verso S 2100 F	HE	+	-	-	-
	HW	+	+	+	+
Verso S 3000 F	HW	+	-	+	-

Fig. 3. Mounting positions of units

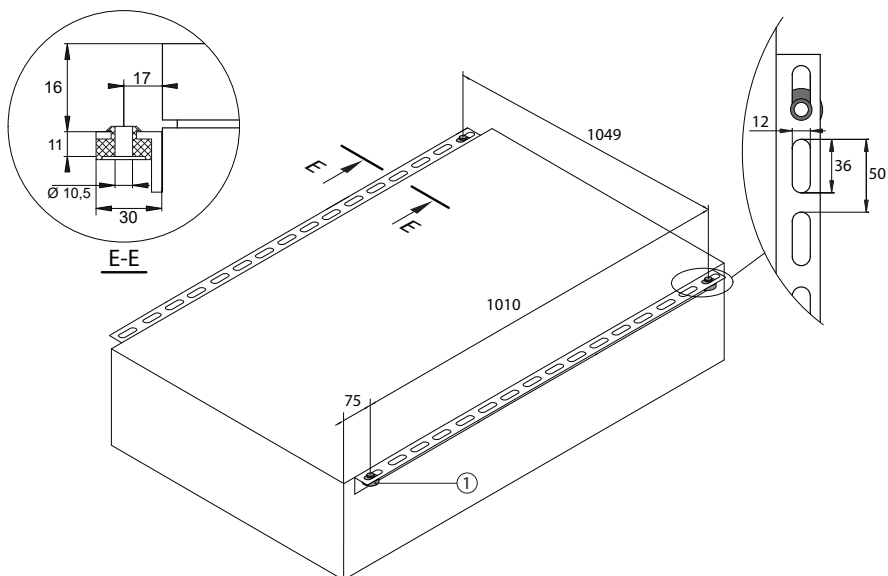
Below are the types of mounting brackets of units and their arrangement dimensions.



① – vibration absorbers

Unit	A, mm	B, mm
Domekt S 650 F	803	526
Domekt S 800 F	903	526
Domekt S 1000 F	823	751
Verso S 1300 F	823	751
Verso S 2100 F	823	1051

Verso S 3000 F



3.2. Inspection Area

When selecting an installation location, you must foresee sufficient and security compliant access space for repair and maintenance operations. The unit must be installed in a way to allow partial or full disassembly and removal of assemblies out of the sections, if needed (e.g., in case of complex repairs).

Do not hang such units above the stairs or high above, where it will not be possible to reach it without using special equipment. If the unit is hidden behind the suspended ceiling the inspection opening (if any) should not be smaller than the size of the unit, or the ceiling must be installed in such a way that it can be easily dismantled without damaging their structures. Most of the Domekt S and Verso Standard S units have seals on the side for routing cables of external components and sensors into the automation box. All external devices and sensors are connected inside of the automation box, thus leave a space of at least 300 mm between it and the wall of the building. This will allow easier access to the electronics during installation or repair.



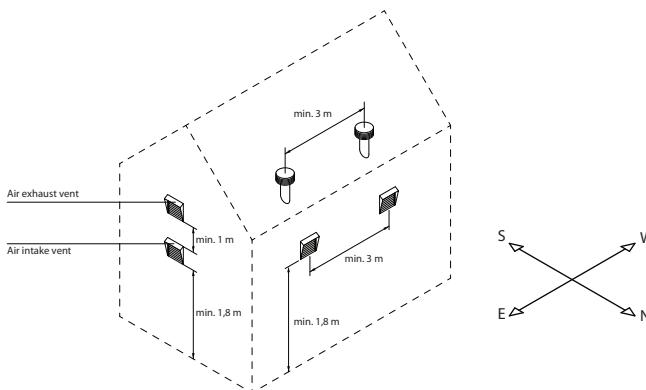
- It is necessary to install additional service areas for units installed high above, which would allow to work safely during technical maintenance (e.g., during filter replacement) or repair.
- When choosing a place to place or hang the unit, keep in mind that preventive maintenance should be performed at least twice a year, and sometimes more often; therefore, the user or the person responsible for the maintenance of the unit must reach it as safe and simple as possible.

3.3. Duct system installation

The air in and out of the unit flows through the duct system. The duct system should be designed and selected to have low airflow rates and low pressure differentials, ensuring more accurate airflow rates, lower energy consumption, lower noise levels and longer life of the unit.

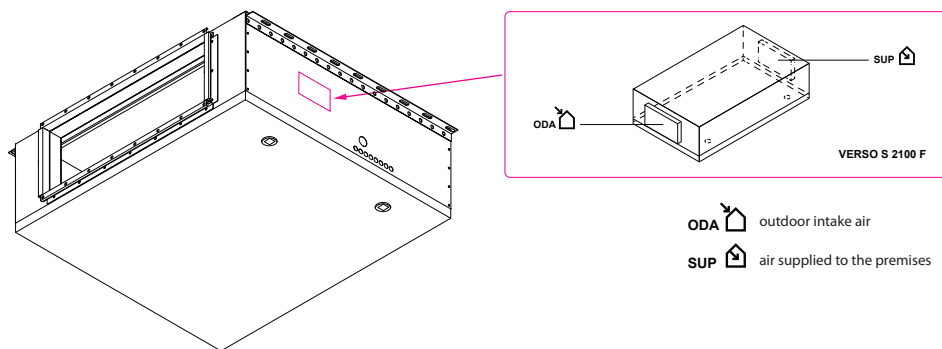
Outdoor vents must be installed as far apart as possible on different sides of the building to prevent the exhaust air from returning to the air intakes. Try to install the air intake vents where the outdoor air is the cleanest: do not direct them towards the street, car park or outdoor fireplace. We also recommend installing the air intake vent on the north or east side of the building, where the heat of the sun in summer will not have a significant effect on the supply air temperature.

It is highly recommended to install unit connecting ducts of supply inlet and exhaust outlet with a minimum slope on the outside of the premise, to avoid water flowing into the unit in case of rain or snow.



It is recommended to insulate the ducts in unheated rooms (attic, basement) to avoid heat loss. It is also recommended to insulate the supply air ducts if the unit is used for room cooling.

Circular air ducts are fitted to the unit with self tapping screws. Rectangular ducts are fitted using flange connections. Different air flow duct positions are marked on the sticker located on the AHU:



- Ducts connecting the unit to the exterior of the building must be insulated (insulation thickness 50–100 mm) to prevent condensation on cold surfaces.
- Air intake ducts must be fitted with air closing dampers (mechanical spring-loaded or electric with actuators) to protect the unit from exposure to climatic conditions when the unit is switched off.
- In order to minimise AHU noise transferring through the ducts into ventilated areas, sound attenuators must be connected to the unit.
- Duct system elements must have separate brackets and to be mounted in a way that their weight is not shifted to the unit casing.

The diameter of the ducts varies by unit model:

Unit	Duct diameter, mm		
	Duct type	Duct ODA	Duct SUP
Domekt S			
650 F	Round	160	160
800 F	Round	200	200
1000 F	Rectangular	500 × 200	500 × 200
Verso S			
1300 F	Rectangular	500 × 200	500 × 200
2100 F	Rectangular	800 × 200	800 × 200
3000 F	Rectangular	800 × 400	800 × 400

3.4. Installation of External Heating/Cooling Devices

Pipes of water heater and cooler are connected to a water mixing unit (PPU) that supplies hot/cold water from the building's water system. Heat exchangers for direct evaporation (DX) coolers/heaters are factory-filled with nitrogen gas. Before connecting a heat exchanger to a refrigerant system, nitrogen gas is discharged through a valve which is then cut off and heat exchanger connections are soldered to a pipeline. Coils for water or DX coolers are fitted with condensate trays to which a siphon and drainage piping must be connected (see Chapter "Connection of a Condensate Drain").



All connections to the heating or cooling system piping and mains must be performed by a qualified specialist.

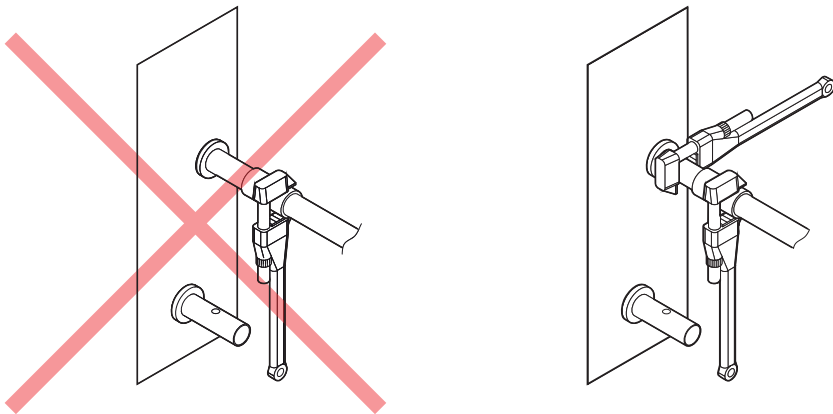


Fig. 4. Connection of sleeves

When connecting sleeves of water heaters/coolers, use two pipe wrenches to secure sleeves, otherwise they will be damaged. If water is used in the heater, for frost protection water temperature sensor (B5), must be installed and fixed with strap on the return water pipe as close to the heater as possible. Fix the sensor in a way that its metal part has good contact with a surface of the pipe. The sensor must be thermally insulated so that the room temperature does not distort water temperature measurements.

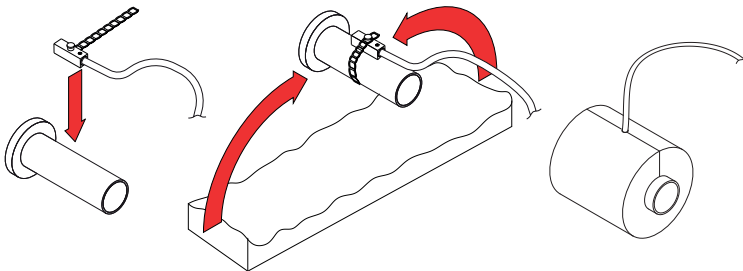


Fig. 5. Installation of a return water temperature sensor



- When operating air handling unit in temperatures lower than 0°C, it is necessary to use water-glycol mixture as a heating medium or to maintain a return water temperature of at least 25°C.
- Pipework package¹ must include circulation pump, which circulates heating/cooling medium through the coil (smaller circuit) and 3-way mixing valve with modulated actuator. In cases if 2-way valve is used, additionally it must be installed non-return valves to ensure continuous circulation around smaller circuit. PPU must be installed as close to the water coil as possible.
- In order to additionally protect the water heater from freezing, you may also use a capillary thermostat (see section "Electrical installation") that should be mounted on the surface of the heater.

3.5. Connection of a Condensate Drain

Operation of units with cooling heat exchangers causes condensation that accumulates in condensate trays. Condensate is removed from condensate trays via drainage pipes, therefore a condensate drainage system must be connected. Drainage piping must be mounted with a slope, without narrowing sections or loops preventing water from draining. If such drainage piping is installed outdoors or in unheated premises, it must be adequately insulated or equipped with a heating cable to prevent water from freezing during winter. Drainage piping is connected to the unit with a siphon. Due to positive or negative air pressure in the air handling unit, water cannot drain out of the condensate collection tray by itself. Therefore, it is necessary to connect a proper height siphon or a siphon with a one-way valve to the drain pipe.

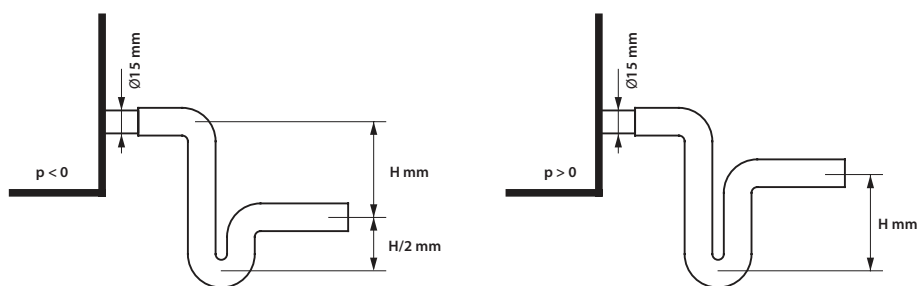


Fig. 6. Installation of a siphon

Height H of a siphon without a one-way valve is selected according to static pressure p inside the air handling unit:

$$H [\text{mm}] = 25 + p [\text{mm H}_2\text{O}] = 25 + 0.1 \times p [\text{Pa}]$$

¹ It is recommended to use PPU made by Komfovent.

The height of a siphon with a non-return valve may be lower; however, it depends on the technical data of the siphon used; therefore, if possible, we recommend choosing its height in the same way as for a siphon without a non-return valve.

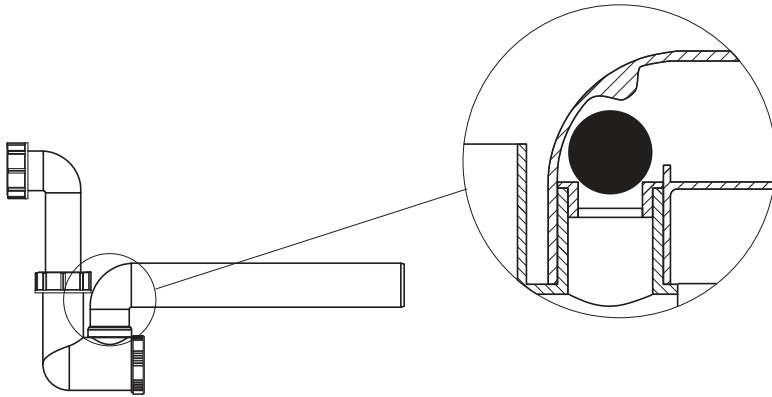


Fig. 7. Example of a siphon with a one-way valve

Any drainage system cannot be directly connected to the common waste water system in order to protect supply air from contamination with bacteria and odours. Condensate from the air handling unit drainage system shall be collected into a separate container or should be lead to a sewage grille without any direct contact: do not connect drain directly to sewer pipe and do not immerse it into water. Condensate collection location must be easily accessible for cleaning and disinfection.

