Библиотека СОК

komfovent

RHP PRO2

INSTALLATION MANUAL

en



CONTENT

1. INTRODUCTION 4
1.1. Safety Requirements 4
1.2. Unit Types and Sizes 4
1.3. Unit Components and Sections 5
1.3.1. Filter-Fan Section 5
1.3.2. Heat pump section 6
1.3.3. Recirculation Section 11
1.3.4. Cooler and Heater Sections 11
1.3.5. Air Dampers 12
1.3.6. Silencers 13
1.3.7. Humidifier section 13
1.3.8. Smoke extraction section 14
1.4. Inspection Sides 15
2. UNIT TRANSPORTATION AND STORAGE 16
3. MECHANICAL INSTALLATION 19
3.1. Requirements for Mounting Location and Installation Base 19
3.2. Inspection Area 20
3.3. Door Handles and Hinges 21
3.4. Connection of Sections 21
3.5. Installation of External Heating/Cooling Devices 24
3.6. Connection of a Condensate Drain 26
3.7. Connection to Air Ducts 27
3.8. Outdoor Units 28
4. ELECTRICAL INSTALLATION 31
4.1. Requirements for Electrical Connection 31
4.2. Connection of Electrical Components 33
4.3. Control Panel Installation 37
4.4. Connection of Cables and Wires Between Sections 38
4.5. Connecting the Unit to the Internal Computer Network or the Internet 39
5. FILTERS 41
6. COMMISSIONING AND INSPECTION OF THE UNIT 42
6.1. Control panel C5.1 42
6.2. Starting the Unit With a Computer 44
6.3. Calibration of Clean Filters 46
6.4. Quick Inspection 47
APENDIX NO.1 48
WARRANTY INFORMATION 48



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.

1. INTRODUCTION

This Installation Manual is intended for professionals, qualified to install RHP Pro2 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.

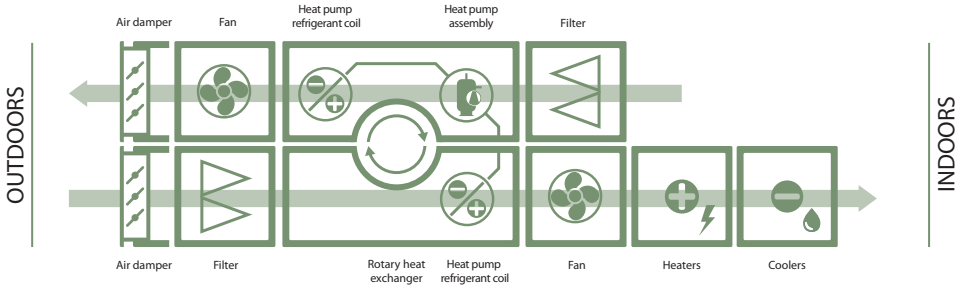
- **Before starting any tasks, make sure that the unit is unplugged from the mains.**
- **Use caution when performing works near internal or external heaters as their surfaces may be hot.**
- **Do not connect the unit to the mains unless all the external assemblies are installed completely.**
- **Do 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.**
- **Heat pump system is filled with refrigerant (F-gas), therefore only qualified refrigeration systems' specialists or "Komfovent" representative can perform any mechanical/electrical works on a heat pump.**
- **Temperature of evaporating refrigerant is very low and causes severe frostbite in contact with skin, therefore use appropriate safety equipment (gloves, goggles).**

1.2. Unit Types and Sizes

An air-handling unit is a device designed to ensure good ventilation in the premises. An air- handling unit removes indoor air containing carbon dioxide, various allergens or dust, while replacing it with filtered fresh air from outside. As the outside air is usually colder or warmer than the air within the premises, an integrated recuperator (heat exchanger) collects thermal energy from the indoor air and transfers the majority of it to the supply air. When a recuperator is not capable of reaching a desired temperature, additional heaters or coolers may be activated.

Heat exchangers and heaters (or coolers) are designed to compensate for heat/cool losses during ventilation, therefore, we do not recommend using this unit as the main heating/cooling source. The unit may fail to reach a user-defined supply air temperature when the actual temperature in the premises differs significantly from the temperature set point, since this will lead to inefficient operation of a heat exchanger.

RHP Pro2 – air handling units with a rotary heat exchanger and an integrated heat pump. Rotating wheel (rotor) of a rotary heat exchanger collects heat or cold from the indoor air and transfers it to the fresh supply air. Recovered heat/cold capacity is changed by adjusting the rotor speed. When heat recovery is not required, the wheel stops. If a heat exchanger alone is not capable of reaching a desired temperature, an integrated heat pump is activated. If heating/cooling capacity is still too low, additional heaters or coolers may be activated.[1]



[1] Depends on configuration.

UAB KOMFOVENT we reserve the right to make changes without prior notice

RHP Pro2 units come in several sizes. Each size is designed for a specific air volume range:

Unit size	Maximum air volume, m^3/h
12	2650
22	3900
32	5150
42	6800
52	9250
62	11300
72	15700
82	27500
92	33500
102	38000
112	46000

Maximum air volume may be limited according to the order, for example, if lower power fans are used or higher air volume is not required by the project requirements. For exact maximum air volume see the technical data print-out of the specific unit.

1.3. Unit Components and Sections

RHP Pro2 air handling units are assembled from separate sections. Depending on the order and unit size, sections may be pre-assembled in a factory or transported separately. Type of each section is marked with a label attached to the section door. The following are the main sections of the air handling unit. For equipment and number of sections in each unit see the technical data print-out of the specific unit.

1.3.1. Filter-Fan Section

Air handling units have two filter-fan sections. Filter contamination is measured and fan is controlled by an electronic circuit board fitted in the same section.

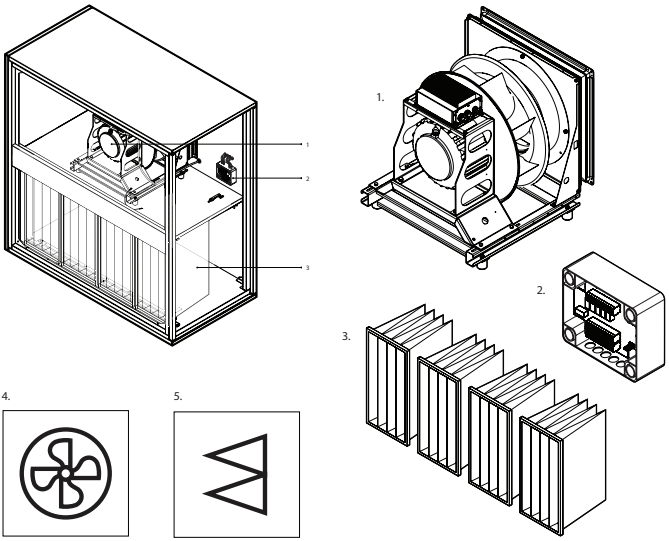


Fig. 1. Filter-fan section
1 – fan assembly with an installation frame 2 – fan control board (C5_VM), 3 – bag filters, 4 – fan section label, 5 – filter section label

1.3.2. Heat pump section

Air-handling units are equipped with an integrated heat pump operating both in heating and cooling modes. All heat pump components and a rotary heat exchanger are installed in a heat pump section. This section is also fitted with a heat pump control electronics and automation box to which many of the main electrical components are connected (see Chapter "Connection of Electrical Components").

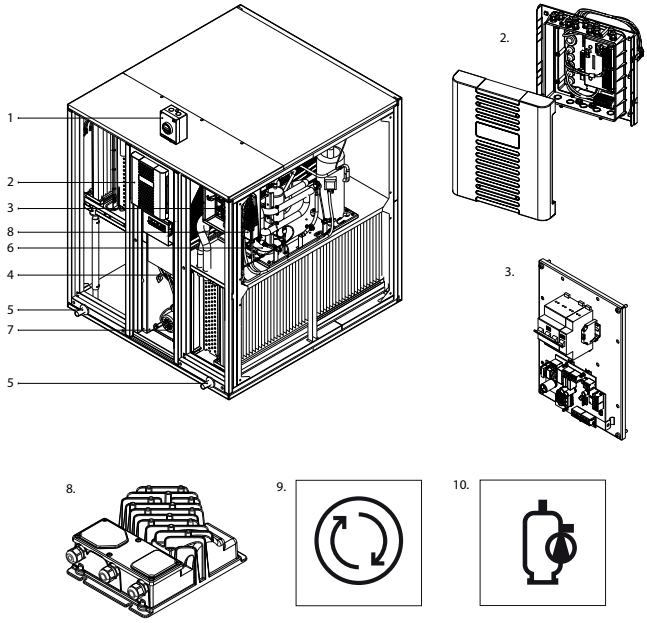


Fig. 2. Heat pump section
1 – main power switch, 2 – C5 controller main board, 3 – heat pump control electronics, 4 – rotary recuperator,
5 – condensate drainage pipes, 6 – heat pump assembly, 7 – rotor motor,
8 – frequency inverter for heat pump compressor, 9 – rotary recuperator marking label, 10 – heat pump section label

Rotor wheel of a rotary recuperator is belt driven by an electric gear motor. Brush seals are installed at the perimeter of a rotating wheel and between air flows to prevent different air flows from mixing. Recuperator section is also fitted with an automation box to which many of the main electrical components are connected (see Chapter "Connection of Electrical Components").

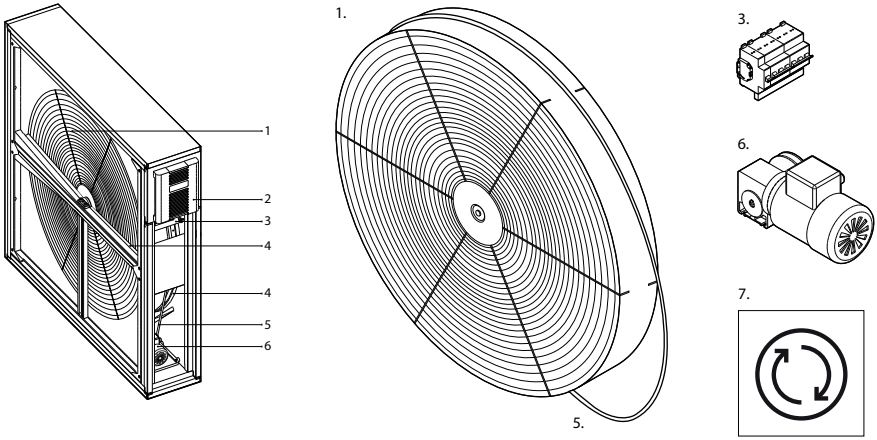


Fig. 3. Rotary recuperator section
1 – rotor wheel, 2 – automation box, 3 – automatic switch,
4 – rotor wheel brush seals, 5 – rotor belt,
6 – rotor gear motor, 7 – rotor section label

A heat pump assembly consists of a piping system containing refrigerant, compressor, two radiators (condenser and evaporator) and separate control electronics. If air velocity in the air handling unit is high (> 2 m/s), optional drop eliminators are installed by the condenser and/or evaporator, which prevent condensate from entering other parts of the unit or air ducts.

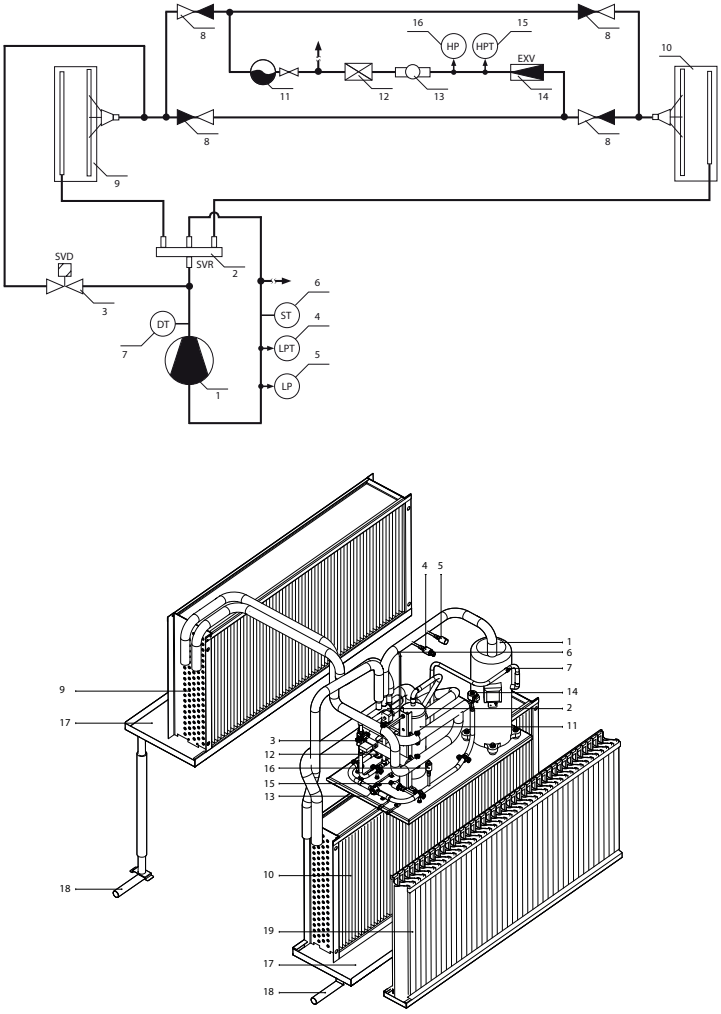
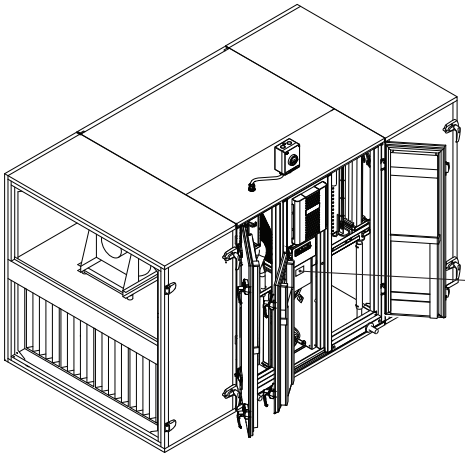


Fig. 4. Hydraulic circuit diagram and components of the heat pump
1 – Compressor, 2 – 4-way valve (SVR), 3 – Defrost valve (SVD),
4 – Low pressure transmiter (LPT), 5 – Low pressure pressostat (LP), 6 – Suction gas temperature sensor (ST),
7 – Discharge gas temperature sensor (DT), 8 – Check valve, 9 – Refrigerant coil positioned in the extract airflow,
10 – Refrigerant coil positioned in the supply airflow, 11 – liquid receiver, 12 – Filter-dryer, 13 – Sight glass,
14 – Electronic expansion valve (EXV), 15 – High pressure transmiter (HPT), 16 – High pressure pressostat (HP),
17 – condensate trays, 18 – condensate drainage pipes, 19 – drop eliminator

Depending on the size of the unit, the heat pump unit may contain up to 3 independent circuits, each consisting of the same components (compressor, pipeline, valves and sensors). In such units, refrigerant coils (condenser and evaporator) of a heat pump also consist of several tiers, which are independent of each other, but the amount of refrigerant in the individual circuits is different.

