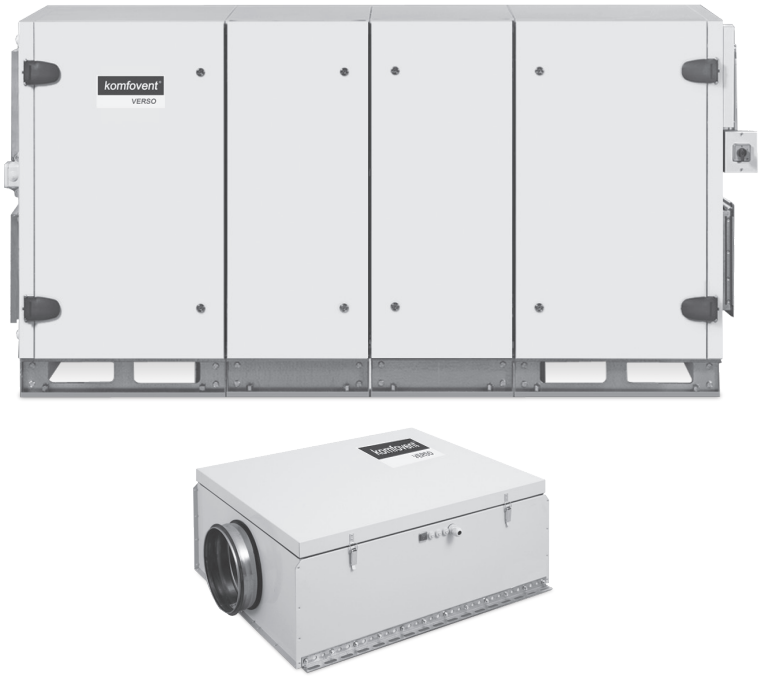
komfovent®




# VERSO Standard Units

EN Installation and Maintenance Service Manual

## Content



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

## 1. SAFETY REQUIREMENTS

- To avoid accidents and/or unit damage, only a trained technician must carry out the connection.
- The appropriate Personal Protective Equipment (PPE) attire is worn relative to the operation being carried out.
- Electrical equipment is rated, connected and earthed in accordance with CE regulations.

The air handling unit must be plugged in to an electrical outlet (with earth), which is in good order and corresponds with all requirements of electric safety. Before starting any operations inside the unit, make sure that the unit is switched off, and the power cable is unplugged.

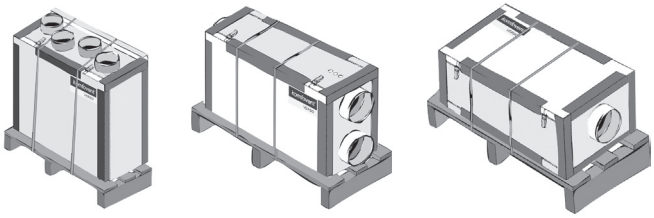
- Earth must be installed according EN61557, BS 7671.
- The unit should be installed according to Installation and Maintenance Manual.
- Before starting the unit, check correct position of air filters.
- Service maintenance should be carried out only in conformity with the instructions specified herein below.
- If main cable is damaged, only manufacturer, service team or trained technician must change it in order to avoid accidents.
- Drilling and using self-tapping screws on the unit casing is prohibited (where it is not provided by the construction), since cables or tubes inside of the casing may be damaged.

## 2. TRANSPORTATION

The air handling units are ready for transit and storage (1 Picture). The unit is packed to prevent damage of the external and internal parts of the unit, dust and moisture penetration.

Corners of the air handling units are protected against the damage – protective corners are used. The entire unit is wrapped up in protective film. For transit or storage, units are mounted on timber pallets. The unit is fastened to the pallet with polypropylene packing tape over protective corners.

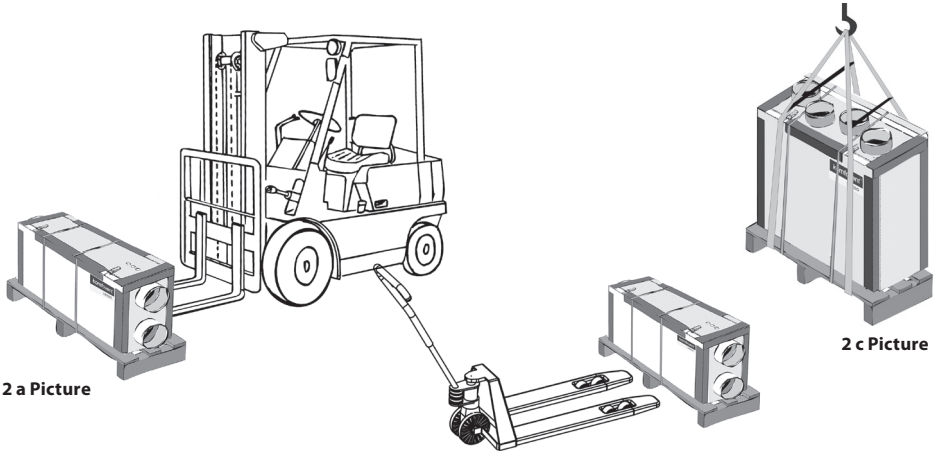
**Vertical and horizontal units ready for transit and storage**