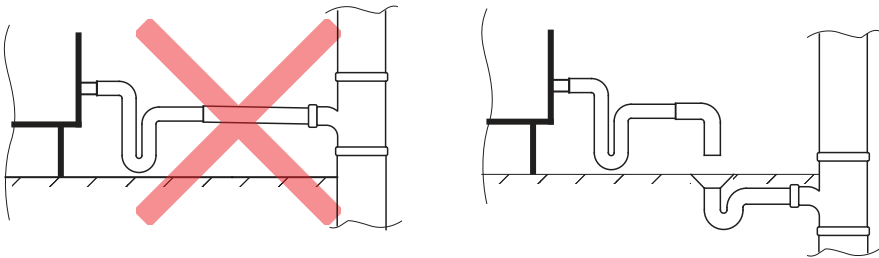
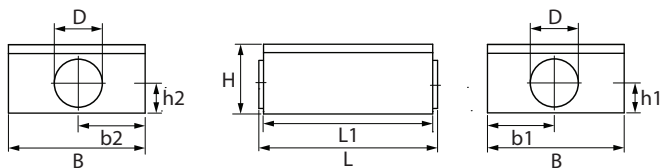


Fig. 8. Condensate drain connection to sewer system

4. TECHNICAL INFORMATION

Unit	Hot water			Electric			Fans input power	Weight
	Operating current	Supply voltage	Heater capacity	Operating current	Supply voltage	Heater capacity		
	A	V	kW	A	V	kW		
Domekt S								
650 F	–	–	–	14,9 / 10,6	1~230 / 3~400	3 / 6	150	35
800 F	1,9	230	4,1	10,3 / 14,6	3~400	6 / 9	181	37
1000 F	2,25	230	5,8	15,0 / 23,7	3~400	9 / 15	124	46
Verso S								
1300 F	2,7	1~230	7	15,4 / 24,1	3~400	9 / 15	236	46
2100 F	4	1~230	13	25,4 / 36,3	3~400	15 / 22,5	337	73
3000 F	3,8	3~400	35,4	–	–	–	680	130

5. UNIT DIMENSIONS



Unit	Dimensions, mm						
	B/B1	L/L1	H/H1	h1	h2	b1	b2
Domekt S							
650 F	475	919/873	297	120	120	237,5	237,5
800 F	475	1005/973	350	152	152	237,5	237,5
1000 F	700	953/893	350	154	154	367,5	332,5
Verso S							
1300 F	700	953/893	350	154	154	367,5	332,5
2100 F	1000	953/893	350	154	154	525	475
3000 F	1015	1290/1160	555	250	250	507,5	452,5

6. ELECTRICAL INSTALLATION

Only qualified professionals may perform electrical installation works in accordance with the manufacturer's instructions and applicable legal acts and safety requirements. Before installation of any electrical components:



- Make sure the unit is unplugged from the mains.
- If the unit has been standing in an unheated room for a long time, make sure there is no condensation inside and check if contacts and electronic parts of the connectors are not damaged by moisture.
- Inspect the power cable and other wiring for damage in insulation.
- Locate the wiring diagram for your unit according to the unit type.

6.1. Requirements for Electrical Connection



- Connect the unit only to a proper power outlet with protective earthing. Earthing must be installed according to the EN61557, BS 7671 requirements.
- It is recommended to connect AHU to the mains via automatic circuit breaker with 30 mA current leakage protection (type B or B+).
- Control cables should be installed at least 20 cm away from power cables to reduce the possibility of electrical interference.
- All external electrical elements must be connected strictly according to the wiring diagram of the unit.
- Do not disconnect the connectors by pulling wires or cables.

Lead-in cable diameter depends on a maximum current specified in the technical data print-out of the specific unit.

Current, A	Cable type
15	5 × 1,5 mm ² (Cu)
21	5 × 2,5 mm ² (Cu)
27	5 × 4,0 mm ² (Cu)
34	5 × 6,0 mm ² (Cu)
50	5 × 10,0 mm ² (Cu)
70	5 × 16,0 mm ² (Cu)
85	5 × 25,0 mm ² (Cu)

6.2. Connection of Electrical Components

All internal and external elements of the unit are connected to the main board of the C5 control panel (marked as "RG1" in wiring diagrams), located inside the unit. In some units, you will need to unscrew the metal cover to access the control panel. You can see the exact location of the C5 control panel in the unit in section "Unit components".

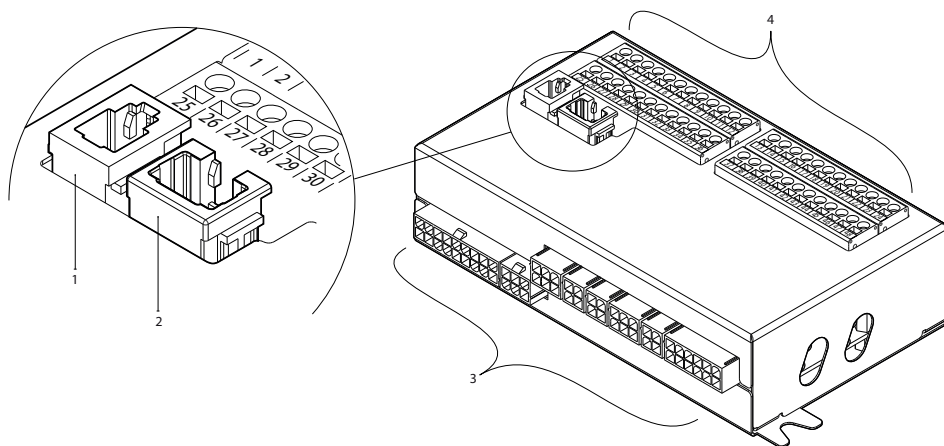


Fig. 9. C5 controller main board

1 – control panel connection, 2 – Intranet or Internet connection, 3 – inner connections of components, 4 – terminals for external components

Terminals for the external elements of the controller board are numbered and are used only to connect external components. These may remain empty if no additional features are required.

INPUTS	B9	Humidity sensor	0..10V	25	1	B	MODBUS RS485 interface	OUTPUT
			~24V	26	2	A		
			N	27	3	GND		
	B8	Air quality sensor	0..10V	28	4	IN4	External control	INPUTS
			~24V	29	5	IN3		
			N	30	6	IN2		
	B7	Exhaust air pressure sensor	0..10V	31	7	IN1		
			~24V	32	8	C	Return water temperature sensor	B5
			N	33	9	NTC		
	B6	Supply air pressure sensor	0..10V	34	10	NTC	Supply air temperature sensor	B1
			~24V	35	11	NTC		
			N	36	12			
OUTPUTS	FG1	Air damper actuator	0..10V	37	13	0..10V	Humidifier control	TG3
			~24V	38	14	GND		
			N	39	15	0..10V		
		Operation Alarm Common	NO	40	16	~24V	Cold water mixing valve / DX capacity control	TG2
			NO	41	17	N		
			C	42	18	0..10V		
	DX	DX3 / Heating DX2 / Cooling DX1 / Start Common	NO	43	19	~24V	Heating damper actuator	TG1
			NO	44	20	N		
			NO	45	21	L		
	INPUT	Water pump/ coil alarm	DIN	47	23	L	Water pump for cooling 230V AC, 1A	S2
			GND	48	24	N		

Fig. 10. Connection terminals for external components on the C5 main board



Total power of all external devices with 24 V supply voltage shall not exceed 25 W.

Modbus RS485 (1-3) – data cable connection for controlling the unit from a building management system via Modbus RTU protocol. Also these terminals can be used for additional heating/cooling zone control module connection (see „Additional zone control installation manual“).

External control (4–8) – terminals for controlling specific functions of the unit via external contacts which are connected to a common terminal 8. These include thermostats, switches, motion sensors and other devices with normally open or closed contacts. Activated functions will operate as long as those contacts are connected.

- **Terminal 4** is used to switch between heating and cooling modes, if a combined water heater is used (after terminals are connected, the water valve actuator and pump will be controlled according to the cooling signal. For example, a thermostat can be connected here to close terminals when cold water circulates in the system).
- Closing contacts **5** and **8** will stop the unit.

- Fire alarm requires a normally closed contact (NC), therefore, a jumper is connected between **terminals 6 and 8**, instead of which, building fire system can be connected. When the contact is disconnected, the unit stops or fans speed up (according to the order) and a fire alarm message is displayed.
 - **Terminal 7** activates an "Override" ventilation mode (OVR). This mode has priority over other AHU functions and may be activated even when the unit is stopped (i.e. to start the unit by closing contacts). OVR function settings are set via the control panel or computer. This function is active as long as terminals are closed.
- B5 (9–10)** – when a water heater is installed, this terminal is used for connecting a return water temperature sensor (NTC 10k Ω) which protects against freezing.

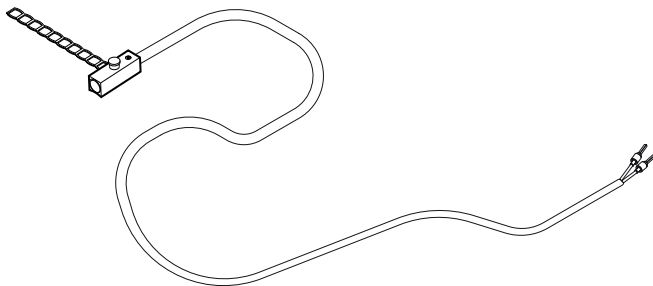


Fig. 11. Return water temperature sensor

B1 (11–12) – terminal for a supply air temperature sensor (NTC 10k Ω) for controlling air temperature.

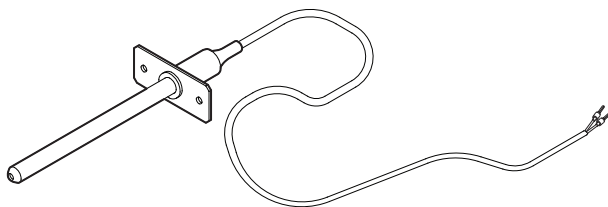


Fig. 12. Supply air temperature sensor

For the most accurate temperature measurement, sensor in a duct must be installed after all heating/cooling devices at least two duct diameters away from the nearest coil.

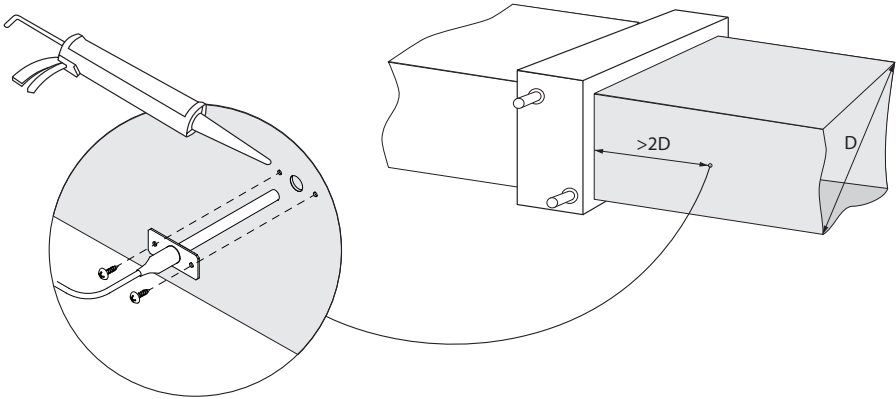


Fig. 13. Installation of a supply air temperature sensor

TG3 (13–14) – for connecting control signal (0..10 V) of an external humidifier or dehumidifier, if activated.

TG2 (15–17) – power supply (24 V AC) and control signal (0..10 V) for a water cooler mixing valve actuator. If a DX unit is installed (controlled by a modulated signal), DX unit control signal is connected to these terminals and water cooling is disabled.

TG1 (18–20) – power supply (24 V AC) and control signal (0..10 V) for a water heater mixing valve actuator. If a combined water heater/cooler is used, valve actuator will be controlled by a heating or cooling signal (whichever is supplied).

S2 (21–22) – 230 V AC supply voltage for a cold water circulation pump, which is used with external water cooler coil and is activated when cooling is needed. Max 1 A.

S1 (23–24) – 230 V AC supply voltage for a hot water circulation pump, which is used with external water heater coil and is activated when heating is needed. Max 1 A.

B8/B9 (25–30) – terminals for air quality and humidity sensors, which are used for the following functions (see “User Manual”):

- Air quality control (AQC).
- Operation on demand (OOD).
- Humidity control (HUM).

These functions may be controlled via the following type sensors (sensor type may be changed only by an authorised service representative):

- Carbon dioxide CO₂ (default setting) – range 0..2000 ppm.
- Air quality VOC (*Volatile organic compound*) – range 0..100%.
- Relative humidity RH – range 0..100% RH.
- Temperature TMP – range 0..50°C.

B6/B7 (31–36) – when a VAV airflow control method is used (see “User Manual”), optional pressure sensors must be installed and connected in the ducts. Follow the manufacturer’s instructions for installation of VAV pressure sensors. Also, these terminals are used for DCV airflow control when a separate 0..10 V signal can be used to adjust the ventilation intensity (see “User Manual”).

FG1 (37–39) – terminals used to connect air damper actuators. These terminals may also be used for connecting 24 V AC power supply actuators with or without a spring return.

Indication (40–42) – terminals are used when a normally open (NO) contact is necessary for operation status or fault indication.

Cooling control (43–46) – digital normally open (NO) outputs for controlling direct expansion (DX) coolers/heaters. The purpose of outputs differs depending on the type of DX device control ordered or programmed in the control panel¹:

- Stepping control of start/stop type DX cooling devices – each of the 3 outputs is activated one after the other, when the power of the previous stage is insufficient, with 5 min. delay.
- Stepping control of start/stop type reversible (cooling/heating) DX devices – DX1 and DX2 outputs are activated one after the other, when the power of the previous stage is insufficient, with 5 min. delay. DX3 output is used for switching DX devices between cooling and heating modes.
- If a DX device is controlled by a modulated signal (0..10 V), digital outputs are used for starting a DX unit and changing operation modes thereof: DX1 – start signal, DX2 – cooling, DX3 – heating. Power control signal for this type of the DX unit is connected to TG2 terminals.

Water pump/coil alarm (47–48) – here you can connect signal for indication of water pump faults (if this function is available on the pump); if the pump fails, the air handling unit is stopped. Also these terminals can be used for additional frost protection of water heater coil, by connecting here capillary thermostat, which is mounted on the surface of the coil.

All wires to be connected to the main controller board shall be pulled through grommets (top or side of the air handling unit). Grommets are fastened to ensure tightness.

6.3. Control Panel Installation

The control panel must be installed in a room with:

- Ambient temperature – 0..40°C;
- Relative humidity – 20..80%;
- Guaranteed protection against accidental water drops.

Control panel can be mounted in a concealed mounting box or directly on the wall (screws supplied with the panel). You can also use magnets (on the back surface) to attach the panel to metal surfaces (i.e. on the door of the unit).



Do not use any other type or size screws but those that are supplied for control panel mounting. Wrong screws may cause damage to a circuit board.

¹ If the DX device was not predefined in the controller software, these outputs will be inactive.

Control panel is supplied with a 10 m cable. If this cable is too short, you can replace it with a $4 \times 0,22$ mm cable, up to 150 m long.

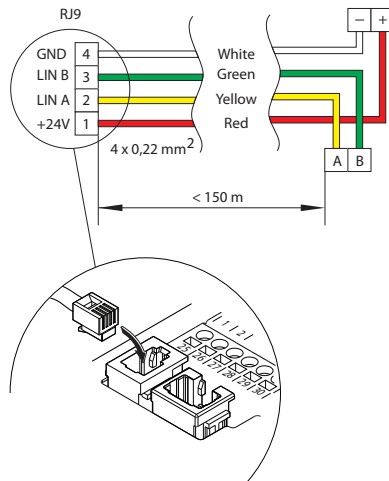


Fig. 14. Control panel wiring diagram

Control panel cable shall be installed further away from other power supply cables or high voltage electrical equipment (electrical enclosure, electrical water heating boiler, air conditioning unit, etc.). The cable can be pulled through openings in the back or bottom part of the control panel (follow the installation instructions provided with the control panel). Cable to the C5 control board must be connected to a dedicated slot (see Fig. 14).

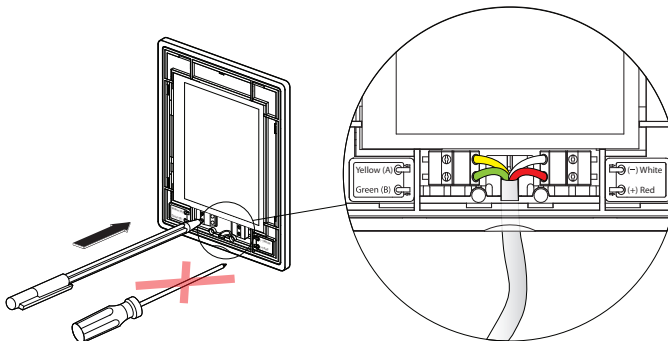


Fig. 15. Control panel cable wiring



- Do not use sharp tools for pinning contacts in the control panel (e.g., screwdriver). Please use a pencil or a ballpoint pen.
- Do not use any ferrules (or lugs) on the wires to be connected to the control panel, as they may prevent the cable from connecting properly or may damage the panel's connectors.
- To the controller main board connect only the completely assembled control panel with back and front covers installed. If installing covers when the control panel is powered up you may damage the internal electronic components.

