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AIR-HANDLING UNITS DUPLEXBASE PS 650, 1100, 1700, 2300, 3500, 4500, 6000

(RD6)

Installation manual

Contents

Symbols explained
Items or sections marked with ➲ (or with a grey background) apply only to appliances manufactured in compliance with the hygienic requirements of Regulation VDI 6022 (indicated on the identification plate, see following chapters).

1. Important notices

- **Electrical connections, commissioning and adjustment of the appliance may only be carried out by qualified electrical engineers.**
- **Before the installation and commissioning of the appliance carefully read the installation, use and maintenance manual, the controller operation manual and, where applicable, the service documentation.**
- **The appliance and all its accessories must be installed and used in compliance with the design, technical conditions specified by the manufacturer and applicable legislation and technical standards in effect.**
- **The appliance may not be installed and operated in an aggressive environment that could damage its external and internal mechanical parts.**
- **Before putting the appliance into permanent operation an initial inspection report on the appliance´s power supply must be provided.**

➲ **Before putting the appliance into operation an approval test (see VDI 2079 and DIN EN V 12599) of the entire HVAC system of which the appliance forms part must be conducted. The test must include the examination of hygienic requirements as per VDI 6022 and must be documented. The user must be able to present the approval test report at any time. If the above requirements are not met, the manufacturer cannot ensure compliance with hygienic requirements.**

The manufacturer is not liable for damage caused by unprofessional installation and operation that is not in compliance with the operation and maintenance manual and general practices applied during installation and operation of HVAC equipment and control systems.

2. Safety instructions

2.1. General safety

1. Only adults sufficiently familiar with the operation and maintenance manual may operate the equipment.
2. The user must not tamper with or modify any part of the equipment, particularly the power supply lines!
3. Only professional service technicians with relevant qualifications may perform equipment repairs. Unprofessional repairs are very risky and may result in loss of warranty.
4. Before opening the equipment´s door for cleaning, filter replacement or general maintenance always make sure that the equipment is disconnected from power supply and prevent its reconnection by another person.
5. To prevent injuries caused by the fan wheel, a duct at least 2 metres long must always be connected to the fan discharge. The duct must be fastened in such a way that it cannot be removed without tools.
6. If the equipment has been out of operation for a prolonged period of time, extra care should be taken when putting it back into operation.

2.2. Safety instructions before commissioning

Before putting the unit into operation, it is necessary to:

1. Carefully inspect the unit;
2. Obtain the initial or latest valid inspection report for the power supply to the equipment. A written document must be issued for this inspection. Next, fill out the commissioning report and familiarize the operator with the equipment;
3. Air ducts must be securely connected to the device's outlet and inlet ports in accordance with the instructions provided in the previous chapters;
4. Filling the siphon for condensate drainage with water;
5. Fill the heating circuit, including the hot water heater and hydraulic kit (this also applies to external hot water heaters in pipes equipped with a hydraulic kit), with heating medium, even outside the heating season. When filling the circuit, it is necessary to check that the shut-off valves at the inlet and outlet of the heating medium to the heater are open and to ensure that the system is vented;
6. Devices with a hot water heater (this also applies to external hot water heaters in pipes equipped with a hydraulic kit) must be permanently connected to the power supply to ensure frost protection for the hot water heater. In the event of a prolonged power outage during the season when temperatures drop below 3°C, the heating medium must be drained from the hot water heater, including the hydraulic kit. We recommend draining the heating medium from the heater using compressed air, not gravity!
7. After commissioning, the unit must be operated at least intermittently (the unit must run for at least 1 hour per day).

2.3. Operational safety

1. The unit is intended for a basic environment:

Indoor version:

- Ambient temperatures between +5 and + 55 °C with relative humidity up to 60 % (60 % relative humidity up to 20°C).

Outdoor version:

- Ambient temperatures between -35°C and +55°C, relative humidity is not limited.
- If the appliance is located elsewhere, its sufficient protection must be ensured. The appliance can only be operated in an environment where there is no risk of fire or an explosion of flammable gases and fumes.

2. The appliance may be operated within the temperature range of ventilation air between -35°C and +40 °C with relative extraction air humidity up to 80%. The transported air must not contain:
   - Explosive flammable gases and fumes;
   - 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.

3. In the event of a failure the appliance must be disconnected from power supply as soon as possible!
4. The water chiller in all versions must be filled with an antifreeze solution with sufficient thermal resistance, or it must be drained for the period during which outdoor temperature might fall below +3°C.
5. We recommend draining water from the chiller with pressurized air, not using a gravity flow!

Appliances with hot water heaters

6. Must be permanently connected to power supply to provide for the anti-freeze protection of the hot water heater. In the 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!
7. A steady supply of hot water must be ensured during the heating season.
8. 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!
9. In the case when the heating system including the hot water heater and control set are not filled with a heating medium, the ventilation unit can be left like this for a maximum of one month, after which there is a risk of corrosion of the internal parts of the register.
10. The appliance is designed for environments with Class ETA 1 extract air; in environments with extract air Class ETA 2 and ETA 3 it is necessary to comply with conditions specified in the chapter 5.2.

! When operating the unit without active heating, it is necessary to take into account the lower temperature of the supply air, which may lead to reduced thermal comfort.

! When extracting air directly from the toilet bowl, the use of chlorine-based products may cause oxidation of the metal parts of the HVAC unit, thereby shortening its service life.

2.4. Protection of the unit during the inactivity

1. During any shutdown, or after installation of the unit until it is put into operation, the unit must be treated as stored equipment in accordance with the conditions in Chapter 3, otherwise there is a risk of, among other things:
   - Corrosion of the inner casing, fans, and other metal parts due to the ingress of air humidity;
   - Mold on filters;
   - Damage to electrical equipment due to the ingress of air humidity;
   - Damage to electrical equipment when connected to the electrical system.
2. Protect the unit from the ingress of dirt. If installation is interrupted or if there is a lot of dust, all openings in the equipment must be covered so that the surfaces that will be in contact with the transported air remain protected from the weather, dry, and clean.
3. Do not operate the units during construction work. Switch off the unit before starting construction work and cover all ends of the pipe distribution system. The unit must be treated as stored equipment (see Chapter 3) until all construction work has been completed and all construction debris and dust has been cleaned up.
4. Protect the units from cooling down, unwanted air flow, and condensation on internal surfaces (e.g., chimney effect when a new building is drying out). Close the manual shut-off dampers on the supply e1 (ODA) and exhaust i1 (ETA) on the unit, and place shut-off dampers in the ductwork to prevent free air flow.

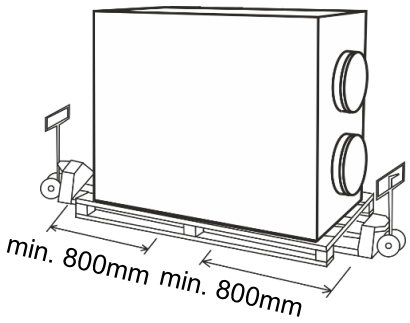
3. Storage and transport

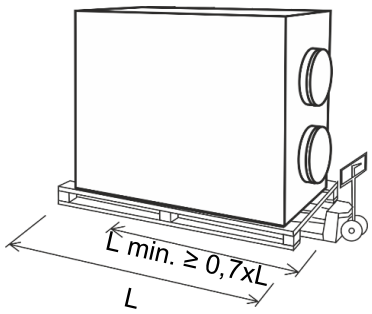
1. Store the unit in such a way as to prevent damage to the device or its packaging. Until it is put into operation, the device must be stored only in dry and covered places so that:
   - the unit or its parts remain protected from weather conditions, direct sunlight, and ultraviolet radiation;
   - the unit or its parts are exposed to temperatures ranging from -25°C to +55°C;
   - surfaces that will come into contact with the transported air and all electrical components remain dry and clean.
2. Do not expose the heat recovery to ultraviolet radiation, store it in a dark place.

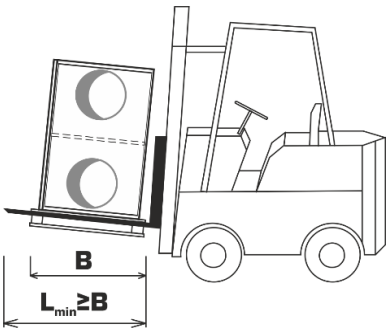
3. Packaging may not be removed until immediately before the installation of the appliance in its operating position. If that is not the case, all parts must be checked for cleanliness before installation and thoroughly cleaned if necessary.
4. The appliance must not contain any operational liquids (e.g. water in the hot water heater, water chiller etc.) during storage and transport.
5. The appliance may only be transported on handling blocks (included). During transportation the appliance must be protected against mechanical damage and water penetration and all openings must be covered with protective covers.
6. During transportation the appliance must be secured against falling. The mode of transport must also eliminate any falls of the appliance or instances of the appliance getting loose.
7. Activities near the unit such as grinding, cutting and other ancillary works that could irretrievably damage the surface or individual parts of the unit are prohibited.
8. The unit casing is protected by a transparent foil from the production. Remove the foil at ambient temperature higher than +5°C to avoid the hazard of damaging the metal sheet surface.

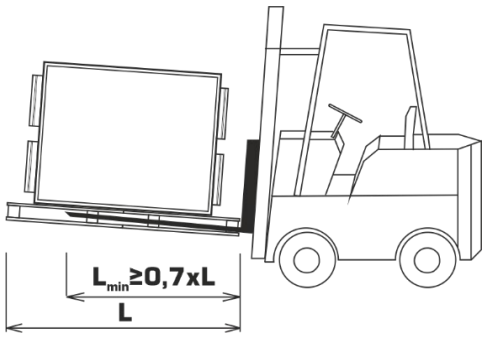
! When handling or transporting the unit, ensure that it is securely positioned. Secure the unit and its accessories against falling or tipping over.

Solely permitted methods of handling



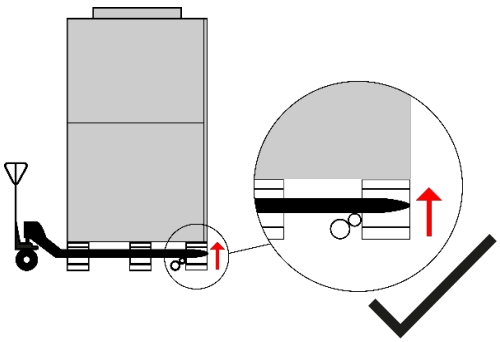


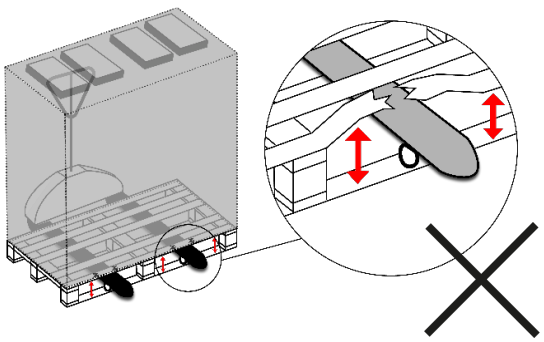




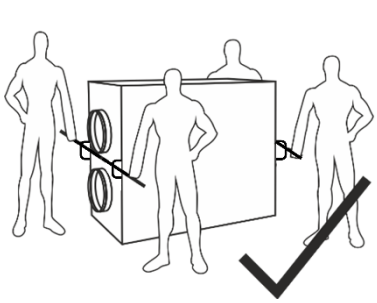
Minimum fork spacing 800mm

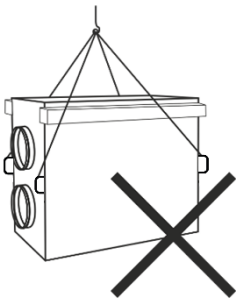
When lifting a pallet, make sure that the wheels of the pallet truck are not on the pallet crossbars to prevent them from breaking and damaging the pallet.