**1 Picture**

When unit is loaded or unloaded by crane, cargo rope is fastened in its designated places.
Forklift truck or hand pallet truck can transport air handling unit as it is shown (2 a, b, c Pictures).

**Vertical and horizontal unit transportation by forklift truck, hand pallet truck or crane**



**2 a Picture**

**2 b Picture**

**2 c Picture**

2 a Unit is transported by forklift truck on a wooden pallet;
2 b Unit is transported by hand pallet truck on a wooden pallet;
2 c Unit is lifted by crane on a wooden pallet.

The unit should be examined upon receipt, to ensure that no visible damage has occurred during transit, and the advice note checked to ensure that all items have been received. If damage or delivery shortages are discovered, the carrier should be immediately informed. KOMFOVENT should be notified within three days of receipt, with a written confirmation sent within seven days. KOMFOVENT can accept no responsibility for damage by unloading from carrier or for subsequent damage on site.

| | |
|---|---|
| ⚠ | If outdoor mounted ventilation unit will be stopped in cold temperatures, it is needed to install additional air closing dampers in the supply and extract ducts (room side). It must not allow the warm air from the premises circulate inside of the unit when it is stopped, otherwise condensate may appear and could damage electronic components. |

| | |
|---|---|
| ⚠ | If ventilation unis is not intended to be installed right away, it must be stored in dry and clean environment, in the original packaging. If unit is installed, but will not be used yet, all duct connection openings must be closed and additional protection from the surrounding conditions (dust, rain, cold, etc.) must be made. |

## 3. BRIEF DESCRIPTION OF THE UNIT

- Casings of air handling units are made of galvanized steel sheets, which are powder painted. Mineral wool is used for thermal insulation and sound attenuation. Unit Verso Standard cover panels are 45–50 mm thick.
- The air handling units are intended for ventilation of medium-sized spaces (eg. single family houses, offices, etc.), having operating ambient temperature and relative humidity. As standard, the unit is designed for indoor placement. The operating temperature range for the unit is -30 °C ... +40 °C, outdoor air temperature.
- Inside of the air handling unit it is integrated heat-exchanger and heater (or cooler), which compensates losses of the heat/cold during ventilation of the premises, thus AHU is not recommended to be used as main heating/cooling source of the building. AHU may not reach the supply temperature setpoint if the actual room temperature differs a lot from the desired value, since in that case heat exchanger capacity will be low.
- The air handling unit is not to be used to transport solid particles, even not in areas where there is a risk of explosive gases.
- Before you open the door, the unit must be switched off and the fans must have been given time to stop (up to 3 minutes).
- The unit contains heating elements that must not be touched when they are hot.
- We recommend to leave air handling unit in working mode (minimum 20 percent of power) during the first operation year. Due to moisture in building constructions, condensation may occur inside and outside the air handling unit. Continuous operation of the equipment will significantly reduce the risk of condensation.
- To maintain a good indoor climate, comply with regulations and, to avoid condensation damage, the unit must never be stopped apart from during service/maintenance or in connection with an accident.
- If the unit is placed in spaces with high humidity, condensation might occur on the surface of the unit when outdoor temperatures are very low.
- Under conditions, when the outdoor air temperature is low and humidity is high, risk of heat exchanger frosting may appear. For this reason anti-frost protection function is foreseen in the controller of the Komfovent air handling units. Depending on the type of the air handling unit, different methods of anti-frost protection are available: cold air by-passing, supply air fan speed reducing and/or integrated preheater. Counter cross flw heat exchanger is the mostly sensitive for low outside air temperatures, as the risk of frosting appears in the temperature range from 0 to -5 °C and below. Standard aluminium cross-flw plate heat exchanger has better features, as the risk of freezing appears only at -10 °C. The lowest risk and the highest resistance to cold outside air is a competitive feature of the rotary heat exchanger, as it is not freezing even at the temperatures of -30 °C if the humidity level of the air is appropriate.

