



# **INSTRUCTION MANUAL**

**for**

**Duplexvent MULTI-N, MULTI ECO-N and Basic-N**

**units**

**- outdoor version -**

## Dear customer,

Thank you for selecting our product. We hope it will work to your full satisfaction.

The installation manual contains all necessary instructions, information, advices and recommendations for safe and correct equipment installation and commissioning. Please, read the manual carefully and follow the instructions.

### Explanation of used symbols:

Items or sections marked with Ü or with grey background; applies only to appliances manufactured in compliance with the hygienic requirements of Regulation VDI 6022 (indicated on the identification plate, see following chapters).

### Important notes

- Only a qualified person may carry out the electrical wiring, commissioning and setting work.
  - Read carefully the installation manual and the operation and maintenance manual before installing the equipment!!
  - The equipment, as well as all accessories must be installed and used in accordance with the design documentation, manufacturer's technical conditions and respective valid regulations and technical standards.
  - The equipment must not be installed and operated in aggressive environment, which could damage inner and outer parts of the equipment.
  - An initial electrical audit report for the power supply to the equipment must be obtained prior to bringing the equipment to a continuous operation.
- Ü Before putting the appliance into operation, the acceptance test (see VDI2079 and DIN EN V 12599) of the entire HVAC system where the appliance is integrated must be carried out. The test must include the inspection of hygienic requirements as per Regulation VDI 6022 and must be documented. The operator must be able to provide the acceptance test report at any time. Otherwise the manufacturer may not guarantee compliance with hygienic requirement.

**The manufacturer is not liable for damages caused by unprofessional installation, which was in contrast with the installation manual and common practice for air-handling systems and controls.**

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# 1. Storage and transport

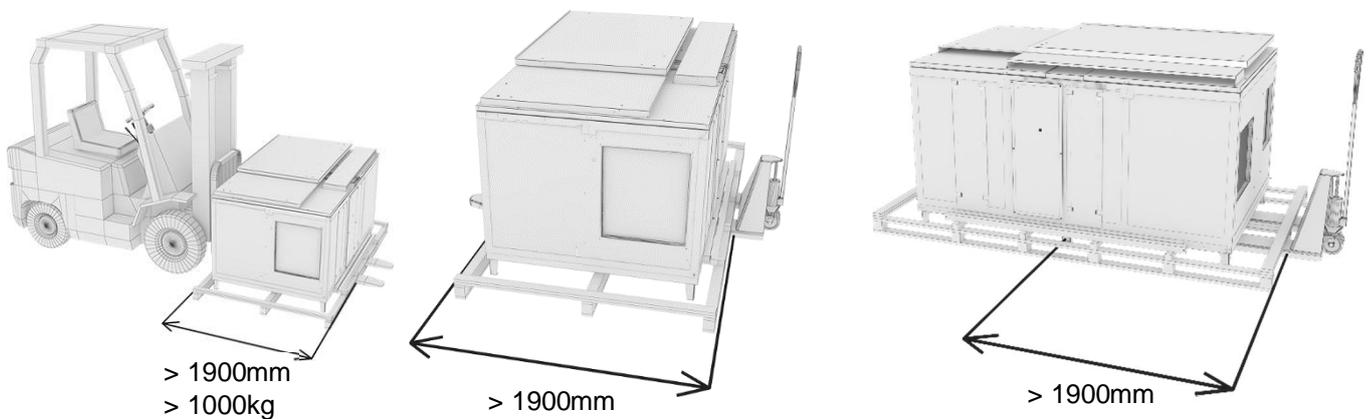
- The appliance may only be stored in dry, covered places with ambient temperature between - 25 °C and +55 °C in such a manner so as to keep the surfaces that will be in contact with transported air weather-protected, dry and clean.
- The packaging may only be removed immediately before the installation of the appliance in its final position. Otherwise it is necessary to check all parts for cleanliness before installation and clean the parts carefully if needed.
- The equipment must contain no operating fluids (e.g. water in heating or cooling coil) during the storage and transport.
- The appliance may only be transported when positioned on transportation racks (supplied as standard). The appliance must be protected against mechanical damage and leaking water during transportation and prior to completing the appliance assembly. All holes must be covered with protective lids. The same applies when the appliance is transported disassembled.
- Secure the equipment against falling during the transport. Also, the transport method should prevent risk of falling or loosening the equipment.
- It is prohibited to carry out activities such as grinding, welding, cutting and other ancillary works near the unit that could irretrievably damage the surface or individual parts of the unit.

! It is necessary to fasten the unit safely prior to any manipulation or transport of the unit. Secure the unit and its accessories against falling down or tipping over.

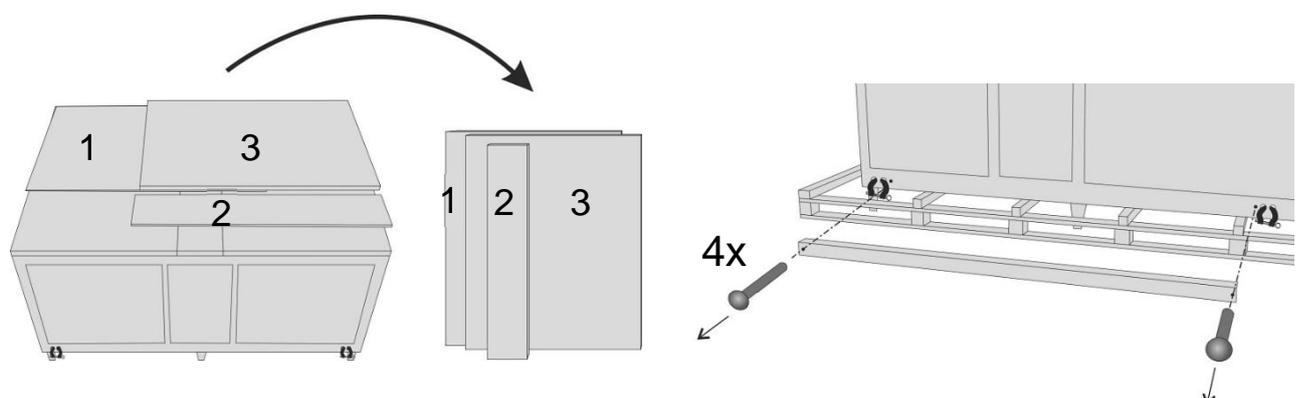
## 1.1. Transport of compact units, roof assembly

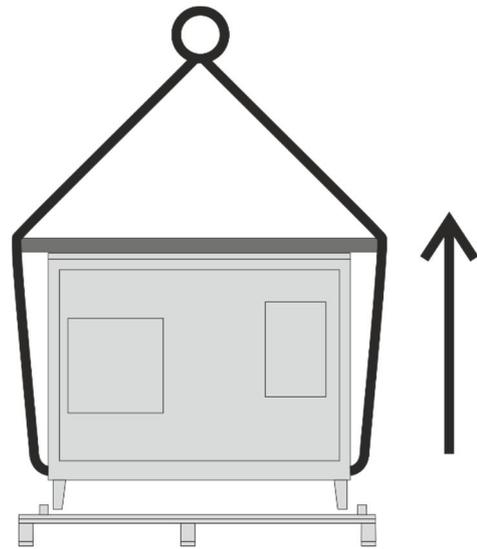
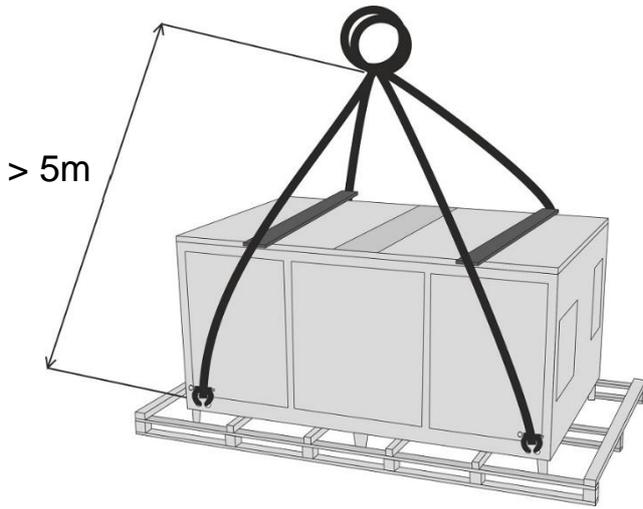
Compact units are understood as units that are placed in one compact casing.

### The only manipulation methods allowed

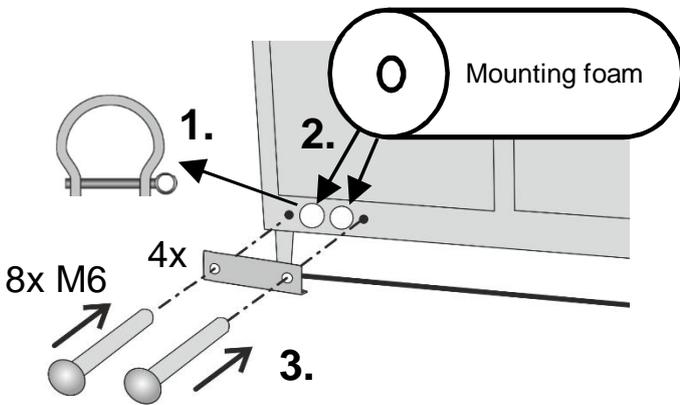


### Transport of the unit by crane, roof assembly

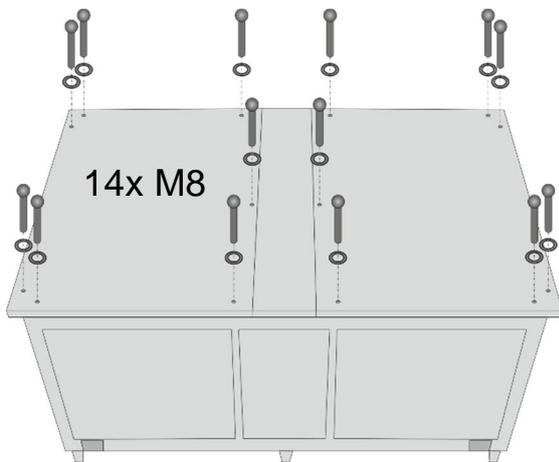
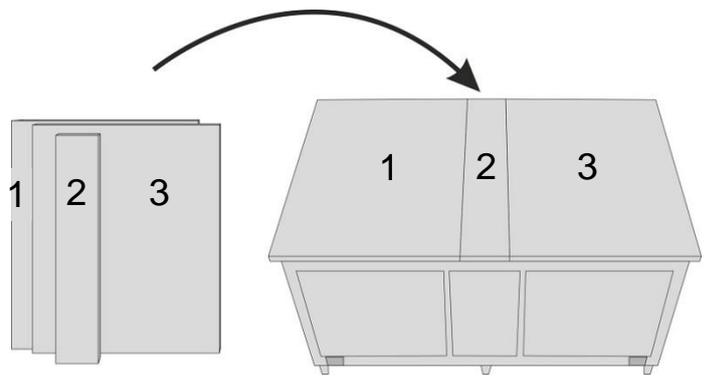




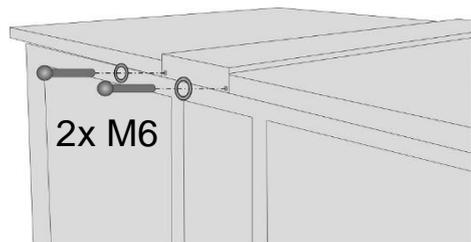
! The bars must be wider than the unit



Upon positioning the unit fill in the shackle holes with a mounting foam. Fill in 8 holes altogether. Then screw the blind flanges (part of delivery).



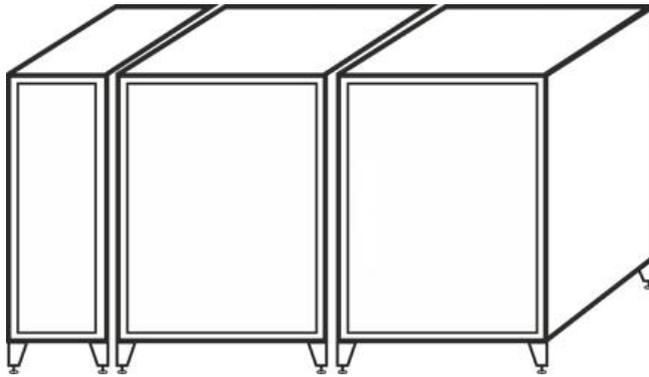
Use waterproof washers (part of delivery) under the screws.



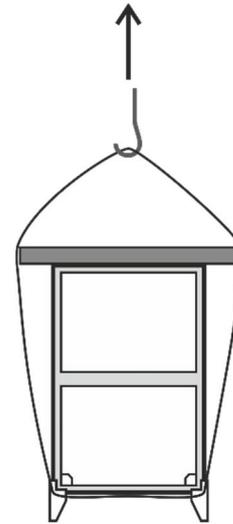
! Fit roof cover sheets right after placing the unit in the final installation position. Protect the unit from rough weather (rain, snow) until the unit assembly is complete.

## 1.2. Transport of semicompact units

Semicompact units consist of two or three blocks that form the unit once they are connected together.



Blocks of semicompact unit



Lift the blocks of semicompact units one after another.  
Tie up individual blocks from underneath before lifting them.

! The bars must be wider than the unit itself.

## 2. Equipment installation

### 2.1. Safety rules

- The equipment in the outdoor version (**marked by letter N in the name**) can be installed into outdoor environment - environmental temperature must be between  $-25^{\circ}\text{C}$  and  $+55^{\circ}\text{C}$ , relative humidity is not limited (except for conditions in the Chapter 2.2, bullet point 2). The equipment must be sufficiently thermally protected from the effect of low temperatures (e.g. by using anti-freeze liquid in the water heater circuit, etc.)
- The unit must have continuous warm water supply during the heating season.
- Protection of the unit's internal components from getting cold when the unit is not working is provided by a shut-off damper in EHA ducting (on the outlet discharge side).
- The appliance may be operated within the temperature range of ventilation air between  $-25^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$  with relative exhaust air humidity up to 80%, in an environment where there is no risk of fire or an explosion of flammable gases and fumes, and air transported must not contain organic solvents or aggressive substances that might damage mechanical parts of the unit. If there is a danger of such gases and fumes temporarily entering the duct system (e.g. during floor bonding, painting), the unit must be switched off sufficiently in advance.
- Be careful during the installation not to damage the unit casing (e.g. by hanging it only on two lugs).
- After placing the equipment make sure its position is stable and secure the equipment against possible movement.
- Follow all work safety rules during the manipulation and installation work (including safety rules for work in heights and lifting weights), use proper tools and protective clothing.
- Only a qualified person may operate the lifting equipment and binding tools.
- Use ropes being at least 5m long to transport the unit on a crane. In no case it is allowed to use shorter ropes, there is a risk of deforming the unit (see label on the unit)!

! In case of manipulation with any detachable parts (e.g. roof of the unit) it is necessary to fasten these parts to the casing of the unit at the designated point.

Appliances with hot water heaters

- Must be permanently connected to power supply to provide for the anti-freeze protection of the hot water heater. In case of a prolonged power outage the heating medium must be drained from the hot water heater including the control set. We recommend draining water from the heater with pressurized air, not using a gravity flow!

- It may only be operated if the heating system including the hot water heater and control set are filled with a heating medium and air bled; also applies to periods outside the heating season! In case the heating system including the hot water heater and control set are not filled with a heating medium, the remaining heating medium must be drained; the appliance must be dried properly and disconnected from power supply.

## 2.2. Hygienic instructions and requirements

- If installation is interrupted or heavy dusting occurs, cover all openings of the appliance in such a way so as to ensure that surfaces to be in contact with transported air remain protected against the weather and stay clean and dry.
- If long-term high relative humidity (short-term more than 90 % or more than 80 % for three consecutive days) is likely to occur with the subsequent moistening of filters (e.g. in areas with frequent fogs, frequent and long rains, flying snow etc.), suitable measures must be taken to prevent microbiologic growth. Recommended measures include more frequent hygienic checks as per VDI 6022 or shorter filter replacement intervals. Another option is the preheating of air using an appropriate control devices (electrical duct heaters are available as accessory), or the appliance must be put out of operation for the period when filters are at the risk of moistening (if the type of operation allows this).
- Should such weather conditions occur at the site of installation that would cause the dew point to be exceeded in the supply air region of the heat recovery exchanger, or an independent cooling system is installed in ventilated rooms, Duplexvent units may only be used provided that it has been arranged via appropriate measures that the dew point is not exceeded in the heat exchanger. The typical weather of central Europe makes this condition almost impossible.
- The e1/ODA air supply chamber has no water drain. An accessible and cleanable chamber with a drain of precipitated water must be installed upstream the outdoor air inlet into the appliance.
- The HVAC network of appliances operated in an environment with Class ETA 2 extract air must be arranged for operation in such a way so that positive pressure is on the supply air side; in an environment with Class ETA 3 the extract air must be arranged for operation in such a way so that positive pressure is on the supply side in comparison to the exhaust side. This must be ensured under all operating conditions of the system. For more details see EN 13779.
- Unpack and install air filters in the last step, just before putting the appliance into operation. You will prevent the filters from getting dirty.
- Air duct including accessories with autonomous regulation of operation is to be connected on the fresh air supply. Such duct will, in compliance with the regulation VDI 6022, provide for appropriate treatment of supplied fresh air to prevent air filter from getting wet. In case the duct is not connected or if it does not include such accessory, the appliance is to be put out of operation as long as the risk of air filters to get wet persists (thick fog, snowing).

Ü In compliance with hygienic standard VDI 6022 HVAC systems must be equipped with shut-off dampers to ensure the automatic closure of the system so that air cannot flow freely through the system. We recommend using shut-off dampers available as an accessory. It is the responsibility of the planner / specialist installation company to comply with this requirement.

Ü Duplexvent series appliances have a single-stage filtration system. Appliances in a hygienic version in compliance with hygienic standard VDI 6022 must have a Class F7 / ePM1 50% filter fitted on the inlet; applies to outdoor air (e1/ODA) class ODA 1 and ODA 2. When outdoor air is Class 3, an M5 / ePM10 50% Class filter must be fitted in the duct upstream the outdoor air inlet into the HVAC unit; alternatively, an M5 / ePM10 50% class filter may be installed in the HVAC unit and a Class F7 /ePM1 50% filter in the duct at the e2/SUP outlet from the unit. Note: M5 / ePM10 50% and F7 /ePM1 55% filters are available as accessories.