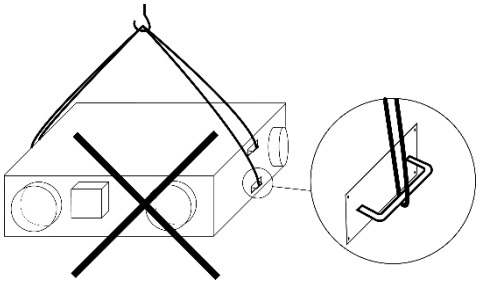




! The handles on the side of the device are intended solely for manual transport and handling of the units!



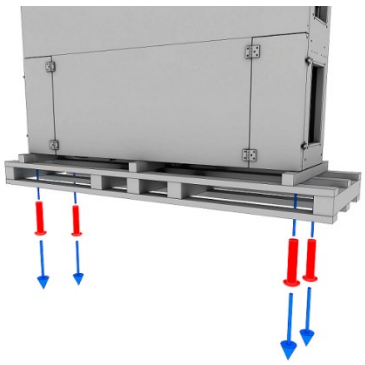




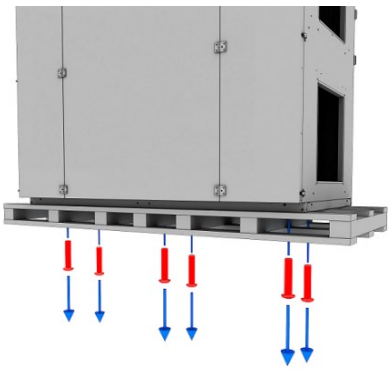
Transport of unit by crane

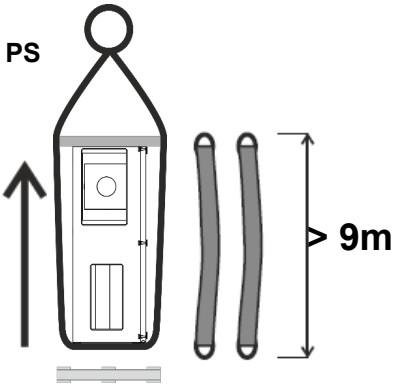
! Mount the roof of the unit after putting the unit on the place of its final installation.

650 – 3500 DUPLEXbase PS



4500 and 6000 DUPLEXbase PS





! The bars must be wider than the unit itself.

! Use a Phillips screwdriver ⊕ PZ2 and Allen key ◉ 6mm to remove the unit from the pallet and auxiliary wooden beams.

Handling doors on the roof

- Handle the door on the roof with extreme caution, especially when there is a risk of gusty winds. There is a risk of injury.
- After removing the door, place it on the roof of the building. The door must be secured at all times to prevent potential damage.

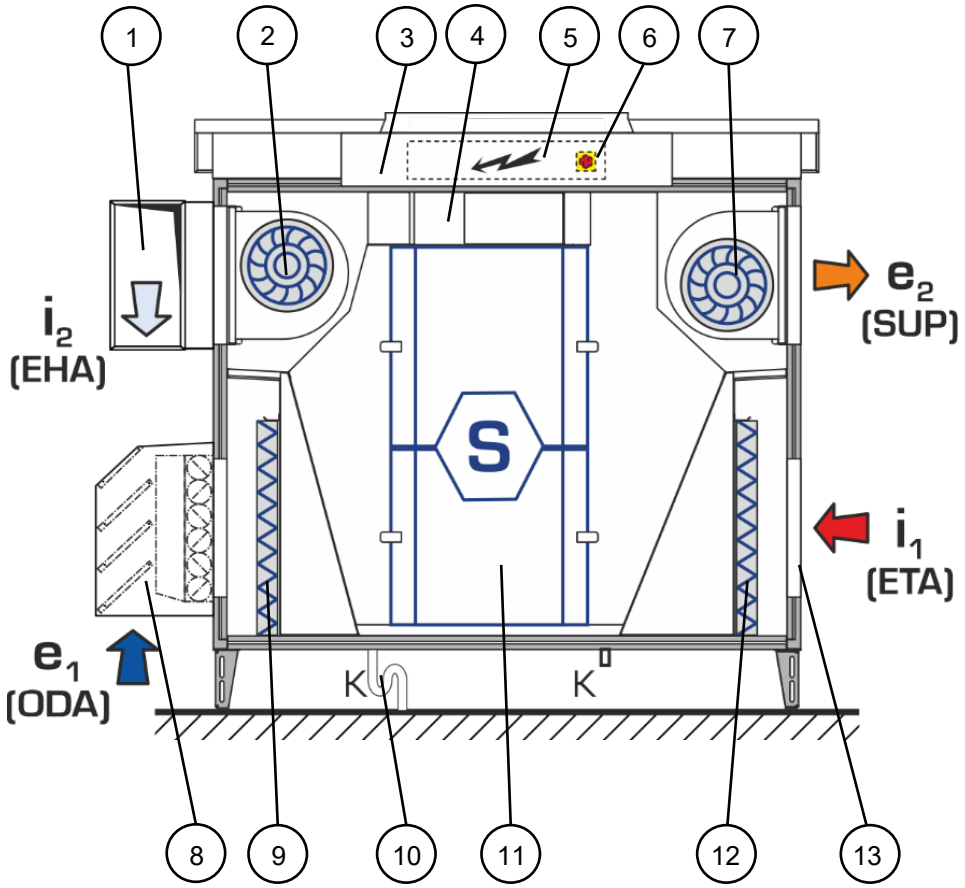
4. Description

4.1. General

DUPLEXbase PS series ventilation units with heat recovery are compact appliances containing in a single cabinet two independently powered fans with flexibly mounted engines, a highly efficient heat recovery exchanger assembled from thin-walled plastic boards for the recovery of heat/cool, a by-pass damper, slide-out filters and drainage trays, and depending on accessories selected also an external heater, chiller, shut-off dampers, flexible flanges and a control system.

Units can be installed in indoor and outdoor environment. Indoor, DUPLEXbase units can be installed as floor-standing (650 DUPLEXbase – 6000 DUPLEXbase) or ceiling suspended (650 – 3500 DUPLEXbase). Outdoor, the units can be installed as floor-standing (650 DUPLEXbase – 6000 DUPLEXbase).

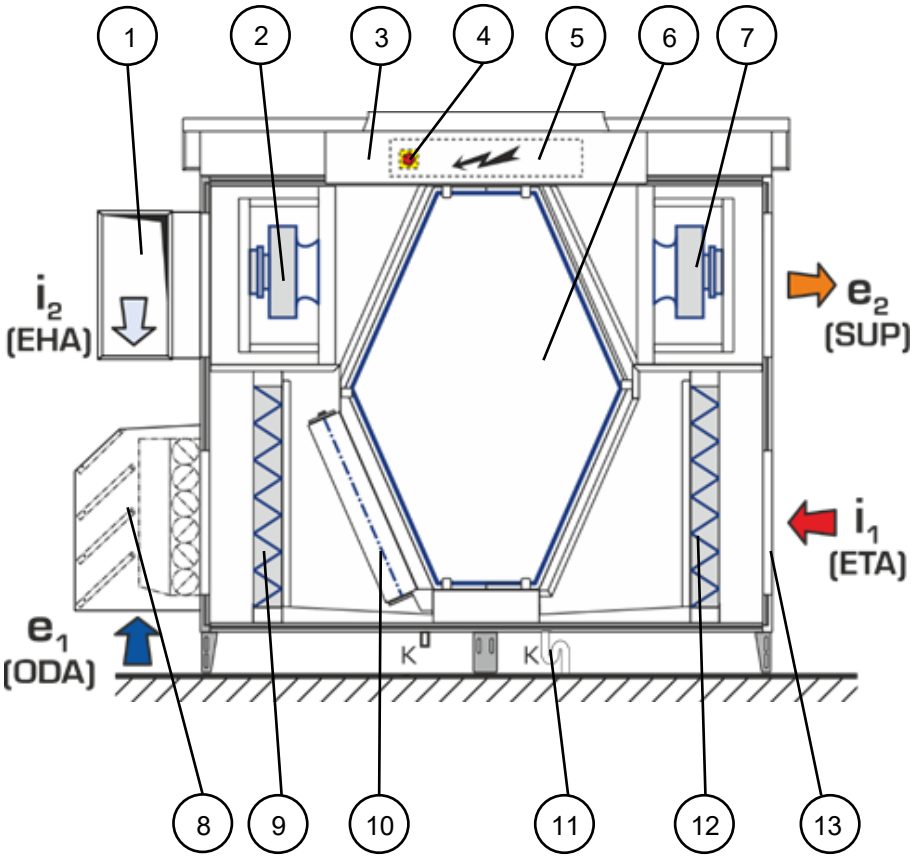
650 and 1100 DUPLEXbase PS



1. Outlet hood *), exhaust air (i2/EHA)
2. Exhaust fan
3. Roof of the unit *)
4. Bypass of heat recovery core
5. Junction box
6. Main switch
7. Supply fan
8. Inlet hood with raindrop eliminator *), outdoor air (e1/ODA)
9. Supply air filter
10. Condensate drain
11. Heat recovery core
12. Extract air filter
13. Intake (extract air)

*) Accessories for outdoor installation

1700 to 6000 DUPLEXbase PS



1. Outlet hood *), exhaust air (i2/EHA)
2. Exhaust fan
3. Roof of the unit *)
4. Main switch
5. Junction box
6. Heat recovery core
7. Supply fan
8. Inlet hood with raindrop eliminator *), outdoor air (e1/ODA)
9. Supply air filter
10. Bypass flap
11. Condensate drain
12. Extract air filter
13. Intake, (extract air)

*) Accessories for outdoor installation

4.2. Intended use

DUPLEXbase PS series ventilation units with heat recovery are intended for the comfort ventilation and possibly hot-air heating and cooling of flats and houses, small plants, workshops, schools, restaurants, cooking facilities and industrial halls with a basic environment. The use of the unit must be in compliance with the Regulation of the Commission (EU) 1253/2014. If the appliance is used for different purposes or it is not operated in compliance with instructions contained in the operation and maintenance manual, the manufacturer is not liable for resulting damages.

5. Installation

5.1. Safety instructions

1. During installation make sure no damage or deformation is caused to the case of the appliance (e.g. as a result of handling operations).
2. After setting the appliance in place check it for stability and secure it in this position against moving.
3. Before installation, check that the switchboard is clean and undamaged. Clean it if necessary.
4. During installation, remove the protective film from the unit casing. Remove the film from the filters immediately before inserting them into the unit. It is necessary **to blind all connection ports**, including the condensate drain, so that the unit is always protected against direct ingress of dirt, unwanted air flow, and condensation on its internal parts. Add inhibitors that absorb air humidity to the unit to prevent mold growth and corrosion of the metal parts of the unit, or degradation of electrical equipment.
5. The unit must be commissioned and put into operation within 2 months of installation.
6. During handling and installation observe all rules of safe work (including work at heights and work with suspended loads) and use appropriate work and safety equipment.
7. Lifting and binding equipment may only be operated by trained personnel.

! When handling removable parts (e.g., the unit roof), these components must be secured to the unit casing in the designated location.

5.2. Hygienic instructions and requirements

- 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 device (electrical duct heaters are an available 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, DUPLEXbase units may only be used provided that it has been arranged via appropriate measures that the dew point will not be exceeded in the heat recovery 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 of the heat recovery unit; in an environment with Class ETA 3 extract air must be arranged for operation in such a way so that positive pressure is on the supply side against the exhaust side. This must be ensured under all operating conditions of the system. For details see EN 13779.

➲ 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 no air can flow freely through the system. A damper shutting off the supply of outdoor air (ODA) must be thermally insulated. Using shut-off dampers available as an accessory is recommended. Compliance with this requirement is the responsibility of the planner / specialist installation firm.