6.4. Connecting the Unit to the Internal Computer Network or the Internet

Your AHU may be controlled not only with a control panel, but also with a computer or smart phone. For this reason the unit must be connected to the internal computer network or the Internet. In case of a computer, the unit is controlled via a web browser, and in case of a smart phone - via the Komfovent app. Use CAT5 type cable to connect your AHU to the computer network (RJ45 connection; see Fig. 9). The total cable length between the unit and the network router must not exceed 100 metres. By default, the IP address of your air handling unit is **192.168.0.50**, however it can be changed (if necessary) according to the local network parameters. IP address can be found and changed in the control panel.

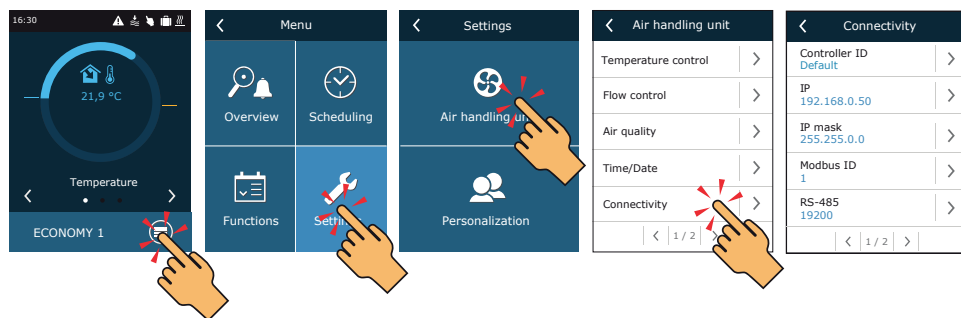


Fig. 16. Viewing and changing the IP address with a control panel

An air handling unit connected to a network router can be controlled by a computer via wireless connection (Wi-Fi). The unit may also be controlled wirelessly in a local network using a smart phone with the Komfovent app. Once the unit is connected to the network router, you should assign a free IP address on the local network.

When connecting your computer directly to the unit, open the network settings and manually assign an IP address, the last number of which would be different from the unit's IP address (for example, if the unit's IP address is 192.168.0.50, assign the address 192.168.0.70 to the computer). Enter the subnet mask: 255.255.0.0.

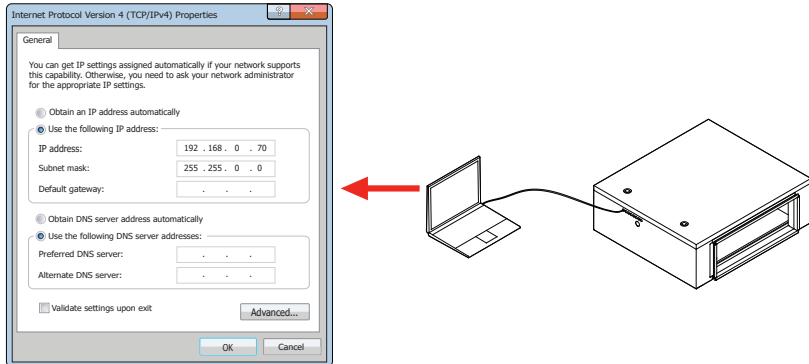
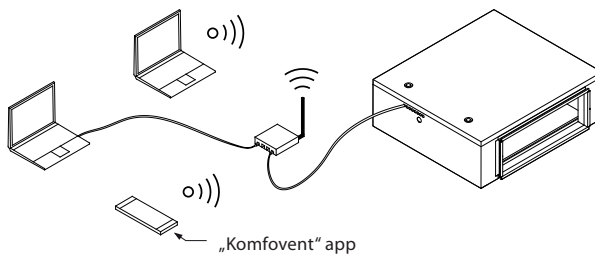


Fig. 17. Computer network settings for direct connection to the unit

In order to control your AHU over the Internet, connect it to the network router which has access to the Internet. Follow the router manual to configure port forwarding to the unit IP address. Depending on whether you will use your computer or smart phone with the Komfovent app to control your AHU, you will also need to enter a corresponding port number to the router. For control via your computer use the port **80**, and for control via your smart phone use the port **502**. Once a computer or smart phone is connected to the Internet, enter an external router IP address and set port number to your web browser or the Komfovent app to access the AHU user interface (for more information on control with a computer or smart phone see "User Manual").

Connection to the local computer network



Connection via the Internet

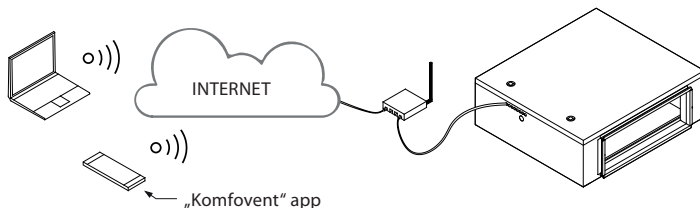


Fig. 18. Examples for the AHU connection to the Internet or the local network

7. FILTERS

Air filters are intended for removing dust, bacteria and other fine particles from the supplied air. Filters are made of synthetic fabric and can have different filtration classes¹, i.e., intended for removing particles of different sizes.

The contamination of the filters is monitored by pressure switches installed inside the unit and set to a certain differential pressure, based on the type of filter used. If filters of other manufacturer or different filtration class is used, the range of the pressure switches must be set correctly after their replacement. The pressure switches are set by removing the top cover and turning the knob to the necessary limit of differential pressure. After the filter becomes dirty and the differential pressure value is reached, a message will be displayed on the control panel or computer screen.

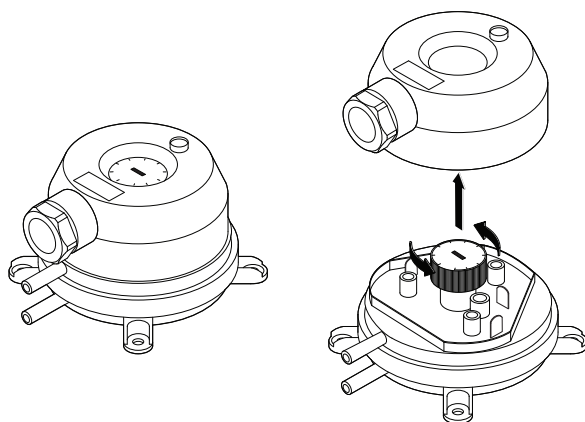


Fig. 19. Pressure switch

Filters are removed/inserted one by one (number of filters depends on the unit size). For some filter sizes an additional sealing gasket must be attached to the frame edge to ensure air tight construction. Be careful not to drop filters or damage them with the unit door when installing in wall-mounted units.

Filters

Unit	Filter type	Supply	
		Class	B × H × L, mm
Domekt S			
650 F	Compact	ePM1 60% (F7)	371×235×46
800 F	Compact	ePM1 60% (F7)	371×287×46
1000 F	Compact	ePM1 60% (F7)	558×287×46
Verso S			
1300 F	Compact	ePM1 60% (F7)	558 × 287 × 46
2100 F	Compact	ePM1 60% (F7)	858 × 287 × 46
3000 F	Compact	ePM1 60% (F7) × 2	450 × 480 × 96

¹ Depends on the order.

USER MANUAL

8. BEFORE TURNING ON THE UNIT

Before turning on the unit, make sure that:

- The unit is installed in a designated location, all ducts and wires are connected, and sections are tightly interconnected.
- There are no foreign objects, debris or tools inside the unit.
- All air filters are installed.
- Condensate drainage is connected (if necessary) and siphons are filled with water.
- All doors are closed and/or locked and all protective caps are screwed on.



- **Do not operate the unit connected to a temporary power supply as unstable power supply can damage electronic components.**
- **The air handling unit shall not be turned on without installed and connected protective earthing.**

In case of any doubts, contact your installer or “Komfovent” representative to make sure that the unit is operational.

8.1. Quick Inspection

The first time you start your device, make sure that:

Task	Yes	No	Comments
Control panel is working, responds to touch, no error messages			
All air filters are installed			
Air dampers fully open			
There are no unusual noise or vibrations			
Changing the ventilation modes changes the fan speed			
The unit is airtight without gaps or air leakage			
Heating/cooling devices are working			
Connected external devices are working			
The condensate easily flows from the unit and the drainage piping is watertight			
CF heat exchanger calibration performed (only in CF units)			
Other comments:			

Installer

Company

Tel. No.

Date

Signature

9. AIR HANDLING UNIT FUNCTIONS

Operation algorithms and functions of the air handling unit are controlled by an integrated automation system. The air handling unit operates in a user-selected ventilation mode, using additional functions to adjust fan speed and/or power of heaters/coolers. Automation system also continuously monitors various parameters to ensure proper operation of individual protective guards: when these parameters go out of range, error messages are displayed or the unit is stopped.



If the unit is supplied without a factory-installed automation system, the company that installed the automation system shall be responsible for operation of the unit and reliability of protective guards.

9.1. Ventilation modes

The unit operates in one of the available ventilation modes. Air volume for fan and desired air temperature can be set individually for mode. The unit comes with the following preset ventilation modes that may be used immediately after installation or, if required, after altering ventilation settings:

- **COMFORT 1** – maximum ventilation intensity (100%), desired air temperature – 21°C.
- **COMFORT 2** – average ventilation intensity (50%), desired air temperature – 21°C.
- **ECONOMY 1** – low ventilation intensity (33%), desired air temperature – 20°C.
- **ECONOMY 2** – minimum ventilation intensity (20%), desired air temperature – 19°C.
- **SPECIAL** – maximum ventilation intensity (100%), desired air temperature – 21°C. This ventilation mode may also be used to block heating/cooling and other functions.

For information on how to select a ventilation mode and change parameters see Chapter “Control and Settings”.

9.2. Air flow control

Fan speed of AHU is adjusted by the selected air flow control method:

- **CAV** – constant air volume control. Fan speed is adjusted by measuring air flow and comparing it against the set value. Fan rotates at a speed required to reach the set air volume, regardless of pressure changes. For example, when air filters get contaminated, fan speed is automatically increased to ensure the same volume of air as during operation with clean filters. In operating modes the user can set the desired air volume for each fan separately. Air volume is set and measured in m³/h, m³/s or l/s.
- **VAV** – variable air volume control mode. This method allows maintaining constant air pressure in ducts and adjusting fan speed according to pressure changes in the ventilation system. Air pressure in ducts is measured with optional VAV pressure sensors installed in supply and extract air ducts and connected to B6 and B7 terminals of the main controller (see “Installation Manual”). The user sets a desired air pressure value for the supplied air flow. Air pressure is set and measured in Pa. For proper activation of this function please see the “VAV Function Installation Instruction”.
- **DCV** – direct air volume control mode. This mode is very similar to the CAV mode, but additionally allows adjustment of fan speed by connecting 0..10 V control signal to terminals B6 of the main board (see “Installation Manual”). As the control signal voltage changes, fan speed is adjusted accordingly, i.e. 10V corresponds to the set air volume value, whereas, 2V corresponds to 20% of the fan power.



VAV or DCV air flow control method requires additional air duct equipment, therefore, use these functions only after consulting the installer or other qualified professional.

For information on how to select an air flow control method see Chapter “Control and Settings”.

9.3. Temperature control

Temperature in the air handling unit is maintained by measuring the actual temperature and comparing it against the user-defined temperature. Then, depending on whether the supplied air requires heating or cooling, additional heaters/coolers are activated. Available temperature control methods:

- **Supply air temperature control** – the unit supplies air of user-defined temperature.
- **Room temperature control** – the unit automatically selects the temperature of supplied air to ensure that the room temperature is reached and maintained as quickly as possible; room temperature is measured by an optional sensor (0..10 V signal corresponds to the range of 0..50 °C). Room temperature control function will only be available if none of the following functions is activated at the same time: AQC, OOD.

For information on how to select a temperature control method see Chapter “Control and Settings”.

9.4. Air Quality Control (AQC)

Air quality control function is intended for adjusting ventilation intensity according to the indoor air quality. When indoor air quality drops below the user-defined limit, ventilation intensity is gradually increased until the air quality improves. This function requires an air quality sensor installed inside the extraction air duct or inside the room (see “Installation Manual”).

Air quality may be controlled by one of the following sensors (type of the sensor is selected during ordering or set in the control panel menu item “Settings”):

- Carbon dioxide CO₂.
- Air quality VOC_q, where maximum signal corresponds to good air quality.
- Air quality VOC_p, where minimum signal corresponds to good air quality.
- Relative humidity RH.
- Temperature TMP.

AQC function is blocked if any of the following functions are activated at the same time: SNC, MTC, OCV.

For information on how to activate this function and set a maintained air quality value see Chapter “Control and Settings”.

9.5. Outdoor compensated ventilation (OCV)

This function adjusts ventilation intensity according to the outdoor temperature. This saves the energy needed for air heating or cooling. The user sets four outdoor temperatures (two for winter and two for summer) for this function to operate. As long as the outdoor temperature is outside the summer or winter temperature limits, the unit keeps running in a currently activated ventilation mode. Ventilation intensity is reduced proportionally to the rising (summer temperature range) or decreasing (winter temperature range) outdoor temperature.

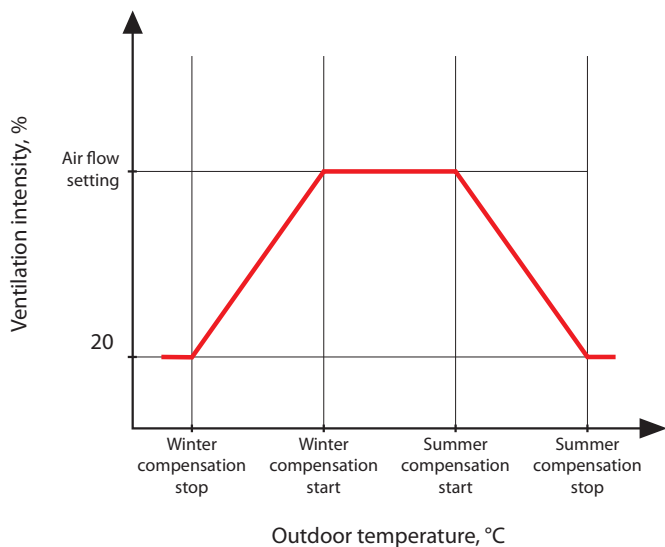


Fig. 20. OCV function operation

OCV function has priority over AQC function.

For information on how to activate this function and set temperature ranges see Chapter “Control and Settings”.

9.6. Minimum temperature control function (MTC)

Minimum temperature control function forcibly reduces the user-defined ventilation intensity when the set minimum temperature cannot be reached. Fan speed is gradually reduced when the outdoor temperature drops below + 5 ° and the power of the heater is insufficient to reach the minimum temperature. If this function runs for a long time, ventilation intensity is reduced to 20%.

During summer, the minimum temperature control function limits power of coolers when, in case of cooling demand, supplied air temperature is below the minimum set temperature value.

For information on how to activate this function and set a minimum temperature value see Chapter "Control and Settings".