RHP PRO2 size (HP size)	Circuit count	Quantity of refrigerant in the circuit, kg	Total quantity of refrigerant, kg
12 (11/11)	1	2,9	2,9
12 (16/15)	1	3,2	3,2
22 (18/17)	1	4	4
22 (20/19)	1	4,4	4,4
32 (25/23)	1	6,6	6,6
32 (38/34)	1	7,8	7,8
42 (28/26)	1	8,6	8,6
42 (41/40)	1	9,1	9,1
52 (29/27)	1	10,1	10,1
52 (45/45)	1	10,1	10,1
62(47/47)	1	9,5	9,5
62 (59/58)	2	6,7	16,7
		10	
72(49/49)	1	9,8	9,8
72 (83/84)	2	9,8	19,6
		9,8	
82(52/52)	1	10,2	10,2
82 (89/90)	3	7	23,7
		7	
		9,7	
92(54/54)	1	10,8	10,8
92 (104/102)	3	7,6	28,6
		10,5	
		10,5	
102(56/56)	1	11,2	11,2
102(90/90)	2	11,2	22,4
		11,2	
102(124/122)	3	11,2	33,6
		11,2	
		11,2	
112(126/126)	3	11,5	34,5
		11,5	
		11,5	

Heat pump model, number of circuits and exact amount of refrigerant is indicated in a label inside the unit.



Air handling unit model / *Vėdinimo įrenginio modelis*		RHP PRO 32
Heat pump model / *Šilumos siurblio modelis*		
Maximum operating pressure *Maksimalus darbinis slėgis*	P_{max} [bar]	42
Refrigerant / *Šaltnešis*		R454C
Number of separate circuits / *Atskirų kontūrų skaičius*		1
Quantity of refrigerant / *Šaltnešio kiekis*	m_{R454A} [kg]	5,6

- Hermeticaly sealed system / *Hermetiška sistema*
- Contains fluorinated greenhouse gases covered by Kyoto Protocol
  Sudėtyje yra Kioto protokole nurodytų fluorintų šiltnamio efektą sukeliančių dujų
- DO NOT VENT INTO ATMOSPHERE / *NEIŠLEISTI Į APLINKĄ*
- R-454C Global Warming Potential (GWP)=148
  R-454C Globalinio šiltėjimo potencialas (GWP)=148

Fig. 5. Example of a heat pump's information label

Heat pump is activated automatically when a rotary heat exchanger is unable to reach desired temperature; and is switched off as soon as desired temperature is reached. Frequent starting and stopping of a heat pump may damage compressor, therefore, when heating/cooling demand is low, the heat pump will continue running for some time after the set temperature has been reached. In such cases, supplied air may be slightly warmer (in heating mode) or cooler (in cooling mode) than desired; however, the extracted temperature control mode will help to reduce such temperature fluctuations (see "User Instructions").

A certain airflow is required to ensure proper operation of a heat pump, i. e. to ensure efficient heat exchange and maintain refrigerant pressure within limits. Therefore, when the unit is operating at a minimum air volume (usually 20% of the unit's maximum capacity), the heat pump's power may be automatically limited.

Heat pump is not operating when outdoor air temperature is between 15°C and 20°C, as, in this case, the rotary heat exchanger is usually capable of reaching desired air temperature.

If heating/cooling demand increases when the heat pump is switched off, additional heaters/coolers are activated[1].

When the heat pump is running, we recommend operating air handling units with the smallest possible air volume difference between the supply and extract airflows. In case of high flow imbalances (>20%), capacity and efficiency of the heat pump decreases, therefore the compressor operates at a critical refrigerant pressure limit. This results in reduced operating life and increased probability of failure.

During winter operation, when the heat pump is in heating mode, condensate on the evaporator starts freezing and forms frost. Large ice deposits block airflow in the evaporator and may damage the heat pump. Therefore, the evaporator is automatically defrosted during winter use. When the outdoor temperature drops below zero, the heat pump automation system starts constantly monitoring pressure difference upstream and downstream the evaporator heat exchanger. When condensate accumulates in heat exchanger plates and ice starts to form, pressure increases and defrosting actions are initiated. During the defrost cycle, part of the hot refrigerant gas is directed from the compressor to the evaporator to melt forming ice crystals, therefore supply air temperature temporarily drops. Integrated electric or auxiliary heaters are switched on to compensate for this change. As soon as frost melts and pressure decreases, all the power of the heat pump is redirected to the heating process.

[1] Depends on configuration.

1.3.3. Recirculation Section

Recirculation section is intended for mixing extract and supply air for heating or cooling thereof by reducing energy consumption of heaters/coolers.

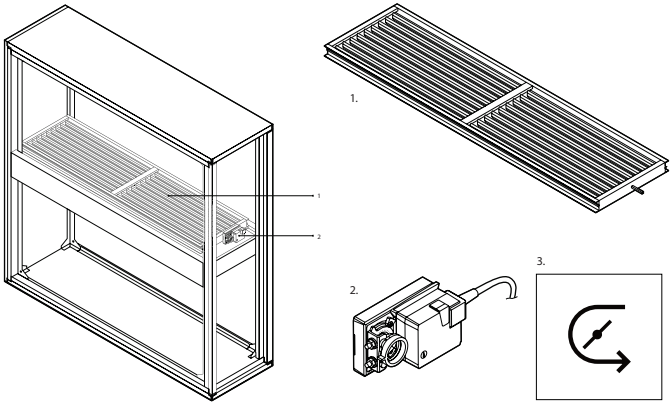


Fig. 6. Recirculation section
1 – air mixing damper, 2 – damper actuator, 3 – recirculation section label

1.3.4. Cooler and Heater Sections

Cooler section is fitted with water or direct evaporation (DX) coolers as well as combined heater/cooler heat exchangers. Cooling air causes condensation, therefore, a condensate tray is installed under a heat exchanger. If air velocity in the air handling unit is high (> 2 m/s), an optional drop eliminator is installed, which prevents condensate from entering other parts of the unit or air ducts.

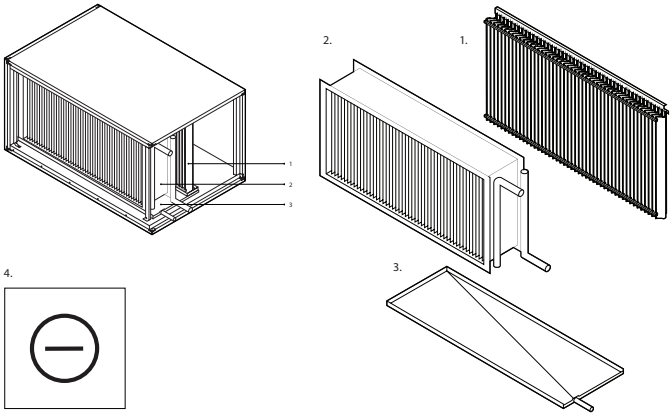


Fig. 7. Cooler section
1 – drop eliminator, 2 – coil for water/refrigerant 3 – condensate tray, 4 – cooler section label

Depending on the order, electric or water heaters may be selected. An electric heater section is fitted with heater control electronics and the main circuit breaker (see Chapter "Requirements for Electrical Connection"). A water heater is fitted with a return water temperature sensor, which protects the heat exchanger against freezing. Sensor installation procedure is described in Chapter "Installation of External Heating/Cooling Devices".

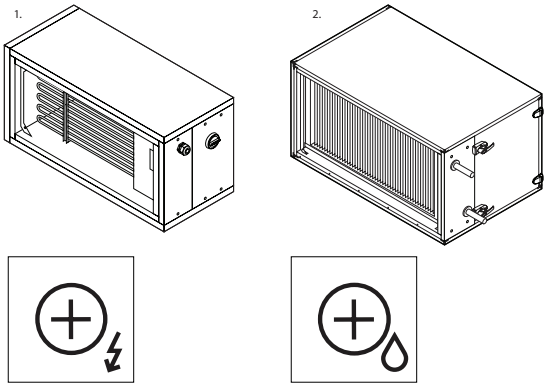


Fig. 8. Heater section
1 – electric heater section and label, 2 – water heater section and label

1.3.5. Air Dampers

Air dampers are mounted on the outside of the unit and are fastened with self-tapping screws. Air dampers are designed to isolate the unit and to protect against air flows and draughts when the unit is stopped. Damper blades are closed/opened with an electric actuator (24 V AC), the power and torque of which is selected according to a damper size. Rectangular air ducts may be connected directly to dampers (see Chapter "Connection of Air Ducts"). For outdoor installation, air dampers with electric actuators must be protected against environmental influences with special covers or other structures.

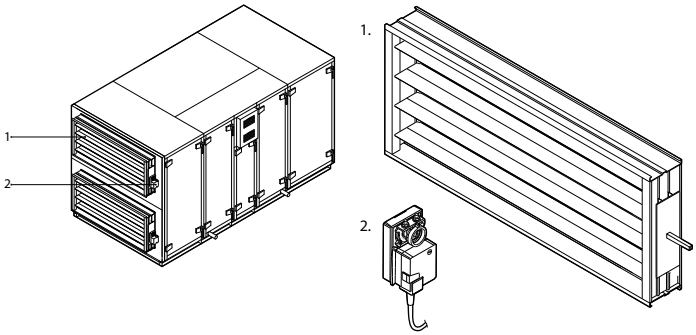


Fig. 9. Air closing dampers
1 – air damper, 2 – electric damper actuator

1.3.6. Silencers

Noise suppressor sections are intended for reducing noise generated by an air handling unit and air flows. Depending on the unit type and location of a silencer section, suppressor sections may be separate for each air flow (e.g., for supply air only) or double, intended for both air flows. Silencer section is equipped with noise absorbing partitions which can be removed and cleaned during inspection works. Silencer section may also be equipped with an optional compact filter.

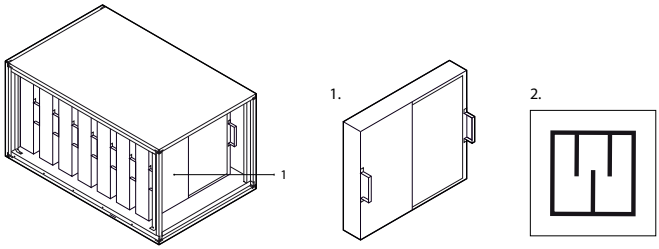


Fig. 10. Noise suppressor section
1 – removable noise absorbing partitions, 2 – silencer section label

1.3.7. Humidifier section

RHP Pro2 units that was ordered with humidity function can control external steam humidifier. Humidifier generates steam that reaches steam distributors located inside of the AHU in the supply airflow. A drop eliminator is placed inside the humidifier section to prevent excess condensate from entering the ducts, so an additional drainage pipe must be connected to this section (see section "Connection of a condensate drain").

In order for the humidifier to operate correctly, humidity sensors must be installed and connected to the C5 controller board (See "Electrical installation"). Humidity control function (HUM) can maintain humidity of the supply or of the indoor air – more information about this function you can find in the "RHP Pro2 user manual"

In most cases (depending on the manufacturer) the humidifier must be installed lower than humidification section in the air handling unit, thus steam hoses will be installed with a slope towards humidifier. Maximum length of the steam hoses is also limited, thus be sure to consider these aspects when choosing the installation location of the air handling unit or humidifier.

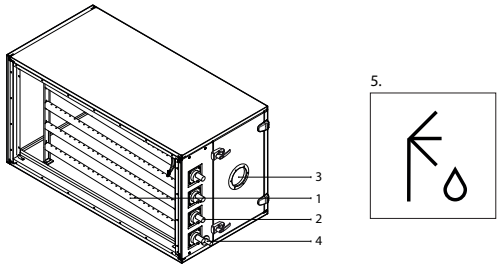


Fig. 11. Humidifier section
1 – steam distributers, 2 – steam hose connection pipes, 3 – inspection window, 4 – condensate drain pipe, 5 – humidifier section label

- **Install the humidifier and connect it to the AHU according to the humidifier manufacturer's instructions.**
- **Water quality used for the humidifier must complain with country-specific hygienic requirements and water specifications described by the humidifier manufacturer.**
- **For hygienic purposes, when the humidifier is on stand-by automatic drain intervals, shorter than 48 hours must be set up according to the humidifier manufacturer's instructions.**

1.3.8. Smoke extraction section

The smoke extraction section is used to direct the gases and smoke generated by fire in the building, directly to the exhaust air fan, which throws them out, bypassing the AHU filters and the heat exchanger. Smoke ducts of the building are connected to a smoke bypass damper, which is mounted at the top or back of the section.

The damper and the extract air fan are controlled by a smoke bypass function, which is activated when a signal from the building's fire system is received (see user manual). During function operation, the thermal protection of the fans is disconnected to prevent them from stopping due to the high temperatures[1].