➲ DUPLEXbase series appliances have a single-stage filtration system. Appliances in a hygienic version in compliance with hygienic standard VDI 6022 must have at least Class ISO ePM1 50% (F7) filter fitted on the inlet (applies to outdoor air e1/ODA Class ODA 1 and ODA 2). When outdoor air is Class 3, a Class ISO ePM10 50% (M5) filter must be fitted in the duct upstream the outdoor air inlet into the HVAC unit; alternatively, a Class ISO ePM10 50% (M5) filter may be installed in the HVAC unit and a Class ISO ePM1 50% (F7) filter in the duct at the e2/SUP outlet from the unit. Note: air filters ISO ePM1 55% (F7), ISO ePM10 50% (M5) and ISO ePM1 80% (F9) are separately supplied accessories.

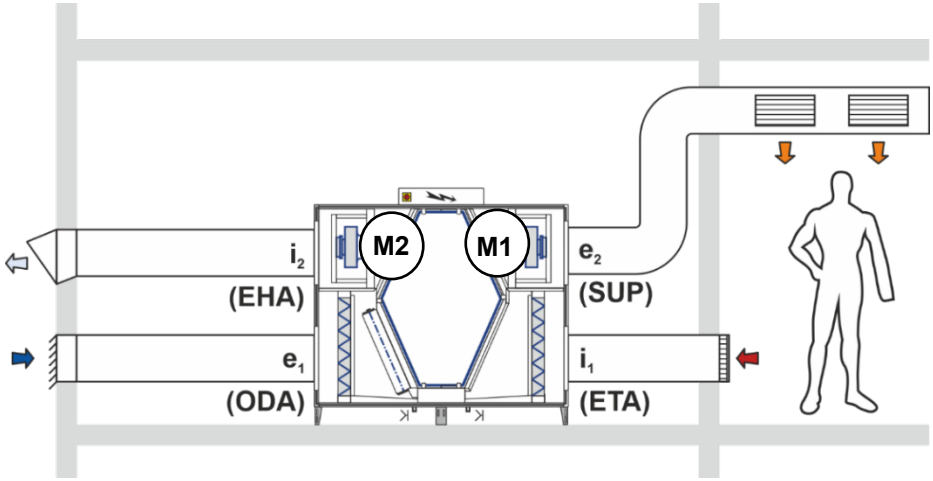
➲ Appliances in a hygienic version in compliance with hygienic standard VDI 6022 may be operated only if the use of recirculating air is suitable for hygienic reasons or the arrangement of operation of the HVAC network ensures positive pressure in the supply section of the appliance against the extraction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

5.3. Configuring orientation of the unit

The versatile design of sizes 650, 1100, 1700, 2300, 3500, 4500 and 6000 allows adjusting orientation of the appliance; it can be configured which fan will be delivering the supply air and extract air. The orientation of the unit must be configured once the unit is switched ON for the first time.

5.3.1. Control system RD6 (aMotion)

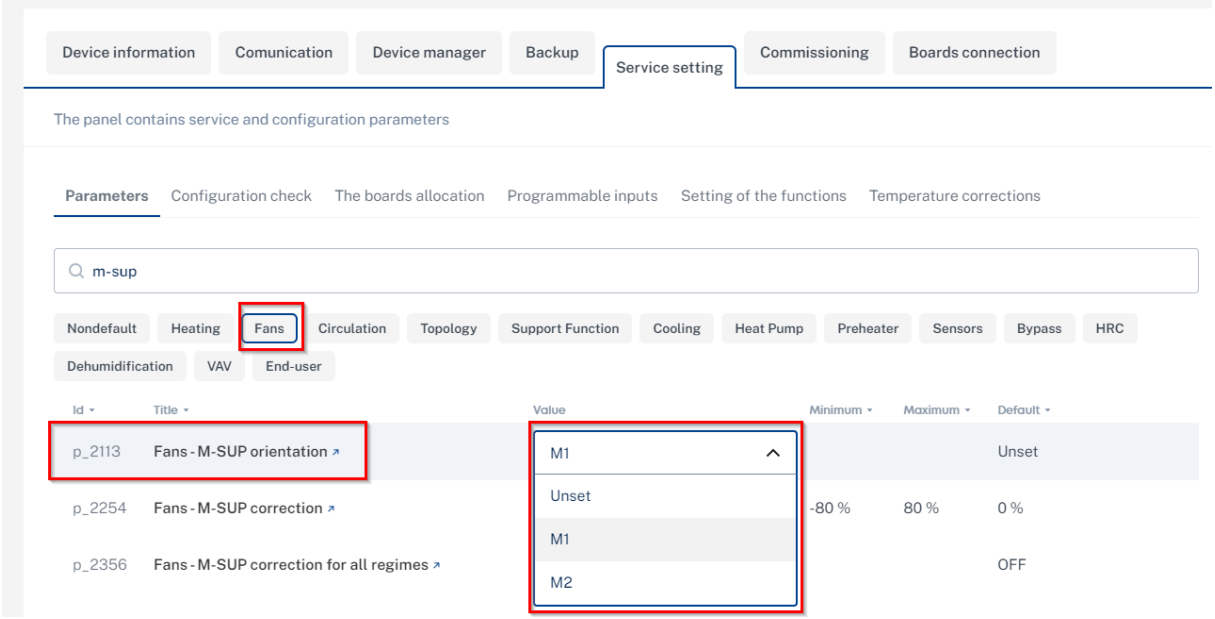
1. The fans are marked with labels such as M1 and M2 at the factory. You can also refer to the position of the M1 and M2 fans according to the drawings:



Key:
e1 (ODA) – intake (supply air)
e2 (SUP) – exhaust (supply air)
i1 (ETA) - intake (extract air)
i2 (EHA) – exhaust (extract air)

The location of the intake and exhaust, such as the supply fan (M-SUP), is set to M1.

2. Connect to the unit using an Ethernet cable and the aTool service program. The program is available to trained service technicians.
3. Select Service Settings > Parameters and select the Fans subgroup.
4. Select whether the supply fan (M-SUP) will be M1 or M2 (parameter 2113).

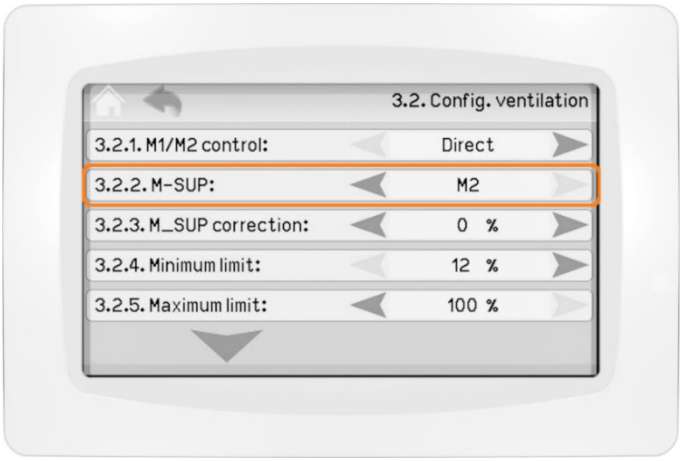


! Until parameter 2113 is set to M1 or M2, unit operation is blocked.

Identify the individual connection ports and mark them with labels (included in delivery) according to the set orientation.
After each change in the unit's orientation, make sure that the supply and exhaust air filters are installed at the supply and exhaust points. For more information, see section 5.10.

5.3.2. Control system RD5

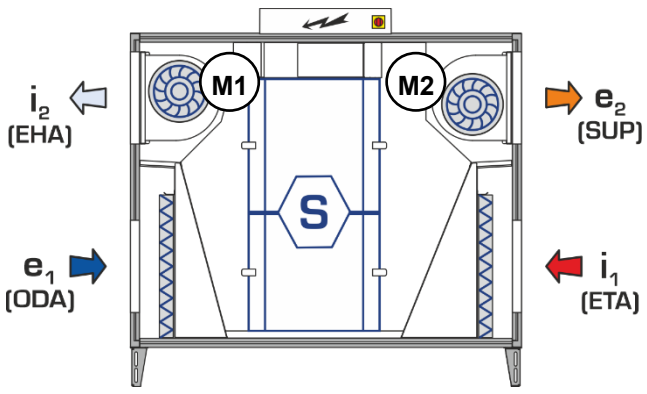
1. Open the door of the unit. Check the labels on the fans to learn which fan is marked M1 and M2.
2. Connect the control panel CP Touch to the unit. Turn the unit ON. The control panel will report an error by showing a yellow triangle on the top of the display.
3. Click on the symbol of the error. The control panel will display the message *Orientation is not set*.
4. Proceed back to the default screen, click on the cogwheel in the bottom left corner.
5. Click on the Settings symbol in the top right corner.
6. Enter the service menu password. The password is available to authorised partners.
7. Proceed to the parameter 3.2.2 on the control panel. Set up the fan M1 or M2 as M-SUP (supply fan).



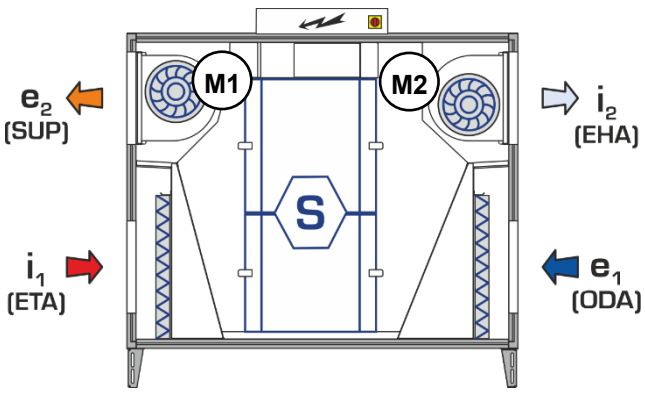
! **The operation of the unit is blocked until the parameter M_{SUP} is configured to M1 or M2.**

! By default, the unit is equipped with filters of different filtration classes. Make sure the filters are placed correctly according to the orientation of the unit. For more information see Chapter 5.10.

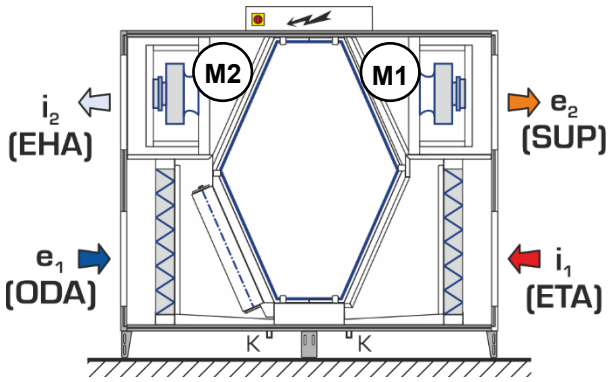
DUPLEXbase 650 and 1100



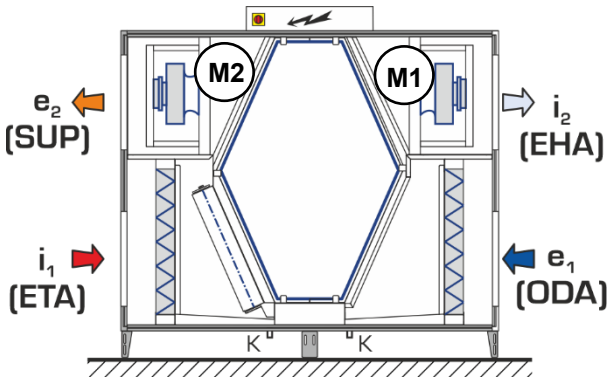
Unit 650 or 1100 Flexi, fan M2 is configured as supply fan (M-SUP).



Unit 650 or 1100 Flexi, fan M1 is configured as supply fan (M-SUP).