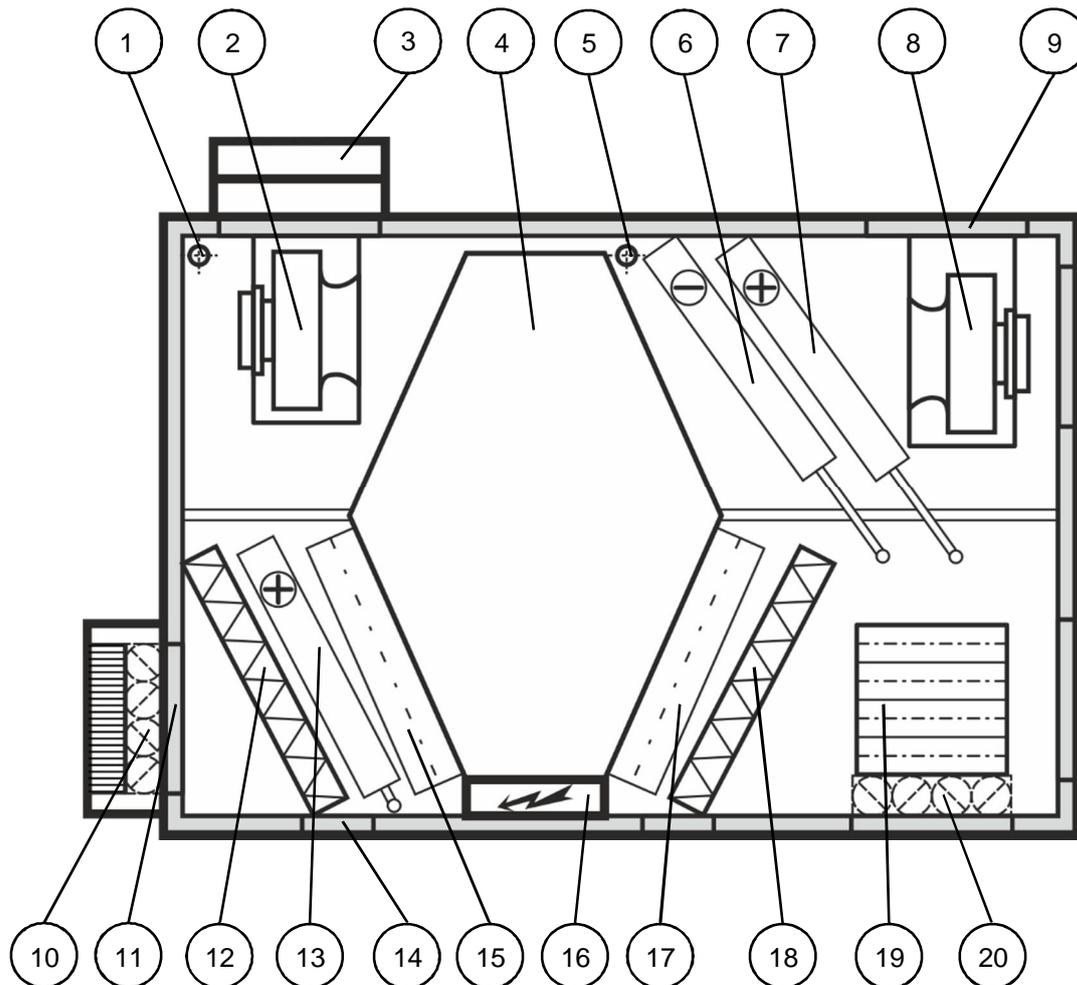
Ü Appliances in a hygienic version in compliance with hygienic standard VDI 6022 may be operated only if the use of recirculating air is suitable for hygienic reasons or the arrangement of operation of the HVAC network ensures positive pressure in the supply section of the appliance against the extraction section.

## 2.3. Compact outdoor units Multi-N and Multi Eco-N

Units Duplexvent 1500 to 8000 Multi-N and Duplexvent 1500 to 6500 Multi Eco-N are a new generation of compact ventilation units with a counterflow heat exchanger. The units are intended for outdoor

(rooftop) installation; they are used for comfortable ventilation, hot-air heating and cooling in small facilities, shop floors, stores, schools, restaurants, shops, sports, industrial halls. Units Multi-N and

Multi Eco-N meet requirements of Commission Regulation (EU) No. 1253/2014 (Ecodesign) in the defined working area.

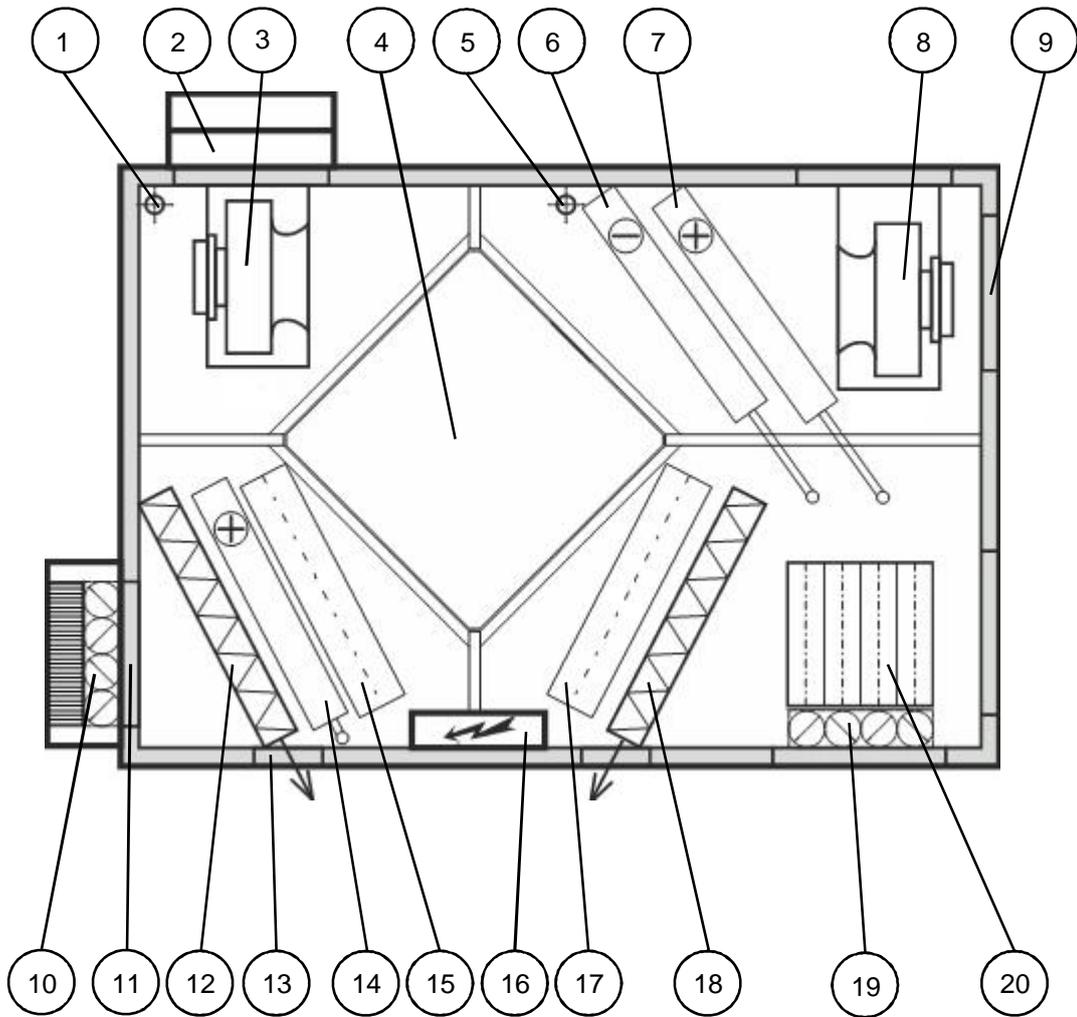


**Key:**

- |                                      |   |
|--------------------------------------|---|
| 1. Heated condensate drain           | 11. Intake (supply air)                 |
| 2. Exhaust fan                       | 12. Supply air filter                   |
| 3. Exhaust (extract air)             | 13. Water / electrical preheating       |
| 4. Heat exchanger                    | 14. Inspection area for filter exchange |
| 5. Condensate drain                  | 15. Bypass flap                         |
| 6. Water cooling / direct evaporator | 16. Junction box                        |
| 7. Water / electrical heating        | 17. Circulation flap                    |
| 8. Supply fan                        | 18. Exhaust air filter                  |
| 9. Exhaust (supply air)              | 19. Intake (extract air)                |
| 10. Intake flap (supply air)         | 20. Intake flap (extract air)           |

#### 2.4. Compact outdoor units Basic-N

Duplexvent 1400 to 10100 Basic are new generation of versatile ventilation units with cross flow heat recovery exchanger. The units are intended for outdoor (rooftop) installation; they are used for comfortable ventilation, hot-air heating and cooling in small facilities, shop floors, stores, schools, restaurants, shops, sports and industrial halls. The units are designed solely for applications that do not fall within the scope of the Commission Regulation (EU) No. 1253/2014 (Ecodesign).



**Key:**

- |                                      |   |
|--------------------------------------|---|
| 1. Heated condensate drain           | 11. Intake (supply air)                 |
| 2. Exhaust (extract air)             | 12. Supply air filter                   |
| 3. Exhaust fan                       | 13. Inspection area for filter exchange |
| 4. Heat exchanger                    | 14. Water / electrical preheating       |
| 5. Condensate drain                  | 15. Bypass flap                         |
| 6. Water cooling / direct evaporator | 16. Junction box                        |
| 7. Water / electrical heating        | 17. Circulation flap                    |
| 8. Supply fan                        | 18. Exhaust air filter                  |
| 9. Exhaust (supply air)              | 19. Intake flap (extract air)           |
| 10. Intake flap (supply air)         | 20. Intake (extract air)                |

Dimensions of ventilation units are depicted in Duplexvent selection SW when you select the Duplexvent unit > **Working point**. The information is available also in technical datasheets as well as in the technical specification which forms an integral part of contract on purchasing of the ventilation unit.

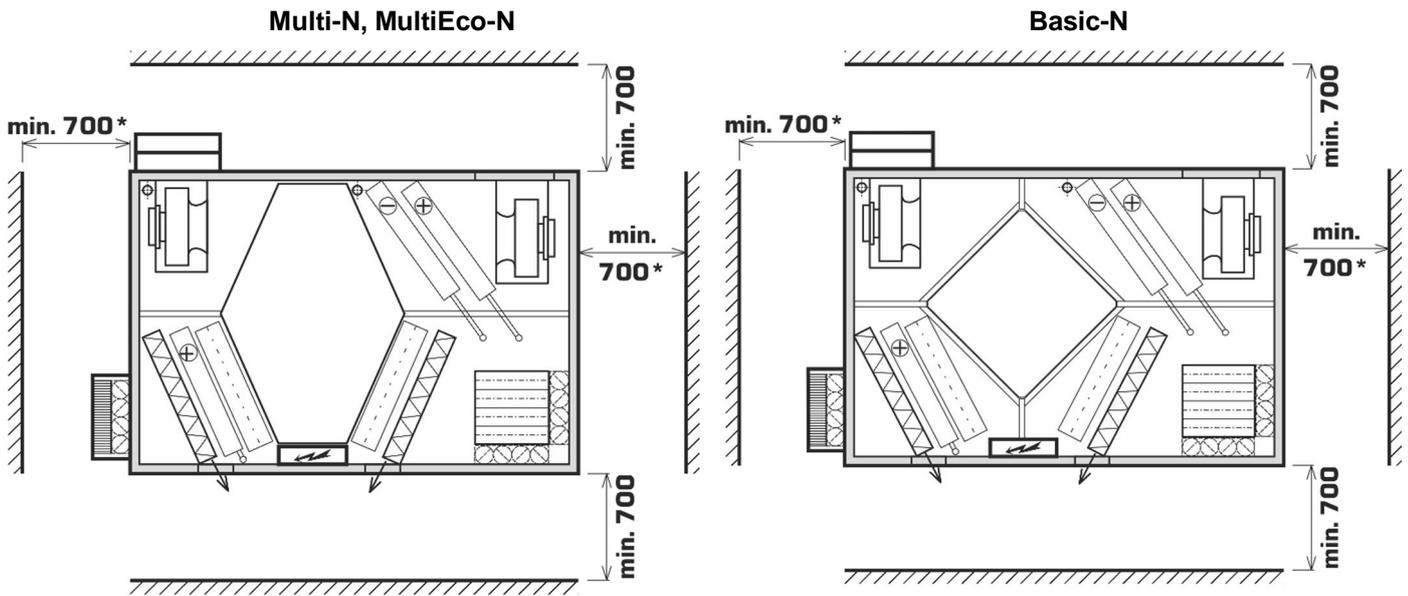
**2.5. Assembly of compact units**

Compact units in outdoor version can be placed on a base frame, stainless feet or steel underlying support frame. Follow the steps in the Chapter 1.1 when lifting the unit.

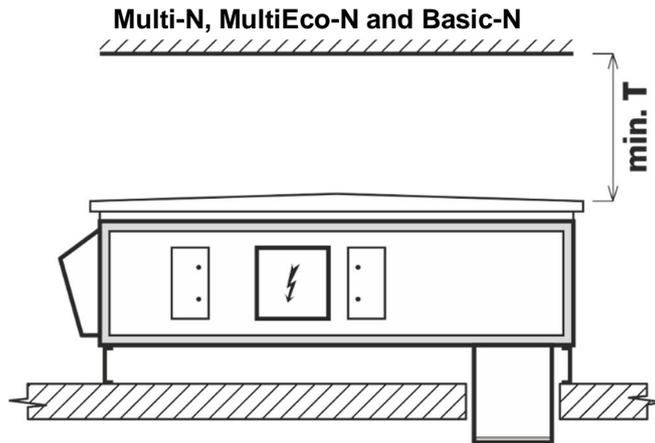
**2.5.1. Placing the unit on a base frame**

Base frame is typically used in configuration when the exhaust of supply air e2 or intake of stale air i1 pass through roof outlets under the unit.

1. Place the unit so that the recommended manipulation area is observed.



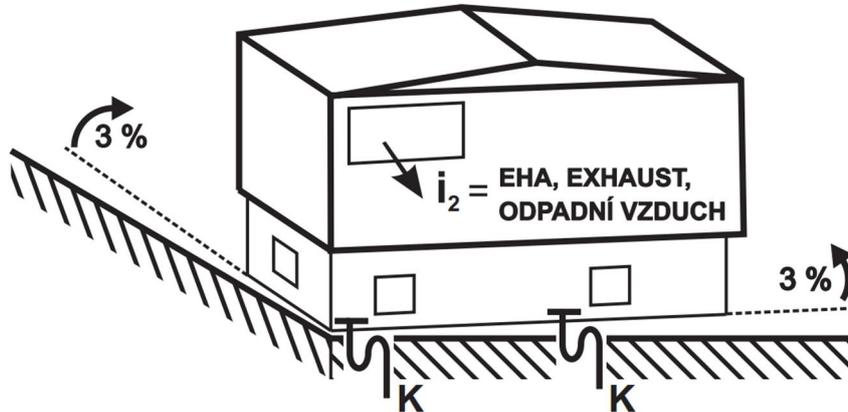
\* Only in units with integrated heater or chiller



Duplexvent Unit Type				
Multi-N	MultiEco-N	T (mm)	Basic-N	T (mm)
1500 Multi-N	1500 MultiEco-N	600	1400 Basic-N	600
2500 Multi-N	2500 MultiEco-N	700	2400 Basic-N	600
3500 Multi-N	3500 MultiEco-N	800	3400 Basic-N	700
5000 Multi-N	4500 MultiEco-N	1000	5400 Basic-N	800
6500 Multi-N	5500 MultiEco-N	1200	7100 Basic-N	1000
8000 Multi-N	6500 MultiEco-N	1400	8100 Basic-N	1200
			10100 Basic-N	1400

2. Cut out the existing roofing and base layers; the dimensions should be about 40 mm larger than those of the base frame. You will find approximate dimensions of the base frame in the Duplexvent selection SW, tab **Design**, keep the option **Base frame** selected and click on **AHU Placement method**. Please contact the manufacturer to confirm the dimensions.
3. Cut out holes for roof outlets according to the configuration of the unit. You will find the roof outlet dimensions in the Duplexvent selection SW; tab **Design** > **AHU Placement method**.

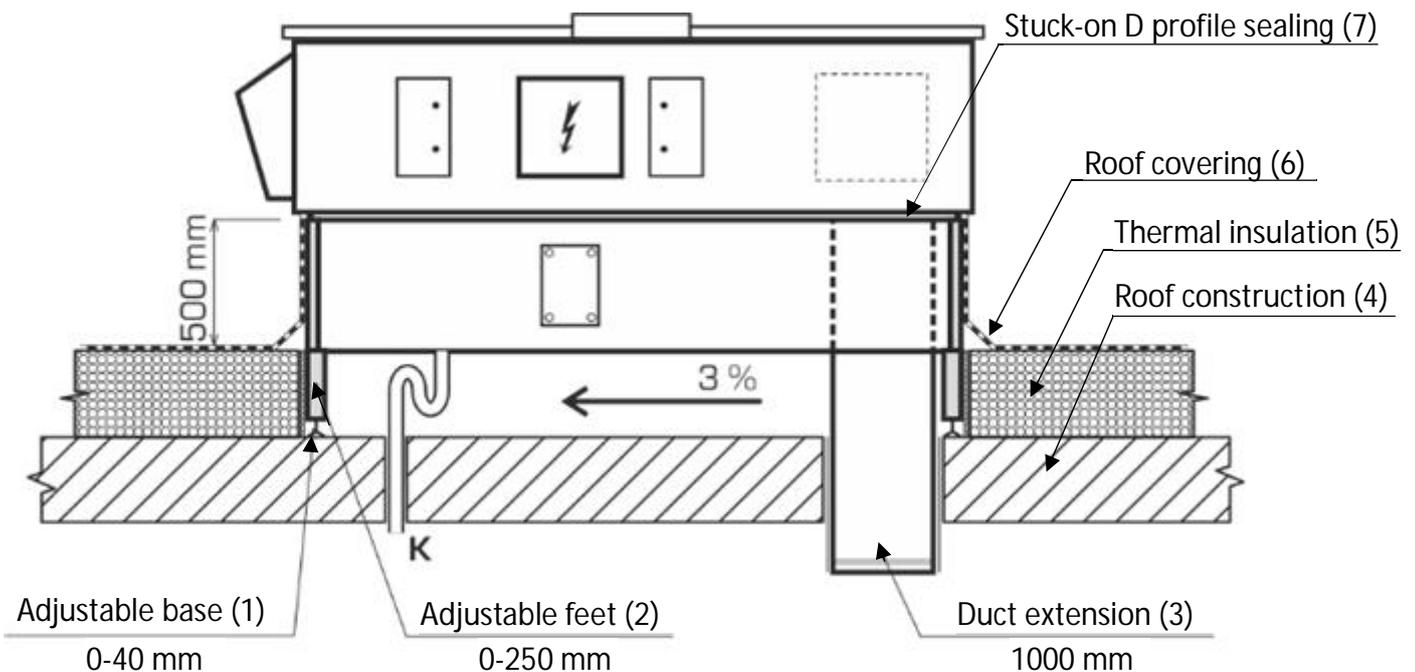
4. Mount the base frame; position the frame according to the planned roof outlets (see technical specification of the unit).
5. Incline both longer and shorter side of the frame in the slope of 3% so that water condensing inside the unit flows towards the condensate drain located at the exhaust of stale air  $i_2$ . Use adjustable feet and their adjustable base to achieve the inclination (see points 1 and 2 in the scheme on the following page). Each location of condensate drain is marked by letter K on the unit.