9.7. Operation on demand (OOD)

This function turns on the AHU as soon as the indoor air quality decreases. In this way, the air handling unit will only run when ventilation is required and will remain stopped when the air quality is good. As the air quality decreases and reaches the user-defined critical limit, the air handling unit starts and runs in the last activated operating mode. If the air quality improves within 30 minutes (pollution drops 10% below the critical limit), the unit stops. If the air quality remains poor, the unit keeps operating.

This function requires an additional air quality sensor installed inside the room (see "Installation Manual"). The same sensor is also used for AQC function.

Sensor type is selected during ordering. Later, the sensor type may be changed in the control panel menu "Settings".

For information on how to activate this function and set a critical air quality value see Chapter "Control and Settings".

9.8. Override (OVR)

Override function is activated by closing designated contacts in the controller board, i.e. by connecting a switch, cooker hood or a motion sensor (see "Installation Manual"). This function ignores current ventilation mode and switches to the pre-selected mode or stops it. In the function setup screen the user can select any ventilation mode, weekly operation schedule or turning off of the unit. Additionally, the user may also specify conditions when the override function should run:

- All the time – function is activated any time by closing contacts, regardless of whether the unit is operating or stopped.
- When running – function is activated by closing contacts when the unit is operating. When the unit is stopped with a control panel or by a weekly schedule, the function cannot be activated by closing contacts.
- When stopped – function is activated by closing contacts when the unit is stopped. If the unit is already running in any ventilation mode, the function cannot be activated by closing contacts.

This function runs as long as contacts are closed. When the contacts are open, the unit returns to the previous ventilation mode or stops, if it was stopped before activating the function.

9.9. Summer night cooling function (SNC)¹

Summer night cooling function uses the night's cool air to ventilate the premises during summer. This function removes excess heat accumulated during the day and fills the building with cooler outdoor air.

Function runs at night (from 00:00 a.m. to 06:00 a.m.) when the outdoor air is cooler than the indoor air and the indoor temperature is higher than the user-defined limit (i.e. ventilation is required). When this function is activated, the ventilation intensity is increased to the maximum and the outdoor air is supplied to the premises (all cooling devices are switched off, heat exchanger is stopped). The user may also set the room temperature at which the function will be stopped.

Summer night cooling function has priority over ACV and AQC functions.

For information on how to activate this function and set ON/OFF temperatures see Chapter "Control and Settings".

9.10. Protective functions

The air handling unit is equipped with several protective functions that affect the operation of the unit. The operator is not allowed to change these settings values. These functions protect the unit and its components against damage as well as provide protection for the building and people when the ventilation system is exposed to dangerous circumstances.

External fire alarm function stops the air handling unit as soon as a signal from the building's fire alarm system or smoke detectors is received. This immediately stops ventilation and fresh air from entering fire zones to prevent fire from spreading. Fire alarm message is displayed on a control panel or other device used for controlling the air handling unit. In case of false fire alarm, for example, due to fire protection system inspections, the air handling unit will need to be restarted after turning off the signal and clearing the fire alarm message. If such tests are run periodically, authorized service person may program the air handling unit to start in the previous mode after turning off the fire alarm.

Connection of the building's fire protection system signal is described in the "Installation Manual".

Internal fire alarm function stops the air handling unit when air temperature increase is detected inside the unit. This can happen, for example, when hot smoke enters the duct system from fire zones both inside and outside the building. This function prevents smoke from spreading inside the premises and warns about a potential fire hazard if the building's fire protection system has not yet responded. If the air handling unit is intended for operation in high temperature premises (for example, in drying chambers, bakeries, etc.), this function may be disabled. This can be done by authorized service person.

Electric heater overheat protection consists of several different control algorithms. Integrated thermostats disconnect electric heater's power supply if its temperature reaches a critical limit (e.g., in case of heater's control electronics failure). Every electric heater has 2 thermostats:

- Automatic thermostat 70°C which prevents heating tubes from overheating when the heater is running at high power and low airflow speed. Protection is restored as soon as the heater cools down and thermostat temperature drops. Heater operation is restored automatically.
- Manual reset thermostat 100°C. This thermostat, in case of overheating, completely disconnects the heater's power supply to protect control electronics and adjacent plastic components. Protection may be reset by pressing the RESET button inside the unit (see Chapter "Troubleshooting").

¹ Is shown only if a room temperature sensor is connected (to be purchased separately).



Eliminate the cause of overheating before restoring the manual reset thermostat of 100°C.

Fan cooling of heating/cooling devices. If the air handling unit is stopped while electric heater or direct evaporation (DX) unit is still running, fan cooling is initiated. Fans run at fixed speed until heater tubes cool down or DX unit's refrigerant pressures stabilize. Blowing time depends on the accumulated heat/cold and ventilation intensity and can take up to 15 minutes.

Water heater frost protection function measures water temperature returning from the heater coil. At low outdoor temperatures, when there's a risk of water freezing, a 3-way water mixing valve is opened and hot water pump is started to prevent temperature of water inside the heater from dropping. If temperature of water returning from the heater coil still falls below the critical limit, the unit is stopped and outdoor air dampers are closed to prevent cold air from entering the unit.



When operating air handling unit in the temperatures lower than 0 °C, it is necessary to use water-glycol mixture as a heat carrier or to maintain a return water temperature of at least 25 °C.

Water flow sensor may also be used as an additional frost protection (see Chapter "Water Flow Monitoring Function").

10. OPTIONAL FUNCTIONS

10.1. Humidity control function (HUM)

Humidity control function is intended for maintaining the user-defined air humidity level. This function controls air humidifiers or dehumidifiers according to the user-defined humidity level and also can perform dehumidification using integrated heating/cooling devices. This function requires one or two humidity sensors connected to the C5 controller board (see "Installation Manual").

This function can be used to maintain:

- **Supply air humidity level** – when a duct-mounted supply air humidity sensor is used.
- **Indoor humidity level** – when two humidity sensors are used. Indoor air (or extract air) sensor measures the desired humidity level in the premises, whereas the supplied air humidity is limited according to the readings of a duct-mounted humidity sensor.

Settings for humidity control function and humidifier/dehumidifier control type is selected during ordering of the air handling unit. Later, these settings may only be changed by a service representative. Humidity control function has priority over AQC function. For information on how set a desired humidity value see Chapter "Control and Settings".

10.2. Additional zone control (ZN)

This function allows controlling up to three different temperature zones with one air handling unit. Temperature of the main zone is maintained by integrated heaters/coolers. Temperature in other zones is maintained by connected additional zone modules¹, which are used to control duct-mounted heating/cooling devices. Every additional temperature zone will also have a separate temperature sensor and a separate setting for the desired temperature that the user will be able to set with the control panel.

An additional zone module may also control heaters/coolers installed in the same supply air flow, when more heating/cooling power stages are required or a pre-heater is connected upstream the air handling unit.

For more information about this function and connection of heating/cooling devices see "Additional zone control C5" Instruction Manual.

For information on how to activate this function and set a desired temperature value see Chapter "Control and Settings".

10.3. Combined water heater/cooler

It is possible to use only one water heater and one piping unit (mixing valve, valve actuator, circulation pump) both for heating and cooling. For the function to work properly, an additional external signal (e.g., from a thermostat) is required to switch between heating and cooling modes (see "Installation Manual").

This feature is pre-ordered and configured at the factory. Later, settings of this function may only be changed by a service representative.

10.4. Control of direct evaporation (DX) devices

When the unit is ordered with an additional direct evaporation (DX) coil, a feature for controlling an external DX unit is enabled. There are several different ways to control the DX unit:

- Modulated control – DX device is controlled by 0..10 V signal.
- Stepping control – START/STOP type DX devices are used.

This feature is pre-ordered and configured at the factory. Later, settings of this function may only be changed by a service representative.

10.5. Water flow monitoring function

Water flow monitoring function is intended for additional protection of a water heater coil. Flow sensor monitors water flow and emits a signal as soon as it slows down to a critical limit or stops completely. Then the air handling unit is stopped and the control panel displays an error message.

Water flow can decrease for a variety of reasons, for example, faulty water pump or jammed valve; decreased water flow is extremely dangerous at low outdoor temperatures as water could freeze and damage the heat exchanger. If this function is ordered in advance, the air handling unit is equipped with a water flow sensor and a 3-way valve for installation thereof. For more information please see the "Water Flow Monitoring Function Manual".

¹ Sold separately.

10.6. External pressure manometers for monitoring filter contamination

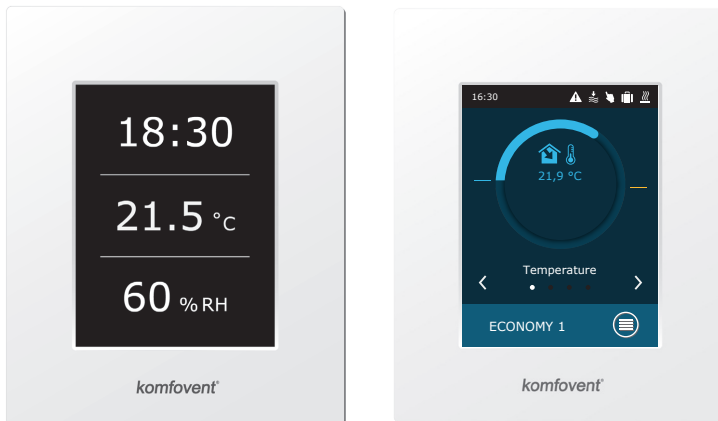
Additional manometers can be ordered for monitoring filter contamination. These gauges will show filter pressure changes in real-time. Manometers are ordered in advance with the unit and installed in the factory. Manometers are mounted outside the unit at outdoor air filters.

11. CONTROL AND SETTINGS. CONTROL PANEL C5.1¹

Air handling unit may be conveniently controlled via the following ways:

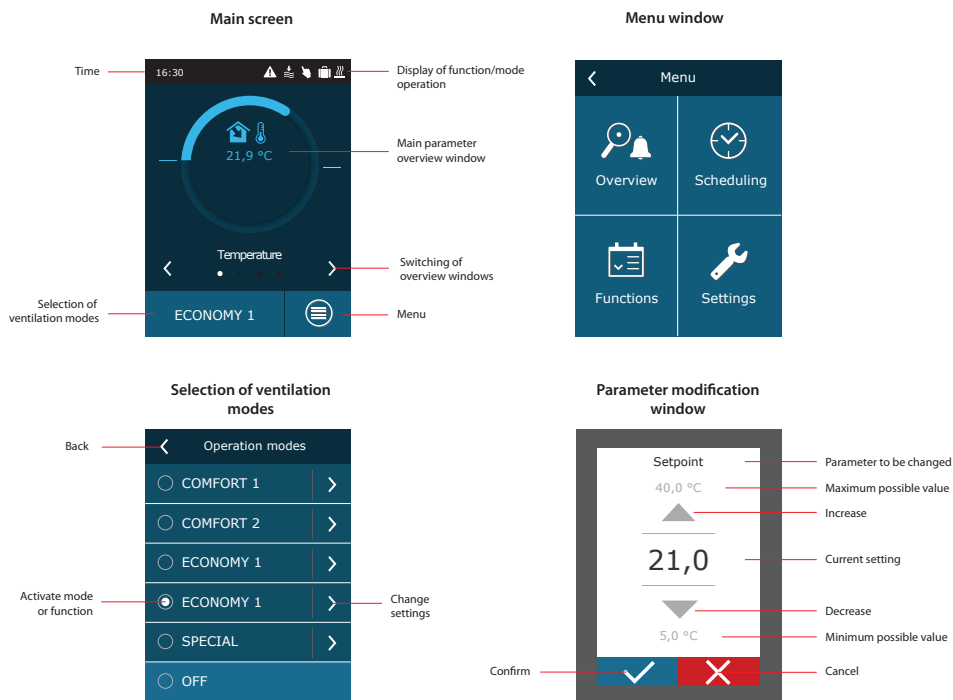
- Control panel.
- Mobile app.
- Web browser.

C5.1 panel has a colour touchscreen. If the unit is connected to the mains, the control panel will display the home screen or screen saver that you can switch off with a single tap.



¹ Sold separately.

This control panel is designed for indication and changing of various functions and settings of the unit. Touch-sensitive display reacts to soft taps, therefore, do not use any sharp tools (screwdrivers or pens), also do not apply excessive force as it may damage the display.



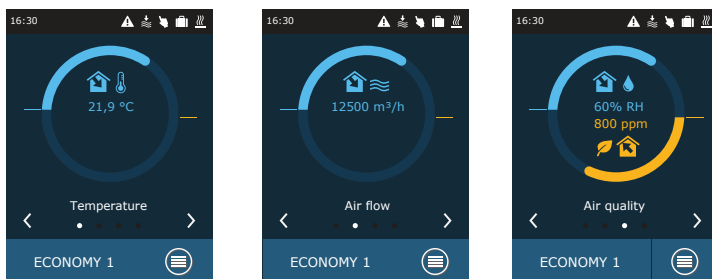
Explanation of the displayed symbols

	Supply air temperature
	Supply air volume
	Supply air humidity
	Fan operation
	Air flow increasing by activated function (see chapter Functions)
	Air flow decreasing by activated function (see chapter Functions)
	Air heater operation

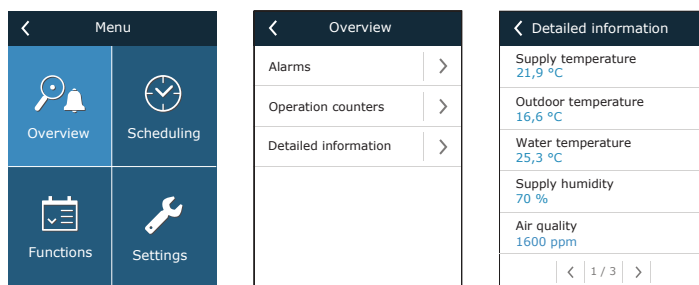
	Air cooler operation
	Air humidifier operation
	Summer night cooling mode
	Weekly operation mode
	Holiday operation mode
	„Override“ mode
	Alarm signal

11.1. Parameter overview

The following parameters are displayed in the main window and parameter overview windows: air flow, temperatures, air quality sensor data and energy recovery. Use arrows on the sides of the main screen to browse across parameter windows.



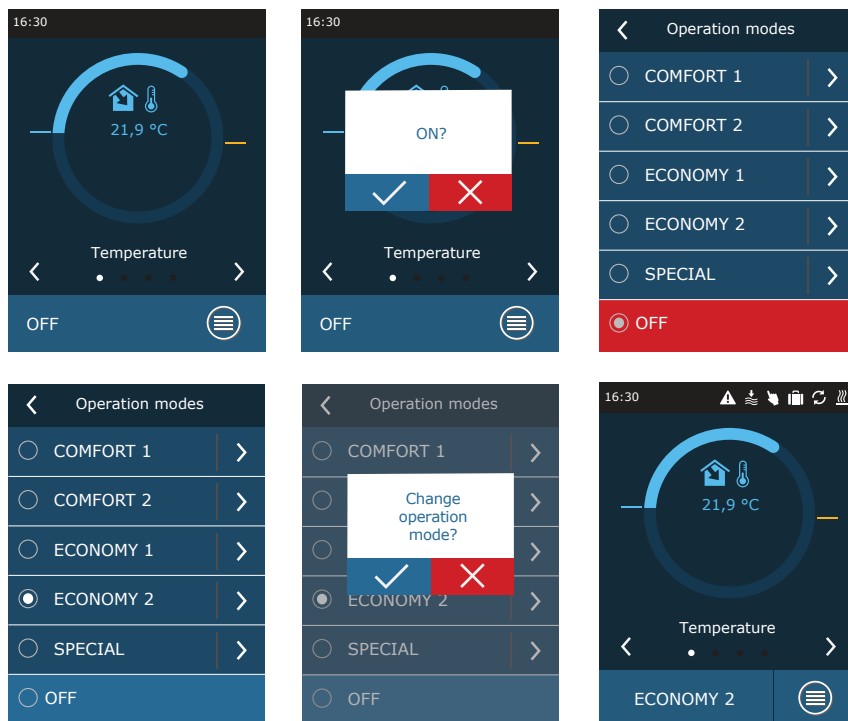
For more parameters see “Detailed information” screen (Menu → Overview → Detailed information).