Units 1700-6000 Flexi, fan M1 is configured as supply fan (M-SUP).

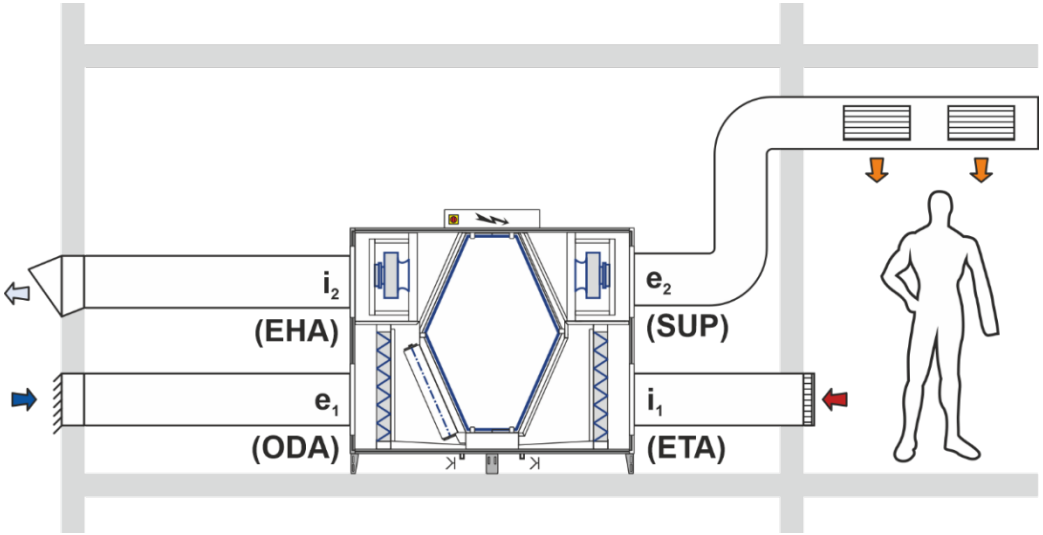


Units 1700-6000 Flexi, fan M2 is configured as supply fan (M-SUP).

5.4. Identification of ports

Identify and label individual ports using the pictures below (labels are included). Begin by identifying port e1 (ODA) - outdoor air inlet; continue toward the fan on the same (shorter) side of the unit with exhaust air outlet port i2 (EHA); next is the port with fan on the opposite side of the unit - supply air outlet e2 (SUP); the last (remaining) port is extract air inlet port i1 (ETA).

Note: Depending on a specific location of the unit proceed clockwise or anticlockwise.



5.5. Connecting the HVAC duct

- Connect the HVAC duct following the design documentation.
- A straight duct being at least 1 meter long must be connected to both outlet ports. This will ensure that an equal air speed profile is achieved throughout the whole port's cross-section area and unit achieves performance levels stated by the manufacturer.
- The duct connected to inlet ports must be arranged in a way allowing a uniform flow rate in the entire cross section of inlet ports.

- To prevent injuries caused by the fan wheel, an HVAC duct at least 2 metres long must always be connected to the outlet of supply air e2 (SUP) and outlet of stale air i2 (EHA). The duct must be fastened in such a way that it cannot be removed without tools.

Outdoor installation of DUPLEXbase

- 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 (EHA). As an alternative, hoods at e1 (ODA) and i2 (EHA) ports can be used; these are provided as optional accessories.

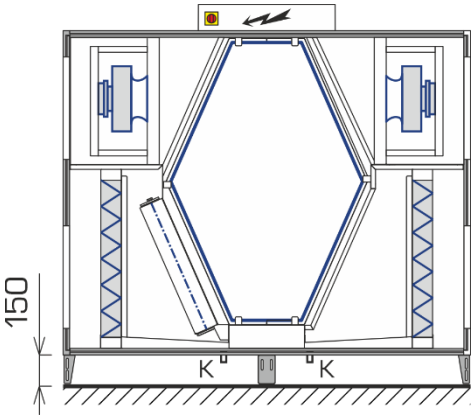
! Protect the shut-off dampers from weather conditions and freezing. Ice on the gear wheels may prevent it from changing position. Sufficient protection for the e1 (ODA) damper is provided by the e1 (ODA) hood, which is available as an optional accessory.

5.6. Installation

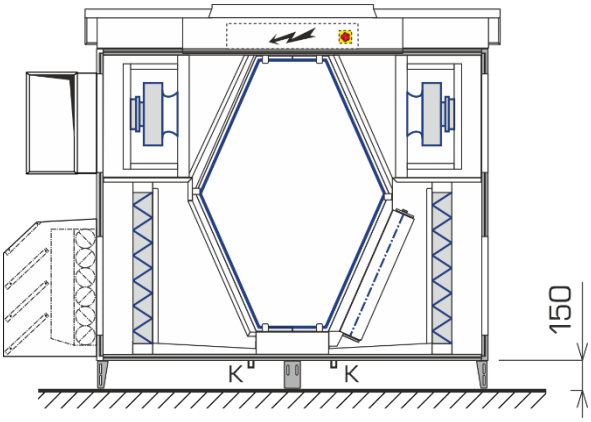
- Before installation remove the wooden transport planks.
- The versatile design of DUPLEXbase allows both indoor (floor-standing, ceiling-suspended) and outdoor installation (floor-standing), see Chapter 4.1 for more information.
- Fit the appliance in such a way that the prescribed handling spaces are observed:

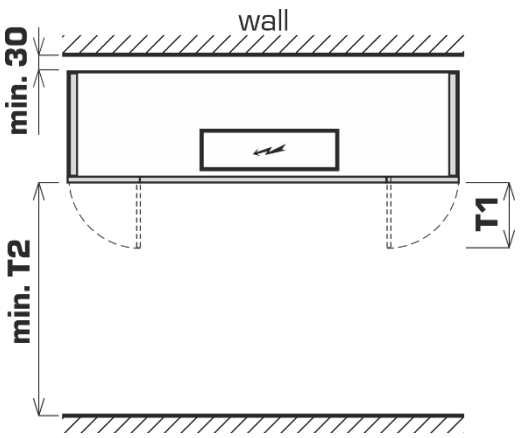
5.6.1. Manipulation space

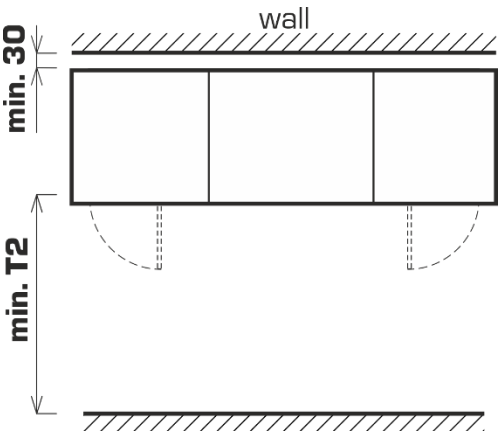
Floor standing position



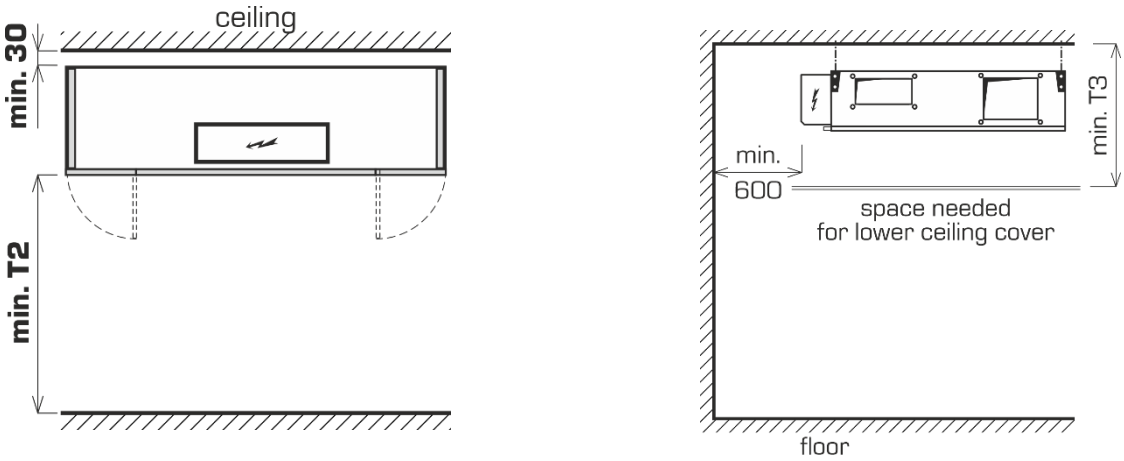
Outdoor installation







Ceiling-suspended position



DUPLEXbase PS	650	1100	1700	2300	3500	4500	6000
T1 filter replacement (mm)	320	320	500	500	500	500	500
T2 service access (mm)	300	500	500	600	800	1000	1300
T3 minimum space, lower ceiling cover (mm)	375	480	560	685	880	1090	1395

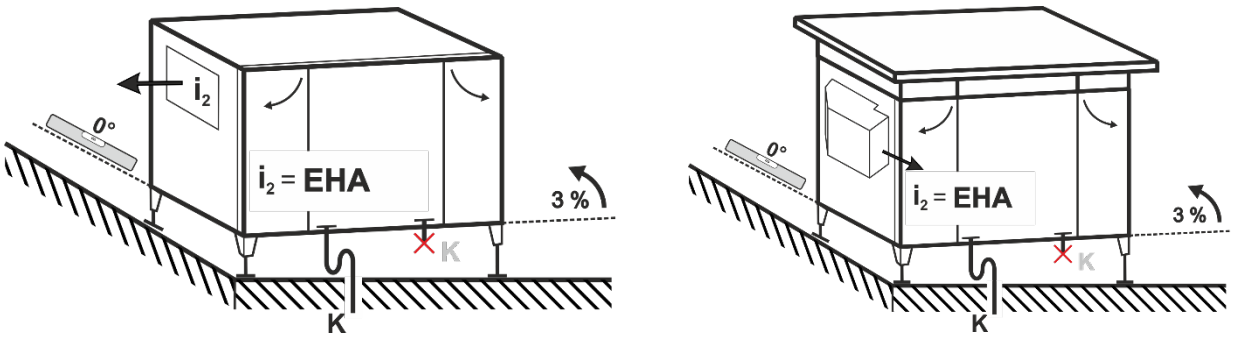
5.6.2. Inclination of the unit

Floor standing position and outdoor installation

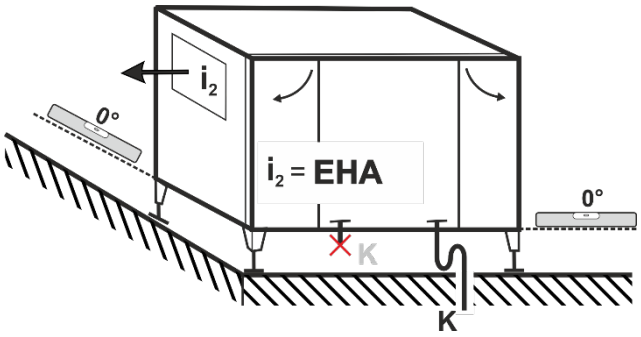
- The appliance is placed on height-adjustable feet included in delivery (4 pieces in sizes 650 and 1100, 6 pcs in sizes 1700 to 6000). Use the adjustable bases of the feet to level uneven ground.