*Sloping the unit towards condensate drain and towards the exhaust of stale air  $i_2$*

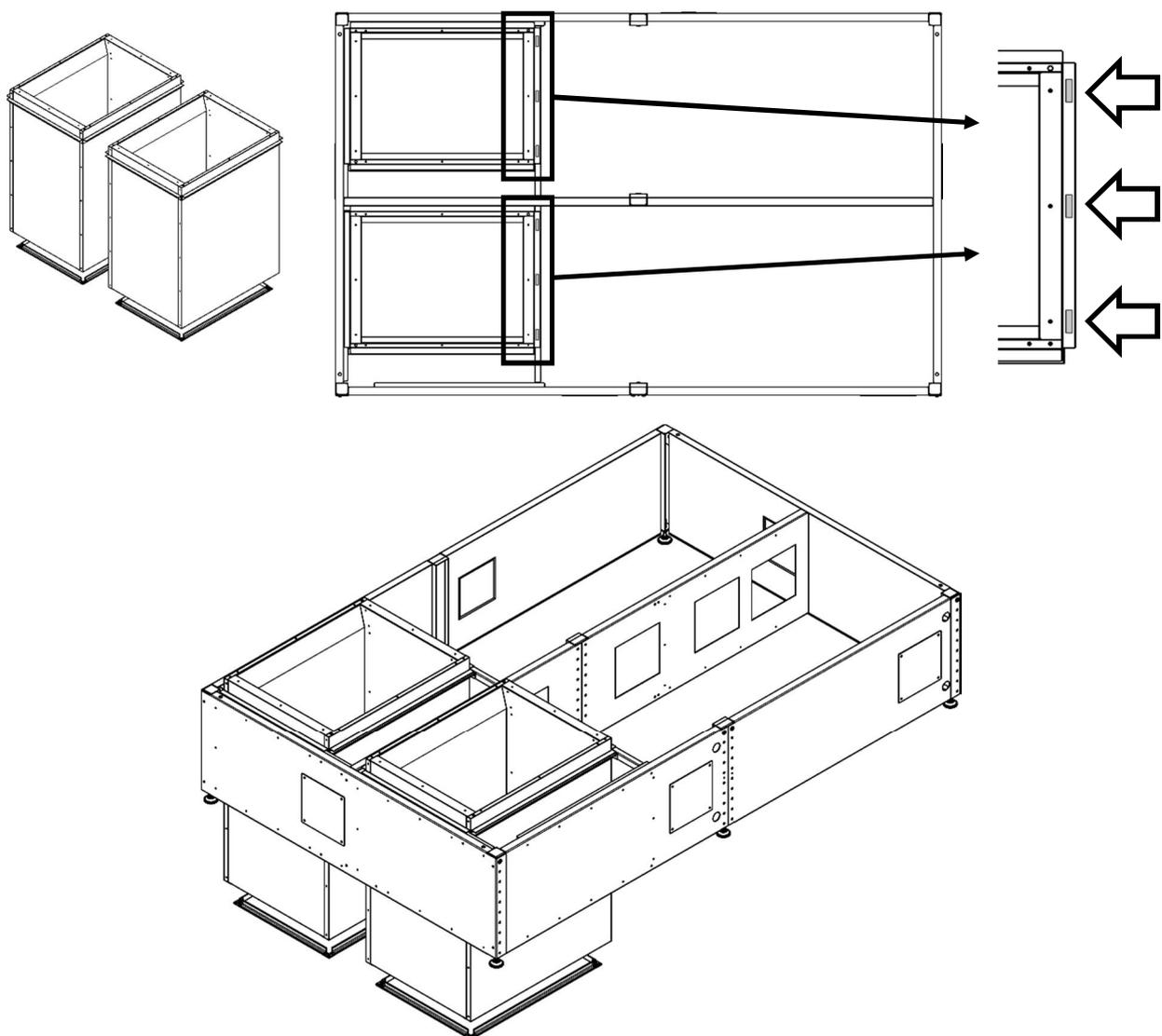
**i** You will find approximate distances between adjustable bases in the selection SW Duplexvent. Select the tab **Design**, keep the option **Base frame** selected and click on **AHU placement method**.

6. Lead the top of the roof covering or felt (point 6 in the picture below) over the edge of the base frame. Place wedge blocks between the thermal insulation and base frame if the roof covering cannot be mounted in rectangular angle.
7. Cut out holes so that spindles of the unit can rest in the base frame. The spindles will provide for correct position of the unit on the base frame. The spindle holes can be found on shorter sides of the base frame near corners.
8. Smelt the roof covering on the base frame, lead the top of the felt over the edge of the base frame.



**i** You will find the scheme of fitted unit also in the selection software of Duplexvent units. Proceed to the tab **Design**, keep the option **Base frame** selected and click on **AHU placement method**.

9. Stick D profile sealing (7) on the upper side of the frame. It is the side over which you have placed the roof covering (sarking felt) (6).
  10. Get the duct extensions with ports ready. Make sure that rubber sealing is attached to the ducts on the whole surface of the upper side of the extensions. The width and depth of ports is determined by the configuration of the unit. The height of the extensions is 1000 mm by default; however, it can differ according to the project. The port can be extended by a galvanized metal sheet or flexible hose to allow access to further duct installation under the roof - minimum overhang of 100 mm).
  11. Slide the tube extensions with ports (optional accessory) via holes in base frame into the prepared roof outlets.
- !** Position the extensions in a way that rectangles on the flange of the extension point towards the
  - centre of the unit, see pictures below.



*Base frame with duct extensions*

12. Fit flexible plastic sleeves for electric cables (NN, SLP) into the outlet in part i1 "Exhaust air suction".
13. Fit flexible PE ducting for draining the condensate at points marked by letter K on the unit.
14. Fill the gap between the installation opening and duct pieces with PU foam; alternatively fit a ceiling-void flange from the bottom – not supplied).
15. Run electric cables through the plastic sleeves and leave free ends approx. 1.5 metres long.

16. Prior to placing the unit on the base frame prepare outlets for condensate drain, heating and cooling. Once you place the unit onto the frame the access to the base frame will be possible via inspection door in the unit as well as in the base frame only.
  - a. to connect the condensate drain follow the Chapter 2.9;
  - b. to connect hot water heater follow the Chapter 2.10;
  - c. to connect water chiller follow the Chapter 2.11;
  - d. to connect direct chiller follow the Chapter 2.12.
17. Place the unit onto the base frame, follow instructions in the Chapter 1.1.

Should you need to fix the base frame to the roof and subsequently also to fix the unit to the base frame we recommend using fastening elements as in the pictures below (included in the delivery).



*Fastening element to connect base frame with the roof or unit with the roof.*



*Fastening element to connect base frame with the unit*

18. Run the free cable ends through the bushings in the unit's bottom.
19. Run the cable of condensate drain heating through the condensate drain pipe.
20. Connect the condensate drain pipe by screwing a PVC sleeve nut onto the inlet port in the unit's bottom.
21. Connect NN and SLP cables to the connecting terminal in the unit and check for correct function (see part "Electrical connections"); this can only be done by qualified electricians!
22. Connect the casing of the unit via an earthing screw and edge-notched washer to the roof's lightning conductor.
23. Connect the condensate drain to the sewer using a trap. If the condensate drain is heated the drain can end on the roof. However, drained water may then freeze over on the roof.

### **2.5.2. Mounting the unit on stainless feet or underlying grid**

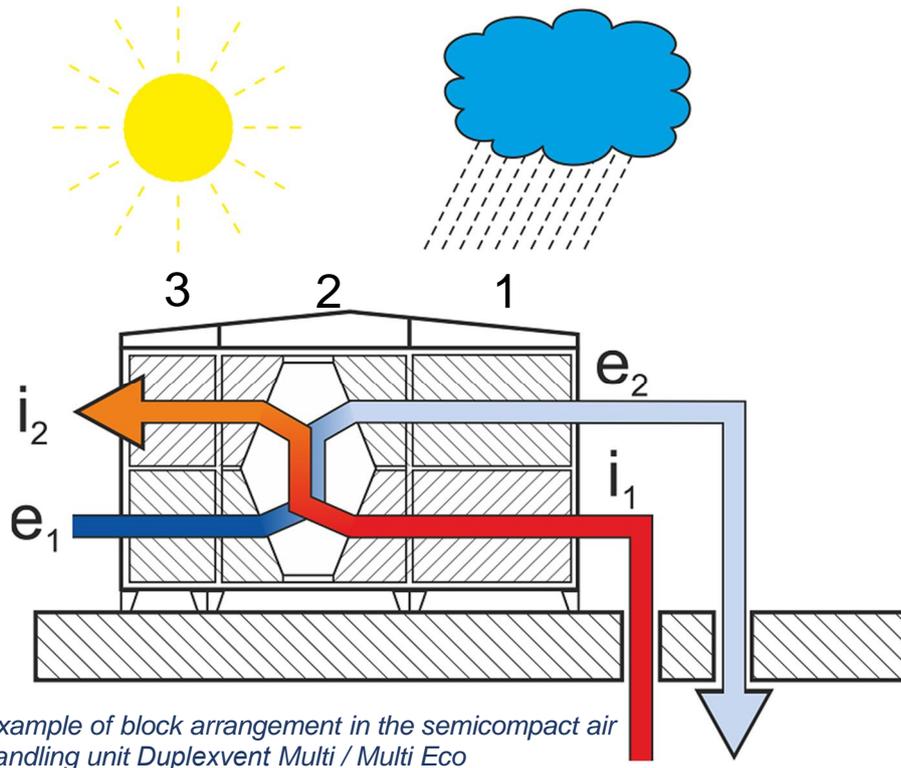
Stand feet include adjustable bases by the means of which you will achieve the inclination of 3% towards the extraction of stale air (i2), see the picture *Sloping the unit towards condensate drain* in the Chapter 2.5.1.

You will find approximate distance between the stand feet in the Duplexvent selection SW. While in the project of your unit, select **Design**, keep the option **Stand feet** selected and click on **AHU placement method**. Use the same distances to determine the position of load-bearing points when you mount the unit onto an underlying grid. Please contact the manufacturer to confirm the dimensions.

## **2.6. Semicompact outdoor units**

Semicompact units Duplexvent 10000 - 11000 Multi-N, Duplexvent 7500 - 9000 Multi Eco-N and Duplexvent 12100 – 15100 Basic-N are a new generation of versatile outdoor ventilation units with counterflow heat recovery exchangers. They consist of two or three blocks that form the unit once they are connected together.

The units are used for comfortable ventilation, hot-air heating and cooling in large facilities, shop floors, stores, schools, restaurants, shops, sports and industrial halls. Units Multi-N and Multi Eco-N meet requirements of Commission Regulation (EU) No. 1253/2014 (Ecodesign) in the defined working area. Units Duplexvent 12100 – 15100 Basic-N are intended solely for applications that fall outside the scope of Commission Regulation (EU) No. 1253/2014.



**Key:**

- 1,2,3 – blocks of the unit
- e1 - Intake (supply air)
- e2 – Exhaust (supply air)

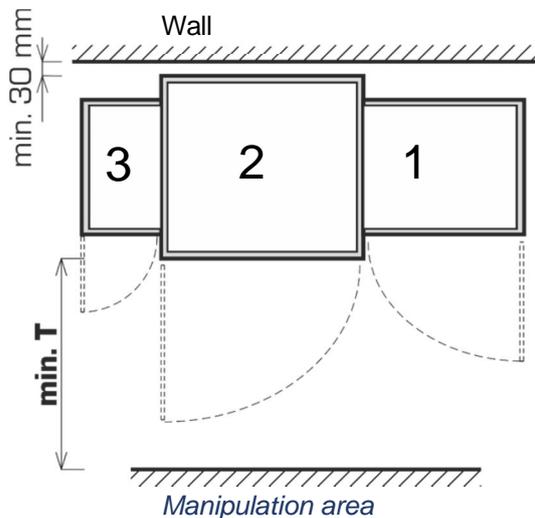
- i1 - Intake (extract air)
- i2 – Exhaust (extract air)

**2.7. Assembly of semicompact units**

The following steps describe the assembly of unit with the configuration of blocks and ports in the Chapter 2.6. The way of connecting wires between blocks via wiring boxes is described in the Chapters 2.7.3 to 2.7.6. The alternative way using connectors is described in the Chapter 7.

**2.7.1. Assembly of blocks**

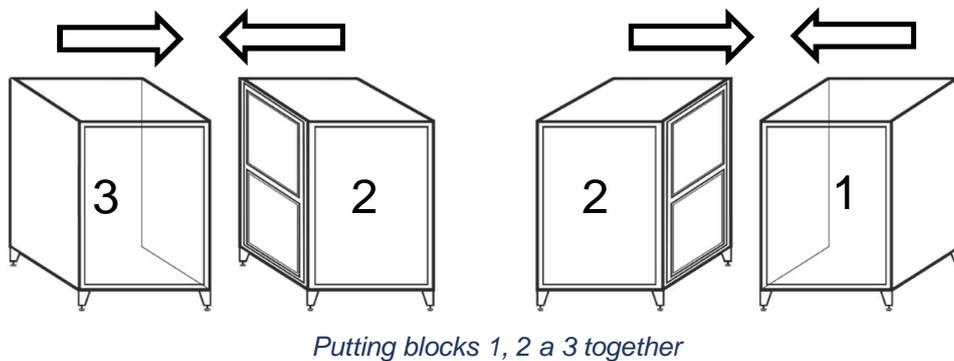
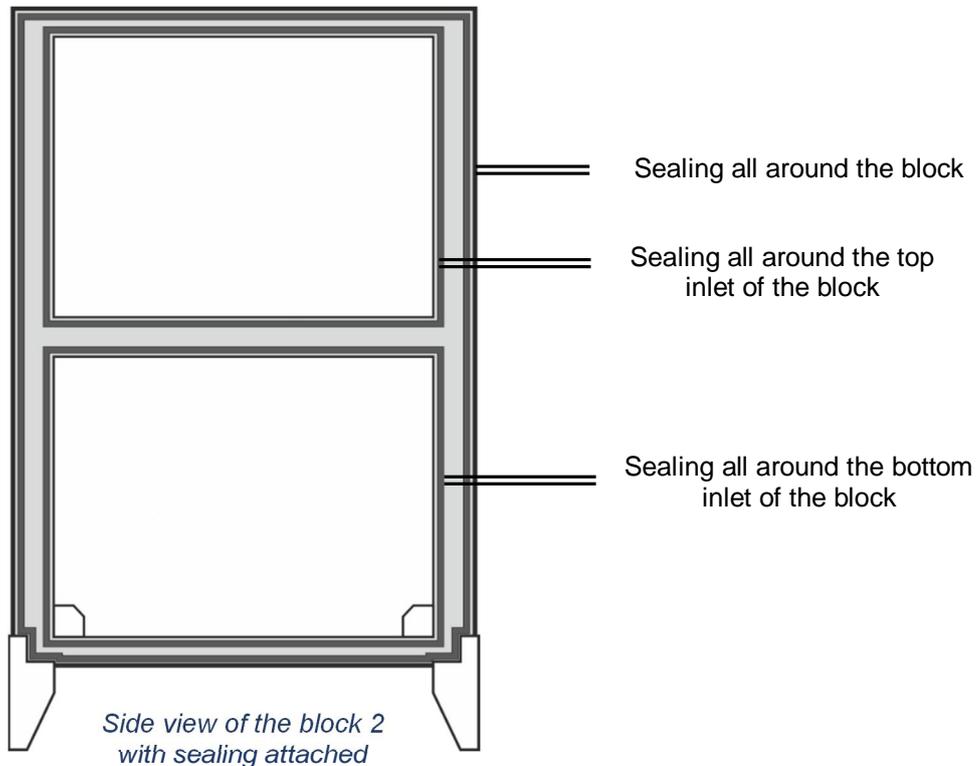
1. Make sure that the surface of the intended placement of the unit is even.
2. Mount adjustable bases on all stand feet (part of delivery). Screw the adjustable bases approximately into the middle of the height.
3. Place the blocks on the surface, keep the recommended manipulation space.



Type	Door T (mm)
Duplexvent 10000 Multi	1600
Duplexvent 11000 Multi	1600
Duplexvent 7500 Multi Eco	1600
Duplexvent 9000 Multi Eco	1600
Duplexvent 12100 Basic	1600
Duplexvent 15100 Basic	1700

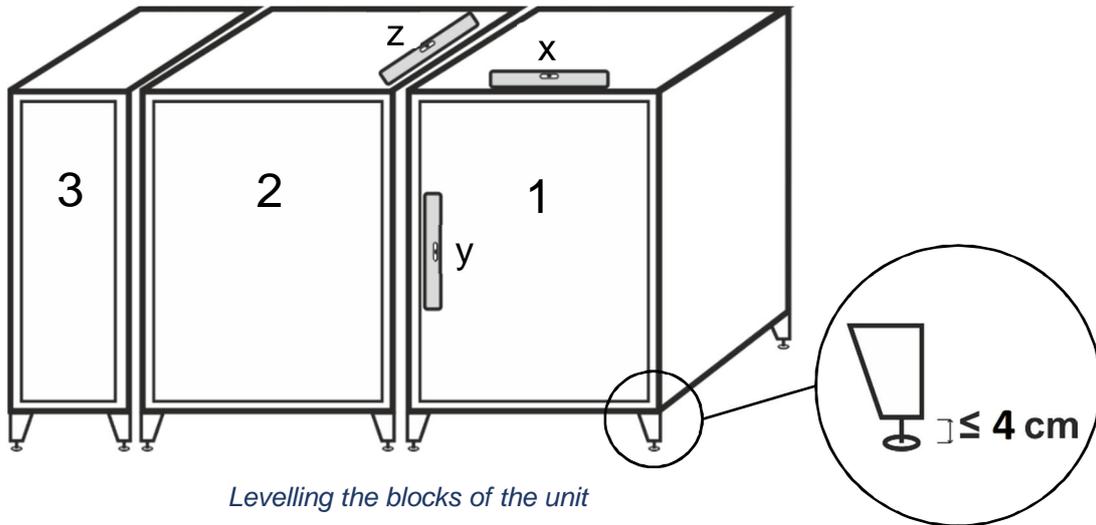
The door is attached to the unit by plastic lockers. Depending on which lockers you loosen, you can open the door to the right, to the left or loosen the door completely and pull the door away.