11.2. Turning on and selection of ventilation modes

To start an air handling unit or to change a ventilation mode:

1. Press the ventilation mode selection button.
2. Confirm the message if you want to run the device in the previous mode (if the unit is stopped).
3. Cancel the message if you want to select another operating mode or you do not remember which mode was activated previously.
4. Select a desired ventilation mode.
5. Press the return key and confirm the message that appears.

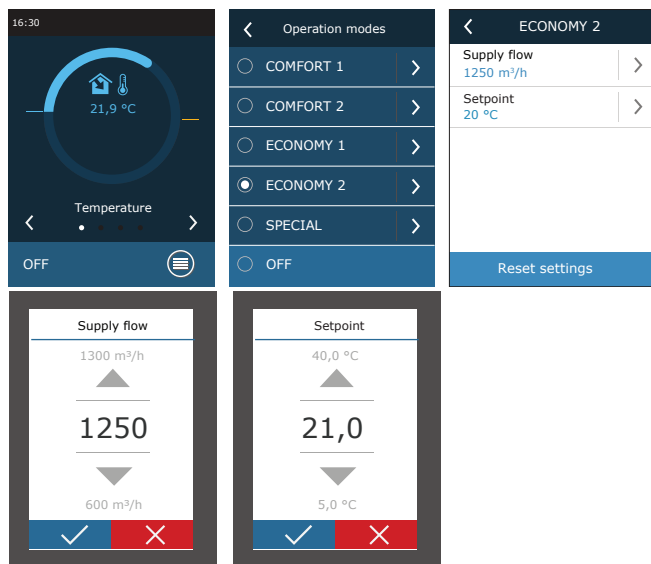


During the first minute of starting the unit, the unit automation checks the settings, automation components and opens air dampers. Later, a signal is released to the fans and the unit starts operating at a selected ventilation mode.

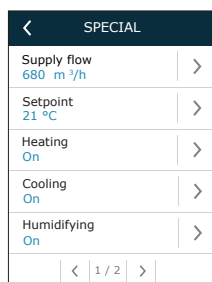
11.3. Setting parameters of ventilation modes

To change the ventilation mode settings:

1. Press the ventilation mode selection button.
2. Press "Change settings" symbol next to the parameter to be changed.
3. Press a parameter you want to change.
4. Use the arrows to select a desired value and press to confirm.
5. Press the return icon at the top of the screen to return to the home screen.

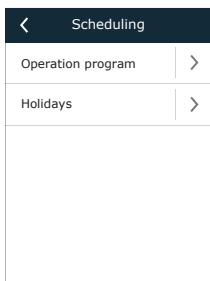


SPECIAL ventilation mode may also be used to disable heating/cooling and other functions. This saves energy when temperature and other ventilation parameters are less important (for example, at night, when the building is empty, when cooling devices can be turned off and will not be activated even when temperature exceeds the desired temperature during the day).



11.4. Scheduling window and ventilation schedule settings

In menu item “Scheduling” you can create your own ventilation schedules so that the ventilation intensity or temperature settings change automatically.



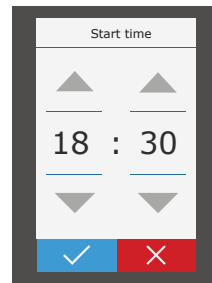
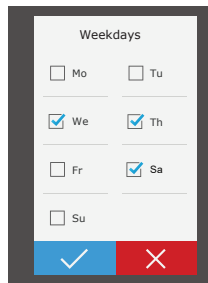
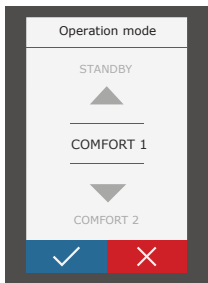
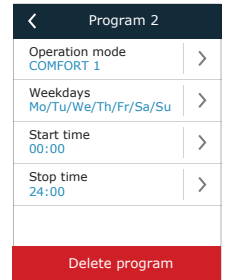
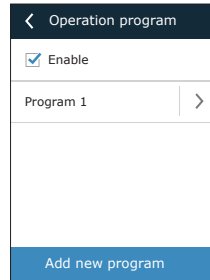
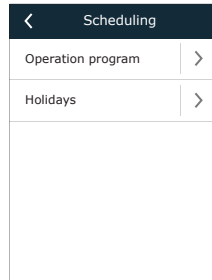
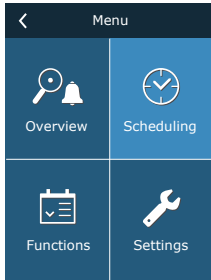
- **Operation program**

You can set up to twenty operating programs. You can assign a desired operating mode, day of the week and time interval for every program.

To create a weekly ventilation schedule:

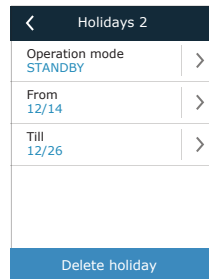
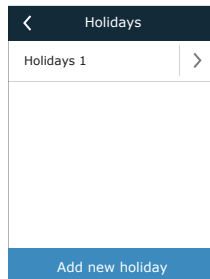
1. Press “Scheduling” key in the menu window.
2. Press “Operation program”.
3. Press “Add new program” key at the bottom.
4. Select a desired ventilation mode. If you don’t want your unit to run at a specified time, select standby mode¹.
5. Select days of the week for the program to run.
6. Set the start and end time for the program.
7. Add additional programs, if needed (up to 20 programs).
8. Once the schedule is created, activate it by checking “Enable” box and returning to the main window.

¹ Standby mode is optional. The device will only operate at a set time. The unit will automatically stop during unspecified periods.



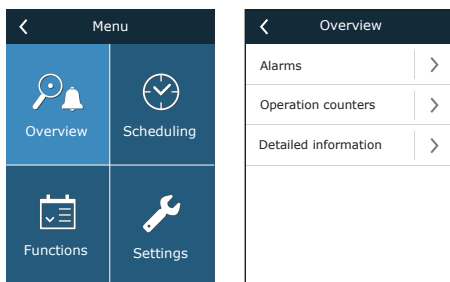
• Holidays

Here you can select a holiday program, set dates for the unit to run in a selected mode or to be stopped (e.g., stopping the air handling unit in the office during Christmas holidays).



11.5. Overview window

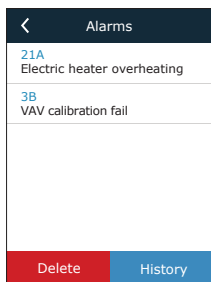
“Overview” screen shows information about the status of the air handling unit and its devices.



- **Alarms**

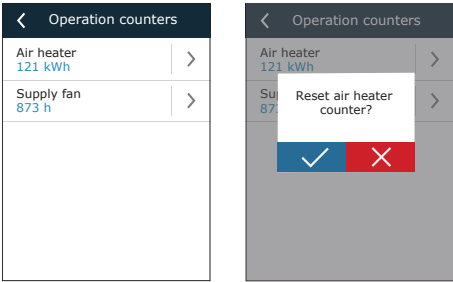
This menu item displays relevant messages with identification codes. “A” at the end of the code means that the error is critical and the unit will be stopped until the fault is rectified. “B” at the end of the code means that the message is informational and the unit will keep running. Once the cause is resolved, delete relevant errors and messages by pressing “Reset”. For more information see Chapter 8. “Troubleshooting”.

Press “History” button to show the last 50 messages along with the date and time they were displayed.



- Operation counters**

These meters show operating time of individual devices, amount of energy returned and consumed. To reset a meter, press an arrow next to a desired parameter.



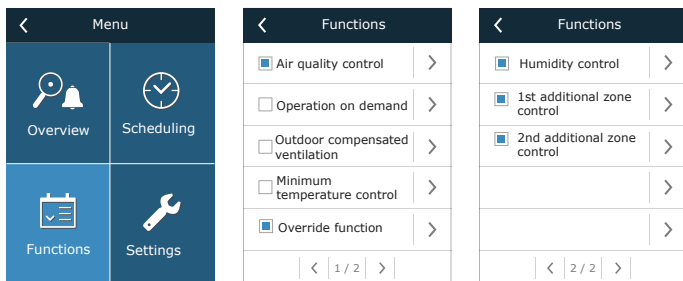
- Detailed information**

This menu item displays readings of all sensors installed in the unit as well as information on operation of individual devices of the AHU and other detailed data.

< Detailed information
Supply temperature 21,9 °C
Outdoor temperature 16,6 °C
Water temperature 25,3 °C
Supply humidity 70 %
Air quality 1600 ppm
< 1 / 3 >

11.6. Functions

In menu item “Functions” you can activate or alter all functions of the unit. Press the function name or an arrow to display the function settings.



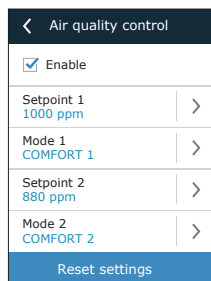
Function status is indicated in a box next to the function name:

- ☐ Blank box: function is disabled.
- ☒ Blue box: function is working.
- ☐ Grey box: function is activated but not working.

In the settings of each function you can activate the function and alter operating conditions.

- **Air quality control (AQC)**

Selecting an air quality limit up to which the air handling unit will run during the activated mode and above which the ventilation intensity will be automatically increased. Air quality limit is set for two different ventilation modes during which the function will be used and the desired value will change automatically as the mode changes. If the unit operates in a different ventilation mode than the one set, air quality control function will be disabled automatically.



• **Operation on demand (OOD)**

Setting a critical air quality sensor value. The unit starts as soon as this value is exceeded.

< Operation on demand

☒ Enable

Setpoint

1000 ppm

>

Reset settings

• **Outdoor compensated ventilation (OCV)**

Setting winter and summer outdoor temperature limits for reducing ventilation intensity. When the outdoor temperature is within the range of “Winter compensation start” and “Summer compensation start”, the unit operates in a selected ventilation mode and when outdoor temperature is out of range, fan speed is decreased to “Minimum airflow”.

< Outdoor compensated...

☒ Enable

Minimum airflow

20 %

>

Winter stop

-15 °C

>

Winter start

5 °C

>

Summer start

25 °C

>

<

1 / 2

>

Reset settings

< Outdoor compensated...

Summer stop

35 °C

>

<

2 / 2

>

Reset settings

• **Minimum temperature control (MTC)**

Setting a minimum desired supply air temperature.

< Minimum temperature ...

☒ Enable

Setpoint

15 °C

>

Reset settings

• **Override function (OVR)**

Selecting conditions for activating the function (all the time, only when the unit is running, only when the unit is stopped) and specifying ventilation mode for the unit to run when the function starts. If the "Standby" ventilation mode is selected, the unit will be stopped.

< Override function	
<input checked="" type="checkbox"/> Enable	
Override If on	>
Operation modes ECONOMY 1	>
Reset settings	

• **Humidity control (HUM)**

Setting a desired relative or absolute humidity level. Humidity level is set for two different ventilation modes during which this function will be used and the desired value will change automatically as the mode changes. If the unit operates in a different ventilation mode than the one set, humidity control function is disabled automatically.

< Humidity control		< Humidity control	
<input checked="" type="checkbox"/> Enable		<input checked="" type="checkbox"/> Enable	
Setpoint 1 55% RH	>	Setpoint 1 10 g/m ³	>
Mode 1 COMFORT 1	>	Mode 1 COMFORT 1	>
Setpoint 2 30% RH	>	Setpoint 2 8 g/m ³	>
Mode 2 ECONOMY 2	>	Mode 2 ECONOMY 2	>
Reset settings		Reset settings	

• **Additional zone control (ZN)¹**

In this window you can set a desired supply air temperature for an individual ventilation zone.

¹ This function only runs when optional additional zone modules are connected.

• **Summer night cooling (SNC)¹**

Setting two indoor temperatures for the function to start running and stop.

< 1st additional zone c...

☒ Enable

Setpoint
22.0 °C

>

Reset settings

< Summer night cooling

☒ Enable

Start when indoor
25 °C

>

Stop when indoor
20 °C

>

Reset settings

• **Water heater/cooler**

It is possible to block the water heaters and coolers by removing the check mark next to the related setting. In this case, water heaters and coolers will not be used either for the desired temperature or in any functions (for example during dehumidification). However, the water heater's freeze protection will work all the time, and if the water temperature drops below the critical limit, AHU will be stopped.

< Functions

☒ Override function

>

☐ Humidity control

>

☒ 1st additional zone control

>

☒ 2st additional zone control

>

☒ Water heater/cooler

>

< | 2 / 2 | >

< Water heater ...

☒ Water heater

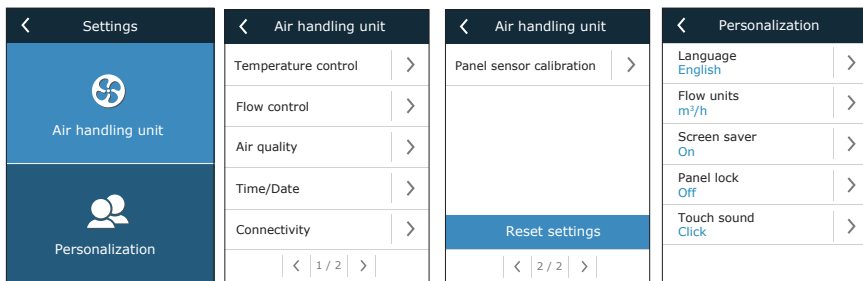
☒ Water cooler

Reset settings

¹ Is shown only if a room temperature sensor is connected (to be purchased separately).

11.7. Settings

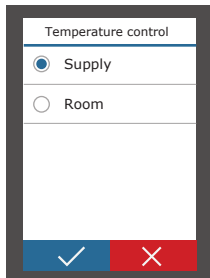
All settings are divided into two groups, covering the main settings of the air handling unit and the user interface.



11.7.1. Air handling unit

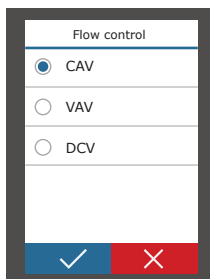
- Temperature control**

The user can select a desired temperature control method (see Chapter “Temperature Control”). The user-set temperature will be maintained during ventilation modes according to the selected control method.



- Flow control**

The user can select a desired air flow control method (see Chapter “Air Flow Control”).



- Air quality**

Selected air quality sensor type is used in AQC, OOD functions.

Sensor type	
<input checked="" type="radio"/>	CO2
<input type="radio"/>	VOCq
<input type="radio"/>	VOCp
<input type="radio"/>	RH
<input type="radio"/>	TMP

✓
✗

- Time/data**

Time and date settings are used for ventilation by weekly or holiday schedules.