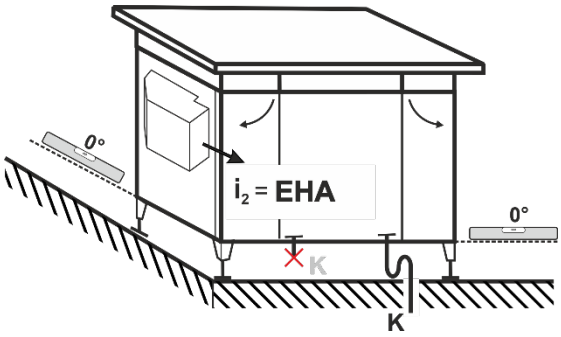
- To achieve correct condensate drainage slope the appliance as follows:

  - **650 and 1100 Flexi:** Slope the longer side of the casing 3% towards the condensate drain located at i2 (EHA). Level the shorter side of the casing horizontally.



- **1700 – 6000 DUPLEXbase:** Level both the longer and shorter side of the casing horizontally**.**

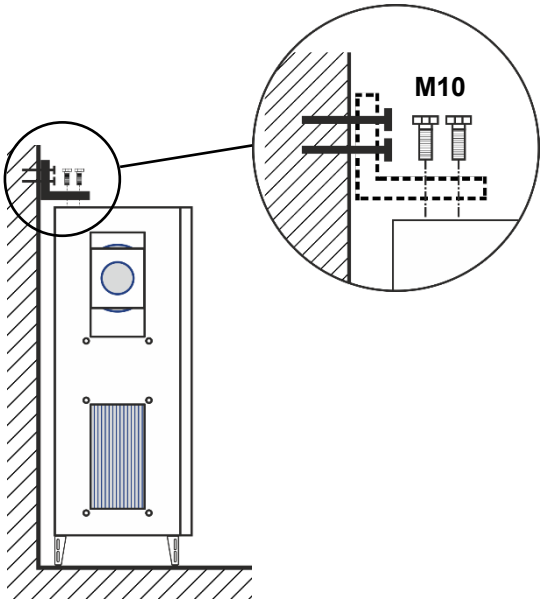




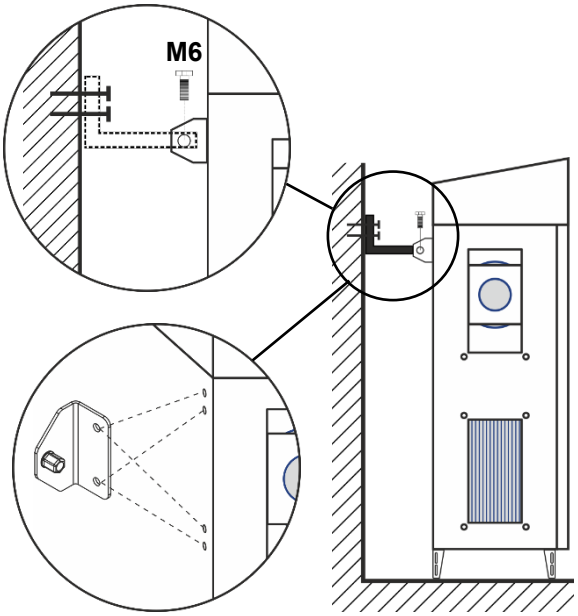
! Adjustable bases of stand feet must remain fully screwed into the feet while manipulating with the unit. Adjust the height of the stand feet after putting the unit into its final installation position only. Failing to do so may cause irreversible damage to the stand feet.

- The unit must be secured against movement.

Floor-standing installation

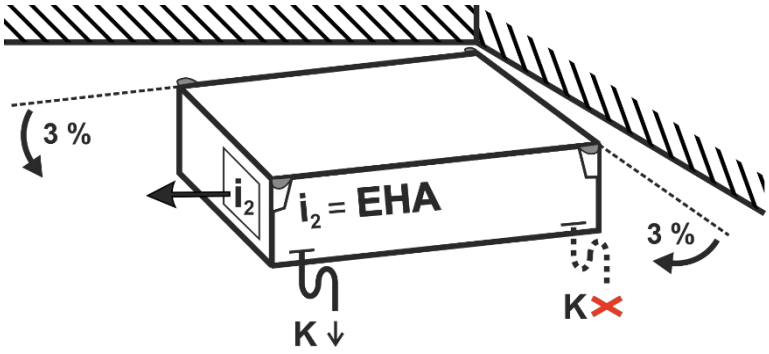


Outdoor installation

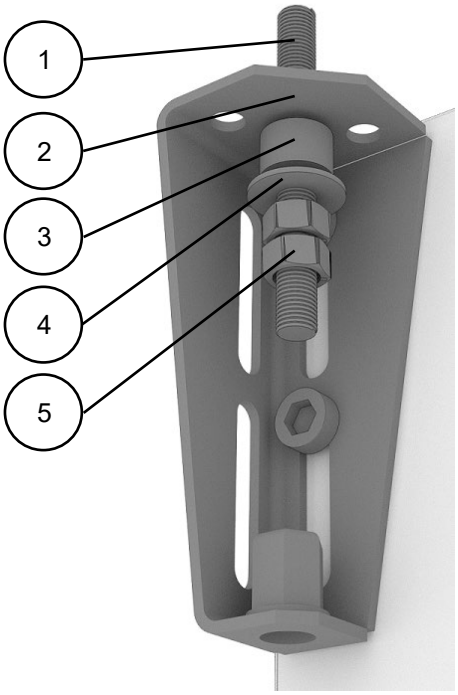


Ceiling-suspended position:

- Ceiling-suspended position is available for 650 – 3500 DUPLEXbase.
- The appliance is suspended from anchors of sufficient load bearing capacity (provided by the building contractor) using four suspension brackets (included in delivery) with Ø 11 mm holes.
- To achieve correct condensate drainage the appliance must be sloped towards section i2 (EHA), see the picture:



The number and distance of suspension points is detailed in the selection software DUPLEXbase in **Design** > **AHU placement method**, as well as in the technical specification that forms an integral part of purchase contract on the ventilation unit.



Description:

1. Screw rod M10 *)
2. Suspension bracket
3. Silent block *)
4. Washer M10 *)
5. Nut M10 *)

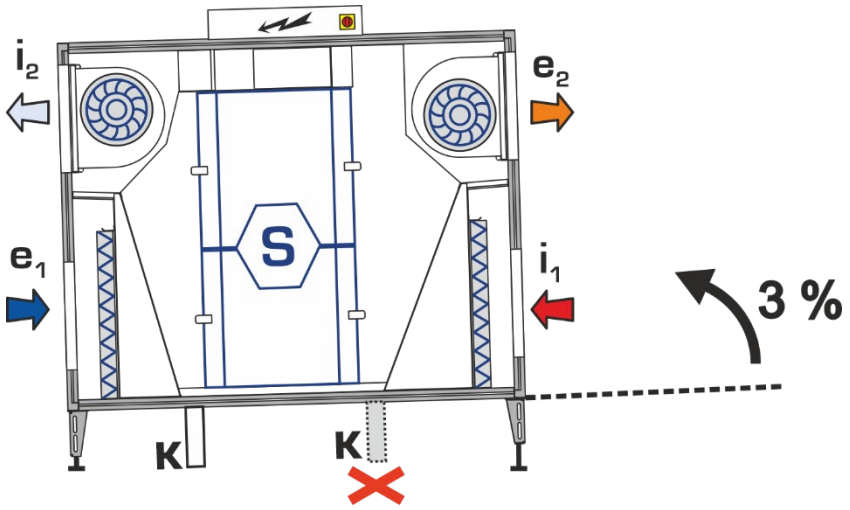
*) Not included in the delivery

5.7. Connecting the condensate drain pipe

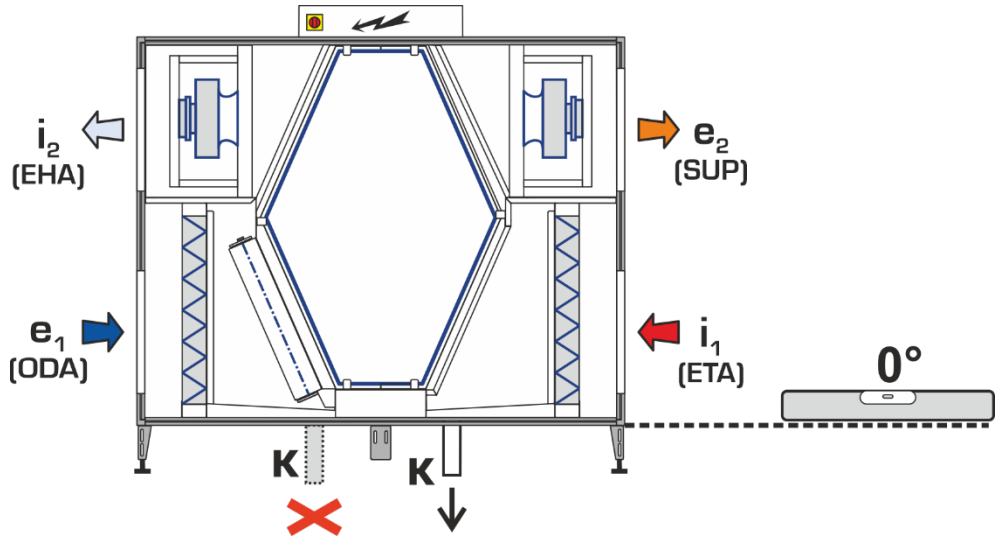
- The unit is versatile and in total has 4 condensate outlets for 2 directions of air flow in 2 installation positions. A single specific condensate outlet is always used for a particular application.
- Seal condensate drains that are not used.

Floor-standing position and outdoor installation

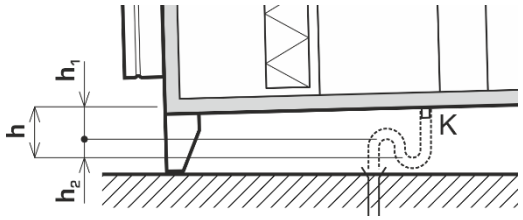
650 – 1100 DUPLEXbase: Use the condensate outlet in section e1 (ODA). Keep the condensate drain in section i1 (ETA) sealed.



1700 – 6000 DUPLEXbase: Use the condensate outlet in section i1 (ETA). Keep the condensate drain in section e1(ODA) sealed.



! In outdoor installation use heating of condensate drain that is supplied as optional accessory. See Chapter 12.1 for more information.



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

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

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

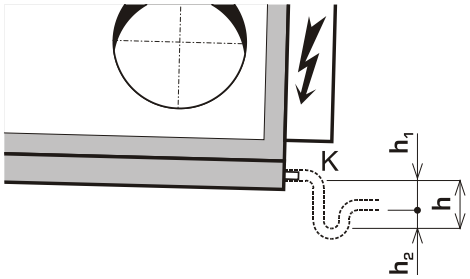
Δp – maximum positive / negative working pressure in the compartment of the unit. The height of condensate drain pipe h = 15 cm, h2 = 6-8 cm is sufficient for all installations.

! Each condensate drain must be connected to its own trap!
The number of condensates drains differs depending on the model of the unit.

! In places where active heating of condensate drainage is used, it is necessary to use material with appropriate temperature resistance. The cable must not come into contact with plastic or other materials, that cannot withstand temperatures of at least 200°C. Stainless steel siphons are available as optional accessories.

Ceiling-suspended position

- Use the condensate outlet in section i2 (EHA), see picture in the Chapter 12.1.



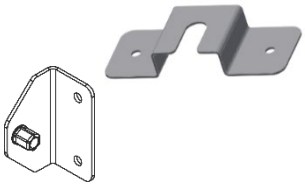
- Connect a pipe or hose (not included; a standard washing machine hose is recommended) to the condensate outlet and shape it into a siphon trap with dimensions as shown in the picture. Appropriately secure the siphon trap shape and connect it to the sewer line.
- Check the entire length of the pipe including the parts inside the unit for free passage and its sloping.
- Prime the condensate drain siphon trap.

ⓘ Condensate pump is alternative to water trap. It minimizes the manipulation space needed for condensate drainage. It is available as optional accessory.