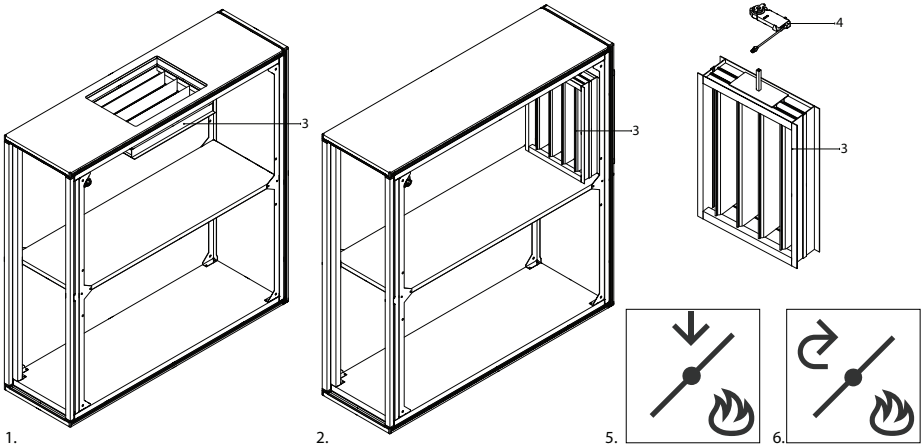


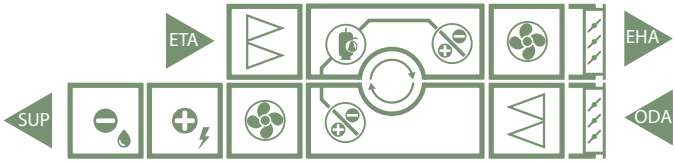
Fig. 12. Smoke extraction section
1 – smoke extraction section with damper on the top, 2 – smoke extraction section with damper at the back,
3 – smoke by-pass damper, 4 – damper actuator, 5 – section label when damper is on the top, 6 – section label when damper is at the back

[1] In smoke extraction mode, fan assembly and control electronics will maintain its operational and mechanical stability for at least 60 min. at 70°C of extracted air/smoke temperature.

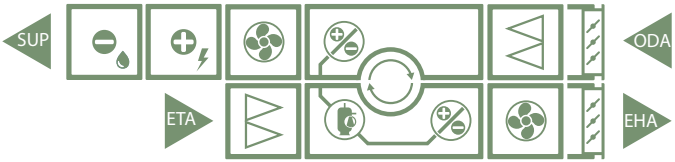
1.4. Inspection Sides

Depending on the installation position and connection of air ducts, RHP Pro2 air handling units are available in four inspection sides. Inspection side is determined by a supply air duct (SUP) position:

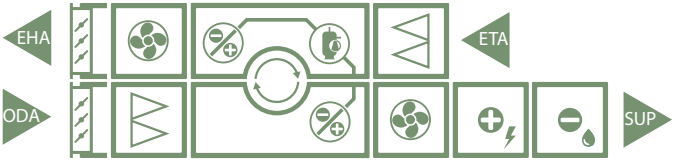
L1 Air duct for supply air connected on the left bottom side of the unit



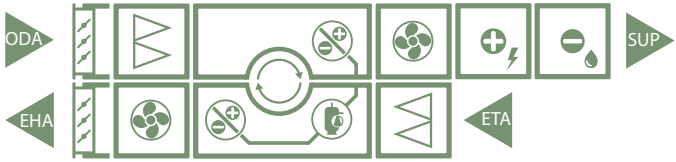
L2 Air duct for supply air connected on the left upper side of the unit



R1 Air duct for supply air connected on the right bottom side of the unit



R2 Air duct for supply air connected on the right upper side of the unit



ODA – outdoor air

SUP – supply air

ETA – extract air

EHA – exhaust air

2. UNIT TRANSPORTATION AND STORAGE

Units must be transported and stored in their original packaging. During transportation, units must be properly fixed and additionally protected against possible mechanical damage, rain or snow. 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. When a forklift is used for lifting or transporting the unit, forks must be long enough to prevent the device from tipping over or to avoid mechanical damage to its bottom part.

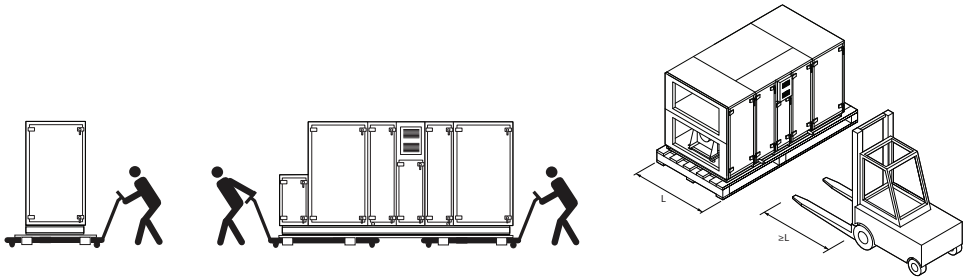


Fig. 13. Unit transportation using a forklift or a trolley

Individual sections of the unit shall be lifted with an installation frame. Pipes should be inserted through the mounting frame into designated openings and lifting ropes or belts fixed. It must be ensured that belts will not disconnect or pipes will not be pulled out of the frame when lifting.

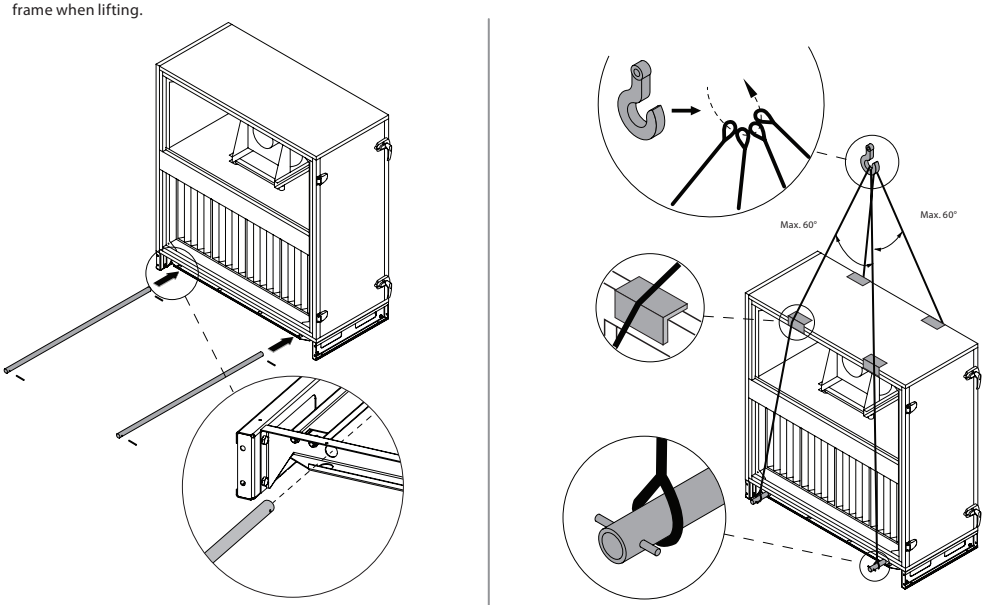


Fig. 14. Lifting of individual sections[1]

[1] Lifting means (pipes, belts, ropes, traverses) are not included.

If fully assembled AHU will be lifted, not each section separately, it must be done using additional reinforced mounting frame. When the unit is ordered fully assembled, it will already be mounted on a reinforced installation frame at the factory. If the unit's sections are transported separately, the reinforced installation frame must be ordered separately. Each section must be placed on to the reinforced frame and connected with other sections as described in paragraph „Connection of sections". Sections are fixed to the reinforced frame using M10 bolts through the holes instead of adjustable feet. Reinforced mounting frame has special retractable lifting holders, for fixing belts or ropes.

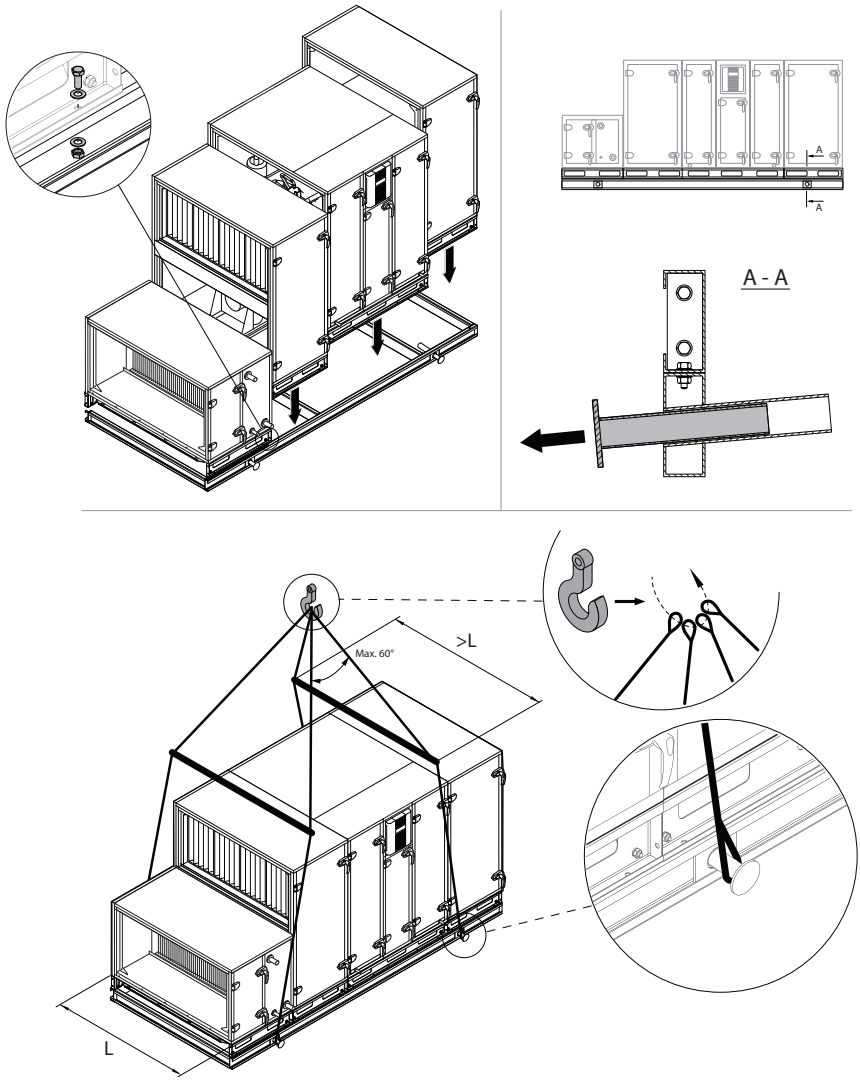
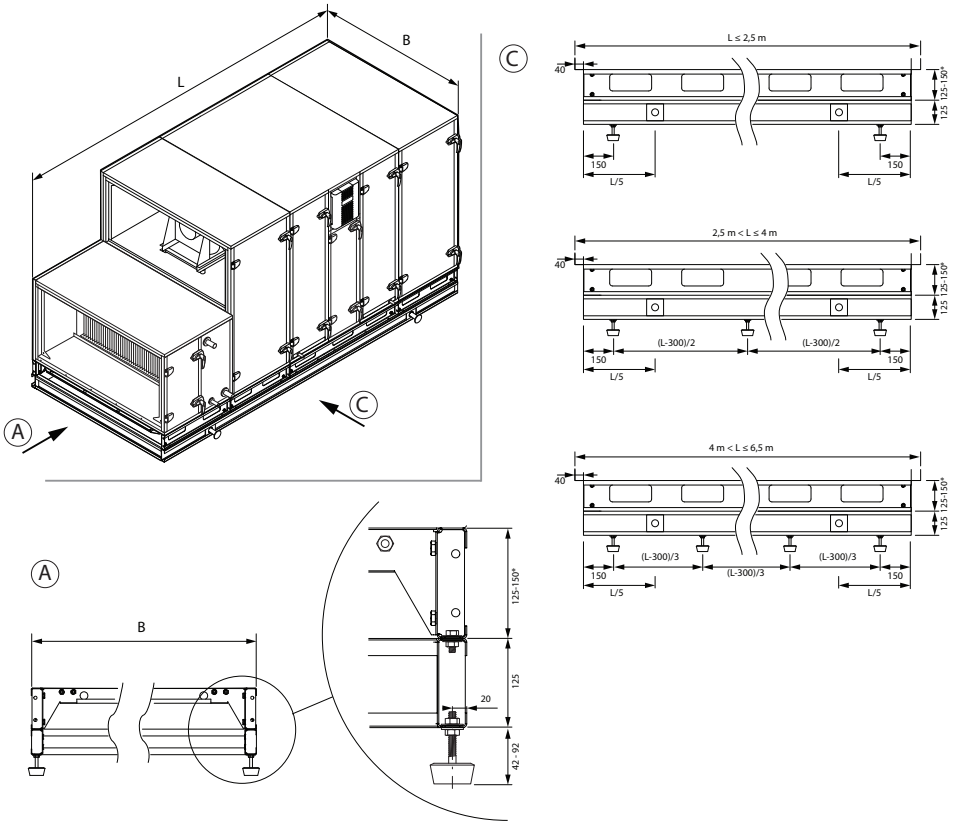


Fig. 15. Lifting AHU fully assembled onto reinforced mounting frame[1]

[1] Lifting means (pipes, belts, ropes, traverses) are not included.



* In units of sizes 12-72 the frame height is 150 mm; in units of sizes 82-112 the frame height is 125 mm.

Fig. 16. Dimensions of the reinforced mounting frame

- **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.).**

3. MECHANICAL INSTALLATION

3.1. Requirements for Mounting Location and Installation Base

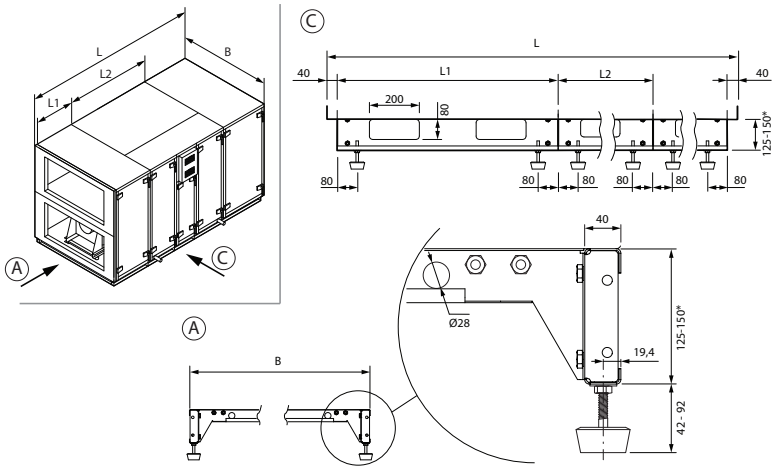
RHP Pro2 air handling units are designed for ventilation of medium or large commercial or industrial premises (e.g., stores, offices, hotels, etc.) where standard air temperature and humidity is maintained. These units are not intended for transporting solid particles within air flows. Standard equipment air handling units are intended for indoor installation; and with additional accessories, these units may be mounted outdoors. Air handling units are designed for ambient temperatures from -30°C to +40°C.