< Time/Date	
Time 09:40	>
Day/Month 25/05	>
Year 2019	>
Daylight saving time On	>

< Daylight saving time	
<input checked="" type="checkbox"/> Enable	

- Connectivity**

Parameters for connecting the air handling unit to a computer network, the Internet or a building management system.

< Connectivity	
Controller ID Default	>
IP 192.168.0.50	>
IP mask 255.255.0.0	>
Modbus ID 1	>
RS-485 19200	>

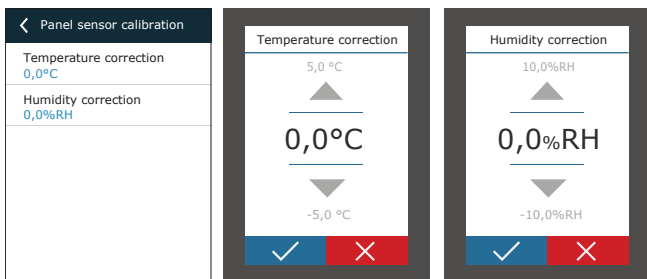
<
1 / 2
>

< Connectivity	
BaCnet port 47808	>
BaCnet ID 0000166	>

<
2 / 2
>

- **Panel sensor calibration**

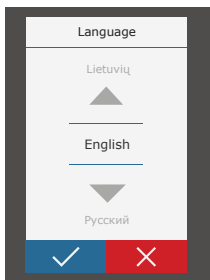
If the temperature and/or relative humidity measured by internal control panel sensors do not match the parameters measured by other devices, the accuracy of the sensors can be adjusted in this menu. The measured temperature may be adjusted within $\pm 5\text{ }^{\circ}\text{C}$ and the humidity within $\pm 10\%$ range.



11.7.2. Customization

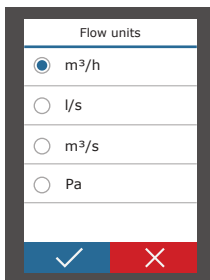
- **Language**

Selecting language of the user interface.



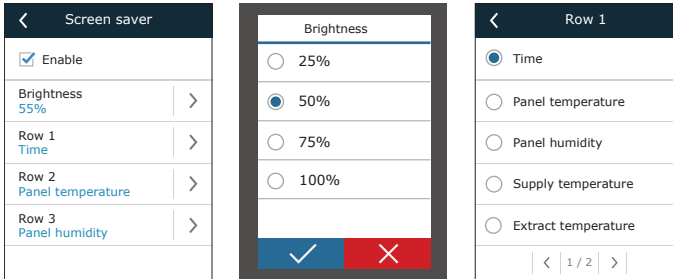
- **Flow units**

Selecting measurement units for air flow measurement. "Pa" can only be selected if the VAV flow control type is enabled.



- **Screen saver**

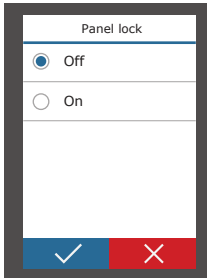
Screen saver is activated after 1 minute of inactivity on the control panel. In this menu the user can enable/disable a screen saver and select parameters to be displayed on screen.



- **Panel lock**

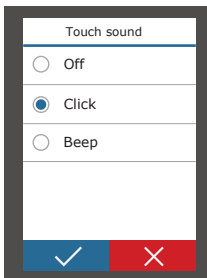
The panel can be locked using a four-digit code. To activate a panel lock, enter your PIN code and press Confirm. When the lock is activated, the panel will lock every time a screen saver appears. You will need to enter the same code again to access the main window or other settings. You must enter a correct PIN code to use the panel. To deactivate the panel lock, enter the same PIN code again in the setup menu.

If you forget your PIN code, you can unlock the panel by connecting to the air handling unit with a computer and resetting factory settings (see Chapter “Control and settings. Computer”).



- **Touch sounds**

You can turn on/off touch sounds. Two types of touch sounds are available.



12. CONTROL AND SETTINGS. COMPUTER

The unit may be controlled via computer using a web browser. For information on how to connect the unit to an internal network or directly to a computer, see the "Installation Manual".

Enter the device IP address in your web browser (IP address is displayed on the control panel) (see Settings → Air handling unit → Connectivity):



Connect to the user interface: enter the user name **user**, password **user**¹ and press "Login".

 A login form with three input fields: "Username:" containing "user", "Password:" containing masked dots, and a "Login" button.

If the login is successful, the overview window is displayed. The overview window contains a simplified diagram² and information about operation of the unit. You can also turn your AHU on/off in this window.

 A screenshot of the AHU overview window. On the left is a sidebar menu with "Overview" selected. The main area shows a simplified functional diagram of the AHU with various sensors and actuators. Below the diagram is a control panel with an "On/Off" button and status indicators for "Operation mode", "Active functions", and "Alarm status".

Setting windows

Simplified functional diagram of the unit

ON/OFF button

Current status of the unit

Currently running functions

Status of messages and errors

12.1. Modes

In this menu item, the user can alter the ventilation mode, flow and temperature control settings. Press the "Save" button for the changes to take effect.

 A screenshot of the "Modes" menu. It lists three options: "► OPERATION MODES", "► FLOW CONTROL MODE", and "► TEMPERATURE CONTROL MODE". Below these is a "Save" button.

¹ If You forgot a changed password, it can be reset to the initial "user" from the control panel (Settings→Air handling unit→Reset settings).

² Displayed unit diagram depends on the unit type and ordered components.

12.1.1. Operation modes

In this menu item the user can select one of the five ventilation modes for the unit (see Chapter 2.1 “Ventilation Modes”). Selecting the “Program” mode:

▼ OPERATION MODES

Mode selection

Comfort1

▼

Comfort2

Economy1

Economy2

Special

Program

You can select air volume (for supplied and extracted air separately) and desired temperature for each ventilation mode. Air volume is set in the units specified in the user interface settings.

Comfort1

Supply flow

600

m³/h

Setpoint

21.0

°C

“Special” ventilation mode may also be used to block heating/cooling signals and disable humidification functions. To disable a function, uncheck a box next to the setting.

Special

Supply flow

1200

m³/h

Setpoint

21.0

°C

Heating

☒

Cooling

☒

Recirculation

☒

Humidifying

☒

12.1.2. Flow control modes

Selecting an air flow control method for controlling fan speed (see Chapter 2.2 “Air Flow Control”).

▼ FLOW CONTROL MODE

Mode

CAV

▼

VAV

DCV

12.1.3. Temperature control modes

Selecting a temperature control method for controlling heating/cooling devices (see Chapter 2.3 "Temperature Control").

▼ TEMPERATURE CONTROL MODE

Mode	Supply	▼
	Room	

12.2. Functions

Here you can enable/disable ventilation functions and change their settings.

12.2.1. Air quality control (AQC)

Selecting air quality limit up to which the air handling unit will operate in a selected mode and above which the ventilation intensity will be automatically increased. Air quality limit is set for two different ventilation modes during which the function will be used and the desired value will change automatically as the mode changes. If the unit operates in a different ventilation mode than the one set, air quality control function will be disabled automatically.

▼ AIR QUALITY CONTROL (AQC)

Enable	<input checked="" type="checkbox"/>
Setpoint 1	800 ppm
Mode 1	Economy1 ▼
Setpoint 2	1200 ppm
Mode 2	Comfort1 ▼

12.2.2. Outdoor compensated ventilation (OCV)

Setting winter and summer outdoor temperature limits for reducing ventilation intensity. When the outdoor temperature is within the range of “Winter compensation start” and “Summer compensation start”, the unit operates in a selected ventilation mode and when outdoor temperature is out of range, fan speed is decreased to “Minimum airflow”.

▼ OUTDOOR COMPENSATED VENTILATION (OCV)

Enable	<input checked="" type="checkbox"/>	
Minimum airflow	20	%
Winter compensation stop	-40.0	°C
Winter compensation start	0.0	°C
Summer compensation start	20.0	°C
Summer compensation stop	50.0	°C

12.2.3. Minimum temperature control (MTC)

Setting a minimum desired supply air temperature.

▼ MIN. TEMPERATURE CONTROL (MTC)

Enable	<input checked="" type="checkbox"/>	
Setpoint	18.0	°C

12.2.4. Override function (OVR)

Selecting conditions for activating the function (all the time, only when the unit is running, only when the unit is stopped) and specifying ventilation mode for the unit to run when the function starts. If the “Standby” ventilation mode is selected, the unit will be stopped.

▼ OVERRIDE FUNCTION (OVR)

Enable	<input checked="" type="checkbox"/>	
Override	All time	▼
Mode	Comfort2	▼

12.2.5. Operation on demand (OOD)

Setting a critical air quality sensor value. The unit starts as soon as this value is exceeded.

▼ OPERATION ON DEMAND (OOD)	
Enable	<input checked="" type="checkbox"/>
Setpoint	800 ppm

12.2.6. Humidity control (HUM)¹

Setting a desired relative or absolute humidity level. Humidity level is set for two different ventilation modes during which this function will be used and the desired value will change automatically as the mode changes. If the unit operates in a different ventilation mode than the one set, humidity control function is disabled automatically.

▼ HUMIDITY CONTROL (HUM)	
Enable	<input checked="" type="checkbox"/>
Setpoint 1	50 %RH
Mode 1	Comfort1 ▾
Setpoint 2	60 %RH
Mode 2	Comfort2 ▾

▼ HUMIDITY CONTROL (HUM)	
Enable	<input checked="" type="checkbox"/>
Setpoint 1	10 g/m ³
Mode 1	Comfort1 ▾
Setpoint 2	8 g/m ³
Mode 2	Comfort2 ▾

¹ Displayed only when this function is pre-ordered.

12.2.7. Additional zone control (ZN)¹

Setting a desired supply air temperature for an individual ventilation zone. You can also monitor temperature of air supplied to the additional zone as well as the heating/cooling signals.

▼ 1ST ADDITIONAL ZONE CONTROL (ZN1)

Enable	<input checked="" type="checkbox"/>
Setpoint	21.0 °C
Supply temperature	0.0 °C
Heating	0.0 %
Cooling	0.0 %

12.2.8. Summer night cooling (SNC)²

Setting two indoor temperatures for the function to start running and stop.

▼ SUMMER NIGHT COOLING (SNC)

Enable	<input checked="" type="checkbox"/>
Start when indoor	25.0 °C
Stop when indoor	25.0 °C

12.2.9. Water heater/cooler

It is possible to block the water heaters and coolers by removing the check mark next to the related setting. In this case, water heaters and coolers will not be used either for the desired temperature or in any functions (for example during dehumidification). However, the water heater's freeze protection will work all the time, and if the water temperature drops below the critical limit, AHU will be stopped.

▼ WATER HEATER/COOLER

Water heater	<input checked="" type="checkbox"/>
Water cooler	<input checked="" type="checkbox"/>

¹ This function only works when optional additional zone modules are connected.

² Is shown only if a room temperature sensor is connected (to be purchased separately).

12.3. Alarms/Status

This menu item shows information about the air handling unit and its assemblies.

- ▶ ACTUAL ALARMS
- ▶ ALARM HISTORY
- ▶ OPERATION COUNTERS
- ▶ VAV STATUS
- ▶ CONTROLLER STATUS

12.3.1. Actual alarms

This menu item displays relevant messages with identification codes. "A" at the end of the code means that the error is critical and the unit will be stopped until the fault is rectified. "B" at the end of the code means that the message is informational and the unit will keep running. Once the cause is resolved, delete relevant errors and messages by pressing "Reset". For more information see Chapter 8. "Troubleshooting".

▼ ACTUAL ALARMS

21A: Electric heater overheat
3B: VAV calibration fail
Reset

12.3.2. Alarm history

Displays the last 50 messages and errors, along with the date and time they occurred.

▼ ALARM HISTORY

27-03-2019	10:10:09	4B: Change outdoor air filter
26-03-2019	16:25:07	1B: Low supply air flow

12.3.3. Operation counters

Depending on the configuration of the unit, operating meters display operating time of various units and the amount of energy returned by the heat exchanger.

▼ OPERATION COUNTERS

Air heater operation	151 h	Reset
Supply fan operation	366 h	Reset

12.3.4. VAV status

This window is intended for VAV mode calibration. Calibration must be performed by a qualified specialist in accordance with a separate “VAV Function Installation Instruction”.

▼ VAV STATUS

VAV mode	
VAV calibration	<div>Run</div>

12.3.5. Controller status

Overview of the controller and control panel software versions.

▼ CONTROLLER STATUS

Main module firmware	v2.340
1st zone module firmware	v1.200
Control panel firmware	v2.223
Log	<div>Download</div>

For detailed performance analysis, you may download a device logbook (Log) which contains weekly operation data. To open a logbook you will need a “Log plotter” app that you can download on the “Komfovent” website. This data can be useful in the event of a failure and may facilitate repair procedures, therefore, we recommend downloading an operation logbook and handing it over to the authorised service personnel.

12.4. Scheduling

In this menu the user can set weekly and holiday schedules.

► OPERATION PROGRAM
► HOLIDAYS

Save

12.4.1. Operation program

You can set up to twenty operating programs. You can assign a desired operating mode, day of the week and time interval for every program. When the "Program" mode is selected in the ventilation mode setup screen, the air handling unit will only operate at a specified time. There is no need to set periods for stopping the unit.

▼ OPERATION PROGRAM

Mo	Tu	We	Th	Fr	Sa	Su	Start		Stop		Mode
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	06	: 00	08	: 00	Comfort1 ▾
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	08	: 00	17	: 00	Economy2 ▾
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17	: 00	24	: 00	Special ▾
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	00	: 00	24	: 00	Comfort2 ▾

12.4.2. Holidays

Here you can select a holiday program, to set dates for the unit to run in a selected mode or to be stopped (e.g., stopping the air handling unit in the office every year during Christmas holidays).

▼ HOLIDAYS

Day - Month - Year					Day - Month - Year					Mode		
24	-	12	-	2019	-	10	-	01	-	2020	Special	▼
												Standby
												Comfort1
												Comfort2
												Economy1
												Economy2
												Program

12.5. Settings

Settings menu is intended for user interface configuration. Here you can set the time, language, measurement units, computer network settings, or change the login password.

▶ DATE/TIME

▶ CONNECTIVITY

▶ USER INTERFACE

▶ LOGIN PASSWORD

▶ SETTINGS RESET

Save

12.5.1. Date/time

In this menu item the used can set the time and date of the unit, used for various functions and operation by a weekly schedule. When the “Daylight Saving Time” function is enabled, the clock will automatically switch between summer time and winter time in spring and autumn.

▼ DATE/TIME

Day - Month - Year	28	-	06	-	2020
Time	07	:	49		
Daylight saving time	<input checked="" type="checkbox"/>				

12.5.2. Connectivity

Setting IP address, Modbus and BACnet or computer network parameters.

▼ CONNECTIVITY

IP	192	.	168	.	0	.	50
IP mask	255	.	255	.	0	.	0
Modbus ID	1						
RS-485	19200 baud		▼	8E1		▼	
Modbus ID	47808						
Modbus ID	166						

12.5.3. User interface

Here you can select the user interface language (the same language will be used on the control panel), air flow measurement units and the device name that will be displayed in the web browser. If one computer is used to control several air handling units, we recommend naming every unit differently. This will facilitate distinguishing the units.

▼ USER INTERFACE

Language	English	▼
Flow units	m³/h	
AHU name	Komfovent	

12.5.4. Log-in password

Here you can change your password used to log in to the air handling unit in a web browser. New password must have at least 4 characters. Forgotten password can be restored by resetting AHU settings to factory defaults.