5.8. Outdoor installation

To install the DUPLEXbase PS unit in outdoor environment, use the following accessories. The elements are depicted in the Chapter 4.1.

- Unit roof, the following elements are also delivered along with the roof:
  - Square extension to keep the main switch available also when roof is installed;
  - Safety elements to fasten stand feet of the unit to the roof;
  - Element to secure the unit against movement, see Chapter 5.6.2;
- Heated condensate drain;
- Droplet eliminator and hood at the port e1 (ODA);
- Hood at the port i2 (EHA).

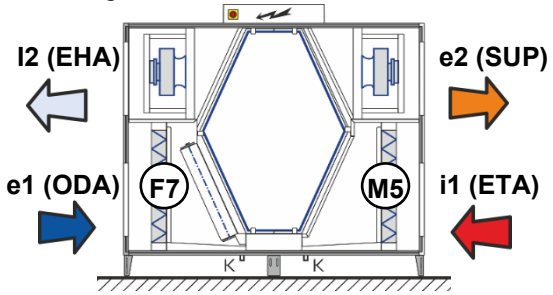


You will find the way of installing particular accessories in the guide enclosed to the accessories.

ⓘ If you use ductwork instead of hoods please follow the rules on duct installation, Chapter 5.5;

5.9. Classification of air filters

- The unit is fitted with filters of different filtration grades - ISO ePM1 55% (F7) and ISO ePM10 50% (M5). The ISO ePM1 55% (F7) grade filter is to be installed in sector e1 (ODA). The filter ISO ePM10 50% (M5) is to be installed in sector i1 (ETA). ePM1 80% (F9) filters can be supplied in the form of replacement filter cartridges.



5.10. Installing air filters

- The unit is supplied with separately packaged filter cassettes. Remove and unpack the cassettes and check their condition.
- Install the cassettes in their proper locations on the unit as shown in the Chapters 5.4 and 5.9. Follow the pictures in the appendix 12.

➲ Unpack and install air filters last, immediately before putting the unit into service to avoid their contamination.

- Should any damage or contamination be detected, replace them with new ones. Spare filter cassettes are to be ordered from the supplier. The supplier´s address and the spare cassette part number are shown on the identification plate of the unit.
- Insert undamaged clean filters into the guide rails.
- Especially, make sure that the arrow showing the direction of air flow through the filter cassette can be seen from the side of the operator (the arrow is by the unit´s door) and that it is always pointing towards the heat recovery exchanger!
- The unit is supplied with filter cassette labels unattached. Attach the relevant identification labels near both filters. (e.g. for the door type).

! Unpack and install air filters last, immediately before putting the unit into service to avoid their contamination.

! Use original filter cassettes only! If different cassettes were used, the manufacturer could not guarantee their proper function!

➲ Record the date of installing filters appropriately in e.g. the operational logbook.

5.11. Installing, connecting and filling liquid manometers

➲ Liquid manometers are a separately supplied accessory. Manometers are compulsory for hygienic units in compliance with VDI 6022.

- Manometers are used for measuring the pressure loss of air filters. During installation follow the visual instructions supplied with this optional accessory. After installation level the manometers horizontally.
- Connect the manometers to collection points on the unit´s surface using tubes. Connect the tube to the top of the manometer and run it to the metal bushing on the unit´s surface (also see a separate manometer installation manual). The tube must always connect two matching connection points identified by symbols “+” and “F+” and “-“ and “F-“ (cannot be combined). Make sure that tubes from just one filter are connected to the manometer.
- Attach the relevant label near each manometer. Fill out the boxes with the filter grade and record the flow rates and pressure losses of the clean filter (initial pressure loss) and when clogged (final pressure loss) using data from the table below; the values must be adjusted on the basis on actual air flow rates through the unit. The unattached label without information filled out is included.

DUPLEXbase PS 650

Filter type	Flow rate (m³/h)	150	300	450	600	700
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	20	42	68	98	119
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	3	10	21	35	47
	Final pressure loss (Pa)	150	150	150	150	150

DUPLEXbase PS 1100

Filter type	Flow rate (m³/h)	250	500	750	1000	1100
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	8	32	71	126	153
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	6	16	29	45	52
	Final pressure loss (Pa)	150	150	150	150	150

DUPLEXbase PS 1700

Filter type	Flow rate (m³/h)	300	600	900	1200	1500
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	10	25	46	72	103
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	4	9	17	26	38
	Final pressure loss (Pa)	150	150	150	150	150

DUPLEXbase PS 2300

Filter type	Flow rate (m³/h)	800	1200	1600	2000	2400
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	16	27	40	56	74
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	9	15	21	27	34
	Final pressure loss (Pa)	150	150	150	150	150

DUPLEXbase PS 3500

Filter type	Flow rate (m³/h)	1500	2000	2500	3000	3500
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	38	58	81	108	138
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	6	11	18	25	34
	Final pressure loss (Pa)	150	150	150	150	150

DUPLEXbase PS 4500

Filter type	Flow rate (m³/h)	1000	2000	3000	4000	4500
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	9	25	48	79	98
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	2	6	14	26	32
	Final pressure loss (Pa)	150	150	150	150	150

DUPLEXbase PS 6000

Filter type	Flow rate (m³/h)	2000	3000	4000	5000	6000
ISO ePM1 55% (F7)	Initial pressure loss (Pa)	24	42	63	87	115
	Final pressure loss (Pa)	300	300	300	300	300
ISO ePM10 50% (M5)	Initial pressure loss (Pa)	9	16	25	36	49
	Final pressure loss (Pa)	150	150	150	150	150

Note: Values in the tables apply to external static pressure 100 Pa. Different pressure requirements may result in a different situation. If needed, the detailed initial and final pressure loss data of the filters are available on request from the supplier of the unit.

- Make sure that the position of the label makes it possible to regularly inspect the values recorded.

For use with inclined tube manometers:

- Unscrew the rotating knob as much as possible to set zero on the scale (the bottom knob identified by - +), then screw it back by approximately two full turns to have leeway to make settings in both directions.
- Unscrew the FILL plug (the top knob) and keep filling the machine with measuring liquid (included in delivery) until the liquid is visible near the zero mark on the scale. Use the bottom knob to set the value on the scale precisely to zero. Screw the top filling plug in.
- After installing the manometers do not tilt the machine or the door (if they are installed on the door). Measurement liquid might leak out.

5.12. Installing hot water heating coil

During the mechanical installation of the hot water air heater follow the manual supplied with this optional accessory.

The supply (and top-up) water should fulfil especially the following criteria:

- The water must be limpid and colourless.
- The pH value of water must not be lower than 7. If water contains dissolved neutral salts its pH value is to be between 8,5 and 9,5. Soda lye or trisodium phosphate (Na_3PO_4) can be used for alkalinisation.
- The content of carbon dioxide in an ion and non-ion form is to be as small as possible.
- The remaining **supply water hardness** should be lower than 7 mmol/l (at q < 23 kW/m2) and 5 mmol/l (at q > 23 kW/m2). To soften the water, the following chemicals can be used: trisodium phosphate Na_3PO_4 or cation-exchange resin (in case water is harder than 7 mmol/l; circuits with high volume of water; when electrical boilers and radiation boilers are present).
- The amount of **calcium ion** in the water up to 3,5 mmol/l (at q < 23 kW/m2) and up to 1,8 mmol/l (at q > 23 kW/m2).
- All **CO_2** up to 75 mg/l (at q < 23 kW/m2) and 10 mg/l (at q > 23 kW/m2).

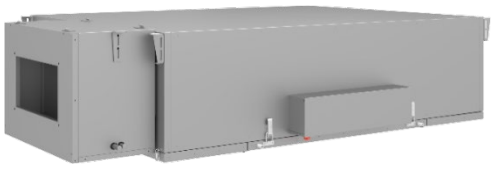
The following rules must be adhered to during the installation of the heater:

- The maximum permitted temperature of heating medium is 110 °C and operational positive pressure up to 1.0 MPa.
- For the proper operation of the hydraulic kit of the hot water heater the heating system must be fitted with a circulation pump of suitable power that will fully cover its pressure losses. The pump, which is supplied with the hydraulic kit, is designed solely to cover the pressure losses of the water heater!
- If the unit is not equipped with a shut-off damper on outdoor air inlet e1 (ODA), a tight shut-off damper must be installed in the duct upstream the unit (a type with a servo drive with emergency stop, that is, that automatically shuts in the event of a power outage).
- The heating system must be equipped with a sludge filter in the inlet into the unit.

! A temperature sensor must be installed into the air duct to provide for anti-freeze protection of the hot water heating coil. The sensor is to be installed behind the hot water heating coil in the direction of air flow. Please follow the instructions in the guide enclosed to the temperature sensor.

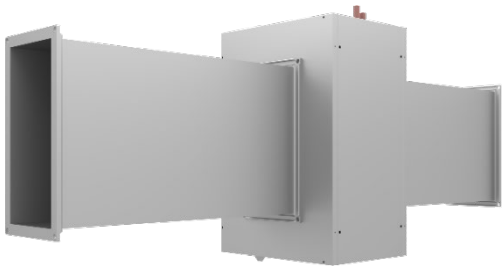
! Electrical installation may be carried out only by a person having the required electrotechnical qualification.

ⓘ You will find the wiring diagram in the unit's Technical Specification or in the selection SW of DUPLEXbase units, tab Controls > Wiring diagram.



Water heater, ceiling-suspended

Water heater, floor-standing



Water heater installed in a duct

ⓘ When DUPLEXbase PS is installed indoor water heater can be attached onto the unit or installed in the supply duct e2 (SUP).

! In outdoor installation of DUPLEXbase PS, water heater can only be installed in the indoor part of the e2 (SUP) air duct.

5.13. Installing mixing valve of hot water air heater

During the mechanical installation and connection of the mixing valve of the hot water air heater follow the manual supplied with this optional accessory.

5.14. Installing shut-off dampers e1 (ODA), i1 (ETA)

During the mechanical installation and connection of the servo drive of shut-off dampers follow the manual supplied with this optional accessory.

5.15. Installing flexible flanges

During the mechanical installation of flexible flanges follow the manual supplied with this optional accessory.

5.16. Installing and connecting water chiller to the cool source

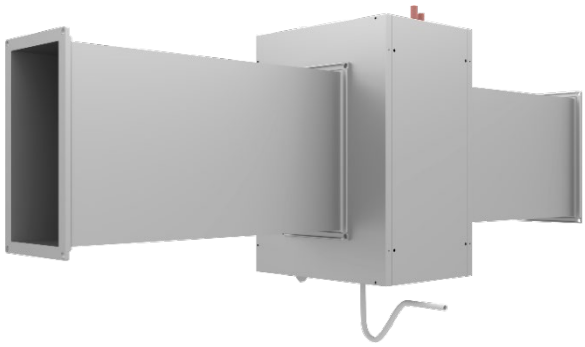
- During the mechanical installation of the water chiller follow the manual supplied with this optional accessory.

! For the appliance to work properly and safely it is necessary to correctly connect a condensate drain line.

- Connect a tube or a hose to the condensate drain outlet (not supplied; we recommend using a conventional washing machine hose) and shape it into a trap. Install the trap in the mounting position (see the pictures below), with the trap size according to chapter 5.7. Secure the trap shape suitably and run the condensate drain line into a drain outlet.

Water chiller, Ceiling-suspended position

Water chiller, floor-standing position



Water chiller installed in a duct

ⓘ When DUPLEXbase PS is installed indoor water chiller can be attached onto the unit or installed in the supply air duct e2 (SUP).

! In outdoor installation of DUPLEXbase PS, water chiller can only be installed in the indoor part of the e2 (SUP) air duct.