4. Make sure that the sealing on the middle block 2 is complete on the side both towards the blocks 1 and 3:
  - a. Sealing all around the block;
  - b. Sealing all around the top inlet of the block
  - c. Sealing all around the bottom inlet of the block



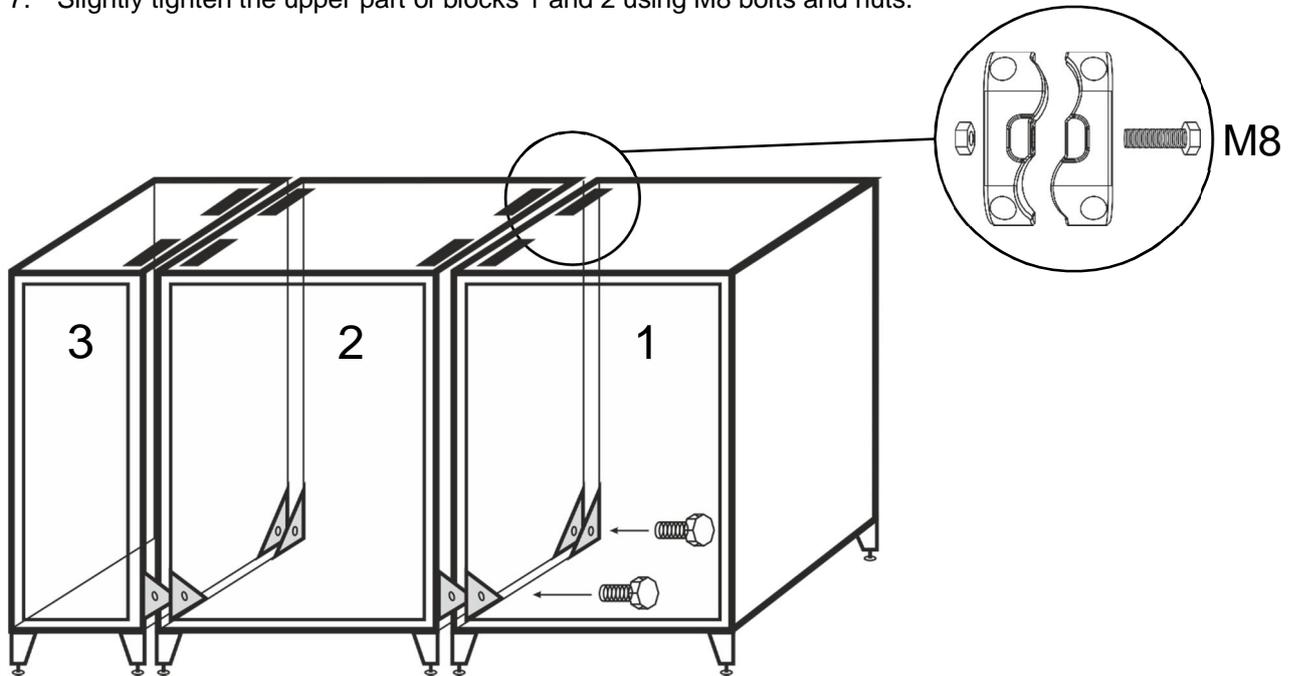
5. Place the blocks next to each other and make sure they are all levelled. Adjust the stand feet as needed. Using the spirit level make sure that the blocks 1, 2 and 3 are levelled in all three axes **x**, **y** and **z**.

- ! **Open the door only after making the blocks even at least in the axes x and y. Failing to do so may cause irreversible bending of the door.**



*Levelling the blocks of the unit*

6. Slightly tighten the lower part of blocks 1 and 2 by using M8 bolts together. Use triangle members in inner corners.
7. Slightly tighten the upper part of blocks 1 and 2 using M8 bolts and nuts.



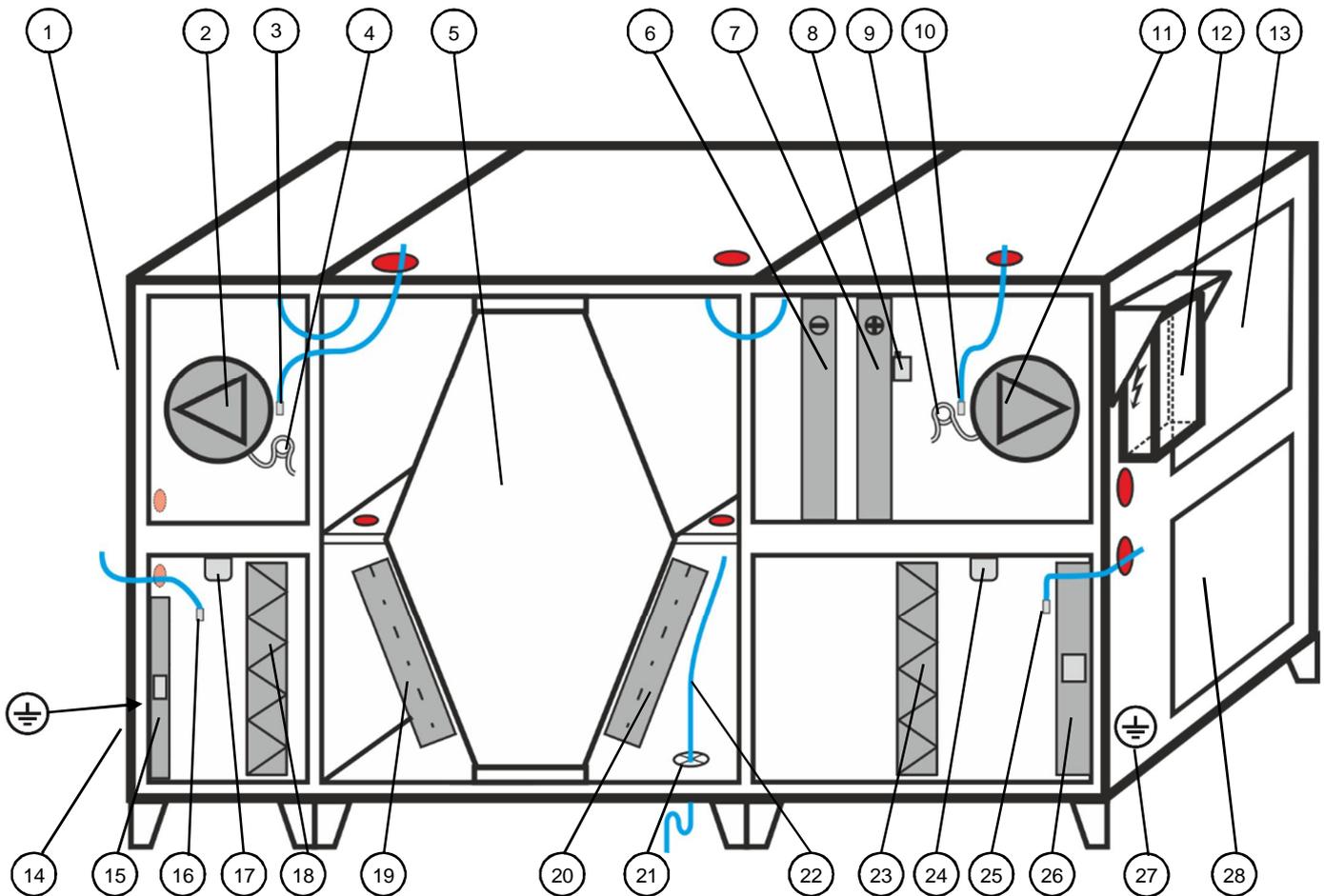
*Tightening the unit blocks together*

8. Gradually tighten the connections. Using the spirit level make sure that the blocks being connected remain levelled.
9. Once you connect the blocks 1 and 2 the sealing between the blocks should be adhering to the construction of blocks along the whole length of the sealed connection. Check visually that no light passes through the connection of the blocks.
10. Repeat the steps 5 through 8 and connect the blocks 2 a 3.
11. Using the spirit level make sure that the connected blocks still remain levelled.

! Should it be necessary to fix the unit to the roof we recommend using fastening elements see Chapter 2.5.1, step 17.

## 2.7.2. Description of assembled unit

### Front view

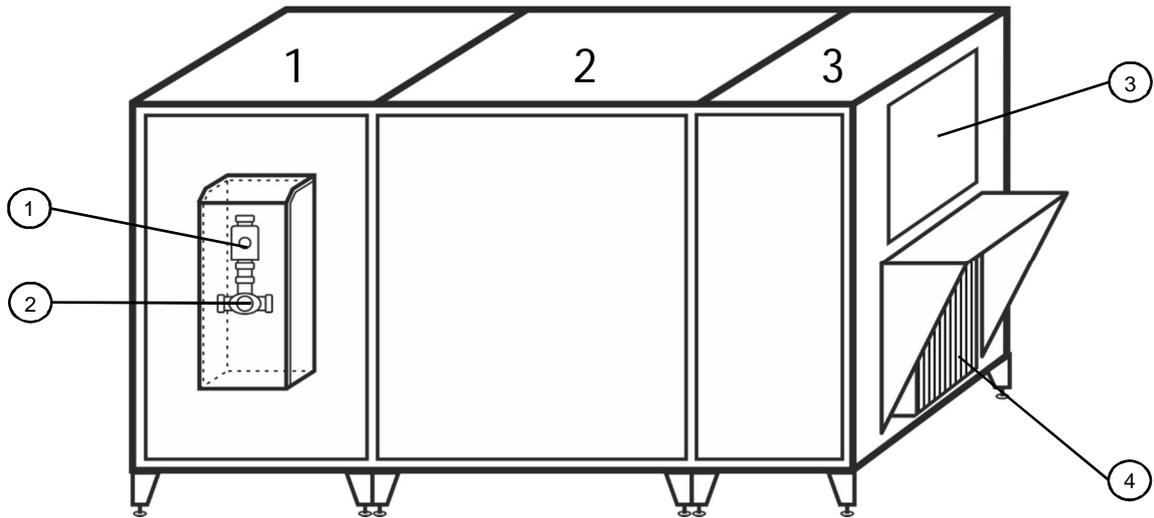


#### Key:

- |   |   |
|---|---|
| 1. Exhaust (extract air) i2             | 16. Temperature sensor TEA                  |
| 2. Exhaust fan Mi                       | 17. Filter manostat PFe                     |
| 3. Temperature sensor TU2               | 18. Supply air filter                       |
| 4. Manometer of exhaust fan PMi *)      | 19. Bypass flap SB                          |
| 5. Heat exchanger                       | 20. Circulation flap SC *)                  |
| 6. Water cooling / direct evaporator *) | 21. Condensate drain                        |
| 7. Water heating *)                     | 22. Heating cable of condensate drain HC *) |
| 8. Capillary thermostat TFK *)          | 23. Supply air filter                       |
| 9. Manometer of supply fan PMe *)       | 24. Filter manostat PFi                     |
| 10. Temperature sensor TU1              | 25. Temperature sensor TEB                  |
| 11. Supply fan Me                       | 26. Shut-off flap (extract air) Si *)       |
| 12. Junction box                        | 27. Grounding point                         |
| 13. Exhaust (supply air)                | 28. Intake (extract air)                    |
| 14. Intake (supply air)                 |   |
| 15. Shut-off flap (supply air) Se *)    |   |

\*) Optional equipment

**Rear view**



**Key:**

- 1. Water pump \*
  - 2. Mixing valve \*
  - 3. Exhaust (extract air)
  - 4. Intake (supply air) with droplet eliminator \*
- \*) Optional equipment

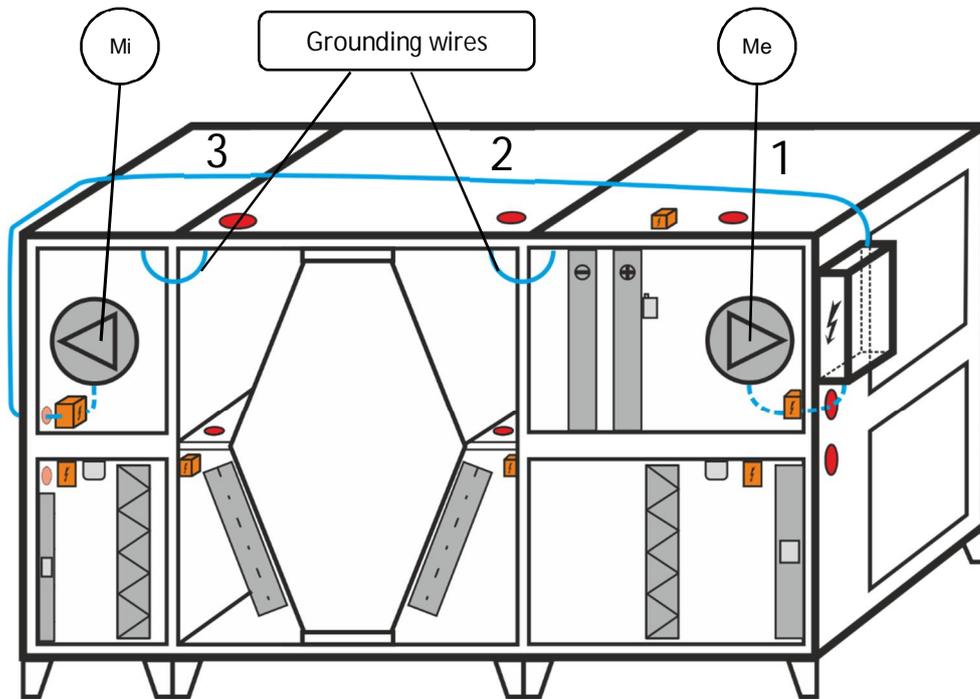
**2.7.3. Connecting fans**

**Connected on delivery:**

- Fan **Me** is completely connected up to the junction box.
- Fan **Mi** is connected to wiring box.

**Connect:**

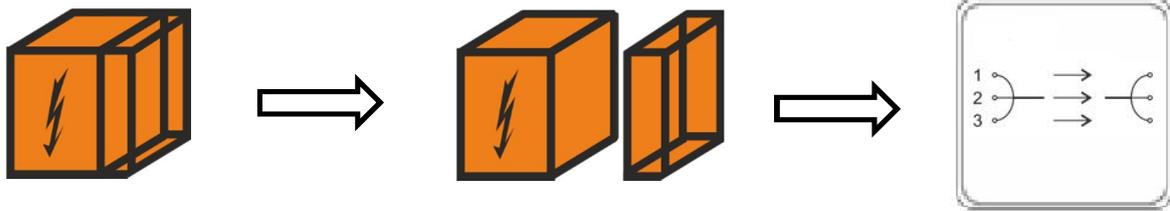
- Lead the cable **Mi** with the working voltage 400V from the junction box into the wiring box.
- Connect the blocks 1 with 2 and subsequently 2 with 3 by green-yellow grounding wires.



*Connection of fans*

- - - - - = cable comes connected on delivery
- = cable is to be connected

You will learn how to connect the wires in the wiring box after opening up the box.



#### 2.7.4. Connecting temperature sensors and condensate drain heating

##### Connected on delivery

- Sensors **TEB** and **TU1** are completely connected up to the junction box;

##### Connected on delivery, optional equipment

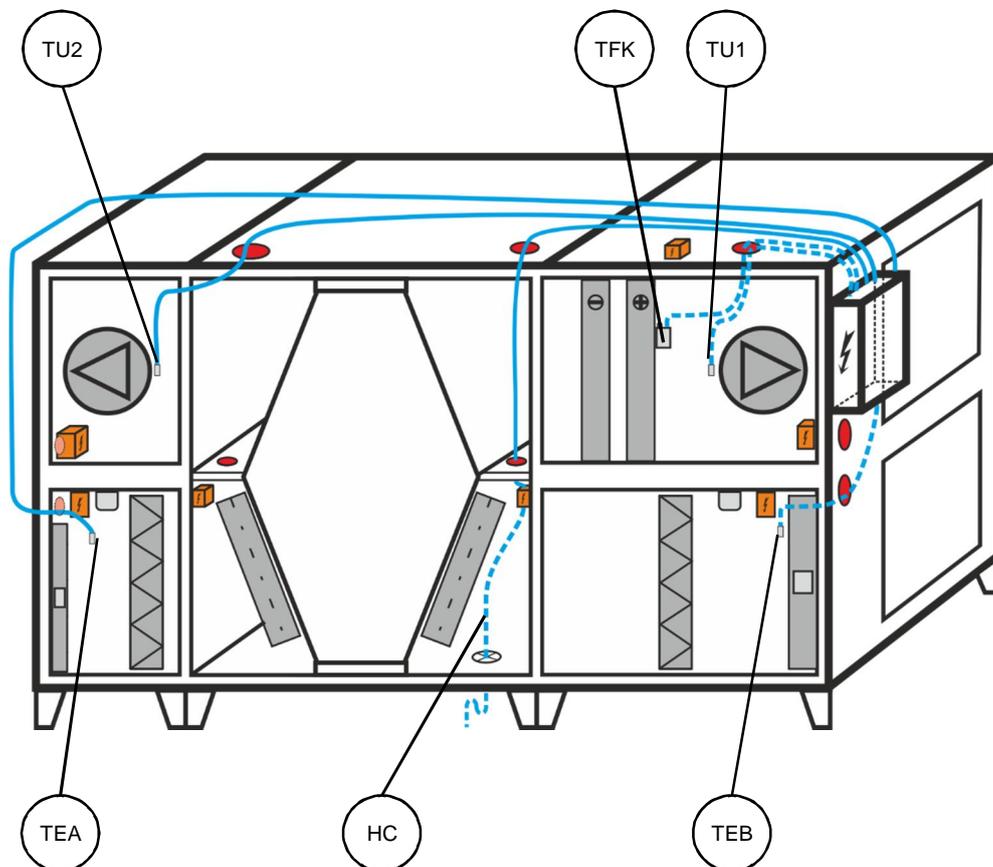
- Sensor **TFK** is completely connected up to the junction box.
- Cable powering the condensate heating **HC** is connected to the wiring box.

##### Connect

- Lead the cables **TEA** and **TU2** with temperature sensors from the junction box into their intended position;

##### Connect, optional equipment

- Lead the cable **HC** from the junction box into the wiring box.



*Connection of temperature sensors and condensate drain heating*

## 2.7.5. Connecting pressure sensors

### Connected on delivery

- Manostat **PFi** is completely connected up to the junction box;
- Manostat **PFe** is connected to the wiring box.