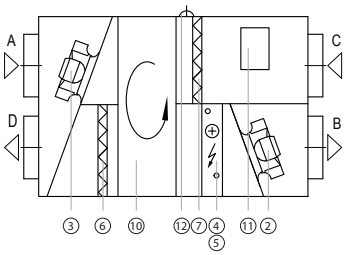
  ⚠ In the units with counter flow or cross flow plate exchangers without integrated preheater, it is necessary to install additional duct mounted preheater in the outside air intake duct, which will ensure temperature of the intake air higher than -4 °C.

- If you choose to operate without the primary heater, it is necessary to increase the power of the secondary heater through a cold air damper.

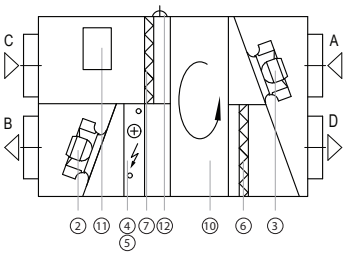
### 3.1. Horizontal units

**VERSO R 1000 UH - 1300 UH - 1500 UH - 1700 UH - 2000 UH**

Right inspection side R1




Left inspection side L1




**VERSO R 2500 H**

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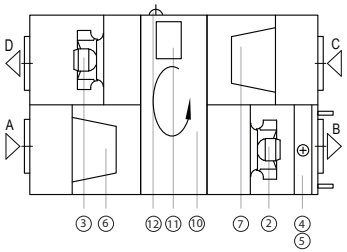


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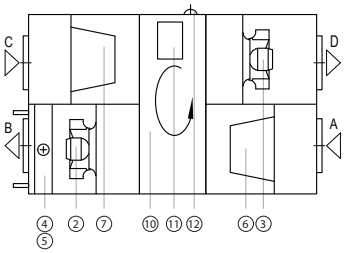
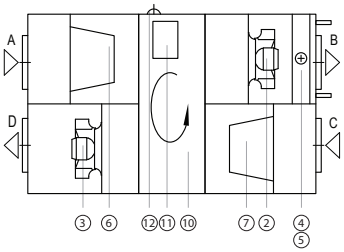



Right inspection side R2

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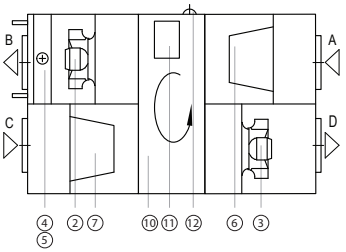
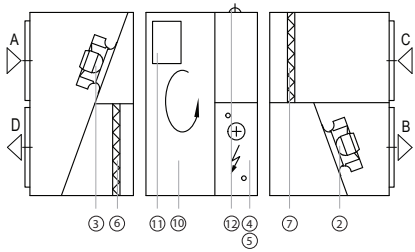


## VERSO R 3000 UH - 4000 UH

Right inspection side R1

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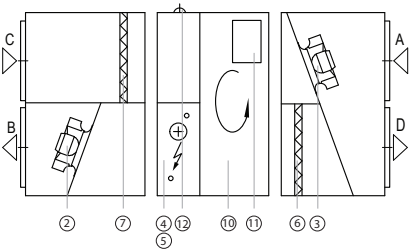


## VERSO R 5000 H

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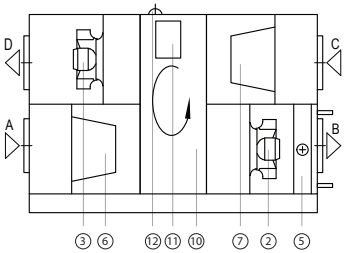


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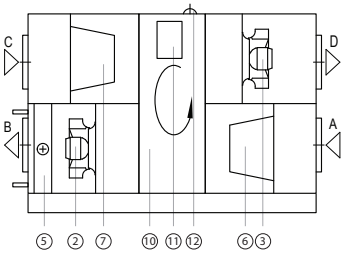


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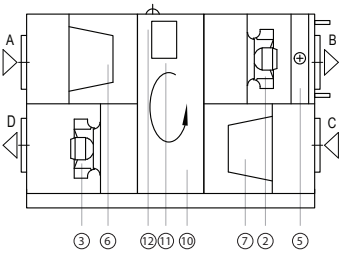


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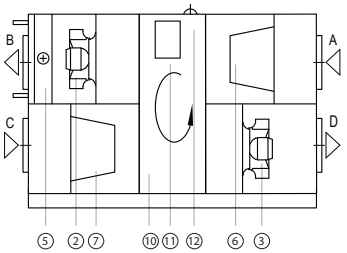