The following rules must be adhered to during the installation of the water chiller:

- The water chiller in all versions must be filled with an antifreeze solution with sufficient thermal resistance, or it must be drained as long as the outdoor temperature might drop below 3°C.
- Maximum permitted operating positive pressure is 1.0 MPa!
- The inlet of the chilled water system into the unit must be equipped with a sludge filter.

5.17. Installing mixing valve of the water chiller

During the mechanical installation and connection of the control manifold of the hot water heater follow the instructions supplied with this optional accessory.

5.18. Installing direct chiller

- During the mechanical installation of the direct chiller follow the manual supplied with this optional accessory.
- During the connection of the direct chiller follow the instructions of the supplier of condensation units and connecting pipes.

ⓘ When DUPLEXbase is installed, indoor direct chiller can be attached onto the unit or installed in the supply duct.

! In outdoor installation of DUPLEXbase PS, direct chiller can only be installed in the indoor part of the e2 (SUP) air duct.

5.19. Installing integrated electrical preheater

- During mechanical installation and electrical connection follow the manual supplied with this optional accessory.
- Electrical connections may only be made by a qualified electrician authorized to service power supply networks.

5.20. Installing external electrical preheater / heater EPO-V

- During mechanical installation and electrical connection follow the manual supplied with this optional accessory.
- Electrical connections may only be made by a qualified electrician authorized to service power supply networks.

! Extra care should be taken regarding the installation conditions of EPO-V heater (indoor environment with the temperature from +5 to +55 °C). For all conditions of installation see the manual included with this optional accessory.

5.21. Installing manometers to control constant flow and constant pressure

During mechanical installation and electrical connection follow the manual supplied with this optional accessory.

6. Electrical connection

- The electrical equipment of the unit is designed following standards in effect for electrical connections to power supply network TN-C, TN-S, TN-C,S. The appliance may only be connected by a qualified electrician with valid service certificate. The appliance is provided with external connections for equipotential bonding.
- The characteristics of the mains voltage must comply with EN 50 160 and the defined standardized voltages according to IEC60038.
- The wiring diagram of the equipment is depicted in technical specification that forms an integral part of unit documentation. The wiring diagram is also available in the selection software DUPLEXbase PS, tab **Controls** > **Wiring diagram**.
- Instructions for and the diagrams of electrical connections of optional accessories are included in the documentation sets of these accessories.
- A disconnecting device - a service switch for disconnecting from power supply – is provided in the power supply line to the equipment.
- 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.
- Commissioning may vary depending on the type of control system. Commissioning is carried out by a trained technician following the separate documentation set included.
- The controls are described in the separate document.

! The unit is to be protected using a 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 sensitive to alternating pulsed DC residual currents, resistant to current surges 5 kA.

7. Unit control

7.1. Control system RD6 (aMotion)

Ventilation units DUPLEXbase equipped with control system RD6 (aMotion)[1] can be controlled from computer via a direct connection or in local network, both via the Ethernet connection. At the same time, the RD6 (aMotion) Cloud **aSpace** can be used.

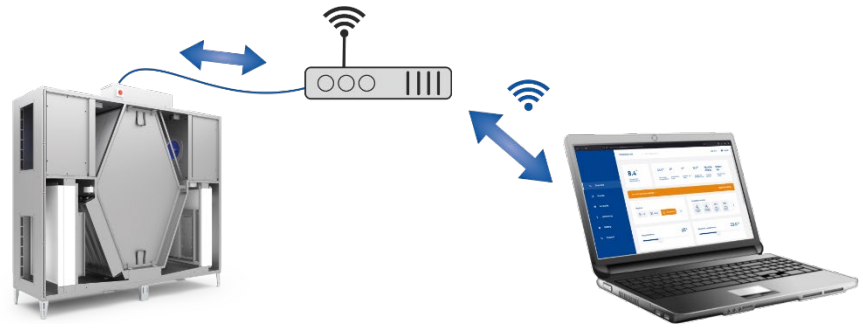
Upon establishing connection to the unit, it is possible to:

- Change user settings of the unit;
- Watch the unit's operational parameters including error messages;
- Browse the unit's operational history.

7.1.1. Connection via ethernet interface

Ventilation unit is connected to a computer by cable via ethernet interface

[1] 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



Ventilation unit is connected to a local network via ethernet interface, computer is connected to the same network

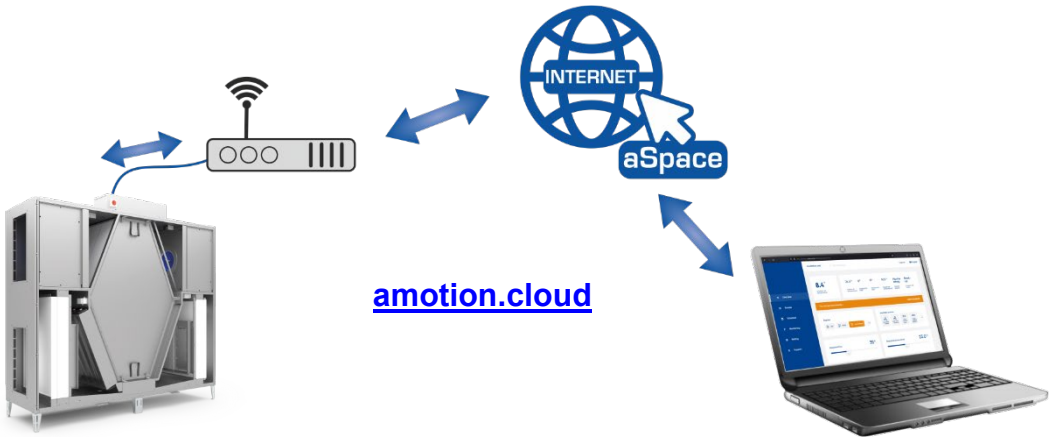
! Ethernet connector RJ45 must not be connected to the Ethernet network operated with PoE (Power over Ethernet).

7.1.2. RD6 (aMotion) cloud

RD6 (aMotion) cloud (aSpace) allows for remote connection to the DUPLEXbase unit using the Internet. Once the connection is established, the user interface of the unit is displayed in the web browser. Communication takes place via a secure protocol.

Steps to connect via RD6 (aMotion) Cloud:

1. Add user to the unit
    a. Connect to the DUPLEXbase unit directly from the computer or via local network;
    b. In the menu **Settings** > **User management** add a user with the same email address as you will be using for connection via RD6 (aMotion) Cloud;
    c. In the menu **Settings** > **Cloud connection** allow Cloud communication
2. Login to RD6 (aMotion) Cloud at RD6 (aMotion).cloud. You will see the unit in the list of available devices.
3. Connect to the unit.



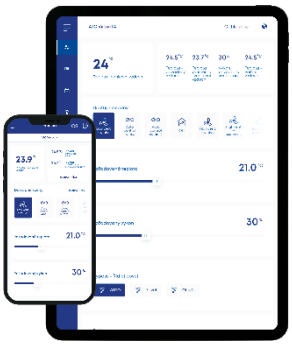
*Ventilation unit is connected to local network with access to the internet, computer uses Cloud **aSpace** for communication*

ⓘ DUPLEXbase units with RD6 (aMotion) control have factory default settings that enable connection to the **aSpace cloud** and automatic firmware updates via an internet connection. These settings can be changed by the user at any time.

- Cloud connection in the **Settings > Cloud Connection**;
- Automatic update in the **Settings > System**.

You will find more information in the Guide on controlling ventilation units DUPLEXbase equipped with RD6 (aMotion) control system.

7.1.3. Mobile application



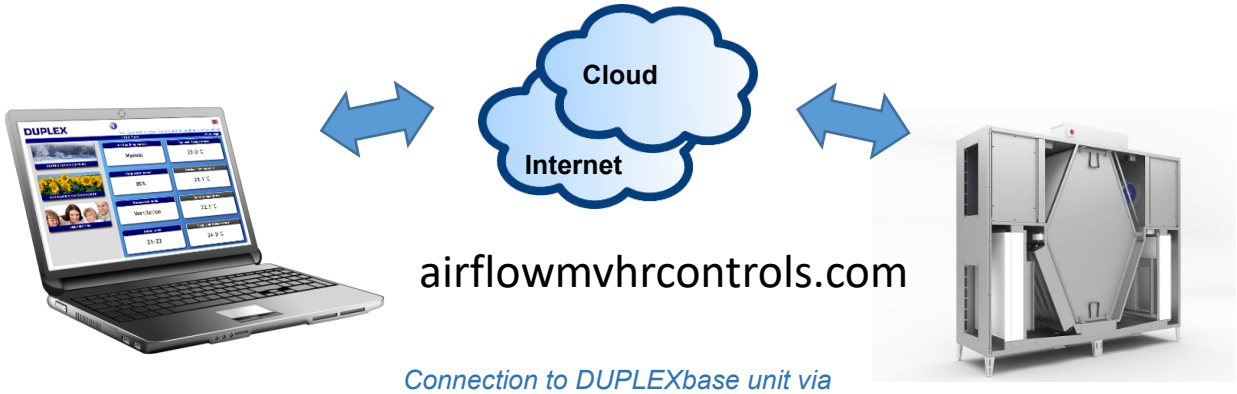
Units with RD6 (aMotion) control can be controlled directly from the mobile app.
In order for the unit to appear in the device list, you need to add user to the unit, see the previous chapter. You can also add units from the local network.

Once connected to the unit, you have access to a user interface with unit operation monitoring, scene settings, calendars and a range of other parameters. The app is available for Android and iOS operating systems.

7.2. Control system RD5

Ventilation units DUPLEXbase equipped with control system RD5 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.



Connection to DUPLEXbase unit via Cloud

ⓘ You will find more information in the Guide on controlling ventilation units DUPLEXbase equipped with RD5 control system.

! Ethernet connector RJ45 must not be connected to the Ethernet network operated with PoE (Power over Ethernet)

8. Hygienic instructions for compliance with VDI 6022

8.1. General instructions

- Basic hygiene-related requirements are outlined in the Chapter 5.2.
- The appliance has been manufactured in a hygienic design that complies with all requirements of the VDI 6022 standard for the hygiene o HVAC device. In order to meet those requirements during operation it is essential to ensure for the appliance to be operated, maintained, inspected and cleaned by sufficiently qualified personnel in accordance with instructions contained in the operation and maintenance manual. It is also essential to ensure for the remaining components of the HVAC system (HVAC distribution systems, distribution elements, ancillary devices, noise

silencers etc.) to meet all hygienic requirements of the VDI 6022 standard and be operated in compliance with those requirements.

- 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 an available 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).
- Before commissioning or if the appliance has been out of operation for a longer period of time, it must be cleaned thoroughly; if stricter hygienic requirements apply, wiping disinfection must be carried out.
- 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).
- Operators must be familiar with the tasks and functions as well as the individual components of the appliance.
- The appliance must be regularly inspected, cleaned and maintained by sufficiently qualified personnel (see the following chapter).
- Regardless of their qualifications, personnel must undergo hygiene training (see the following chapter).
- The user must be able at any given time to provide evidence as to the qualifications of operators. If sufficient number of qualified operational and service staff are not available, those activities must be commissioned to a specialist company that will be responsible for the proper operation of the appliance.
- The user has an obligation to carry out regular hygiene inspections of the appliance every 3 years (see following chapters).
- The appliance may not be operated without air filters. The filter grade of supply fresh air must be at least ISO ePM1 50% (F7). The filter grade of exhaust air must be at least ISO ePM10 50% (M5).
- If the appliance has been out of operation for a longer period of time, it must be cleaned thoroughly before recommissioning; if stricter hygienic requirements apply, wiping disinfection must be carried out.
- The permanent low-frequency noise level (10 to 100 Hz) generated by the appliance must 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.
- After disinfecting make sure that no toxicologically suspicious or odour-active substances enter supply air!
- The user has an obligation to appropriately record the appliance's operation (e.g. in the operational logbook).