### Connected on delivery, optional equipment

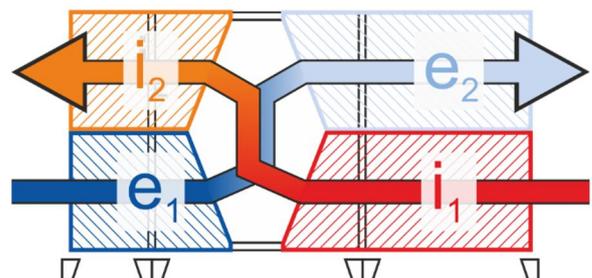
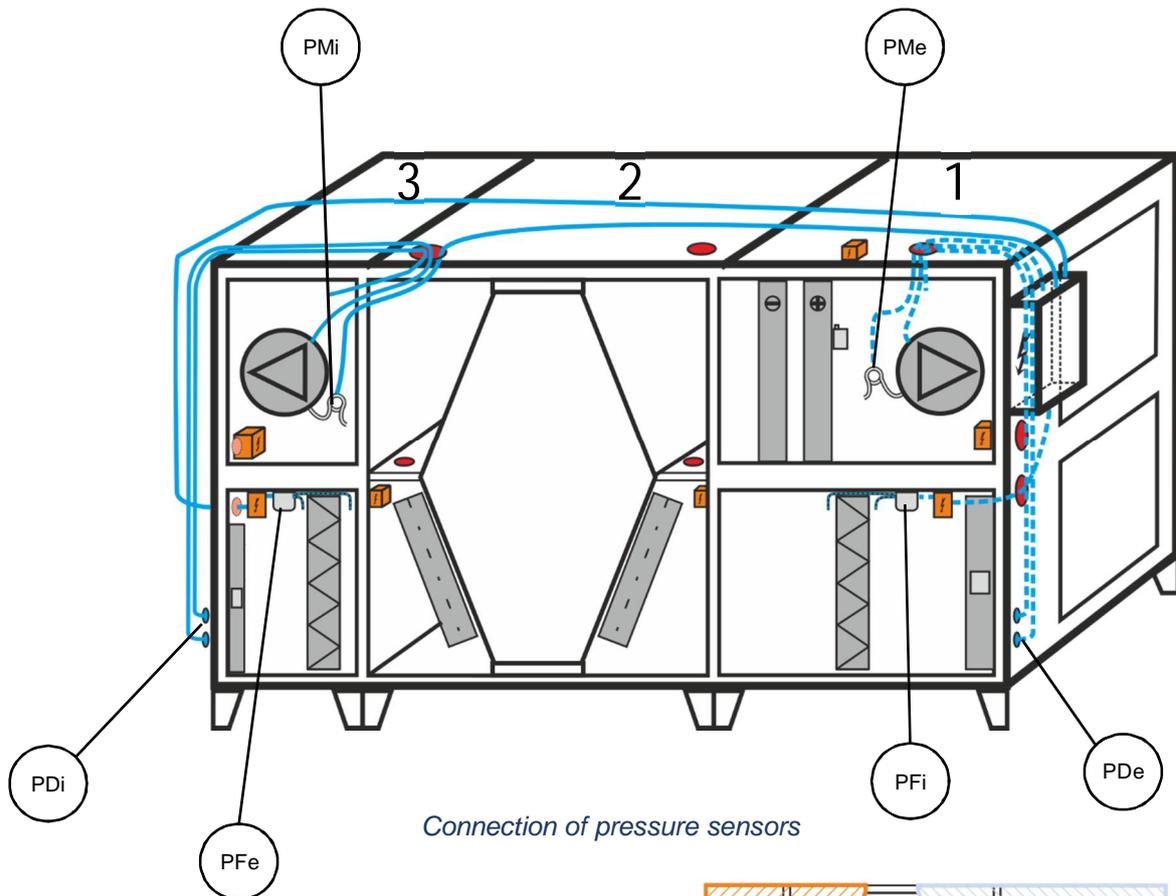
- Manometer cable **PMe** is connected up to the junction box;
- Pressure measurement point **PDi** measuring the pressure increase of the fan **Mi** is installed on the left side of the unit. Pressure measurement hoses are located on the top side of the block 3.
- Pressure measurement point **PDe** measuring the pressure increase of the fan **Me** is installed on the right side of the unit. Hoses leading from the pressure measurement point are installed.

### Connect

- Lead the cable of manostat **PFe** from the junction box to the wiring box in the compartment E1. The same cable powers also the servo drive of the flap **Se**.

### Connect, optional equipment

- Lead the cable **PMi** from the junction box to the manometer **PMi**;
- Lead the hoses of the pressure measurement point **PDi** folded on the top side of the block 3 through a feed-through. The shorter hose ends up after going through the feed-through. Lead the longer hose to the nozzle of the fan **Mi**.



## 2.7.6. Connecting servo motors

### Connected on delivery

- By-pass damper (**SB**) servo motor is connected to the wiring box.

### Connected on delivery, optional equipment

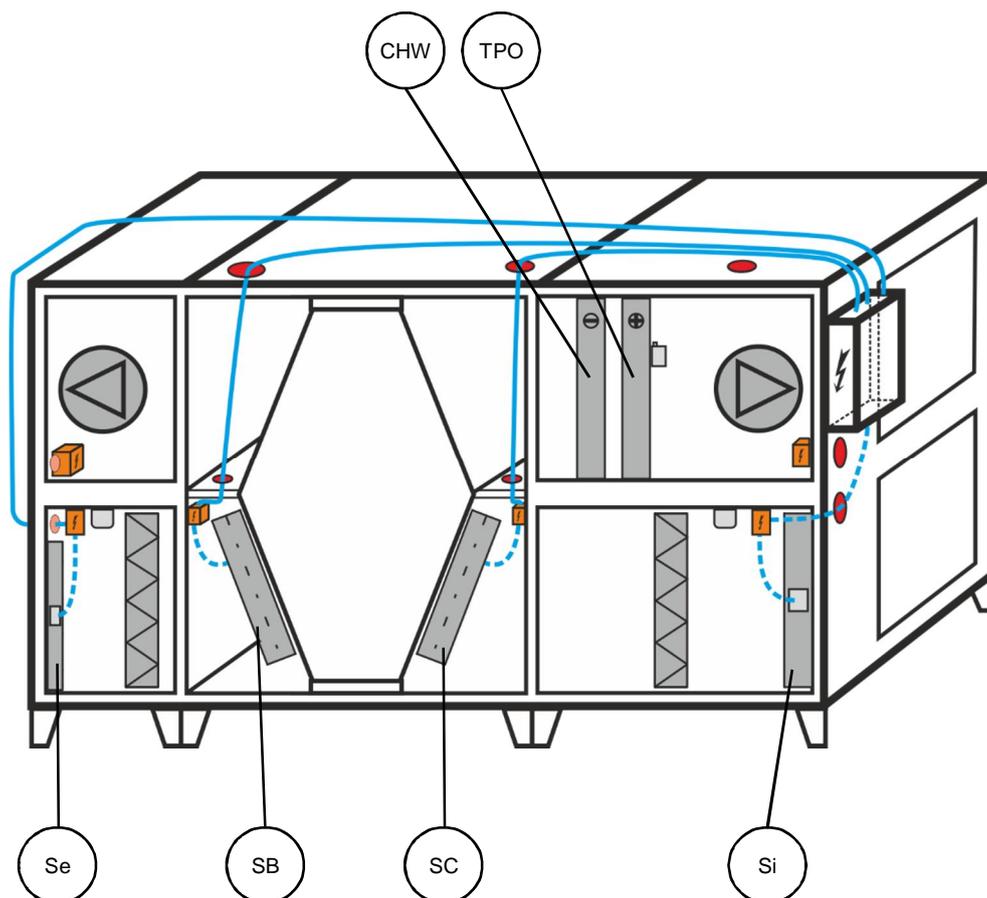
- Circulation damper (**SC**) servo motor is connected to the wiring box.
- The circuit of cooler **CHW** is connected to the hydraulic kit.
- The circuit of heater **TPO** is connected to the hydraulic kit.
- Hydraulic kit **LS** controlling the chiller or heater is located on the back side of the unit. The kit is completely connected up to the junction box;
- Water pump **LP** in the heating circuit is located on the back side of the unit. The kit is completely connected up to the junction box;
- Shut-off flap **Si** is connected up to the junction box;
- Shut-off flap **Se** is connected to wiring box.

### Connect:

- Lead the cable actuating by-pass damper (**SB**) from the junction box to wiring box.

### Connect, optional equipment

- Lead the cable actuating the circulation flap (**SC**) from the junction box to the wiring box;
- Lead the cable actuating the supply air flap **Se** from the junction box to the wiring box. The same cable powers also the manostat PFe.

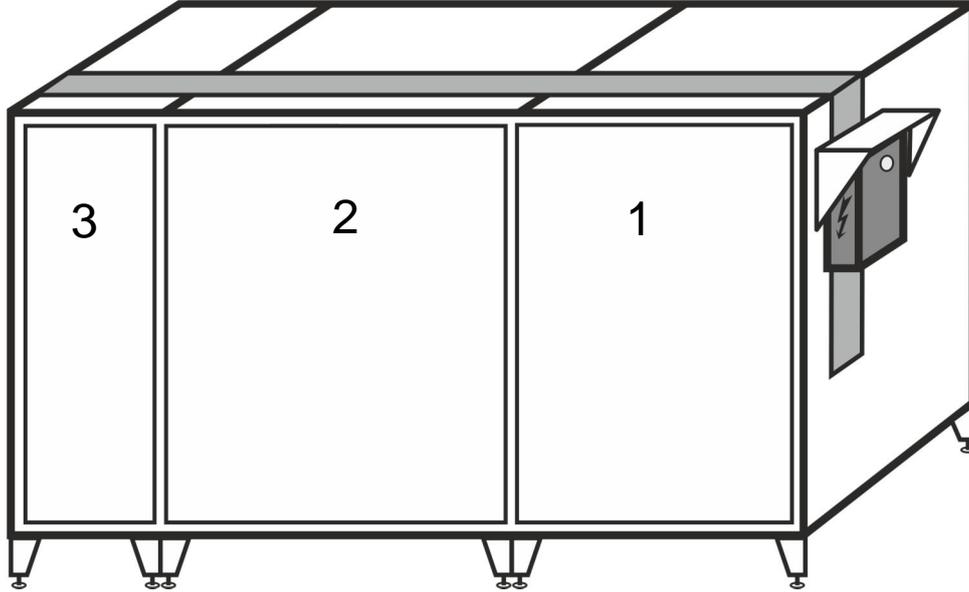


*Connection of servo motors*

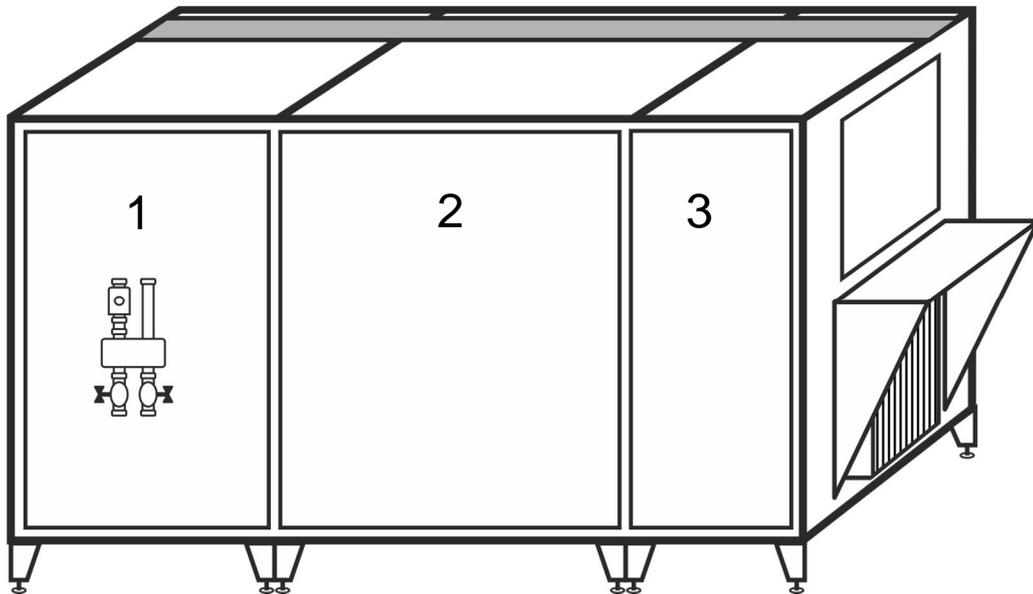
### 2.7.7. Covering the slots

Cover the slots where cables lead from the junction box. Use cover metal sheets and 4mm rivets supplied along with the unit. Cover the connected junction box.

If the wiring of blocks is connected via connectors (Chapter 7) the slot above the block No. 2 remains uncovered.



*Unit with covered slots, front view*

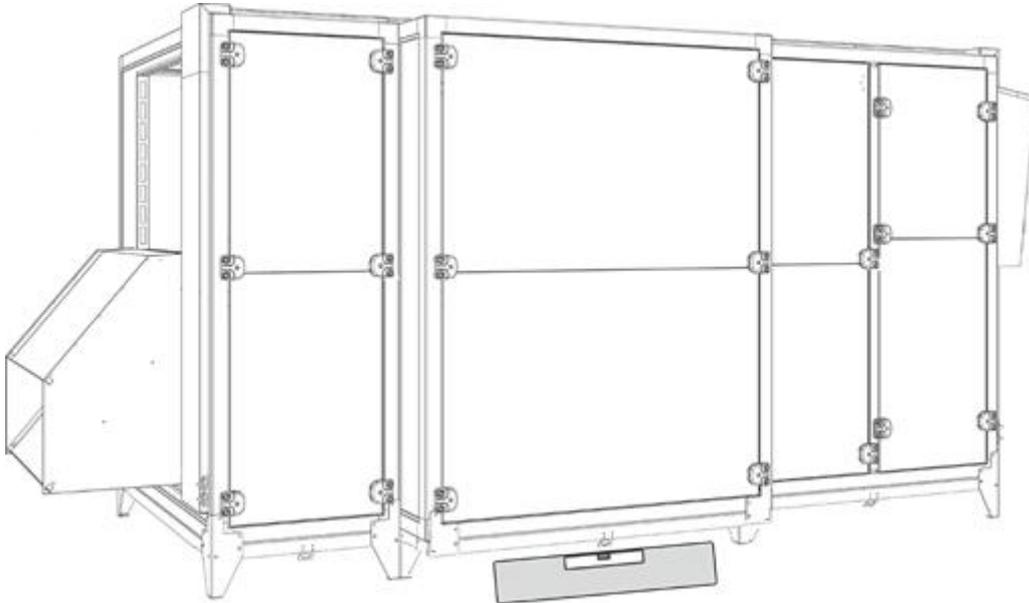


*Unit with covered slots, rear view*

### 2.7.8. Roof assembly

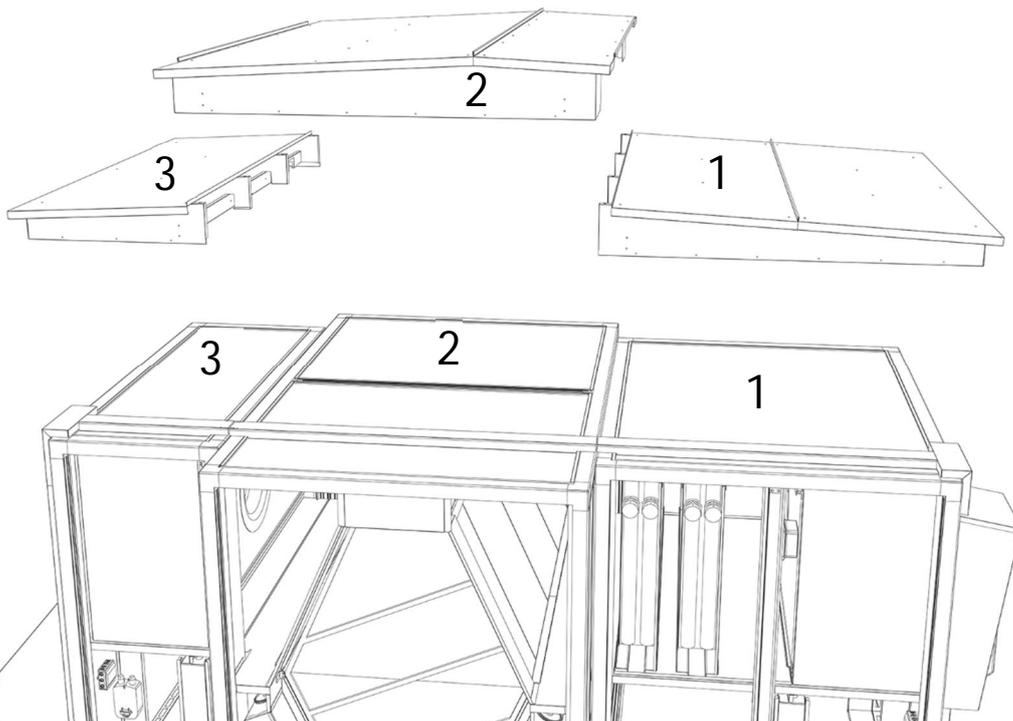
The chapter is related to units 10000 and 11000 Multi-N, 7500 and 9000 MultiEco-N as well as 12100 and 15100 Basic-N.