▼ LOGIN PASSWORD

Enter new password	<input type="password"/>
Confirm new password	<input type="password"/>

12.5.5. Restoring factory settings

Click the “Reset” button to undo all user-performed changes (desired temperature, air volume, function settings, weekly schedule, etc.) and to restore factory settings (the user interface language will be restored to English).

▼ SETTINGS RESET

Reset settings to default values	Reset
----------------------------------	-------

A factory reset also removes a PIN code. If you have locked the panel and forgot the PIN code, a factory reset will restore the PIN code to 0000 and then you will be able to unlock it.



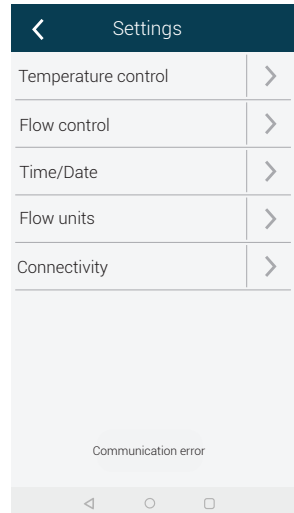
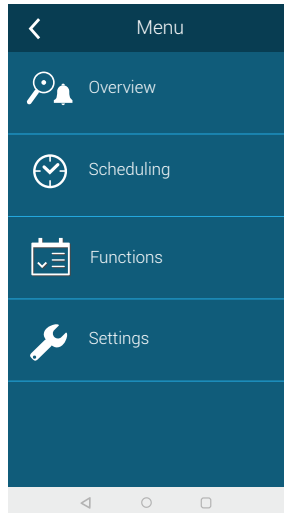
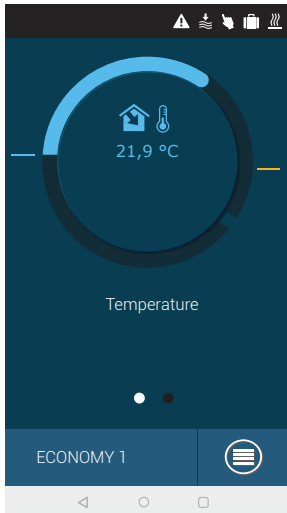
Write down the computer network parameters before restoring factory settings (see Menu “Connectivity”), as these settings will also be reset and communication with the air handling unit may be lost until re-configuration.

13. CONTROL VIA A SMARTPHONE

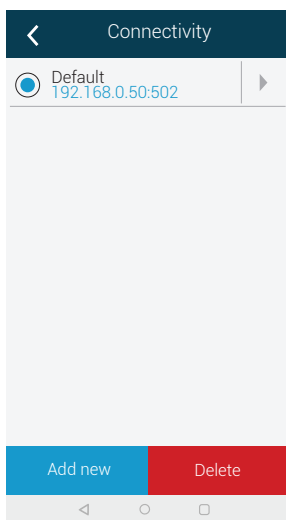
"Komfovent C5" app is necessary for controlling your air handling unit via your mobile phone. The unit can be controlled in a local network via mobile phone. Controlling the air handling unit with your mobile device is almost the same as with a C5.1 control panel. Screens and settings are so similar that you can follow the chapter "C5.1 Control Panel" to perform necessary changes or settings. The app language is automatically selected according to the language used in your mobile device and can differ from the language set in your air handling unit.

Connect the unit to a network router. The unit IP address must be on the same gateway as the network router. If the default IP address is incorrect, set the IP address and IP mask (see the "Connectivity" menu). Connect your mobile device to the internal network via Wi-Fi and run the "Komfovent C5" app. Launched for the first time, "Komfovent C5" app will attempt connecting to default IP address (192.168.0.50) (if not changed); after a while a home screen for the air handling unit will appear on the mobile phone screen. If you changed the IP address according to the router settings, "Communication error" message will be displayed. In this case connection settings must be changed:

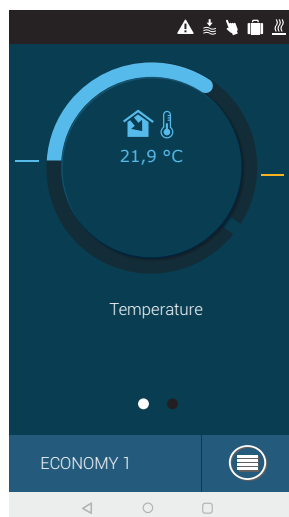
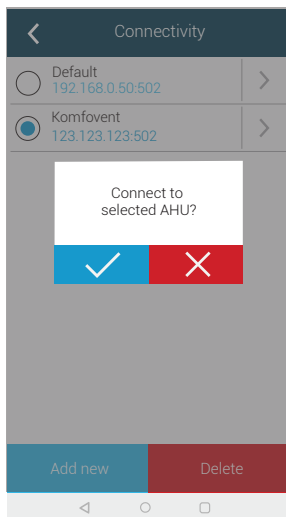
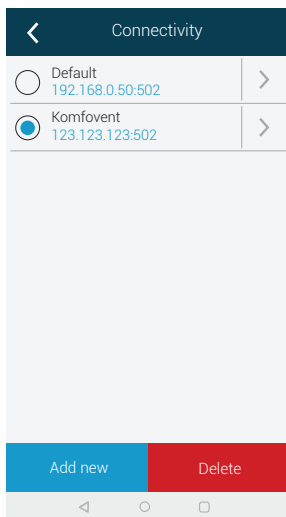
- Press Menu → Settings → Connectivity.



- Press “Add new” at the bottom.
- Enter your device name and new IP address.
- Enter port number 502 and confirm settings.



- Select a row with newly entered settings and press the return button.
- When the app asks you if you want to connect to the selected unit, confirm the message.
- Once connected to the unit, the main screen and current status of the unit will be displayed on the app.



14. PERIODIC MAINTENANCE

For proper operation of the air handling unit, it should be periodically inspected, the air filters replaced in due time and the interior of the unit cleaned. Some of the maintenance works can be performed by the user and others only by a qualified specialist.



- Before starting any tasks, make sure that the unit is unplugged from the mains.
- Use caution when performing works near internal or external heaters as their surfaces may be hot.
- Remove all foreign objects and tools from the unit.
- Use appropriate safety equipment (gloves, goggles).
- If you have washed or cleaned any of the components, wait for them to dry completely before starting the unit.

The following table provides recommended regular maintenance intervals for the unit. Actual frequency of maintenance procedures depends on operating conditions, amount of dust and impurities in the supplied air as well as environment in which the unit is installed. Maintenance intervals may be shorter, following the national hygiene norms and specific requirements for ventilation of the premises. Locations of all the mentioned device components and notes indicated in the "Installation Manual".

Task	Frequency			
	Commissioning	3 months	6 months	12 months
14.1. Housing				
Mechanical damage	X			X
Air-tightness and gaskets of the sections	X			X
Horizontality of the sections	X			X
Air-tightness and gaskets of doors and locks	X			X
Air damper operation	X		X	
Condensate drainage	X		X	
Cleaning of drip trays			X	
14.2. Filters				
Visual inspection of filters	X	X		
Inspection of filter pressure relays	X	X		
Filter replacement			X	
14.3. Fans				
Extraneous noise and vibrations	X		X	
Fan operation, speed adjustment	X		X	
Cleaning of the impeller				X
Motor overheat protection	X		X	
14.4. Water heater/cooler				
Fluid leakage	X		X	
Operation of valves, gears, pumps	X		X	
Frost protection	X		X	
Cleaning of the heat exchanger				X

Task	Frequency			
	Commissioning	3 months	6 months	12 months
14.5. Direct evaporation cooler/heater				
Refrigerant leak	X		X	
Cleaning of the heat exchanger				X
Operation of an external unit	X		X	
14.6. Electrical heater				
Wiring	X		X	
Operation of overheat protection	X	X		
Cleaning of heating elements				X

The inside of the air handling unit can be cleaned with a vacuum cleaner and/or a damp cloth. When cleaning, prevent water from entering electrical components of the unit. Make sure all surfaces are completely dry before starting the unit.

14.1. Housing

Once the unit is installed (and periodically) check whether there are no foreign objects, debris or tools inside the unit. Inner and outer surfaces shall be cleaned with a damp cloth or a vacuum cleaner. Also check the housing for mechanical damage or signs of corrosion which could affect normal operation of the unit. As building stability may change over time (e.g., settling of foundations), regular unit horizontality checks using a level gauge are recommended; levelling shall be performed if needed. Check the unit doors for tightness and if all gaskets or sealant joints are intact. Replace gaskets and reseal joints, if needed. Inspect air collection/exhaust dampers and grilles. Remove accumulated dirt; check dampers for proper opening and tight closing. Check operation of electric actuators and wiring contacts of dampers. Check whether condensate is freely removed from drip trays; check siphons for proper operation; check drainage pipeline components for damage/blockage. If the unit is equipped with drip trays, regularly clean any dirt from drip trays.

14.2. Filters

Filter contamination is monitored by integrated pressure relays. These relays are set for a given differential pressure, depending on the filter type. When filter is contaminated, an error message is displayed on a control panel or a computer.

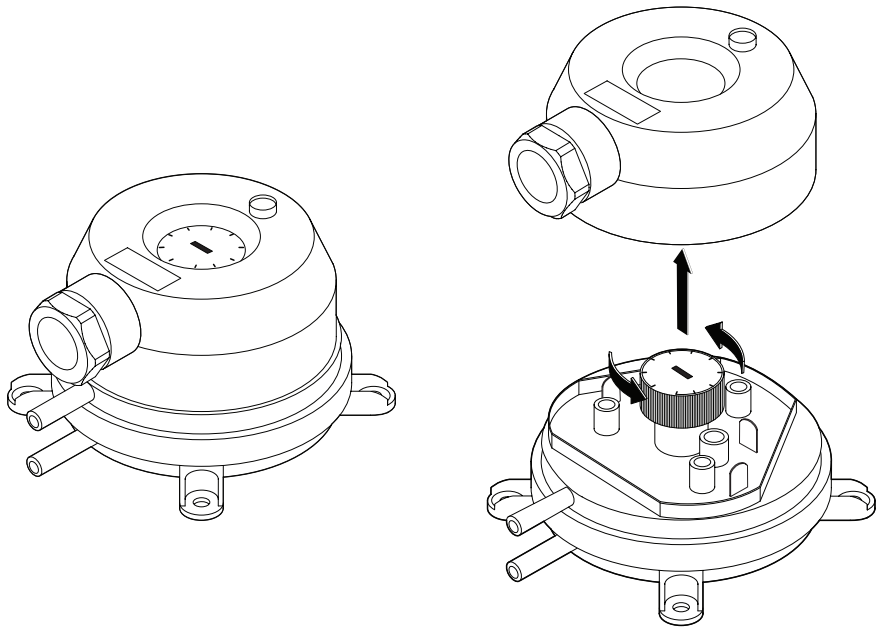


Fig. 21. Pressure relay

Check if filters are not damaged, torn or dampened. Filter replacement intervals depend on the environment as well as time of year, for example, during spring and summer filters may be contaminated with pollen, pubescence or insects, therefore replacement intervals are shorter. Replace filters if they are visibly dirty even though it is not time yet and a filter change message is not displayed yet. Contaminated filters increase pressure loss of the unit, reduce purification efficiency and increase power consumption. Once the filters are removed, clean all dirt accumulated on the walls of the unit.

Filters are removed/inserted one by one (number of filters depends on the unit size). For some filter sizes an additional sealing gasket must be attached to the frame edge to ensure air tight construction.

In case filters from another manufacturer or filters of other filtration class is used instead of factory-fitted filters, pressure relay range shall be adjusted after filter replacement. Pressure relays are adjusted by removing the top cover and rotating the handle to the required differential pressure limit (see Fig. 21). As soon as the differential pressure reaches the set limit, filter contamination message is displayed.

Once the filters are replaced, clear the contaminated filter message on a control panel or computer.

14.3. Fans

Check whether fans rotate freely without obstructions, extraneous noise and vibrations. Check the fan frame shock absorbers for wear. Replace worn out or damaged components, if needed. Dirt, grease or dust may unbalance the impeller and cause additional vibrations as well as shorten the motor service life. Impeller shall be cleaned with a damp cloth. Motor surfaces shall be cleaned with a dry cloth or a vacuum cleaner. Check motor connecting cables; check for corrosion on contacts; clean contacts with special agents, if needed. Check operation of a motor overheat protection, if installed. Turn on the ventilation device and check whether the fans are rotating to the desired direction and the rotation speed alternates depending on the automation settings.

14.4. Water heater/cooler

Check for fluid leakage; check for proper operation of a check valve and a pump. Check threaded connections for tightness. Check operation of an antifreeze protection system. Check whether the return water temperature sensor is installed and isolated correctly. Check a capillary thermostat, if installed, for proper operation.

Dirt from the water coil surfaces shall be removed with compressed air. Be careful not to damage the coil lamellas while cleaning.

14.5. Direct evaporation cooler/heater (DX)

Check for refrigerant leaks. In a humidity indicator check whether the refrigerant is moisture free; check for sufficient amount of refrigerant. Check operation of the external unit and temperature sensors. Perform regular maintenance works of a direct evaporation cooler/heater in accordance with the manufacturer's documentation.

Dirt from the refrigerant coil surfaces shall be removed with compressed air. Be careful not to damage the coil lamellas while cleaning.

14.6. Electrical heater

Check operation of overheat thermostats and automation. Inspect power supply installation, contacts and automatic switches.

Heating tubes of the electrical heater may get contaminated with dust and other dirt that may ignite under excessive heat, therefore they must be cleaned. Tubes must be cleaned with a damp cloth or compressed air. Wait for the tubes to dry completely before turning on the device.

15. TROUBLESHOOTING

Device automation continuously monitors the operation of various nodes and function algorithms. If something goes wrong, the device informs you with a message and an audible alarm from a control panel. Messages are divided into critical messages and notifications. Critical messages occur when the device cannot continue operation without intervention of the user or an authorised service representative. Notifications are used to warn the user about possible faults or small discrepancies but they do not stop the device.

In case of a message, perform the following actions:

- Read the message and note its number displayed on screen (control panel, computer, smartphone).
- Stop the unit. If heating/cooling devices were running at that time, after pressing the OFF button they will keep running for a few minutes until their temperature is stabilized.
- When the unit stops, unplug it from the mains.
- Find tips in the "Alarm Table" by the message number.
- If possible, eliminate the cause. If a fault cannot be resolved, contact an authorized service representative.
- After troubleshooting, make sure no foreign objects, debris or tools are left inside the unit, and only then close the unit door.
- Connect the unit to the mains and delete all messages from the message window.
- If a fault is not resolved, depending on its nature, the device may not start at all or start and then stop after a while by displaying a message.

Below is a list of messages and recommended actions to resolve faults. These messages are displayed on the C5.1 control panel, mobile app or a computer. Letter "A" marks critical alarms, letter "B" marks informational messages. If you can't find your fault code in the table, contact an authorized service representative.

Code	Message	Possible cause	User's actions
1B	Low supply air flow	1. Contaminated air filters. 2. Excessive resistance of the air duct system. 3. VAV air flow control selected but pressure sensors are not connected. 4. Supply air fan not working properly.	1. Check air filters and replace, if needed. 2. Check air dampers, air inlet/exhaust openings. 3. If VAV air flow control is required, install and connect duct-mounted pressure sensors. If VAV mode is not necessary – select CAV or DCV in the settings. 4. Contact authorised service.
3B	VAV calibration fail	Not connected or faulty pressure sensors.	Check pressure sensors and their measuring range. If a sensor needs to be replaced, contact an authorized service representative.
4B	Change outdoor air filter	Contaminated outdoor air filters.	Replace the air handling unit filters and clear the message.
6B-11B	Electric heater off	Electrical heater temperature has risen above 70 °C, because: 1. Supply air flow is too low at high heating demand. 2. Electric heater malfunctioning.	When the heater cools down, it will turn on again automatically. 1 a. Check air filters and air ducts. 1 b. Decrease the desired temperature. 1 c. Increase ventilation intensity. 2. Contact authorised service.
14B	Service time	Time for annual periodic maintenance.	Clear the message after performing periodic maintenance.