8.2. Required qualifications of personnel as per the type of activity

Activities	Operators	Inspection	Maintenance	Repairs
Required personnel qualifications	No special professional qualifications	Professional engineering qualifications in building maintenance, familiarity with measurement procedures for the hygiene inspections of HVAC devices	Professional qualifications in electrical or metal engineering with relevant experience in the field of HVAC (familiarity with equipment design, measurement technologies, equipment control and function)**	
Required hygiene training of personnel	Category B	Category A	Category B	

** simple inspection and maintenance of the equipment (e.g. replacing filter fabric, regular cleaning of equipment etc.) may be carried out by personnel without professional qualifications who received category B hygiene training

a) Category B hygiene training of personnel

➲ Personnel must demonstrate familiarity with the following areas:

(1) Need for and the importance of hygiene during the operation of HVAC equipment
(2) Hygiene issues of individual aggregates carrying air through HVAC equipment
(3) Maintenance of HVAC equipment, the effects of its size on determining maintenance intervals
(4) Simple measurement methods for checking HVAC equipment
(5) Actions to be taken in the case of occurrence of substances harmful to the environment and their removal
(6) Personal protective measures in the area of hygiene during operation and service activities
(7) Key regulations (in particular regulations on accident control) and technical standards
(8) Handling chemical cleaning and disinfecting agents

b) Category A hygiene training of personnel

➲ Personnel must demonstrate familiarity with the areas of category B training specifications and additionally the following:

(1) Hygiene basics
(2) Significance of the various hygienic methods of air treatment
(3) Physical and chemical measurement methods, hygiene and microbiological inspection methods
(4) SBS (Sick-Building-Syndrome) issues, symptoms of problems and possible causes
(5) Technical development and its practical applications
(6) Hygiene regulations and technical rules for the operation of HVAC equipment

If these instructions are not adhered to, the manufacturer cannot guarantee the permanent maintenance of the unit´s hygiene parameters.

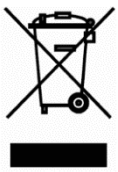
9. Package disposal, recycling

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.



The guide on disassembling the unit is published at www.airflow.com, in compliance with the Regulation of the Commission (EU) 1253/2014.

10. Repairs, spare parts

All warranty and post-warranty repairs are performed by the supplier or an authorized service company.

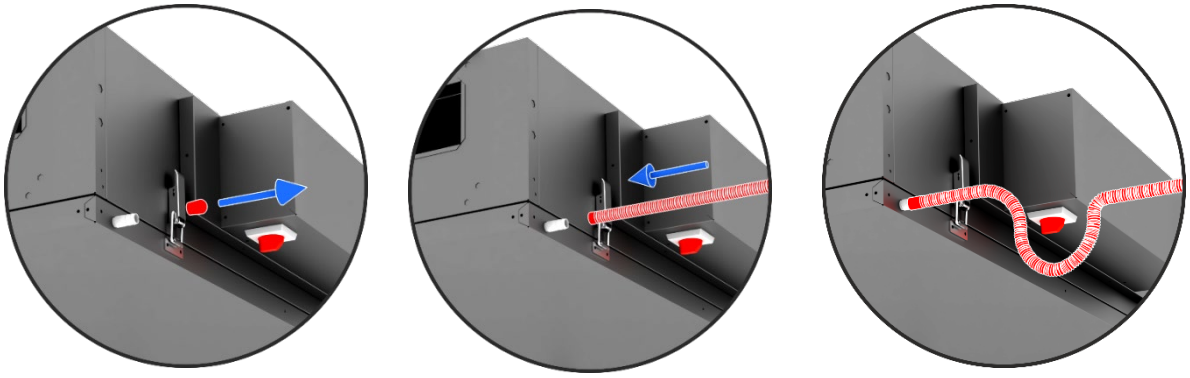
11. Warranty

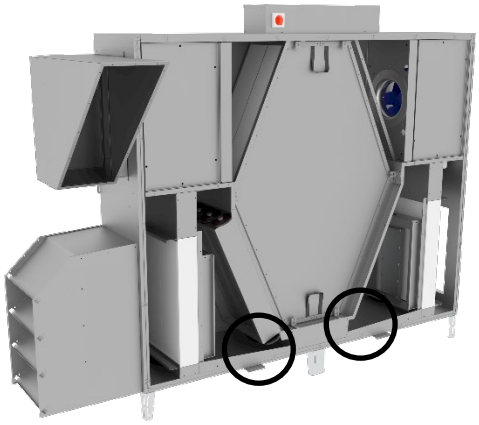
The product is covered by warranty according to Terms and Conditions of Airflow, which are a part of the accompanying documentation.

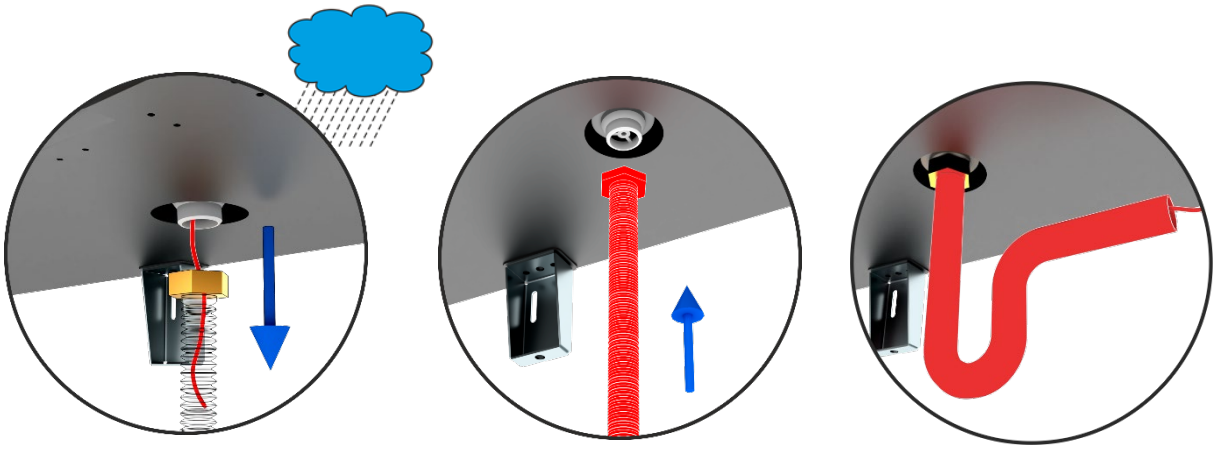
The supplier is not liable for damage caused by unprofessional installation and operation that is not in compliance with the operation and maintenance manual and general practices applied during installation and operation of HVAC equipment and control systems.

12. Visual appendix - manuals

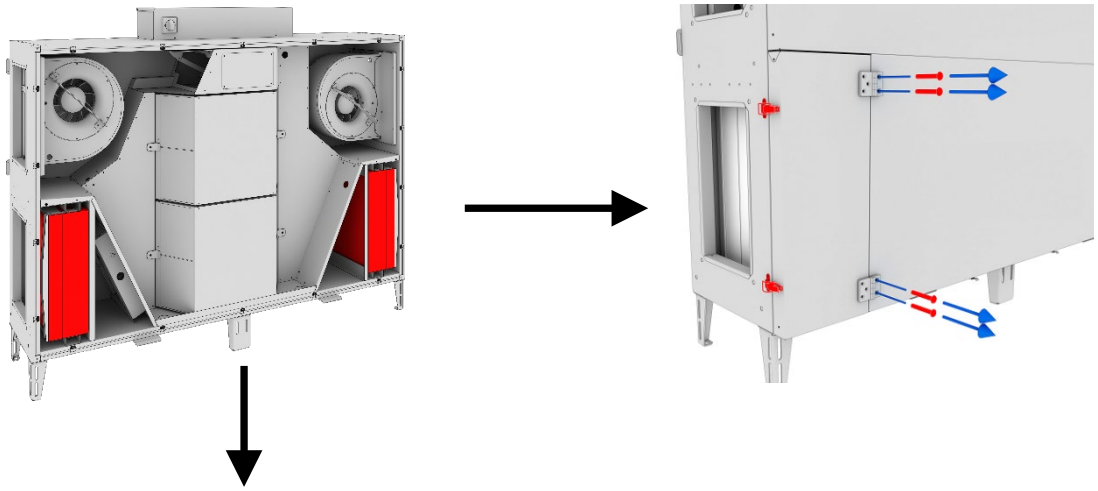
12.1. Connecting the condensate drain line

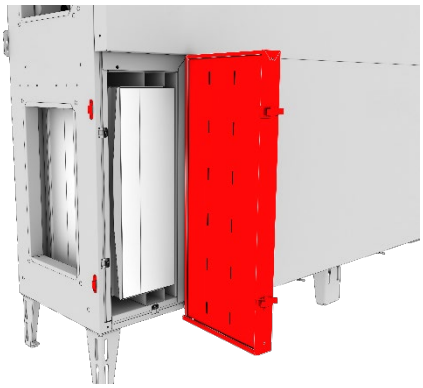


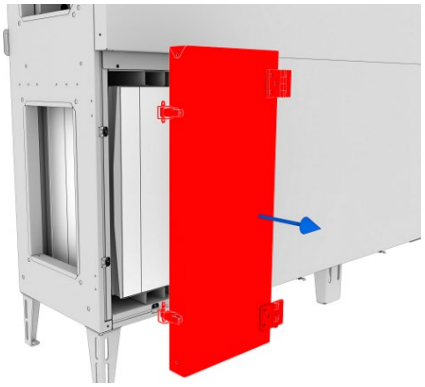


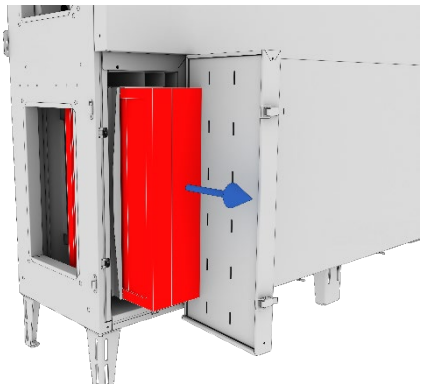


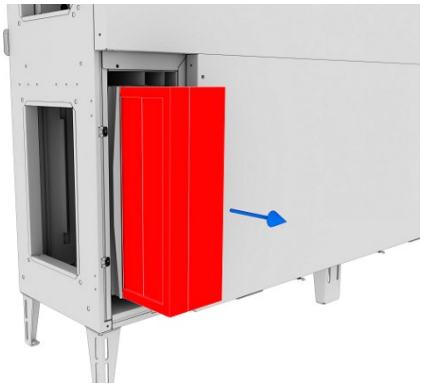
12.2. Fitting the filters

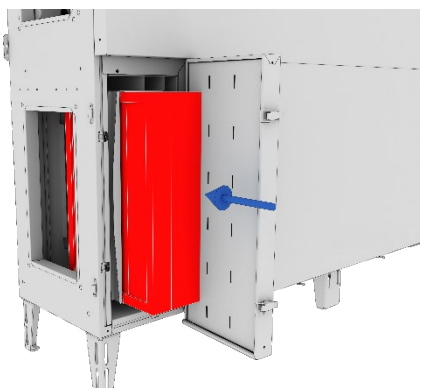


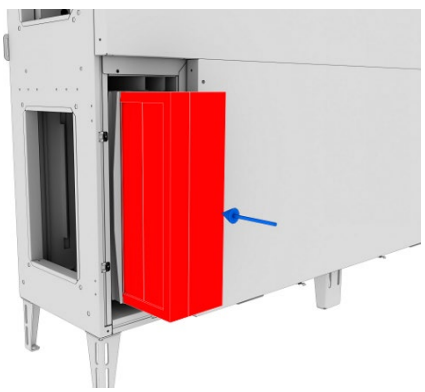












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