- **RHP Pro2 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.**

The ventilation unit uses a low-flammable refrigerant, therefore additional requirements are imposed on the installation room. The area of the installation room cannot be less than S_{min} (see table), and if the area of the room is less than *S*, it must be additionally ventilated and must not contain any ignition sources (e.g. gas heaters) or exposed hot surfaces with a temperature higher than 800°C.

AHU size	S_{min}, m²	S, m²
12	7	24
22	9	33
32	16	59
42	19	69
52	21	77
62	21	76
72	20	74
82	20	74
92	22	82
102	23	85
112	24	87

An air handling unit must be mounted on a relatively large and sturdy base, based on the weight of the unit and in accordance with building regulations. Base must be made of reinforced concrete or metal structures. If the unit is not equipped with adjustable height feet, it must be installed on a flat base. Vibration dampening gaskets must be fitted between the unit and installation base. When the unit is not equipped with an installation frame or adjustable height feet, it should be fixed to the base with metal angle-pieces and rubber vibration dampening gaskets. When installed outdoors, air handling units must also be attached to the base. During installation, unit sections must be levelled in respect to the horizon: deviations shall not exceed 0.3 mm for 1 m in the longitudinal direction and 0.5 mm for 1 m in the transverse direction.



* In units of sizes 12-72 the frame height is 150 mm; in units of sizes 82-112 the frame height is 125 mm.

Fig. 17. Installation frame with adjustable feet

3.2. Inspection Area

Based on its type, an air handling unit may be installed indoors or outdoors. When selecting an installation or mounting 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).

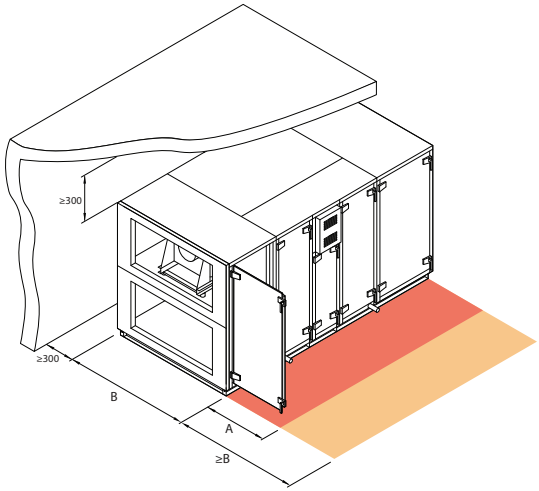


Fig. 18. Device inspection area

Minimum service area A defines an area which must be free of any stand-alone or immovable devices, equipment, partitions, structure or furniture. This area is sufficient for performing service and filter replacement works. For repair and replacement of components (e.g., removal of rotary heat exchangers), access area equal to the width of the device B shall be ensured in front of the device. Additionally, for easier installation and maintenance, it is recommended to leave at least 300 mm behind and on top of the unit where possible.

Unit size	A, mm	B, mm
12	760	1110
22	760	1260
32	760	1410
42	760	1610
52	890	1810
62	890	2010
72	890	2210
82	1000	2400
92	1000	2700
102	1000	2900
112	1000	3200

Measurements in the table are approximate. For exact unit measurements see the technical data print-out.

3.3. Door Handles and Hinges

RHP Pro2 door handles are designed in such a way that the unit door does not swing open due to the pressure accumulated inside the unit and does not injure the person opening the door. By pressing the handle, the door slightly opens and locks to release air pressure inside the unit. Return the handle to its original position to fully open the door.

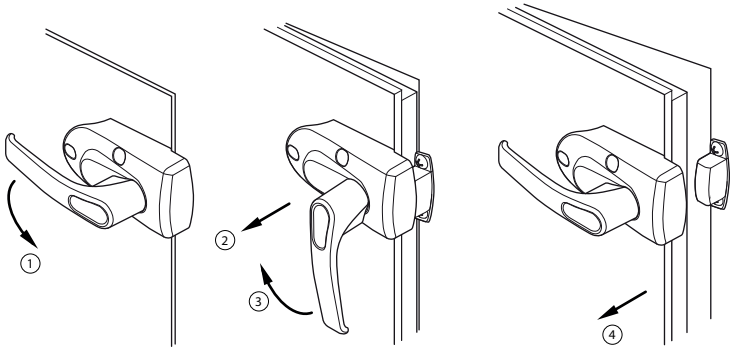


Fig. 19. Opening the door

As large unit sections may be difficult to connect properly on site and the unit door may warp, it is necessary to adjust the hinges. Loosen the lock screw to raise/lower the door by a few millimetres.

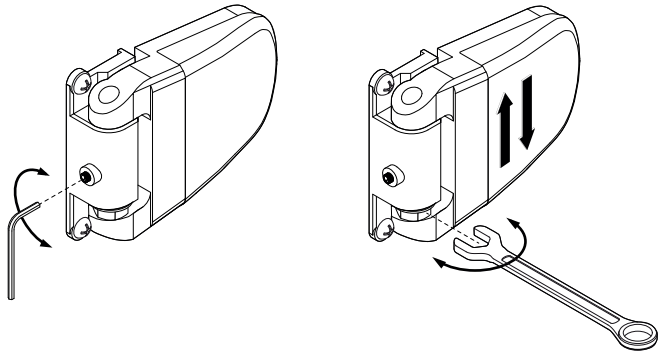


Fig. 20. Adjusting the hinges

3.4. Connection of Sections

Connect connecting cables and wires of the sections (see Chapter "Electrical Installation") before fastening sections of an air handling unit.

- **If, for any reason, sections of the unit were disassembled, before installation at it's final location, airtightness of the unit may differ from the data provided in documentation, unless the unit is assembled by personnel trained by the manufacturer.**
- **Sealing gaskets must be fitted between the sections (supplied with the unit).**
- **For outdoor installation, joints between the sections must be additionally sealed with silicone or other sealant.**
- **Drilling and using self-tapping screws on the unit casing is prohibited (where it is not provided by the construction), since cables or tubes inside of the casing may be damaged.**

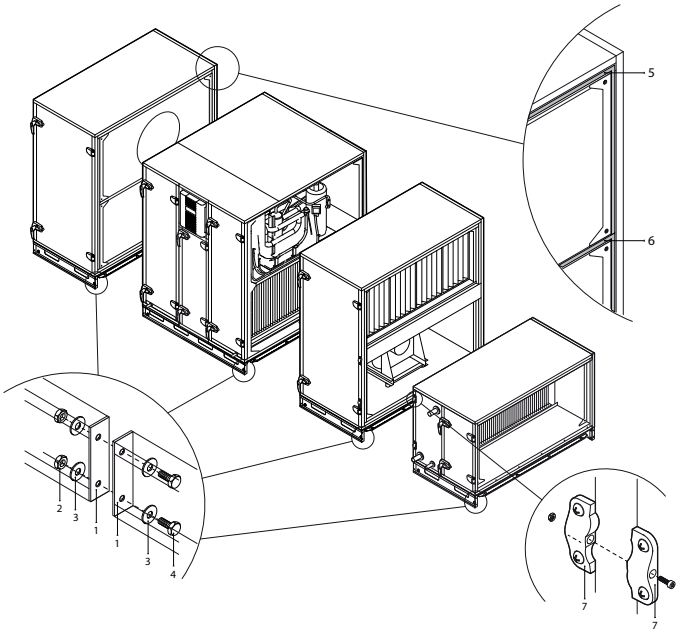


Fig. 21. External connection and sealing of sections
1 – installation frame, 2 – nut M10, 3 – washer, 4 – screw M10,
5 – adhesive gasket, 6 – gasket on a shelf between different air flows,
7 – external tightening elements

Depending on the unit size and purpose of sections thereof, separate sections may be interconnected with external tightening elements or internal tightening brackets, using supplied screws and/or spacers. Sealing gaskets must be attached to joints before joining the sections (supplied with the unit). Gaskets are installed around the entire perimeter of the section as well as on a shelf which separates different air flows. Screws must be tightened so that the gasket is fully compressed and distance between the sections does not exceed 2–3 mm. If the unit is ordered with an installation frame, additionaly sections shall be tightened through the designated holes in the installation frame (insert internal section connection screws first, before tightening installation frame).

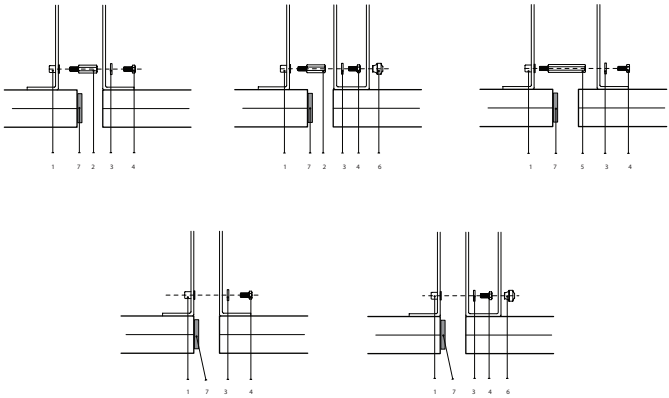


Fig. 22. Types of internal section connections
1 – threaded bushing, 2 – spacer 35 mm, 3 – washer, 4 – screw M6, 5 – spacer 70 mm, 6 – grommet d29, 7 – adhesive gasket

Sections are tightened at the inside corners as well as in the middle at the shelf separating different air flows. For easier access of tightening locations, special openings are provided in a fan section (on a wall to which the fan is mounted). These openings shall be covered with rubber grommets. If some of the connection openings near the fans are hard to reach, air closing damper can be dismounted or external tightening elements can be used for easier section tightening.

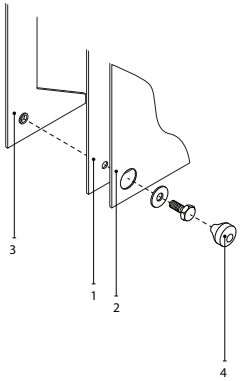


Fig. 23. Internal connection in a fan section
1 – fan section tightening angle-piece, 2 – wall to which the fan is mounted,
3 – other section tightening angle-piece, 4 – grommet d29

3.5. Installation of External Heating/Cooling Devices

Based on their equipment, RHP Pro2 air handling units may be operated with various heating or cooling devices. Heaters/coolers are usually installed in separate sections that are connected at the end of the unit (in the supply air stream). For air handling units with R1 or L1 inspection sides, heater/cooler sections are mounted on an installation frame and connected at the bottom part of the unit. For R2 and L2 inspection side units, heater/cooler sections are mounted at the top part of the unit and must be additionally fastened or suspended (fastening/suspending accessories not included). Heat exchanger sections are mounted to the AHU and sealed in the same way as other sections (see Chapter "Connection of Sections").

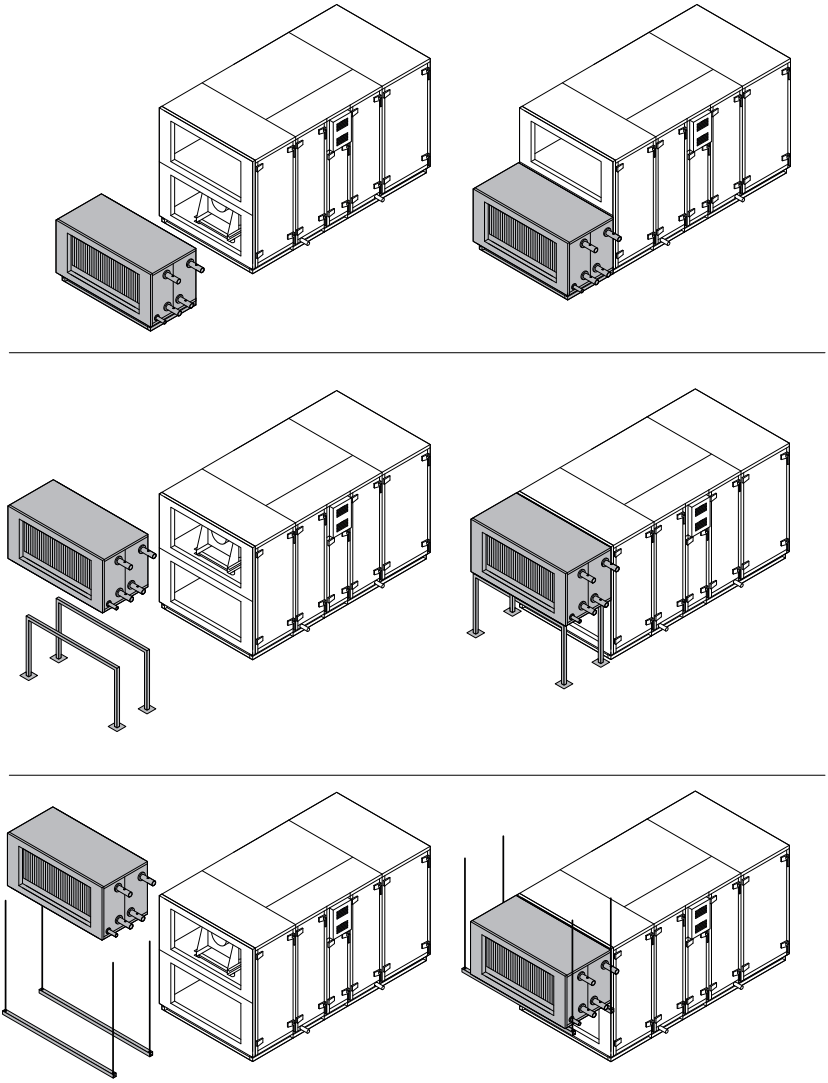


Fig. 24. Examples for installation of heater/cooler sections

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").

Electrical heater sections require a separate power supply.

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

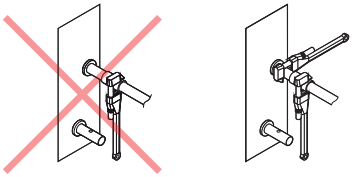


Fig. 25. Connection of sleeves

When connecting sleeves of liquid coupled heat exchanger or 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 return water temperature sensor (B5) must be installed on the return water pipe as close to the heater as possible. It can be screwed[1] into a special opening or fixed with a strap on the pipe. 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.