Kodas	Pranešimas	Galimos priežastys	Naudotojo veiksmai
112B	Water pump/coil alarm	Signal from the water flow sensor or circulation pump received (see "Water flow monitoring function").	Check if there is enough water in the system and whether the circulation pump and water mixing valves are working.
127B	Service mode	Temporary special operating mode that can only be activated by a service specialist.	If the unit has been previously repaired, contact the person who repaired the unit to make sure that the service mode can be disabled. Service mode is turned off by deleting a message.
1A, 2A	Supply air temp. sensor failure	Not connected or faulty supply air temperature sensor.	Check whether the sensor is connected. If a sensor needs to be replaced, contact an authorized service representative.
5A, 6A	Outdoor air temp. sensor failure	Not connected or faulty outdoor air temperature sensor.	Check whether the sensor is connected. If a sensor needs to be replaced, contact an authorized service representative.
9A, 10A	Water temp. sensor failure	Not connected or faulty return water temperature sensor.	Check whether the sensor is connected. If a sensor needs to be replaced, contact an authorized service representative.
11A	Return water temp. low	Return water temperature of the water heater dropped below the permissible limit.	Check the condition of a circulation pump and the heating system as well as operation of a mixing valve actuator. Check if hot water is available in the system.
12A	Internal fire alarm	1. Internal temperature is above 50°C 2. Faulty temperature sensor.	1. Locate the heat source in the ductwork or unit. 2. Contact authorised service.
13A	External fire alarm	A fire alarm received from the building's fire protection system.	Once fire alarm is resolved, the unit must be started using a control panel, computer or a smartphone.
14A	External stop	The unit stopped by an external device (button, timer, sensor).	Once the additional device is stopped, the unit will operate in normal mode.
17A	Low supply air temperature	1. Integrated heaters not working. 2. Additional heating/cooling devices faulty or installed incorrectly. 3. Faulty air temperature sensor.	1. Contact authorised service. 2. Contact the company that installed or sold additional heating/cooling equipment. 3. Contact authorised service.

Kodas	Pranešimas	Galimos priežastys	Naudotojo veiksmai
18A	High supply air temperature	<ol style="list-style-type: none"> 1. Integrated heaters malfunctioning. 2. Additional heating/cooling devices malfunctioning or installed incorrectly. 3. Faulty air temperature sensor. 	<ol style="list-style-type: none"> 1. Contact authorised service. 2. Contact the company that installed or sold additional heating/cooling equipment. 3. Contact authorised service.
19A	Low supply air flow	<ol style="list-style-type: none"> 1. Obstacle in the duct system. 2. VAV air flow control selected but pressure sensors are not connected. 3. Faulty supply air fan. 	<ol style="list-style-type: none"> 1. Check that the air dampers, air intake and exhaust openings are not blocked, check whether the adjustment valves are not completely closed. 2. If VAV air flow control is required, install and connect duct-mounted pressure sensors. If VAV mode is not necessary – select CAV or DCV in the settings. 3. Contact authorised service.
21A-23A	Electric heater overheat	<p>Electrical heater temperature has risen above 100°C, because:</p> <ol style="list-style-type: none"> 1. Supply air flow too low at high heating demand. 2. Power failure during operation of the electric heater; the heater could not cool down. 3. Electric heater malfunctioning. 	<ol style="list-style-type: none"> 1 a. Check the air duct system, air intake and exhaust dampers, fan operation. 1 b. Decrease the desired temperature. 1 c. Increase ventilation intensity. <ol style="list-style-type: none"> 2. Check whether the unit is connected to the mains. 3. Contact authorised service. <p>Once the fault is eliminated, reset an overheating protection fuse before restarting the unit. Look for a yellow sticker with the word "Reset" inside the unit that marks an overheating protection fuse.</p>
31A-38A	Temperature sensor failure	One of the additional zone temperature sensors is faulty or not connected.	<ol style="list-style-type: none"> 1. Check if the sensor is connected. If a sensor needs to be replaced, contact an authorized service representative. 2. Check whether the auxiliary temperature zone parameters are configured correctly (see Chapter "Functions" or "Additional zone control C5" of the Instruction Manual).
39A,40A	Return water temp. low	Return water temperature of the additional temperature zone water heater dropped below the permissible limit.	<ol style="list-style-type: none"> 1. Check the condition of a circulation pump and the heating system as well as operation of a heating damper actuator. Check if hot water is in the system. 2. Check that the auxiliary temperature zone parameters are configured correctly (see Chapter "Functions" or "Additional zone control C5" of the Instruction Manual)
43A,44A	External stop	The unit stopped by an external device connected to the additional zone module.	Once the additional device is stopped, the unit will run in a normal mode.

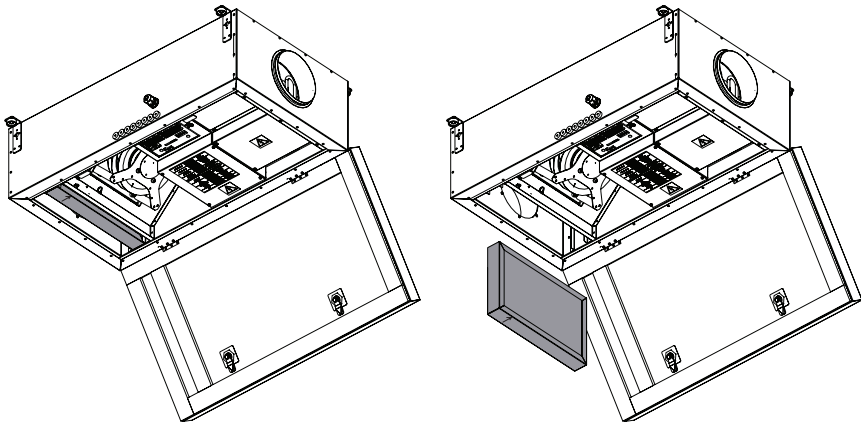
Kodas	Pranešimas	Galimos priežastys	Naudotojo veiksmai
45A	Water pump/ coil alarm	Signal from the water flow sensor or circulatory pump received (see "Water flow monitoring function").	Check if there is enough water in the system and whether the circulation pump and water mixing valves are working.
90A	Service mode	C5 controller blocked.	Contact authorised service.
91A-98A	Controller failure	Faulty controller electronic or no connection between controller electronics.	1. Check if all wires and cables are connected between the unit sections. 2. Contact authorised service.
99A-103A	Supply fan failure	Supply air fan or frequency converter not working.	1. Check if all wires and cables are connected between the unit sections. 2. Check the fan circuit breakers. 3. Contact authorised service.
114A-124A	Communication error	Faulty controller electronic or no connection between controller electronics.	1. Check if all wires and cables are connected between the unit sections. 2. Contact authorised service.
125A,127A	Controller failure	Faulty C5 controller.	Contact authorised service.
126A	Controller failure	1. Improperly connected or defective external devices. 2. Faulty C5 controller.	1. Check connection of external devices or contact the representative of the installer. 2. Contact authorised service.

ANNEX 1

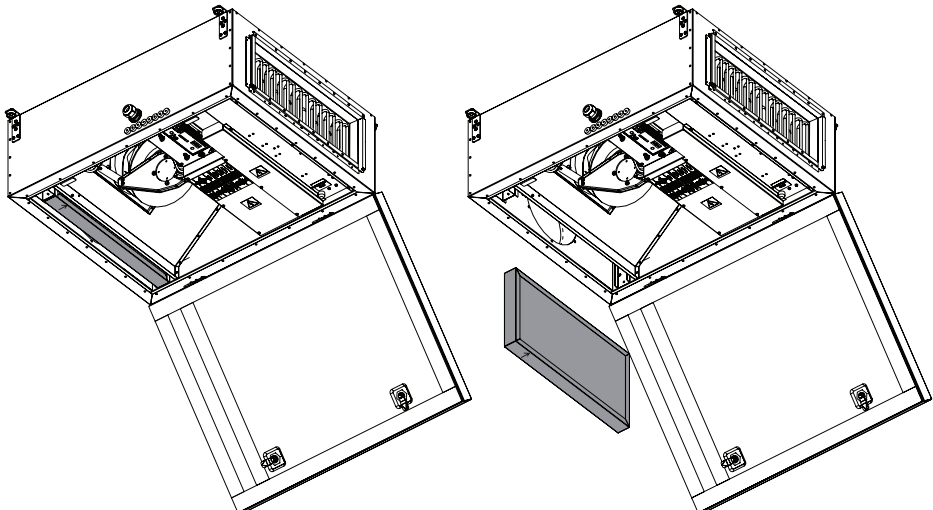
Filter inspection and replacement

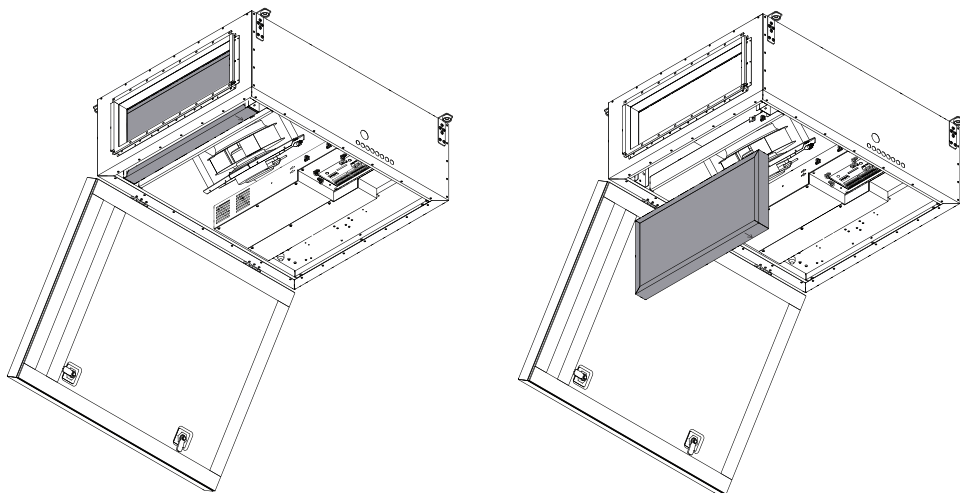
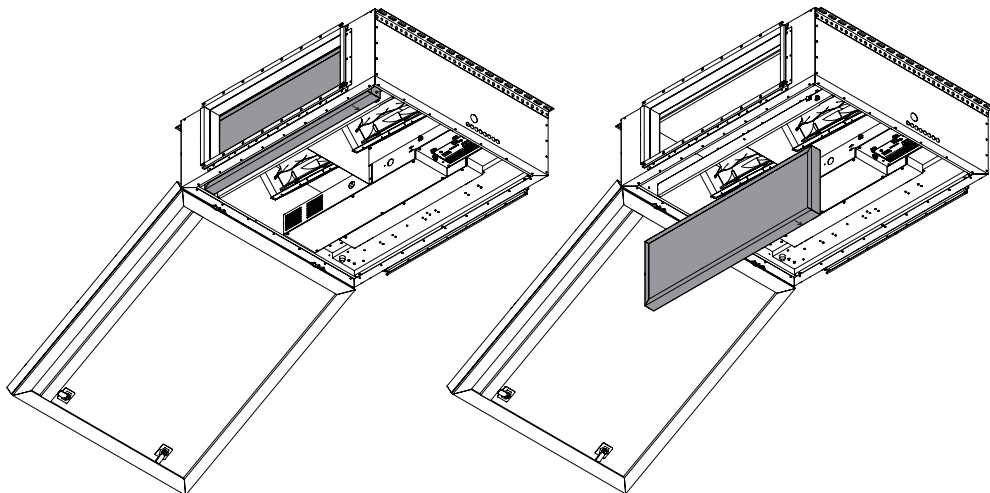
The pictures below show the location of filters on different models of devices. Because the devices are manufactured with the right and left access sides, and the images show only one access side, your device may look different from the one shown. Layout of filters and components presented in the "Installation Manual".

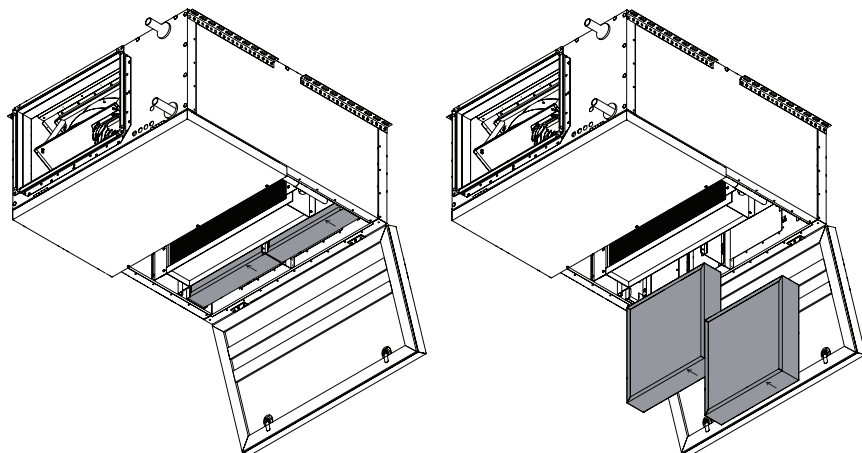
Domekt S 650 F - S 800 F



Domekt S 1000 F



Verso S 1300 F**Verso S 2100 F**

Verso S 3000 F

SERVICE AND SUPPORT

LITHUANIA

UAB KOMFOVENT

Phone: +370 5 200 8000
service@komfovent.com
www.komfovent.com

FINLAND

Komfovent Oy

Muuntotie 1 C1
FI-01 510 Vantaa, Finland
Phone: +358 20 730 6190
toimisto@komfovent.com
www.komfovent.com

GERMANY

Komfovent GmbH

Konrad-Zuse-Str. 2a,
42551 Velbert, Deutschland
Phone: +49 0 2051 6051180
info@komfovent.de
www.komfovent.de

LATVIA

SIA Komfovent

Bukaišu iela 1, LV-1004 Riga, Latvia
Phone: +371 24 66 4433
info.lv@komfovent.com
www.komfovent.com

SWEDEN

Komfovent AB

Ögärdesvägen 12A
433 30 Partille, Sverige
Phone: +46 31 487 752
info_se@komfovent.com
www.komfovent.se

UNITED KINGDOM

Komfovent Ltd

Unit C1 The Waterfront
Newburn Riverside
Newcastle upon Tyne NE15 8NZ, UK
Phone: +447983 299 165
steve.mulholland@komfovent.com
www.komfovent.com

PARTNERS

AT	J. PICHLER Gesellschaft m. b. H.	www.pichlerluft.at
BE	Ventilair group ACB Airconditioning	www.ventilairgroup.com www.acbairco.be
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NL	Ventilair group DECIPOL-Vortvent CLIMA DIRECT BV	www.ventilairgroup.com www.vortvent.nl www.climadirect.com
NO	Ventilution AS Ventistål AS Thermo Control AS	www.ventilution.no www.ventistal.no www.thermocontrol.no
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