1. Make sure that the unit is still levelled as described in the Chapter 2.7.1.

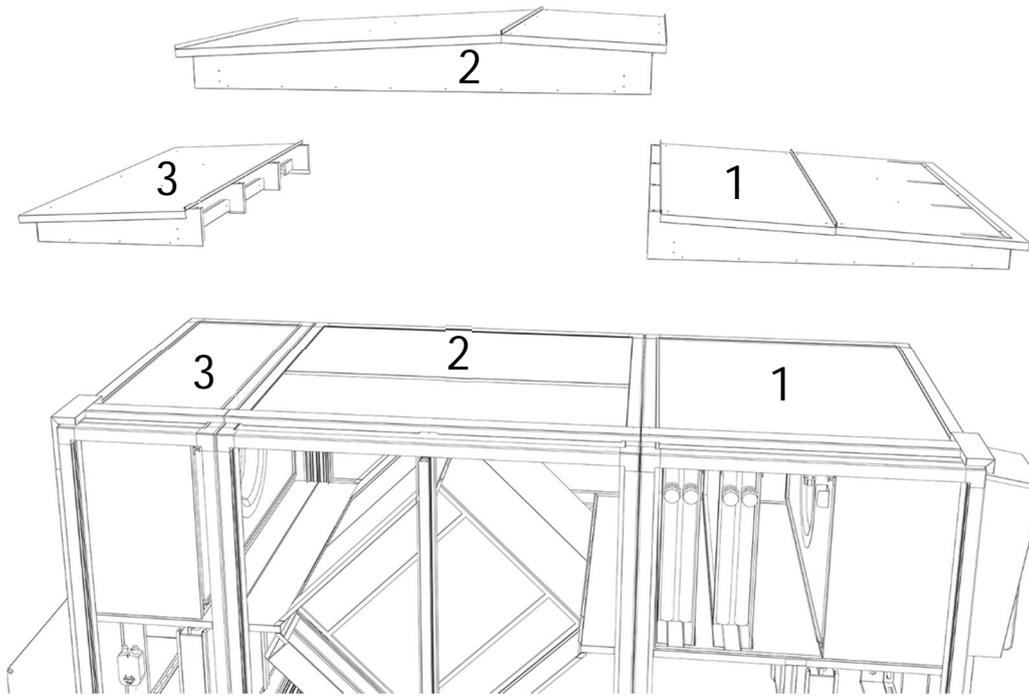


**!** Protect the unit from adverse weather conditions until the roof assembly is finished.

2. Make sure that cables leading on the top of the unit are placed in a slot so that they are not damaged during the roof assembly.
3. Put the roof blocks on the top side of unit casing. The length of roof blocks corresponds with the length of unit blocks.

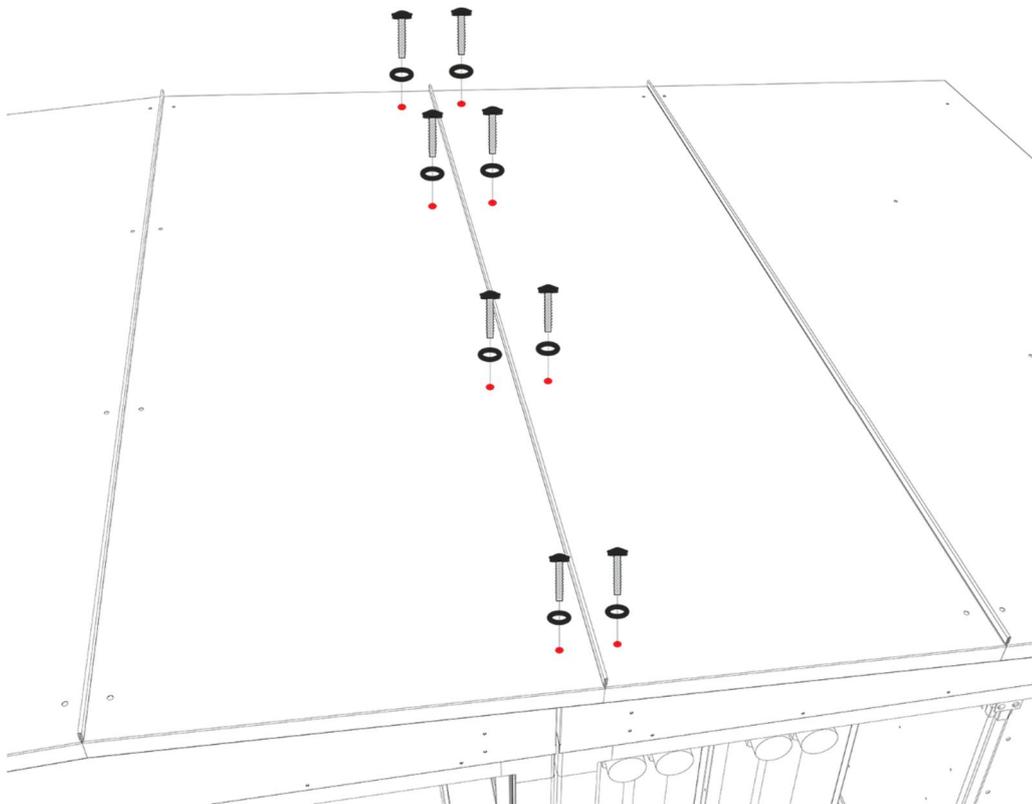


*Roof blocks on the units 9000 MultiEco-N and 11000 Multi-N*

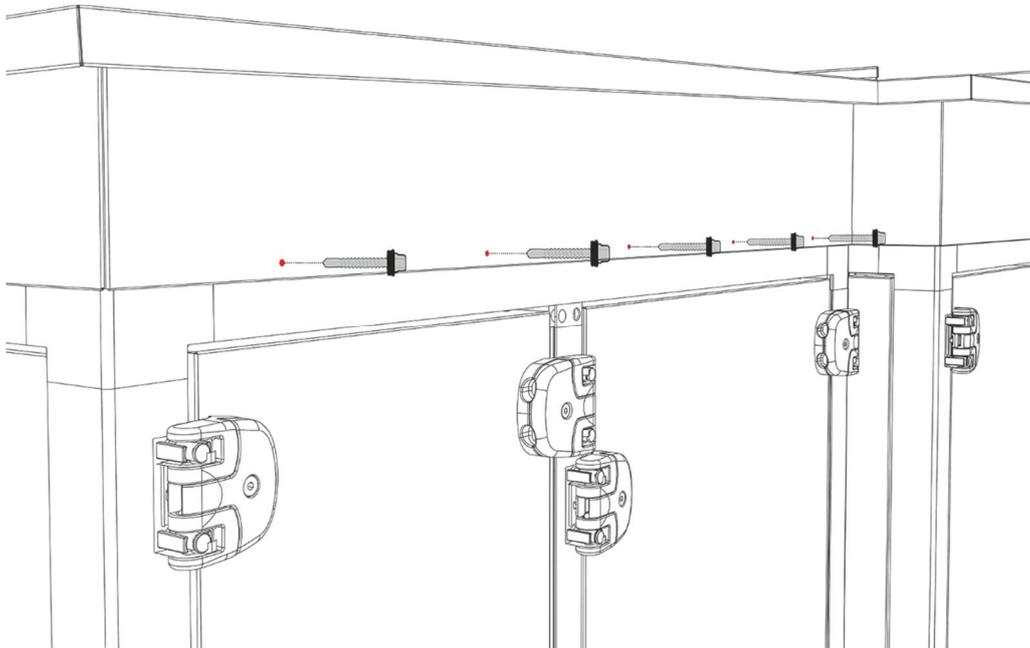


*Roof blocks on the units 12100 Basic-N and 15100 Basic-N,  
7500 MultiEco-N and 10000 Multi-N*

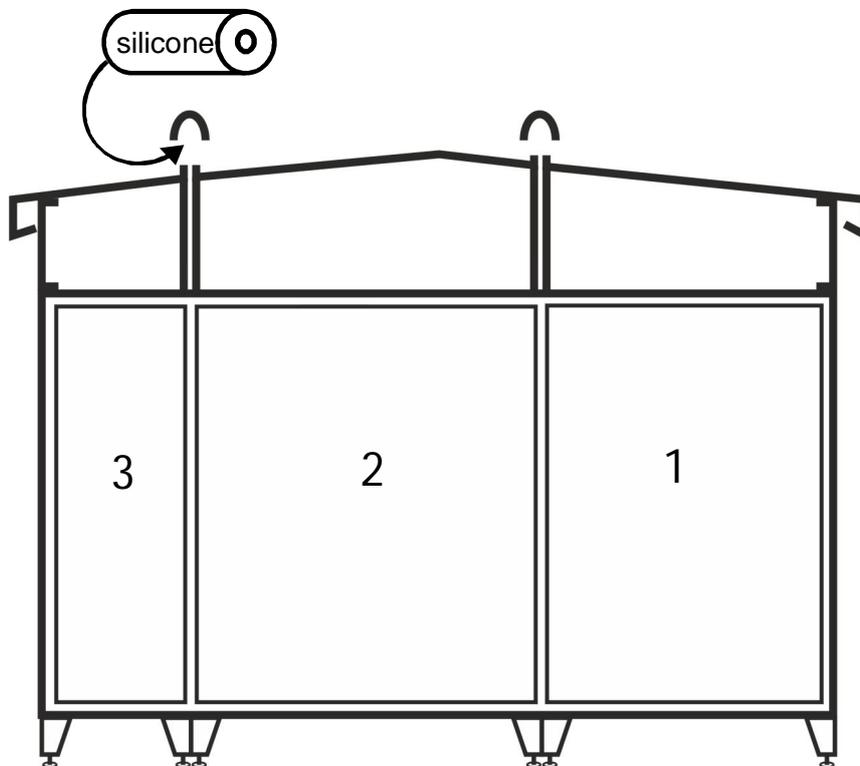
4. Fix the roof blocks together, use 8 screws M6, place waterproof washers (part of delivery) under the screws.



5. Attach side plates of roof blocks to the side of unit casing. Use holes that are drilled in the side plates. Use tek screws star 4x16mm (part of delivery). Attach the tek screws directly into the casing all around the unit.

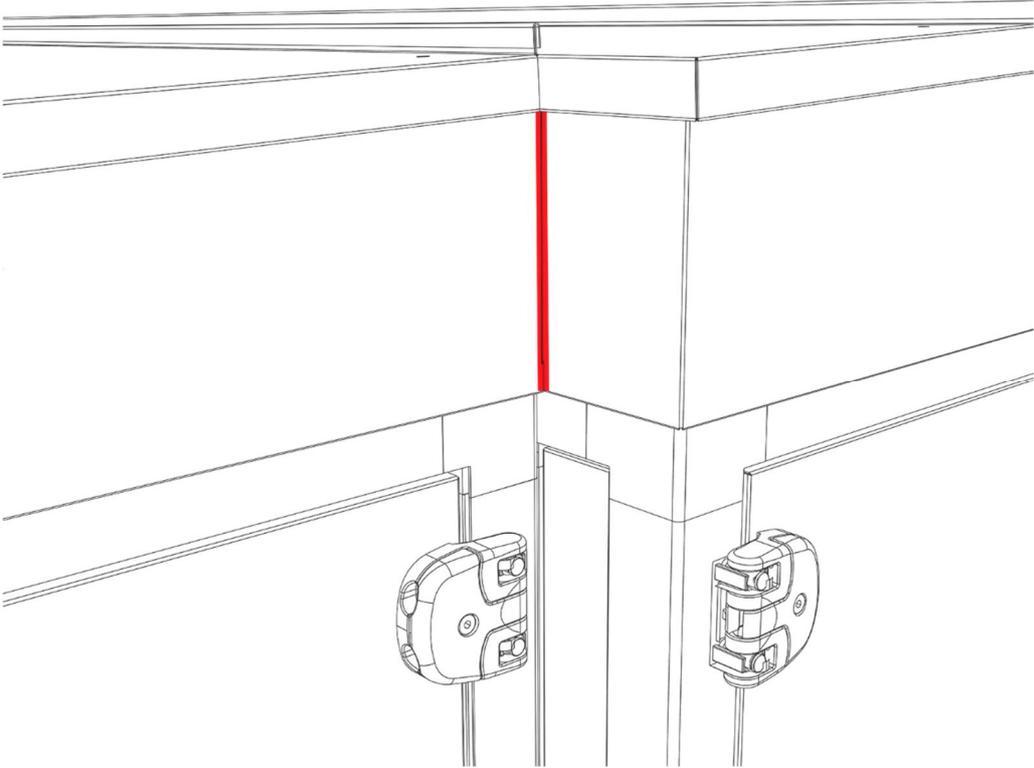


6. Paste silicone into metal U-shaped profiles. Put the profiles onto the connections of roof plates.

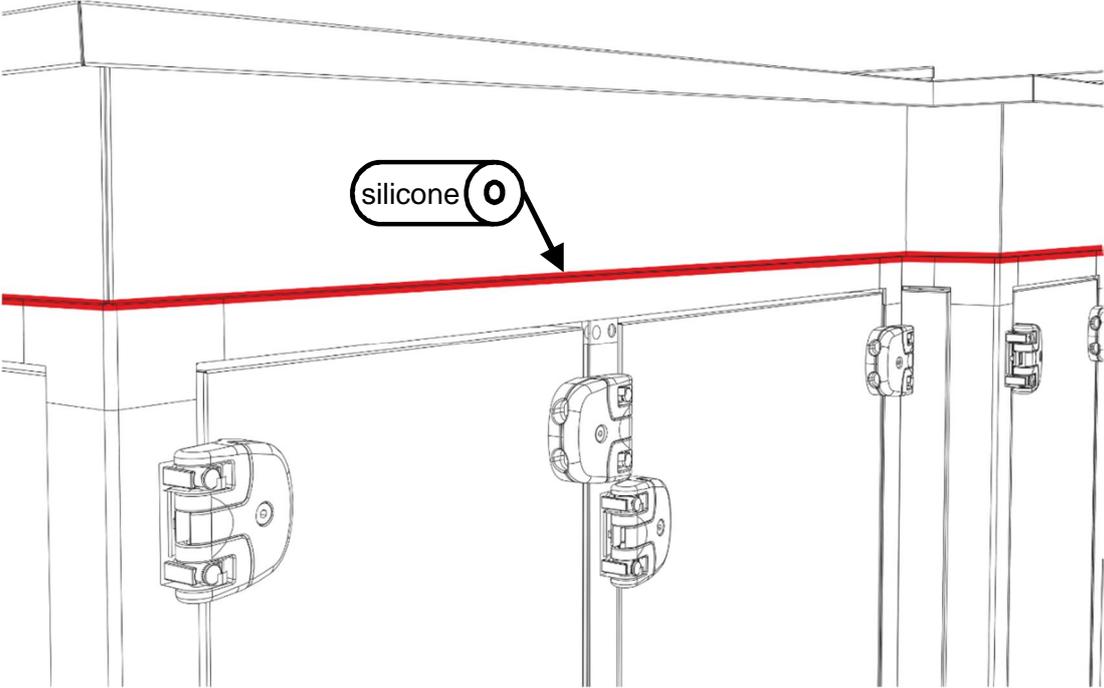


7. Seal the connections between attached U-profiles and roof plates by silicone. Seal the entire length of the connections; you will seal two connections along both ends of each U-profile.

8. Seal vertical connections between the middle and outer roof blocks. You will seal 4 connections altogether.



9. Seal the connection between the unit casing and the attached roof by silicone. Seal the connection all around the unit.

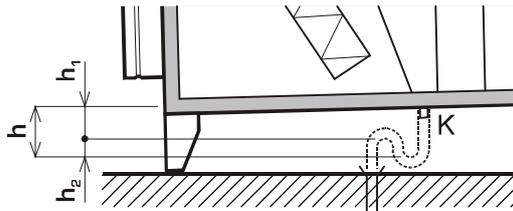


## 2.8. Ductwork connection

- Connect the ductwork according to the design documentation
- Straight ductwork being at least 1m long must be always firmly connected to all ports. This will ensure that an equal air speed profile is achieved throughout the whole port's cross-section area. The rule does not apply on the intake of supply air e1 when droplet eliminator with hood is fitted here.
- A duct of min. length of 2m must be always connected to the fan outlet to prevent injury caused by the fan's impeller. This duct must be connected in such a way that it can be dismantled only by using tools.
- If there is a risk of short-circuit between the exhaust of stale air i2 (EHA) and intake of fresh air e1 (ODA) a duct being at least 3 m long must be connected to the outlet port i2. This applies to semi-compact units 10000 and 11000 Multi-N, 7500 and 9000 MultiEco-N, 12100 and 15100 Basic-N.

## 2.9. Condensate drain connection

- Connect a pipe to the condensate drain outlet KV and lead through the condensate heating cable HC. Shape a pipe to form a trap with dimensions stated below. Sufficiently fix the trap's shape.
- Connect a pipe of the same or larger diameter to the trap and connect this to a sewer.
- Adjust the length of the heating cable HC so that it heats the connected duct up to the place where the drained condensate will not freeze.
- Check the pipe's slope and make sure the whole pipe run (including inside the equipment) is free of foreign materials.
- Fill the trap with water.



$$h_1 = \frac{\Delta p}{10} + 50 \text{ [mm]}$$

$$h_2 = \frac{\Delta p}{2 \cdot 10} + 50 \text{ [mm]}$$

$$h = 1,5 \frac{\Delta p}{10} + 100 \text{ [mm]}$$

$\Delta p$  - maximum positive / negative working pressure in the compartment of the unit. The height of trap  $h = 15\text{-}20\text{cm}$  is sufficient for the vast majority of installations.

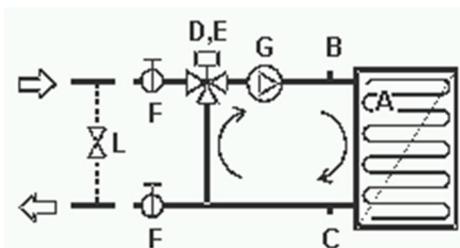
- ! Each condensate drain must be connected to its own trap.
- The number of condensate drains depends on the unit's configuration.

## 2.10. Connecting hot-water heating coil to a heating water supply

During the installation of water heating coil follow the guide that is enclosed to this optional accessory.

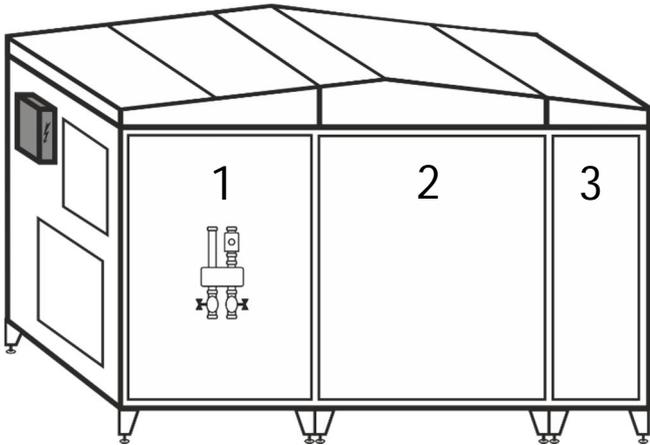
**When connecting the water heating coil follow the instructions below:**

- Maximum heating medium temperature allowed is 110 °C. The max. operating pressure is 1.0 MPa.
- To ensure correct performance of the heating coil hydraulic kit, fit the system with a pump with sufficient performance that covers the entire pressure drop. The pump supplied with the hydraulic kit is designed to cover pressure drop of the water heating coil only!
- If no shutoff damper on outdoor air intake (e1) is fitted on the equipment put a tight shutoff damper in the outside air inlet duct (we recommend a type with a spring return actuator, closing on power interruption).
- Water heating system in outdoor units Multi-N, MultiEco-N and Basic-N must be protected by an antifreeze with sufficient thermal resistance.
- Fit a strainer in the equipment heating system inlet pipe.