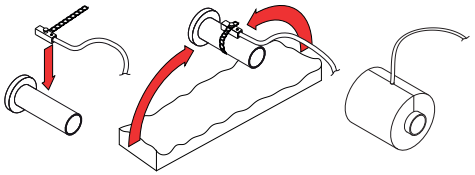


Fig. 26. Installation of a surface-mounted return water temperature sensor[2]

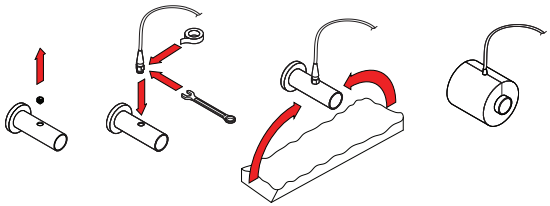


Fig. 27. Installation of a return water temperature sensor with thread[3]

When operating air handling unit in 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.

Pipework package[4] 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.

[1] Depending on the order.
[2] Depending on the order.
[3] Depending on the order.
[4] It is recommended to use PPU made by Komfovent.

3.6. Connection of a Condensate Drain

During operation of the heat pump, air humidity condensates and accumulates in specially designed condensate trays. Condensate is removed from condensate trays via drainage pipes, therefore a condensate drainage system must be connected. Drainage piping must be at least 40 mm in diameter, 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.

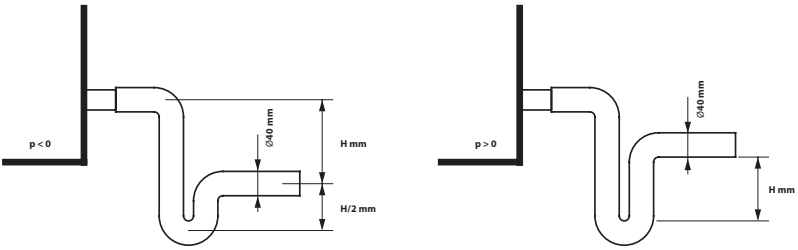


Fig. 28. Installation of a siphon

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

$$H\,[mm] = 25 + p\,[mm\ H_2O] = 25 + 0.1 \times p\,[Pa]$$

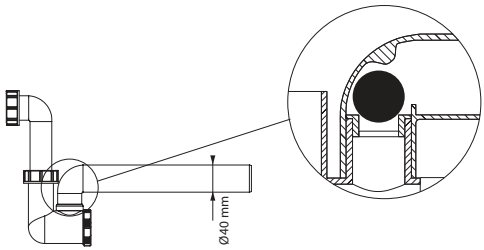


Fig. 29. Example of a siphon with a one-way valve

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.

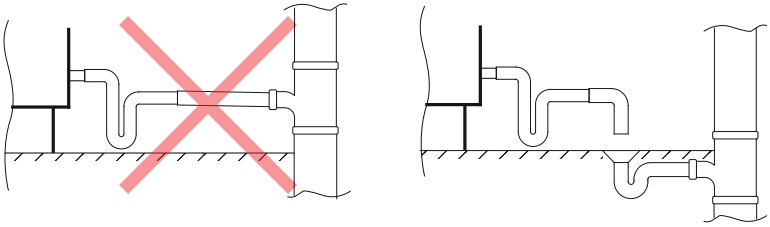


Fig. 30. Condensate drain connection to sewer system

3.7. Connection to Air Ducts

- **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 and exhaust ducts must be fitted with air shut-off dampers (electric with actuators) to protect the unit from exposure to climatic conditions when the unit is switched off.**
- **In order to minimise AHU generated noise and noise transferring through the ducts into ventilated areas, sound suppressors (silencers) must be connected to the unit.**
- **Air duct system elements must have separate brackets and must be mounted in a way that their weight is not shifted to the unit casing.**

Air ducts shall be connected to flexible unit connections, flanges or air dampers. Depending on the AHU size, L-20 or L-30 flanges shall be used. Special adhesive gasket must be attached to flanges for airtightness of air ducts. We recommend installing a solid gasket, i.e. do not cut it to smaller pieces. Make sure that the gasket does not cover fastening holes in the corners and is not damaged when fastening screws. Flanges in the corners are fastened with M8x20 screws and a C profile is pressed on edges to connect the flanges.

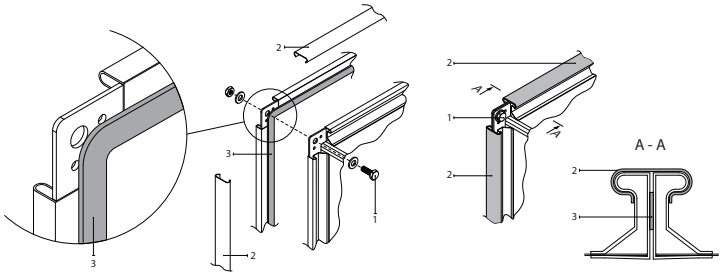


Fig. 31. Example for fastening and sealing of a flange ductwork connection
1 – screw, 2 – C profile for connection of flanges, 3 – adhesive gasket

For rectangular ducts where opening sides are longer than 500 mm, it is recommended to use universal clamp connectors instead of C profile to ensure better air tightness. Clamp connectors should be spaced evenly at intervals of no more than 265 mm.

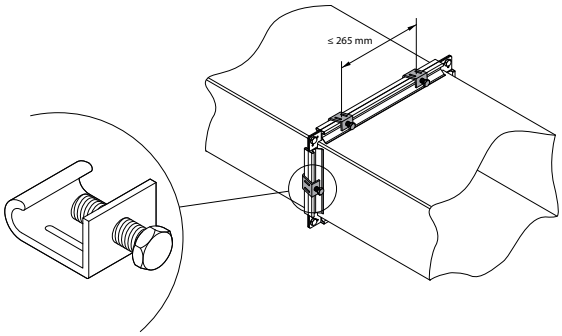


Fig. 32. Duct connection example using universal clamp connectors

Air closing damper profile dimensions are the same as those of L-20 flange (for all AHU sizes), thus when mounting additional parts (ducts, flexible connectors, duct heaters/coolers, silencers and etc.) directly to the air damper, they should also have an L-20 flange connection for easier installation.

The air handling unit uses a low-flammable refrigerant, so a refrigerant leak sensor is installed in the heat pump section. Its purpose is to trigger an emergency function that will purge the leaked refrigerant from inside the unit, thus preventing it from catching fire. When the function is activated, the ventilation unit fans will maintain a certain air flow, not less than Q_{min} (see table).

When designing and installing the duct system, it is necessary to ensure that in the event of a refrigerant leak, there will be no obstacles preventing the ventilation unit from achieving the required Q_{min} air flow (e.g. closed regulation dampers, too small ducts, unregulated VAV system).

AHU size (HP size)	Qmin, m³/h
12 (11/11)	594
12 (16/15)	655
22 (18/17)	819
22 (20/19)	901
32 (25/23)	1352
32 (38/34)	1597
42 (28/26)	1761
42 (41/40)	1863
52 (29/27)	2068
52 (45/45)	2068
62(47/47)	1945
62 (59/58)	2048
72 (49/49)	2007
72 (83/84)	2007
82 (52/52)	2089
82 (89/90)	1986
92 (54/54)	2212
92 (104/102)	2150
102 (56/56)	2294
102 (90/90)	2294
102 (124/122)	2294
112 (126/126)	2355

The duct system directly connected to the air handling unit must not contain any ignition sources (e.g. gas heaters) or exposed hot surfaces with temperatures higher than 800°C.

3.8. Outdoor Units

RHP Pro2 air handling units for outdoor installation must be additionally protected against environmental effects by installing a protective roof and exhaust air hoods. Units shall be mounted on an installation frame which is attached to an installation base. Ventilation devices, when possible, should be installed near the walls for protection against wind loads. For outdoor installation, units with drainage pipes must be additionally protected against freezing, for example, with electric heating cables for drainage pipes. If the unit was ordered for outdoor installation, each section of the unit will be fitted with a protective roof. Separately ordered protective roof shall be installed once the unit is fully assembled.

Connections of units for outdoor installation must be additionally sealed (sealant not included).

- **If the outdoor unit will be switched off during the cold season, supply and extract air ducts (on the indoor side) must be fitted with additional air shut-off dampers. These should prevent warm indoor air from circulating inside the unit when it is stopped to avoid condensation, which may be detrimental to electronic components.**
- **Outdoor installation of air handling units with vertical duct connections is prohibited.**

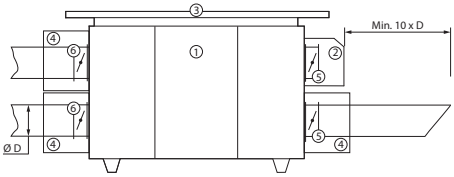
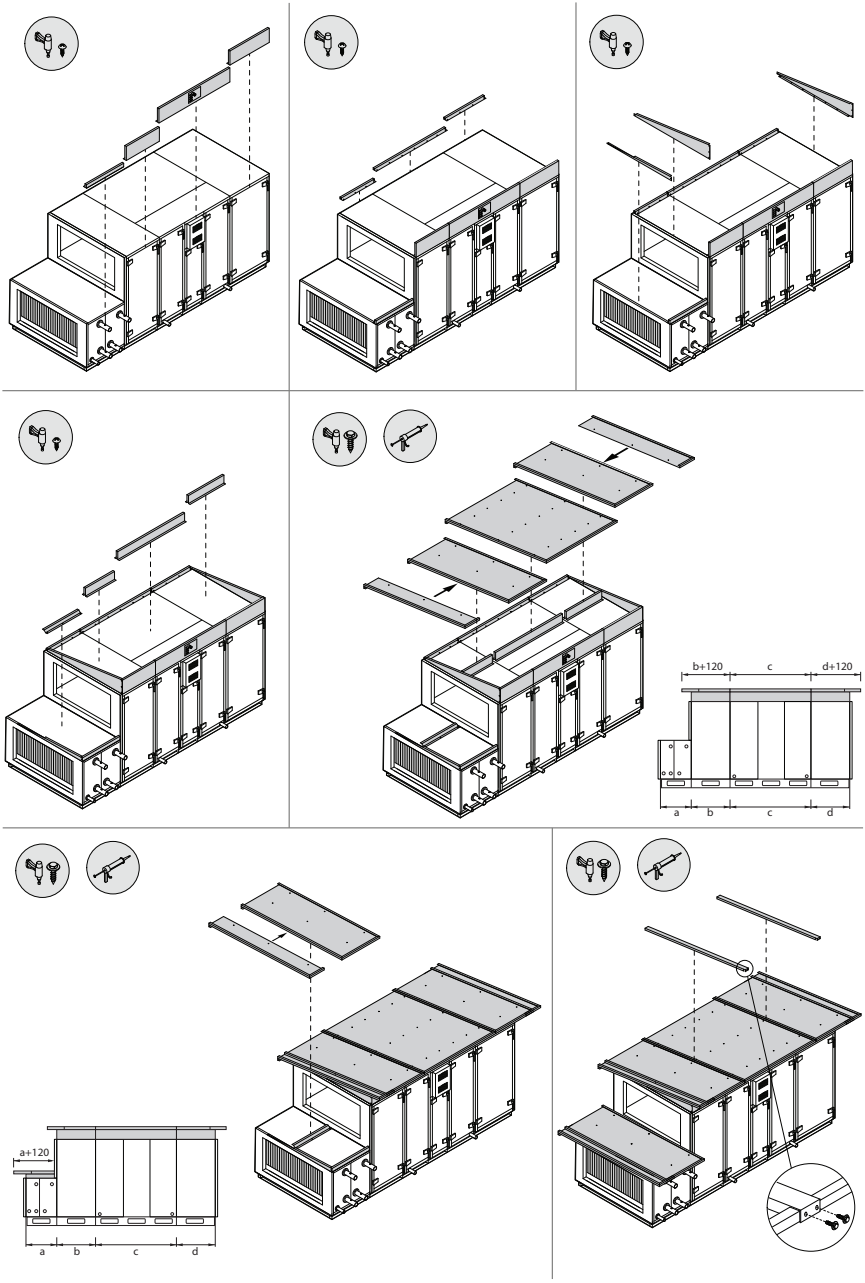


Fig. 33. Accessories for outdoor installed units
1 – air handling unit, 2 – air intake hood, 3 – roof, 4 – boxes or covers for air damper actuators, 5 – air shut-off dampers, 6 – additional air dampers for protection of a stopped unit

Air intake and outlet hoods must be installed as far apart as possible (for example by installing additional duct segments between AHU and hood), to prevent the exhaust air from returning to the air intakes.

RHP PRO2 12-72



RHP PRO2 82-92

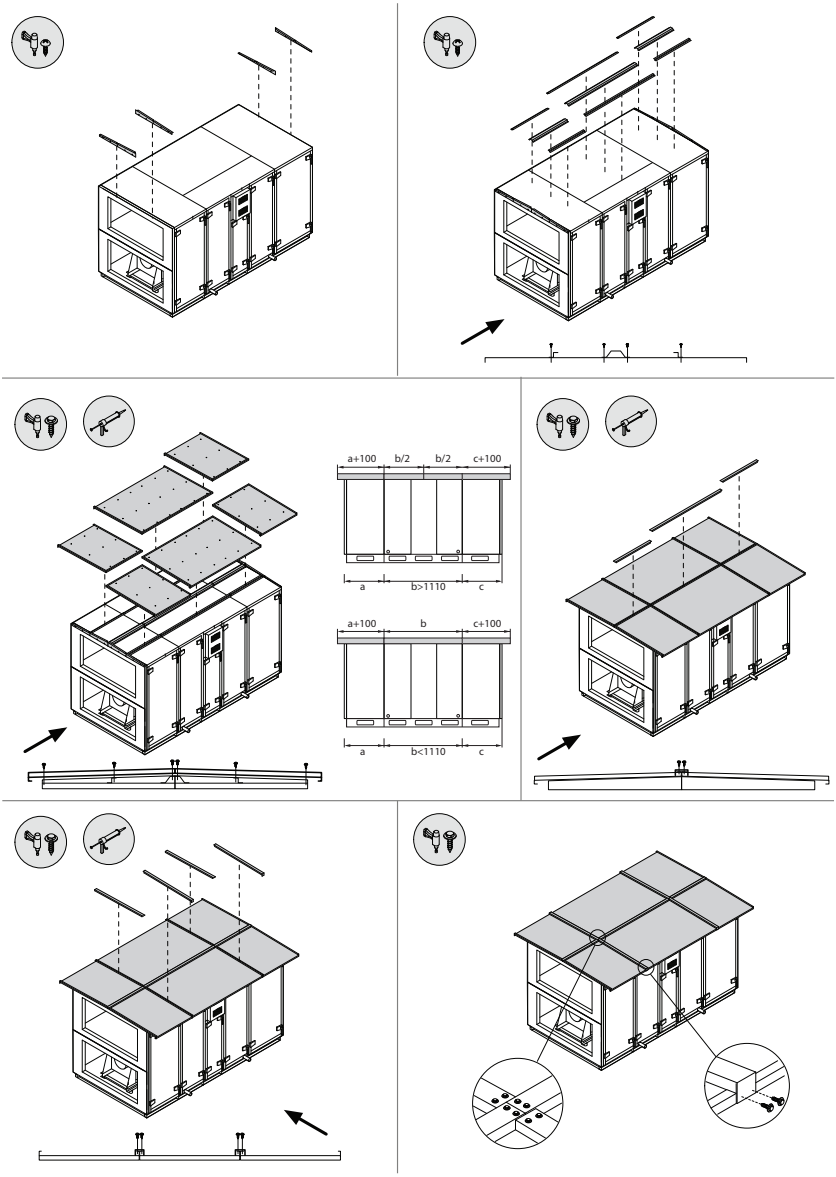


Fig. 34. Installation of a separately ordered protective roof [1]

[1] Part count and measurements may differ depending on the unit type or project requirements.

UAB KOMFOVENT we reserve the right to make changes without prior notice

4. 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 ant other wiring for damage in insulation.**
- **Locate the wiring diagram for your unit according to the unit type.**

4.1. Requirements for Electrical Connection

- **Connect the unit only to a proper power outlet with a protective earth connection. If the AHU is fitted with a main power switch, connect the electrical supply to it. The power socket or main switch, along with its earthing, must be installed in accordance with the requirements of EN 61557, BS 7671, or IEC 60364.**
- **It is recommended to connect AHU to the mains via automatic circuit breaker with 300 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.**

Air handling units designed for 400 VAC, 50 Hz supply voltage, connected through the main circuit breaker (QS1 in wiring diagrams). The main circuit breaker comes with a universal bracket that allows fixing it on the top or side of the AHU.

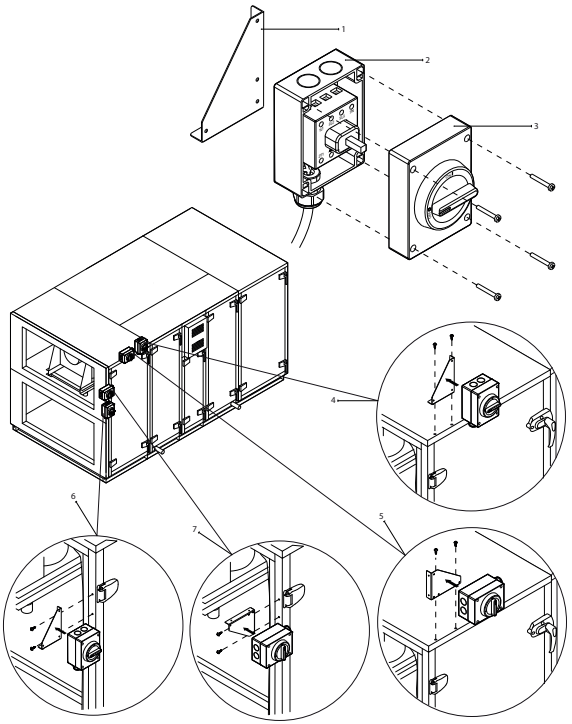


Fig. 35. Main circuit breaker and its mounting examples
1 – universal bracket, 2 – circuit breaker, 3 – cover of the breaker, 4 – mounting on top of AHU vertically, 5 – mounting on top of AHU horizontally, 6 – mounting on the side of AHU vertically, 7 – mounting on the side of AHU horizontally

If circuit breaker bracket is used, it must be mounted on the edge of the unit casing, otherwise self-tapping screws may damage wires or tubing that is routed inside.

Units fitted with an additional electric heater section will be equipped with a separate main circuit breaker inside the section.

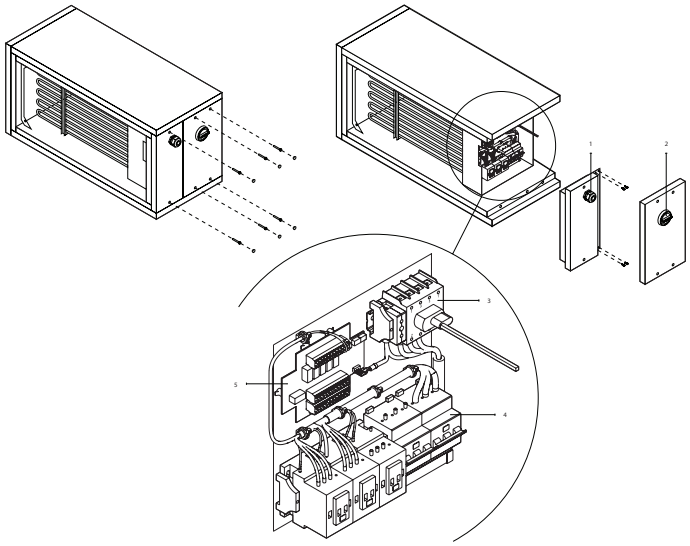


Fig. 36. Main circuit breaker inside an electric heater section
1 – lead-in cable grommet, 2 – main circuit breaker handle, 3 – main circuit breaker,
4 – automatic switch, 5 – electronic heater control board

Large RHP Pro2 units (size 62 and larger) also has a separate power circuit breaker for the heat pump section.
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 mm² (Cu)
21	5 × 2,5 mm² (Cu)
27	5 × 4,0 mm² (Cu)
34	5 × 6,0 mm² (Cu)
50	5 × 10,0 mm² (Cu)
70	5 × 16,0 mm² (Cu)
85	5 × 25,0 mm² (Cu)

4.2. Connection of Electrical Components

All internal and external devices are connected to the main board of the C5 control panel (RG1 in wiring diagrams) located in the automation box. Automation box is fitted at the front of the unit, top part of the heat exchanger section. Box is airtight and is opened by removing four screws and pressing the four latches on the sides of the box.

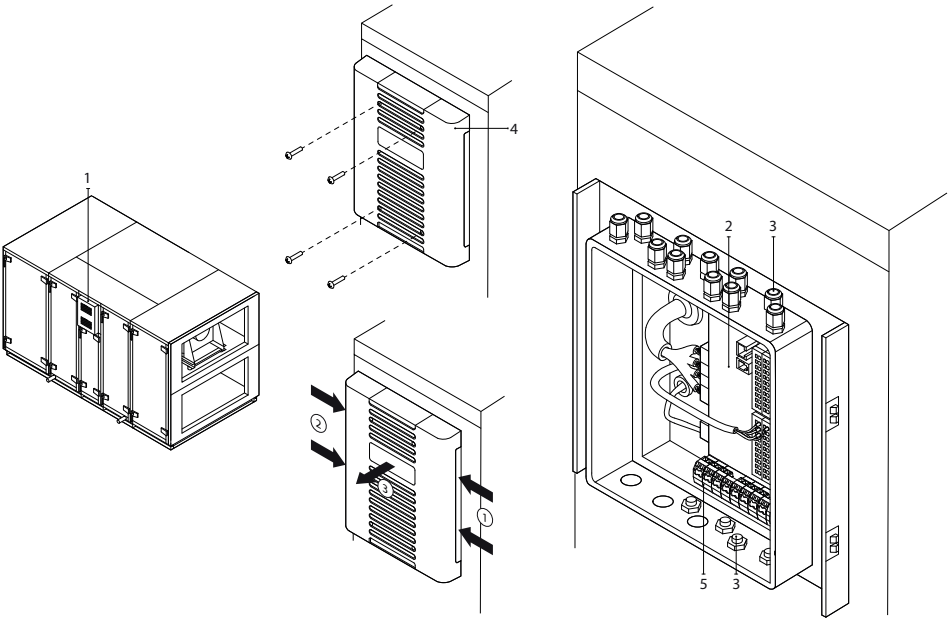


Fig. 37. Automation box
1 – automation box, 2 – main board of the C5 control panel, 3 – grommets for wires;
4 – Automation box cover, 5 – additional connection terminal block

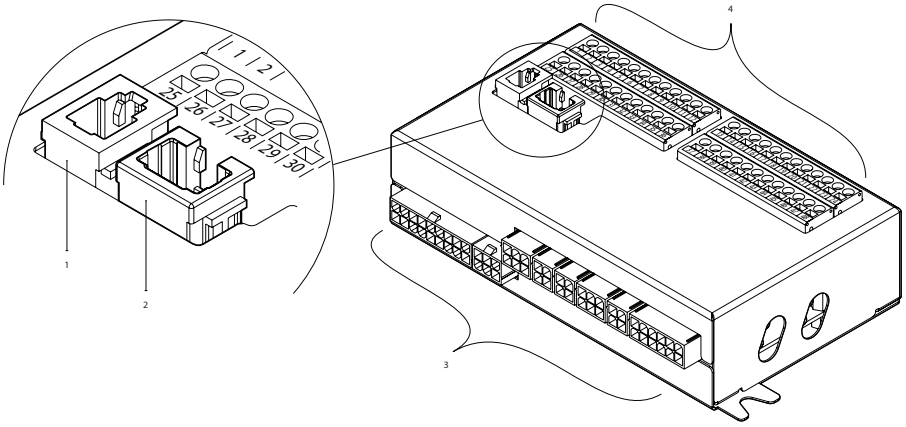


Fig. 38. Main board of the C5 control panel
1 – control panel connection, 2 – Intranet or Internet connection, 3 – inner connections of components,
4 – terminals for external components

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.

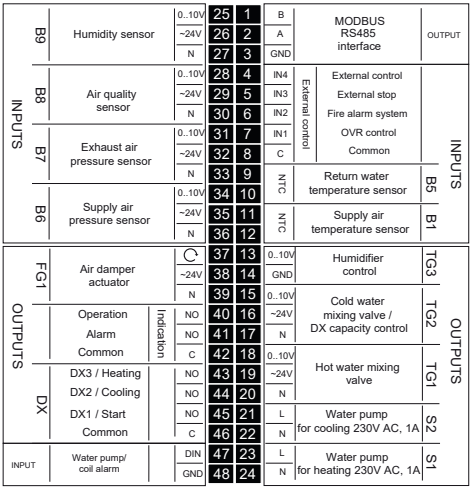


Fig. 39. Connection terminals for external components on the C5 main board

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.

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 for activating recirculation (if a recirculation damper is ordered, controlled by an external contact) or switching between heating and cooling modes when a combined water heater/cooler coil is fitted (when terminals are connected, the water valve actuator and pump will be controlled by a 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, fans speed up (according to the order) and a fire alarm message is displayed.
- **Terminal 7** actives 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 10kΩ) which protects against freezing.

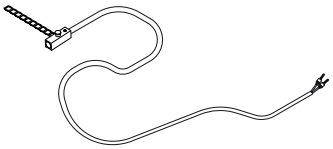


Fig. 40. Surface-mounted return water temperature sensor[1]

[1] Depending on the order.

UAB KOMFOVENT we reserve the right to make changes without prior notice



Fig. 41. Return water temperature sensor with thread[1]

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



Fig. 42. 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.

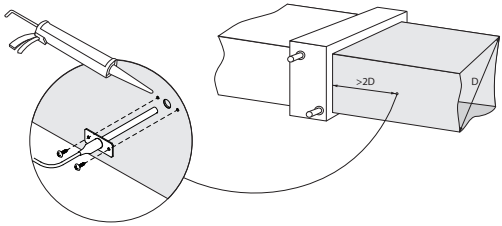


Fig. 43. Installation of a supply air temperature sensor

TG3 (13–14) – for connecting control signal (0..10 V) of an external humidifier or dehumidifier, if activated. If the humidifier/dehumidifier also needs an additional "Run" signal when AHU is in operation, 40 and 42 terminals can be used for this purpose.

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).
- Recirculation control (REC).
- 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 CO_2 (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. Also terminals are dedicated for smoke by-pass damper actuator, when optional smoke extraction function is ordered and fans are forced during fire alarm. These terminals may also be used for connecting 24 V AC power supply actuators with or without a spring return.

[1] Depending on the order.

Indication (40–42) – terminals are used when a normally open (NO) contact is necessary for operation status or fault indication. Terminals 40 and 42 are closed when AHU is in operation, thus it can be connected to any external device, which needs such a signal (for example humidifier). Terminals 41 and 42 close when AHU is in an alarm state.

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 panel[1]:

- 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.

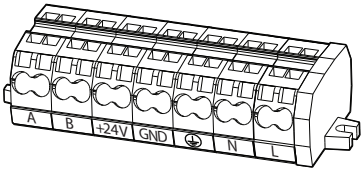


Fig. 44. Additional connection terminal block

Additional zone connection (A, B, +24V, GND) – terminals are used for optional additional zone modules, that are used to control duct-mounted heating/cooling devices. For information on how to activate this function and set a desired temperature for each zone see "User manual".

230V power output (N, L) – auxiliary devices that require a 230V power supply (e.g. laptop charger) can be connected here during AHU repair or maintenance.

All wires to be connected to the main board of the control panel shall be pulled through grommets (top or bottom of the automation box). Grommets are fastened to ensure tightness. Depending on whether the wires will be pulled up or down, break a tab at the top or bottom edge of the box cover.

On AHUs installed outdoors all the wires must be pulled through the bottom of the automation box cover and only the tab at the bottom edge must be broken.

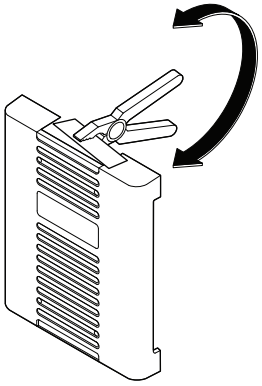


Fig. 45. Automation box cover

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

4.3. 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.

Control panel is supplied with a 10 m cable. If this cable is too short, you can replace it with a 4 × 0.22 mm cable, up to 150 m long.