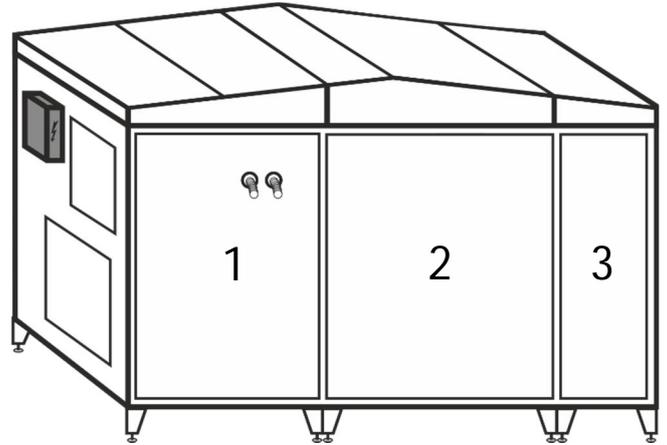


A: frost thermostat; B: drain valve; C: drain valve; D: mixing valve; E: actuator; F: ball valve; G, pump L, short-circuit bypass

- When using a 3-way mixing, we recommend fitting a short circuit. You will find the installation scheme and connection dimensions in the Duplexvent SW; in your project select **Operation point > Water heater**.



Mixing valve of water heater or cooler, place of connecting heating or cooling circuit



Pipes leading from water heater or cooler in delivery without mixing valve

**When connecting fluid pre-heater, observe the following principles:**

1. The maximum permitted temperature of the heating fluid is 110°C and operating pressure is up to 1.0 MPa.
2. Antifreeze must be used for circulation in all units fitted with the thermal fluid air pre-heater.
3. The heating system must have a sludge filter fitted in the inlet to the unit.
4. When a 3-way mixing manifold is used, we recommend installing a short-circuit by-pass.

Fluid pre-heater power control:

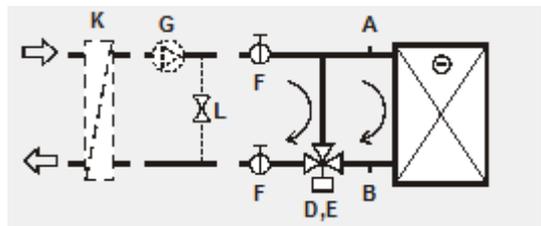
1. The pre-heater is used for protecting heat recovery exchangers from freezing.
2. The RD5 control system has a power control output.
3. Pre-heater control is continuous.
4. Pre-heaters are installed by service technicians.

 For the wiring diagram see the selection software (**Controls > Wiring diagram**) or service documentation.

**2.11. Connecting water cooling coil a chilled water supply**

**When connecting the water cooling coil follow the instructions below:**

- Fill the water cooling coil with a non-freezing mixture with sufficient low-temperature resistance! Or drain the cooling coil when temperatures may drop under 3°C.
- The maximum operating pressure is 1.0 MPa !
- A strainer must be fitted on the inlet from the chilled water system into the equipment.



A: strainer; B: strainer; D: 3-way ball tap; E: servo drive; F: ball valve; G: pump; L: short-circuit by-pass; K: water / ethylene glycol coil

**2.12. Connecting direct-expansion cooling coil**

When connecting the DX cooling coil follow instructions of your supplier of condensing unit and refrigeration system.

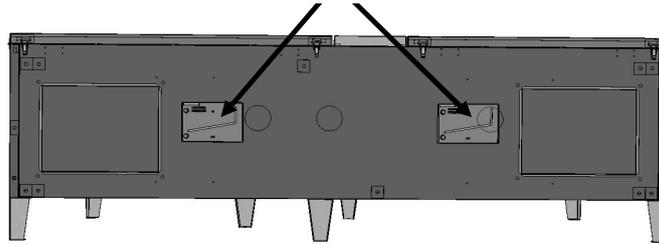
### 2.13. Installation of manometers for constant flow and constant pressure

When installing the accessory mechanically and connecting its electronics please follow the guide enclosed to this optional accessory.

### 2.14. Installation of liquid manometers

1. If the appliance is supplied without liquid manometers for measuring the pressure difference of air filters, place each manometer on a suitable vertical surface near the pressure measurement points (the maximum length of connecting hoses is 1 meter). Suitable location is indicated in the production by a sunk slot where drilling can begin. Make sure that the location of manometers enables regular inspection of values to be measured. Level manometers horizontally and secure them with self-tapping screws provided.

Installation of manometers (compact unit)

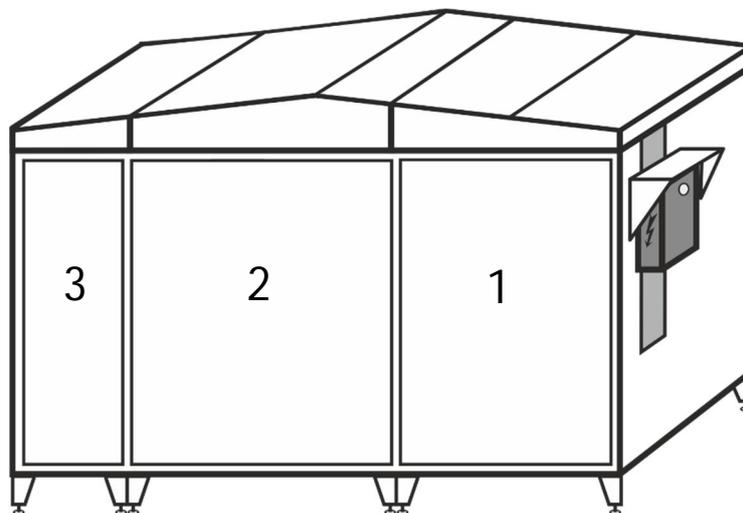


2. Connect monometers using hoses with the pressure measurement points on the casing of the appliance. Connect the hose on the top of the manometer and lead it to the plastic bushing on the casing of the appliance. The hose must always connect two connection points marked identically by "+" or "-" (must not be swapped). Make sure that hoses from only one filter are connected to each single manometer!
3. Stick a relevant label supplied together with accompanying documentation near each manometer. The label contains information about each air filter. Make sure that the location of the label enables regular inspection of values to be measured.
4. Fully unscrew the rotation knob for setting zero on the scale (bottom knob marked "+") and then screw it approximately two full turns back to allow for setting in both directions.
5. Unscrew the "FILL" plug (top knob) and start filling the appliance with measurement fluid (part of delivery) until you can see the fluid near zero on the scale. Use the bottom knob to accurately set the zero value on the scale. Screw the top filling plug back.

- ! After connecting manometers do not tilt the appliance or door (if manometers are located there)!
- Danger of measurement fluid leakage.

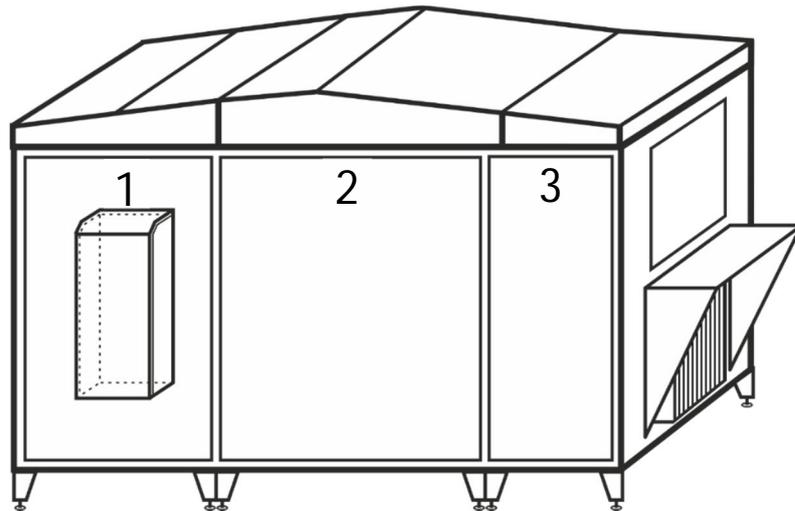
### 2.15. Covering the unit (semicompact models only)

1. Mount a roof cover above the connected junction box.



Covered semicompact unit, front view

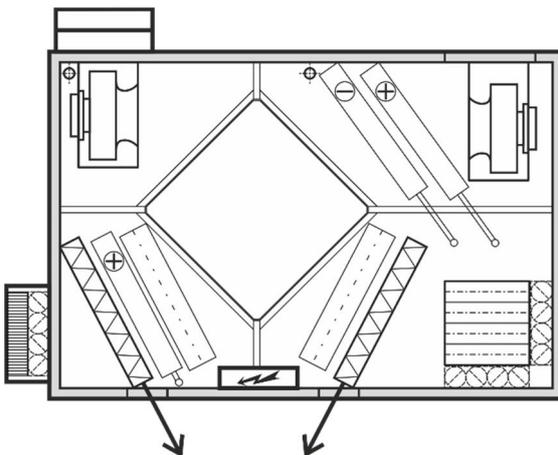
2. Hang up the cover of the manifold on the rear side of the unit. Fasten the cover by two screws (part of delivery).



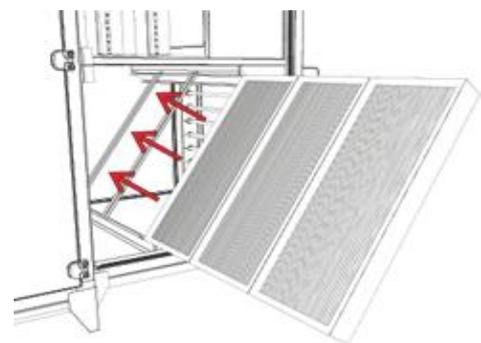
*Covered semicompact unit, rear view*

## 2.16. Fitting air filters

1. If the appliance was supplied with separately packed filter cartridges, unpack the cartridges and check their condition. If they are damaged or stained, replace them. Spare filter cartridges may be ordered from the manufacturer. Please include in the order the ordering number of the cartridge (the number is shown on the identification plate).
  2. Insert undamaged and clean cartridges into the guides. To access filter in a semicompact unit open or pull away the door behind which the filter is located.
  3. During insertion make sure that the identification plate of each cartridge faces towards you (i.e. towards the door of the appliance) and the arrow indicating air flow direction through the cartridge always points towards the heat exchanger!
  4. Make sure that each section (supply, exhaust) contains filter cartridges with the appropriate filtration class as shown on the identification plate of the appliance.
- U Record the date when the filters were replaced, e.g. in a book of unit's operation.



*Fitting filters in compact unit, top view*



*Fitting filters in semicompact unit, front view*

- ! Use only original filtration cartridges! If different cartridges are used, the manufacturer cannot guarantee their proper functionality!

## 3. Electrical wiring

### 3.1. General rules

1. The electrical wiring in the equipment observes valid standards for electrical connections to the TN-C, TN-S, TN-C, S networks. Only a qualified person possessing valid service certificate issued by Airflow Developments Ltd. may carry out the electrical wiring work. The equipment is fitted with terminals for external common grounding.
2. Wiring diagram of the whole air-handling system is attached as an inseparable supplement of documentation enclosed to the unit. Installation guides and wiring diagrams of optional accessories are included in the documentation of these accessories.
3. A circuit-disconnecting device (a service switch) with the distance of disconnecting contacts of at least 3 mm at all poles must be placed into the power supply to the equipment. This disconnecting device must be fitted appropriately and located near the equipment. A standard circuit-braking device (supplied with the equipment) may be used as such a device if the electrical panel is located in a reachable distance from the equipment. This applies only when the unit is not equipped by a main service switch.
4. Protection of the unit from the strike of flash must be carried out according to EN 62305-3 Physical damage to structures and life hazard. If the outer containment equipment does not protect the unit from direct strike of flash it is necessary to connect the conductors leading the flash currents to conductors that come from the unit into the premises. The purpose is to limit the intrusion of partial flash current into the premises.
5. The way of commissioning may differ depending on the control system. Commissioning is performed by a trained technician based on separate documentation.
6. You will find the description of the control in a separate guide on control system.

! Overcurrent protection of the unit must be provided by a circuit breaker with characteristics "C".

! In case of using additional overcurrent protection against accidental direct or indirect contact, it is necessary to use a **special** circuit breaker designed for frequency inverters and switching sources. It is a protector being sensitive to alternating and pulse DC residual currents, resistant to current surges of 5 kA.

## 4. Commissioning

### 4.1. Safety rules

Ensure that the following is done prior to commissioning the equipment:

- Carry out initial electrical audit according to valid standards. A written report must exist about this audit.
- Connect ducts to equipment's air inlet and outlet ports according to instructions stated in previous paragraphs.
- Fill in water to condensate drain trap.
- Fill the heating circuit including the hot water heater and regulatory coil (including external hot water heaters in ducts equipped with mixing valve) with heating fluid even when operating the unit out of the normal heating period. When filling the circuit, make sure the manifold shut-off valves are open both on the heater fluid inlet and outlet. Make sure the air is bled from the system.
- Check the rotation direction of each fan impeller. In case of opposite direction swap phases.
- Check the current consumption of each fan at all speed steps. The current should not exceed the maximum value on the fan's label. In case of exceeding the maximum value properly decrease the air volume flow in the ductwork.
- Appliances with hot water heaters (including external hot water heaters in ducts equipped with regulatory coils) must be permanently connected to the electricity supply to ensure antifreeze protection of the hot water heater. In case of longer power cuts the heating fluid in both the heater and the manifold must be discharged. We recommend discharging the fluid using compressed air; do not rely simply on gravity drainage!
- For more information please refer to this installation manual, alternatively ask the supplier of measuring and control system to provide the information.

## 4.2. Hygienic instructions for the appliance to comply with VDI 6022

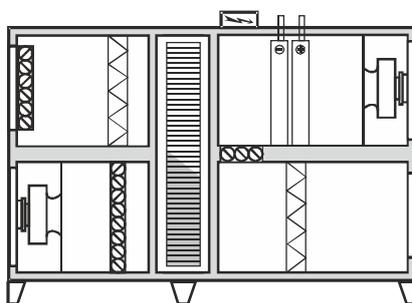
- Ü Before commissioning the appliance must be thoroughly cleaned; in case of stricter hygienic requirements wiping disinfection must be carried out.
- Ü After disinfecting make sure that no toxicologically suspicious or odour-active substances enter the air to be supplied!
- Ü In case of stricter hygienic requirements the measurement of pathogen concentration must be carried out.
- Ü The appliance must not be operated without air filters.
- Ü The permanent low-frequency noise level (10 to 100 Hz) generated by the appliance may not exceed the audibility threshold. The value to be applied as guidance is that the low-frequency level of acoustic pressure LCF should not exceed the value of acoustic pressure LAF by more than 20 dB (see DIN 45680). In case of doubt a frequency analysis of the low-frequency value of acoustic pressure must be carried out in order to make it possible to identify and suppress the source of the narrow band of the faulty zone.
- Ü Suitably record the date of your appliance's commissioning, e.g. in the plant log!

## 5. Access to the unit using the internet

Ventilation units Multi-N, MultiEco-N and Basic-N equipped with control system RD5 <sup>1)</sup> can also be controlled using a web browser. This allows the user to do the following, either from a local network on site or through the Internet:

- Change user setting of the unit;
- Watch the unit's operational parameters including error messages;
- Browse the unit's operational history;
- Set e-mail notification with Alarm or Warning messages for up to three e-mail addresses.

You will find more information in the Guide on controlling ventilation units Duplexvent equipped with regulation RD5.



## 6. Disposal of package and disused unit

Materials marked with the symbol  are recyclable. Put these materials in the respective bins in order to be recycled.

PAP – corrugated cardboard  
FOR – wood

PE – polyethylene  
PS – polystyrene

PP – polypropylene

Please leave materials marked with the  symbol at the community place used for waste disposal!

Disused ventilation unit sold on the EU market can be recycled in compliance with the regulation 2012/19/EU. For further information please contact your distributor.



<sup>1)</sup> Information regarding the control module your unit contains is shown on the unit's name plate on the Controls / Specification line. The information is also included in the unit's Technical Specification.

## 7. Annex: Connecting blocks of semicompact units using connectors

The chapter describes the way of connecting wiring between blocks of semicompact units by using connectors. It is an alternative to connecting the wires via wiring boxes (see Chapters 2.7.3 to 2.7.6).

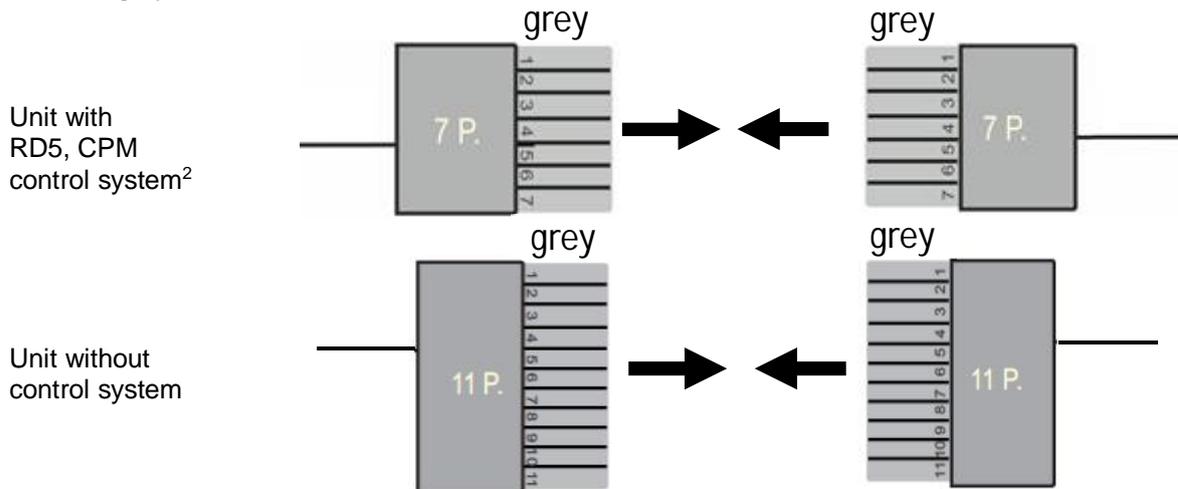
### 7.1. Connecting fans

#### Connected on delivery:

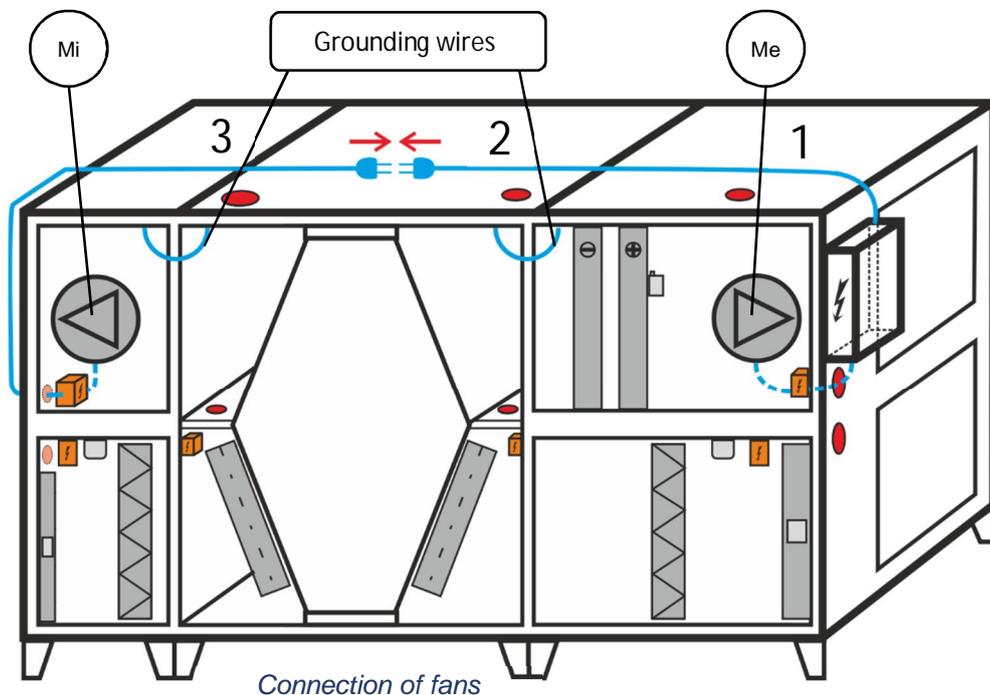
- Fan **Me** is connected up to the junction box.
- Fan **Mi** is connected to the connector.