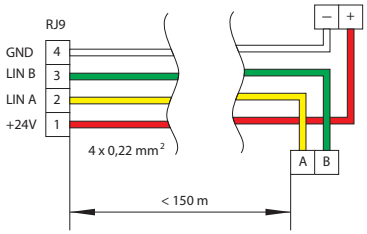


Fig. 46. Control panel wiring diagram

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 (RJ9 connector; see Fig. 38).

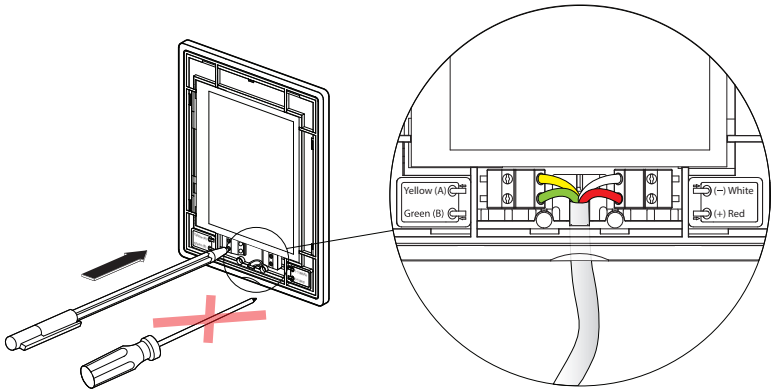


Fig. 47. Control panel cable wiring

- **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.**

4.4. Connection of Cables and Wires Between Sections

Before fastening parts of the air handling unit, you shall connect connecting cables and wires of the sections. Cable connectors are labelled with connector numbers; only connect connectors with the same number. Number of cables and connectors in different sections may differ depending on fitted components. If any features or external components are not ordered, there may be some uncoupled connections between the sections. Refer to the wiring diagram of the specific unit to see what connections should be used.

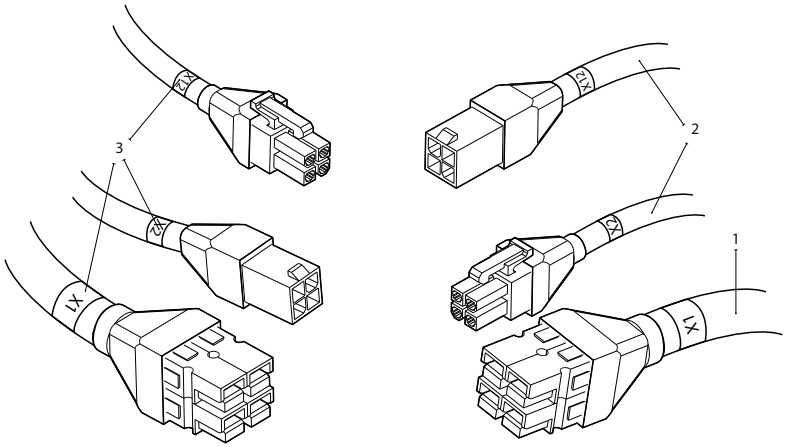


Fig. 48. Cable connections between sections
1 – power supply cable, 2 – communication cables between circuit boards 3 – labels with connection numbers

Some components (e.g., damper actuators, humidifier, etc.) do not have separate connectors and must be connected to a terminal block of a junction box (PD in wiring diagrams).

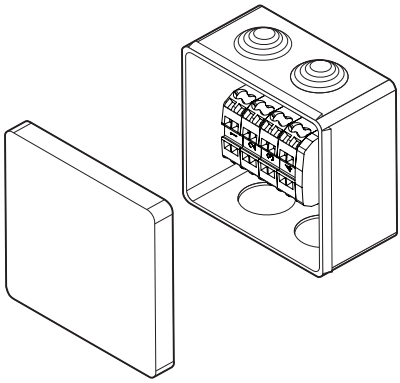


Fig. 49. Junction box PD1

Connected wires and cables must be inspected to ensure that they will not accidentally disconnect due to vibrations of the unit or get in contact with moving parts of the unit (fans, valves, rotor wheel). If necessary, use special ties to attach the wires to the unit housing.

4.5. 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. 38). 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.

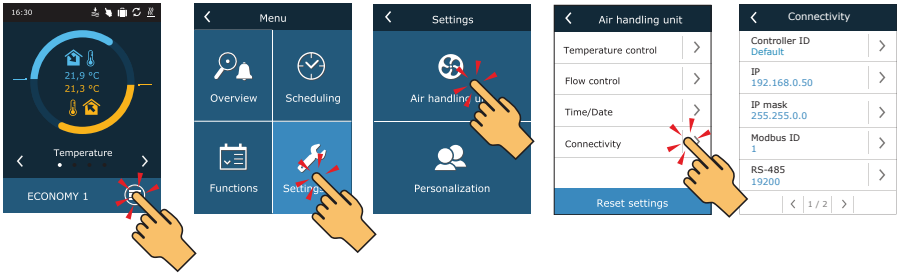


Fig. 50. Viewing and changing the IP address with a control panel

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.

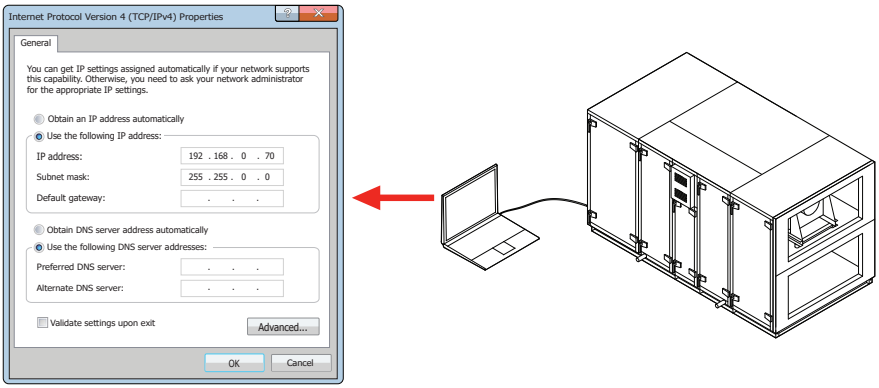


Fig. 51. Computer network settings for direct connection to the unit

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").

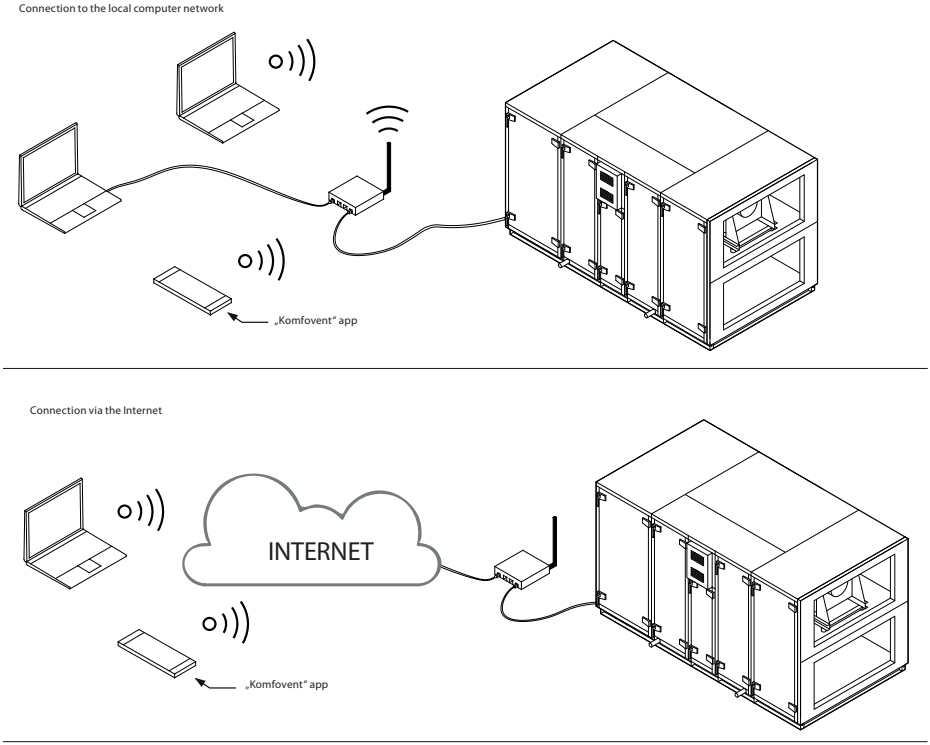


Fig. 52. Examples for the AHU connection to the Internet or the local network

5. FILTERS

Air filters are intended for removing dust, bacteria and other fine particles from the supplied and extracted air. RHP Pro2 air handling units are fitted with bag filters, since they have a larger filtering surface than compact filters and will require less frequent filter replacement. Filters are made of synthetic fabric and can have different filtration classes[1], i.e. intended for removing particles of different sizes. In general, supply air ducts are equipped with better filtering class filters than extracted air ducts, since the cleaned outdoor air is supplied to the premises. Make sure to replace filters on time, as contaminated filters increase pressure loss of the unit, reduce purification efficiency and increase power consumption.

The unit has an integrated filter contamination monitoring function. It continuously measures pressure difference upstream and downstream the filter to evaluate level of contamination. In case filters from another manufacturer or filters of other filtration class are used instead of factory-fitted filters, calibration of clean filters shall be performed before using the air handling unit. Filter replacement intervals depend on the environment pollution conditions as well as time of year, for example, during spring and summer filters may be contaminated with pollen, pubescence or insects, therefore change 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.

Filter type, dimensions, filtering class, number and exact location is specified in the technical data print-out for the specific unit.

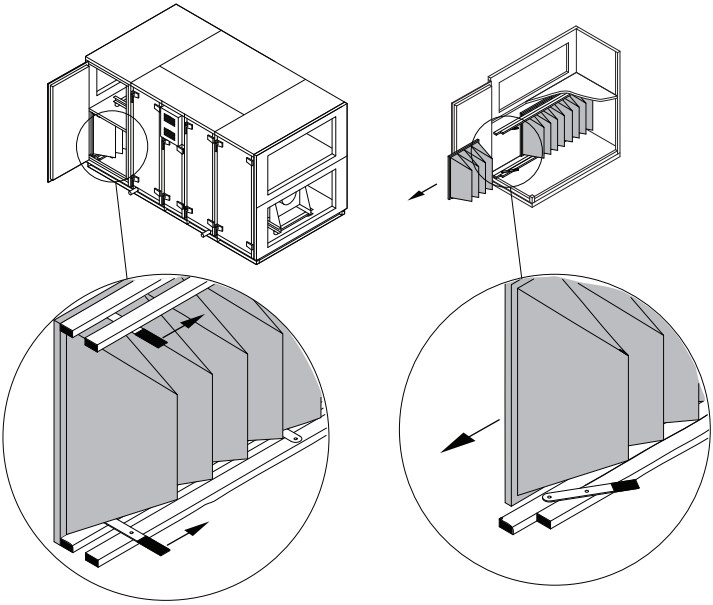


Fig. 53. Filter clamping device

To insert/remove filters, push two handles at the top and bottom of the filter forward to release a filter clamping device. Filters are removed/inserted one by one (number of filters depends on the unit size). Once the filters are replaced/inserted, handles are retracted and the filter clamping device presses the filters to the gaskets.

When inserting filters, make sure that their pockets are upright, filter frames are tightly seated and gaskets are intact.

[1] Depending on the order.

6. COMMISSIONING AND INSPECTION OF THE UNIT

Before switching on the device, check for foreign objects, debris or tools inside the unit. Make sure that air filters are installed and condensate drainage is connected (if necessary), fill the siphon with water. Make sure that the ductwork is free from obstructions such as fully closed diffusers or adjustment valves or blocked external air intake grilles.

- **The operation, maintenance or repair of the air handling unit is prohibited for people (including children) with mental, physical or sensory disabilities, as well as for persons without sufficient experience and knowledge, unless supervised and instructed by the person responsible for their safety in accordance with these instructions.**
- **You may start your AHU only when it is fully installed, ducts and external electrical elements are connected. Do not start the unit without air ducts connected. This may distort air volume measurements required for stable operation of the fans.**
- **Do not use the unit with a temporary electrical power supply as unstable power can damage the electronic components.**

See the KOMFOVENT website for user manuals.

The unit is controlled via a control panel or a computer. The unit is supplied with the following operation modes that may be used immediately after installation or different ventilation settings may be selected.

- **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 mode may also be used to disable heating/cooling and other functions.

6.1. Control panel C5.1[1]

C5.1 is control panel with coloured touch-screen for remote control of your air handling unit. This control panel is designed for indication and changing of various functions and settings of the unit.



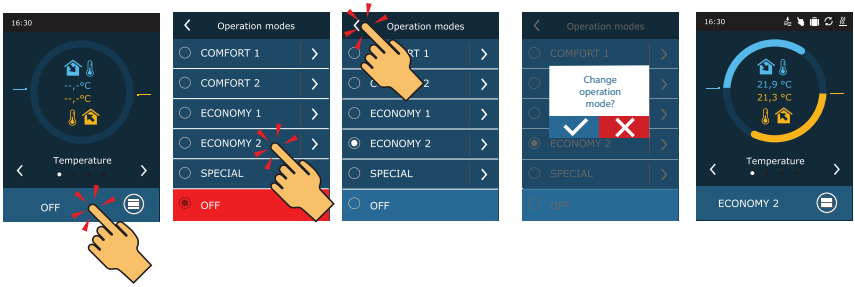
Fig. 54. Control panel

[1] Sold separately.

UAB KOMFOVENT we reserve the right to make changes without prior notice

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

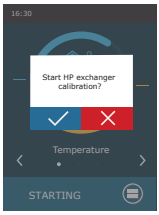
To start an air handling unit or change a ventilation mode:



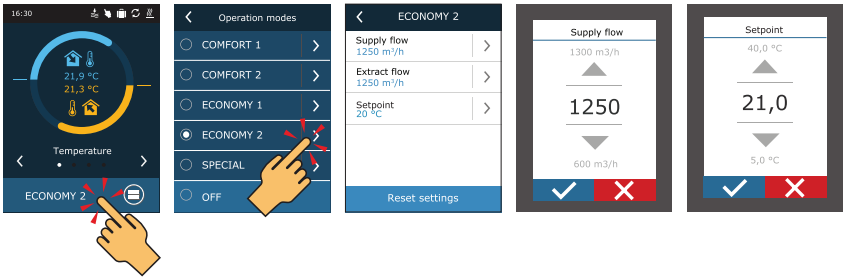
During the first minute of starting the unit, the unit automation checks the settings, automation components and opens air dampers. Later, a signal is sent to fans and a heat exchanger, and the unit starts operating at a selected ventilation mode.

The first time you turn on your air handling unit, you will have to perform calibration of a HP evaporator (if not performed during installation). This calibration is necessary for proper operation of the antifreeze prevention function.

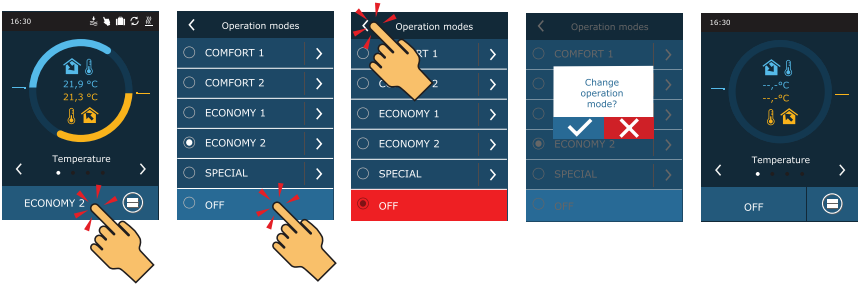
During calibration, the unit will run for 10 minutes by changing fan speed and will be measuring pressure inside the unit, therefore, do not open the unit door, do not adjust the duct system or change parameters at that time. To stop calibration, turn off the unit with a control panel or in the Overview screen.



To change the ventilation mode settings: select a desired mode and set a desired air volume or temperature with the arrows.



To turn of the AHU and return to a home screen:



6.2. Starting the Unit With a Computer

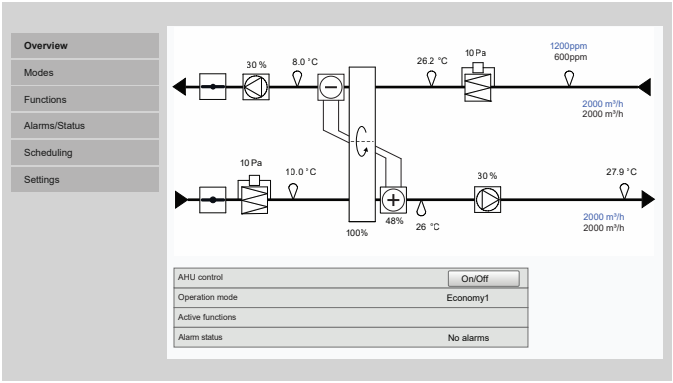
If the unit was ordered without a control panel or it is not used, you can start it with your computer. In this case the unit is controlled via a web browser. Connect your computer directly to the AHU or to the same computer network as described in Chapter 4.5. Run the Internet browser on the computer and disable the use of all Proxy servers that may block the connection in the settings. In the web browser address bar, enter the IP address of the unit:



Login to the C5 control panel interface in a window that opens: enter the user name ***user***, password ***user***[1] and press CONNECT.



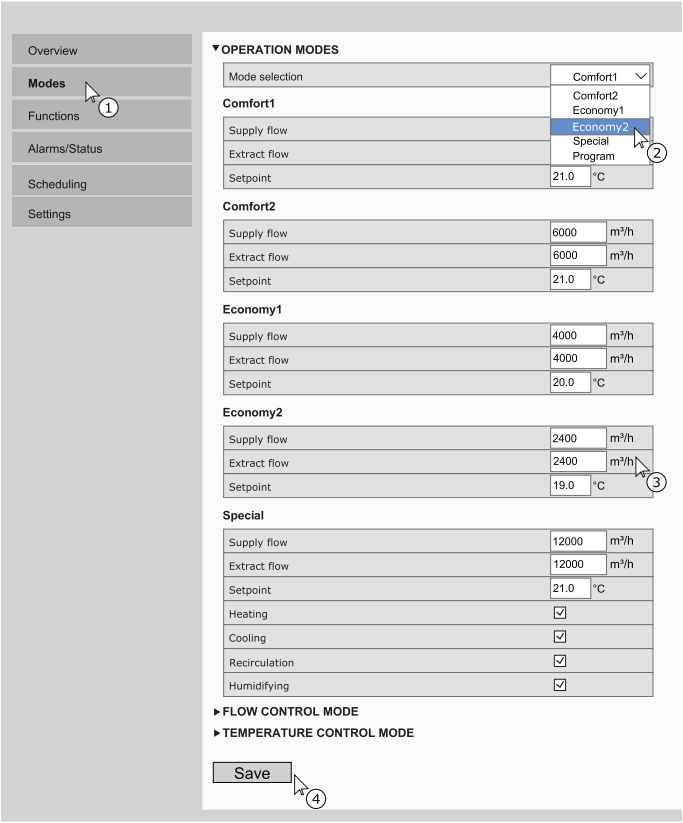
If you login attempt is successful, "Overview" window is opened.



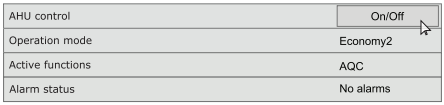
[1] If the password was changed, use the changed password.

UAB KOMFOVENT we reserve the right to make changes without prior notice

To start the unit and change the ventilation mode settings:
1. Press button “Modes”.
2. Select a desired ventilation mode from the list.
3. Enter desired air flow and temperature in the selected mode settings.
4. Press “Save” button at the bottom of the screen.



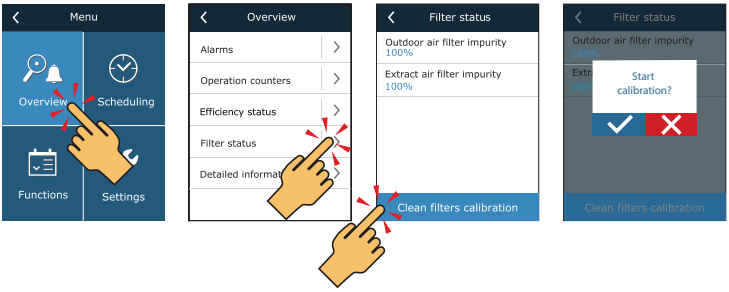
You can stop the unit by pressing ON/OFF button in the “Overview” window.



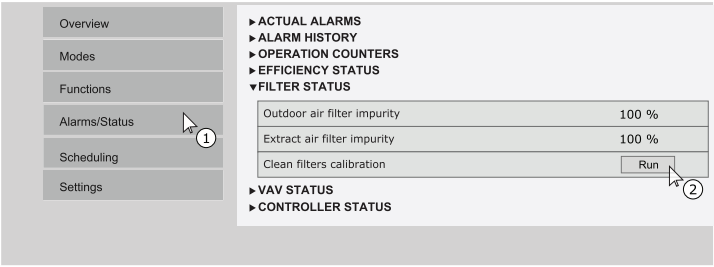
6.3. Calibration of Clean Filters

RHP Pro2 control automation continuously monitors filter contamination. Pressure drop of clean filters is preset in the factory. If filters are from another manufacturer or of different filtering class, we recommend performing initial calibration of clean filters before commissioning of the unit. During calibration, the unit will operate at a maximum speed for a few minutes, measure the pressure difference upstream and downstream the filter and automatically set the filter filtration class.

Calibration of clean filters with the control panel:



Calibration of filters with a computer:
Select Point “Warnings/States”:



If filters ordered with the unit are used (same manufacturer and filtration class), calibration of clean filters is not required.

UAB KOMFOVENT we reserve the right to make changes without prior notice

6.4. 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			
Check for leaks in the heat pump piping system			
Check if there is no moisture in the refrigerant system			
The heat pump compressor operates properly, without any extraneous noise and vibrations.			
HP heat exchanger calibration performed (only in HP units)			
Other comments:			

Installer	
Company	
Tel. No.	
Date	
Signature	

APENDIX NO.1

WARRANTY INFORMATION

Dear Customer,

KOMFOVENT thanks you for your choice. We are pleased that you have chosen us and will strive to ensure you are satisfied with your purchased product. To avoid misunderstandings, we kindly ask you to read the installation and operating instructions of the product carefully.

KOMFOVENT hereby confirms the obligations set by applicable consumer rights protection laws to fulfil consumer claims in case of detected product defects.

In case of any problems, we recommend immediately contacting the company that installed your ventilation unit, the company providing technical maintenance, or the nearest KOMFOVENT distributor branch. Please always note the device serial number. The device's serial number can be found on a sticker attached to the outside of the unit or on a plate mounted on the unit frame. Your claim will be registered and, if repair of the device is required, a representative will agree with you on a convenient arrival time. All repairs covered by the warranty will be carried out free of charge – with no charges for spare parts or labour.

Only an authorized representative can decide whether defective parts should be repaired or replaced with new ones. Replaced or repaired parts remain covered by the overall unit warranty. If repairs are performed after the end of the device's warranty period, the replaced or repaired parts are covered by a 6-month warranty.

The warranty covers all defects in the device arising from manufacturing or assembly faults. When operating the device under the conditions listed below, this warranty is valid from the product purchase date. If the purchase date is unknown, the warranty is calculated from the manufacturing date.

NORMAL OPERATING CONDITIONS

1. The devices must be protected from direct water ingress (rain or snow) and the effects of chemicals or be of special configuration intended for outdoor and/or aggressive environments.

2. The ambient temperature must be from -30 °C to +40 °C (if the unit wall thickness is at least 45 mm) or from 0 °C to +30 °C (if the unit wall thickness is at least 20 mm); exhaust air temperature – from +10 °C to +40 °C; relative air humidity – from 20% to 80%, non-condensing. The ratio of temperature and humidity must not exceed condensation conditions, i.e., condensation must not form on the inner or outer walls of the unit.

3. When starting equipment in new buildings or renovated premises during the autumn-winter season, the exhaust air humidity often exceeds normal operating conditions, and due to dust from construction materials, air filters may become clogged immediately after startup. It is recommended to dry and ventilate the premises before starting the ventilation equipment.

4. The ventilation unit must be periodically inspected (recommended interval – every 4 months): filters and heat exchangers checked for contamination, moving parts and belts checked. Air filters must be replaced at least once per year (recommended twice per year – before and after the heating season).

5. In the case of an extended warranty, periodic inspection of the unit must be performed at least twice a year throughout the entire warranty period, and the results must be recorded. Periodic inspections may only be performed by qualified specialists or a KOMFOVENT representative.

6. It is advisable not to switch off the ventilation unit; when ventilation is not required, reduce the intensity to the minimum.

7. System balancing must be performed before operating the ventilation unit.

KOMFOVENT representative reserves the right to refuse free warranty maintenance services if the following conditions are not met.

WARRANTY CONDITIONS

1. The warranty does not apply in the following cases:
   1.1. If the product usage or operating conditions, as specified in the installation and operating instructions, are violated;
   1.2. If the storage conditions of the unit are violated;
   1.3. If there are signs indicating attempts of unqualified repair;
   1.4. If the unit's construction has been altered;
   1.5. If the unit is used for purposes other than its direct intended use;
   1.6. If the device serial number on the attached plate or sticker has been changed, removed, or is impossible to identify;
   1.7. If the unit is installed not according to the manufacturer's installation instructions, has no space left for maintenance, or is installed in a location difficult to access;
   1.8. For noise, vibration, or colour changes arising from normal wear of the unit or its components.

2. The warranty does not apply to device malfunctions that occur due to:
   2.1. Damage to the unit caused by improper transportation or installation errors;
   2.2. Mechanical damage;
   2.3. Damage caused by foreign objects, materials, liquids, or condensation entering the device, except when this occurs due to a design flaw;
   2.4. Damage resulting from natural disasters, fire, domestic factors, accidental external effects (voltage fluctuations in the electrical network, lightning, etc.), or accidents.

3. Warranty service is not provided in cases where it is necessary to replace operating parts (filters, fuses).

4. Preparatory work required to access the unit and perform quality repairs, such as removal of furniture, walls, partitions, ceilings, ducts, plumbing, equipment from other manufacturers, or other obstructing items, is not considered warranty service. KOMFOVENT representatives have the right to refuse to perform such work.

5. The warranty does not cover additional fluids used in ventilation systems, such as heat exchanger filling fluids, in the event of leakage.

6. The warranty does not cover additional losses attributable to device failure, such as inconvenience, transportation expenses, phone calls and accommodation, personal or business losses, loss of salary or income.

7. KOMFOVENT is not responsible for direct or indirect damage caused by KOMFOVENT products to people, pets, or property if the cause of such damage is failure to comply with the unit's usage and installation rules and conditions, intentional or negligent actions of users or third parties.

Since great attention is paid to product quality, we welcome your feedback, comments, or suggestions regarding the technical and operational properties of the equipment.

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. 2,
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: 0191 429 4503
info_uk@komfovent.com
www.komfovent.com

PARTNERS

AT	J. PICHLER Gesellschaft m. b. H.	www.pichlerluft.at
BE	Ventilair group	www.ventilairgroup.com
	ACB Airconditioning	www.acbairco.be
CZ	REKUVENT s.r.o.	www.rekuvent.cz
CH	WESCO AG	www.wesco.ch
	SUDCLIMATAIR SA	www.sudclimatair.ch
	CLIMAIR GmbH	www.climair.ch
DK	Øland A/S	www.oeland.dk
EE	BVT Partners	www.bvtpartners.ee
FR	ATIB	www.atib.fr
HR	Microclima	www.microclima.hr
HU	AIRVENT Légtechnikai Zrt.	www.airvent.hu
	Gevent Magyarország Kft.	www.gevent.hu
	Merkapt	www.merkapt.hu
IE	Lindab	www.lindab.ie
IR	Fantech Ventilation Ltd	www.fantech.ie
IS	Blikk & Tækniþjónustan ehf	www.bogt.is
	Hitataekni ehf	www.hitataekni.is
IT	ICARIA	www.icaria.srl
NL	Ventilair group	www.ventilairgroup.com
	DECIPOL-Vortvent	www.vortvent.nl
	ForClima BV	www.forclima.nl
NO	Ventilution AS	www.ventilution.no
	Ventistål AS	www.ventistal.no
	Thermo Control AS	www.thermocontrol.no
PL	Ventia Sp. z o.o.	www.ventia.pl
SE	Nordisk Ventilator AB	www.nordiskventilator.se
SI	Agregat d.o.o	www.agregat.si
SK	TZB produkt, s.r.o.	www.tzbprodukt.sk
UA	TD VECON LLC	www.vecon.ua