#### Connect:

- Connect grey connector above the middle block.



- Connect the blocks 1 with 2 and subsequently 2 with 3 by green-yellow grounding wires.



- = cable comes connected on delivery
- = cable is to be connected

<sup>2</sup> Information regarding the control module your unit contains is shown on the unit's name plate on the Controls / Specification line. The information is also included in the unit's Technical Specification.

## 7.2. Connecting temperature sensors and condensate drain heating

### Connected on delivery:

- Sensors **TEB** and **TU1** are connected up to the junction box;

### Connected on delivery, optional equipment:

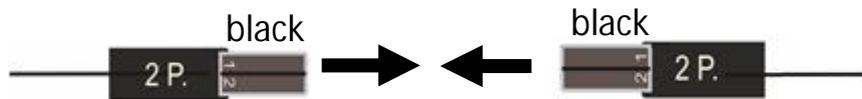
- Sensor **TFK** is completely connected up to the junction box.
- Cable powering the condensate heating **HC** is connected to the connector.

### Connect:

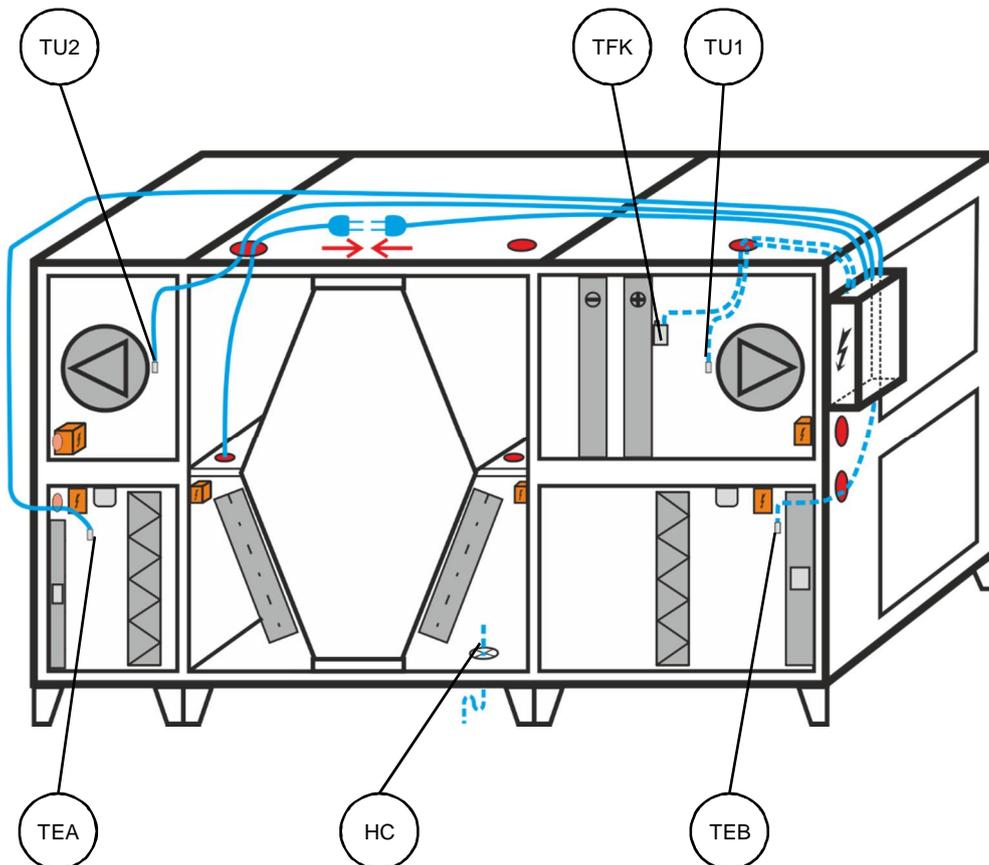
- Lead the cables **TEA** and **TU2** with temperature sensors from the junction box into their intended position;

### Connect, optional equipment:

- Connect the black connector powering the **HC**.



 In units without control system, temperature sensors are not included in the delivery package.



*Connection of temperature sensors and condensate drain heating*

### 7.3. Connecting pressure sensors

#### Connected:

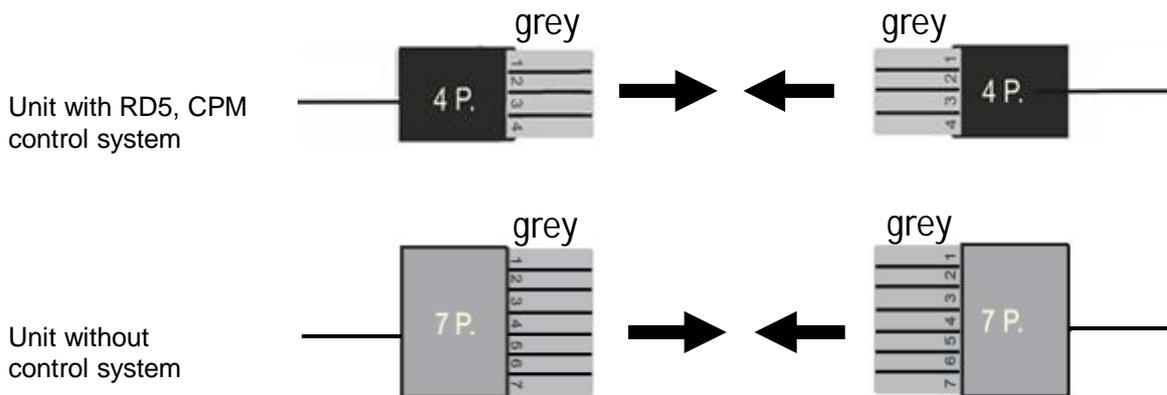
- Manostat **PFi** is connected up to the junction box;
- Manostat **PFe** is connected to the connector.

#### Connected, optional equipment:

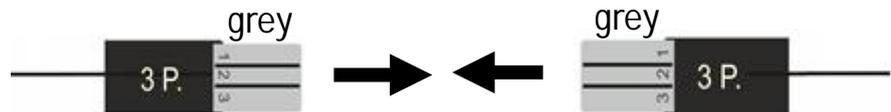
- Manometer **PMe** is connected up to the junction box;
- Pressure measurement point **PDi** measuring the pressure increase of the fan **Mi** is installed on the left side of the unit. Pressure measurement hoses are located on the top side of the block 3.
- Pressure measurement point **PDe** measuring the pressure increase of the fan **Me** is installed on the right side of the unit. Hoses leading from the pressure measurement point are installed.

#### Connect, optional equipment:

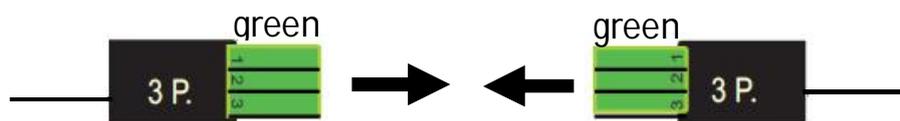
- Connect grey connector which powers manostat **PFe**. The same connector powers also the servo drive of the flap **Se**.

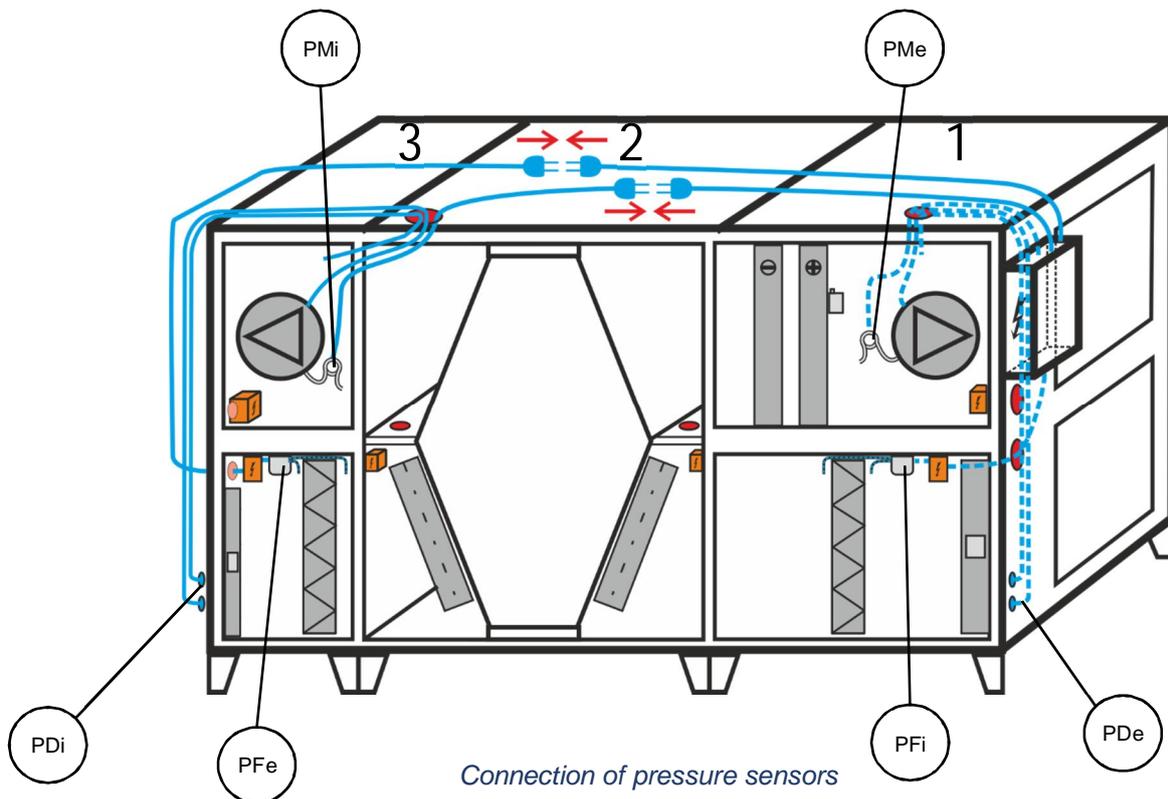


- Connect grey connector which powers manometer **PMi**. Available only for units with RD5 control system.



- Lead the hoses of the pressure measurement point **PDi** folded on the top side of the block 3 through a feed-through. The shorter hose ends up after going through the feed-through. Lead the longer hose to the nozzle of the fan **Mi**.
- Connect green connector which powers manostat **PFR**; manostat PFR monitors whether heat recovery core is not freezing over. Available only for units without control system.





#### 7.4. Connecting servo motors

##### Connected:

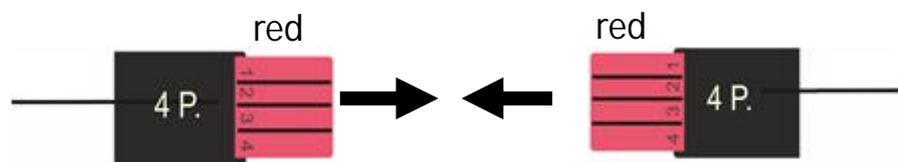
- Cable powering the by-pass flap (**SB**) is connected to the connector.

##### Connected, optional equipment

- Circulation damper (**SC**) servo motor is connected to the connector.
- The circuit of cooler **CHW** is connected to the hydraulic kit.
- The circuit of heater **TPO** is connected to the hydraulic kit.
- Hydraulic kit **LS** controlling the chiller or heater is located on the back side of the unit. The kit is completely connected up to the junction box;
- Water pump **LP** in the heating circuit is located on the back side of the unit. The kit is completely connected up to the junction box;
- Shut-off flap **Si** is connected up to the junction box;
- Shut-off flap **Se** is connected to the connector.

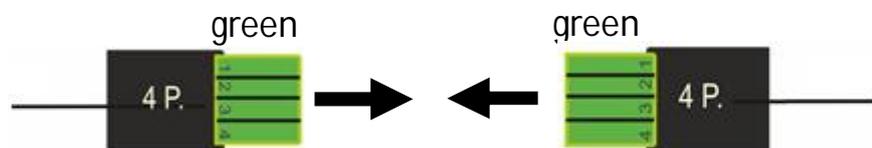
##### Connect

- Plug in connector powering the by-pass flap (**SB**).

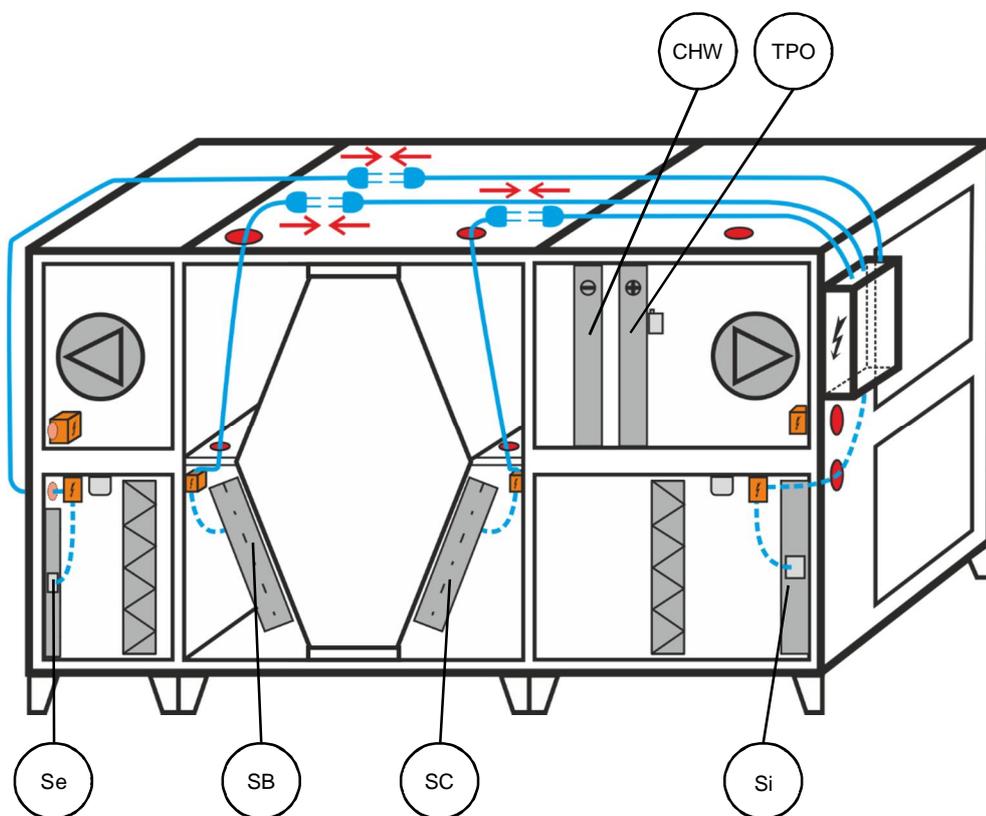
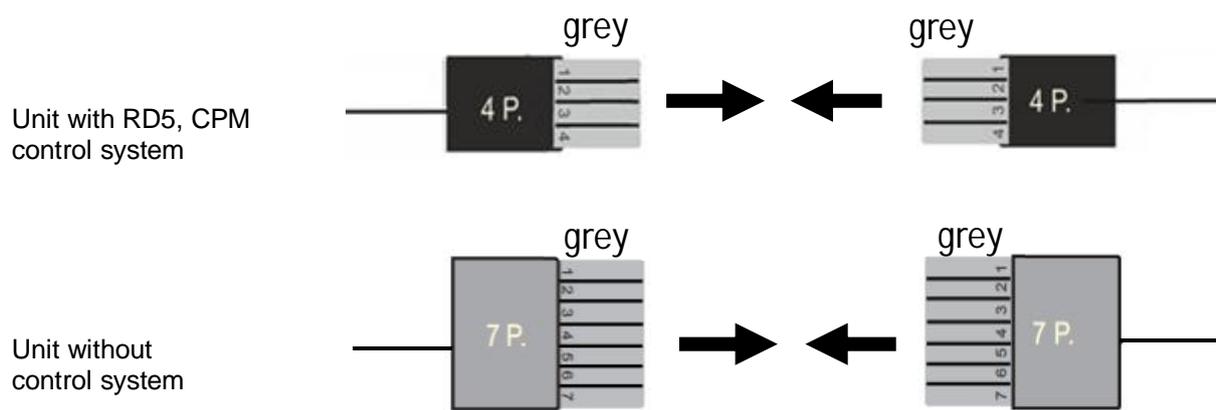


##### Connect, optional equipment:

- Plug in connector powering the circulation flap (**SC**). Available only for units equipped by RD5 control system or for units without control system.



- Plug in connector powering the supply air flap **Se**; the same connector powers also the manostat **PFe**.



*Connection of servo motors, front view*





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**Airflow Developments Limited**  
Aidelle House, Lancaster Road,  
Cressex Business Park,  
High Wycombe, Buckinghamshire,  
United Kingdom, HP12 3QP

E-mail: [info@airflow.com](mailto:info@airflow.com)  
Telephone: +44 (0) 1494 525252

[airflow.com](http://airflow.com)

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