## VERSO R 7000 UH

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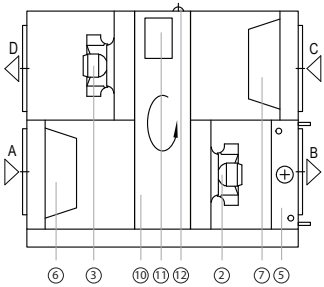


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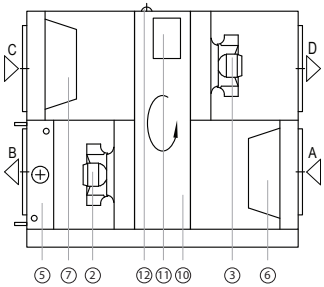

## VERSO CF 1000 UH - 1300 UH - 1700 UH

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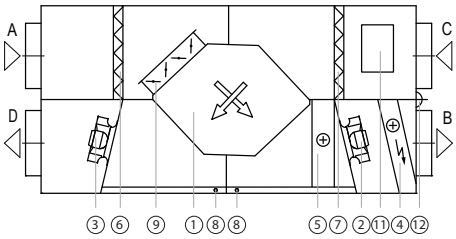


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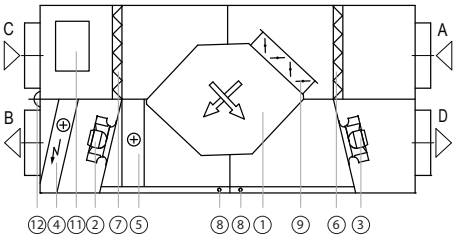


## VERSO CF 2300 UH

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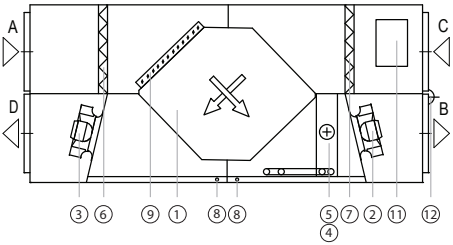


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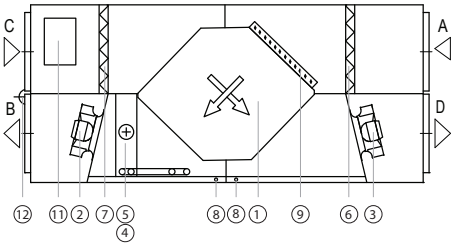


## VERSO CF 3500 UH

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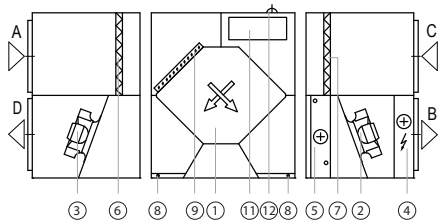


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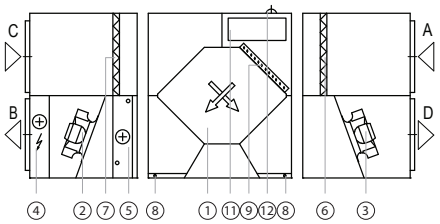



A – outdoor intake air
B – air supplied to the premises
C – air extracted from the premises
D – exhaust air

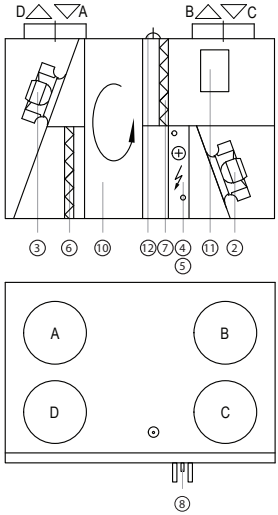
1 – counter-flow heat exchanger
2 – supply air fan
3 – extract air fan
4 – electric heater
5 – water heater / cooler / DX
6 – outdoor air filter

7 – extract air filter
8 – condensate drainage
9 – air bypass damper
10 – rotary heat exchanger
11 – C5 controller main board
12 – Input cable location

### 3.2. Vertical units

**VERSO R 1000 UV - 1300 UV - 1500 UV**

Right inspection side R1

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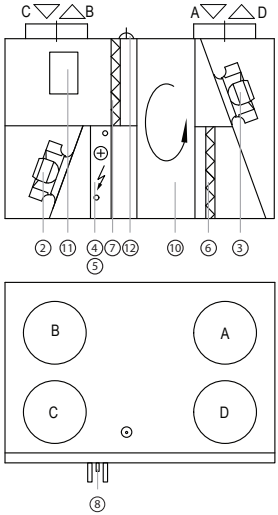


**VERSO R 1700 UV - 2000 UV**

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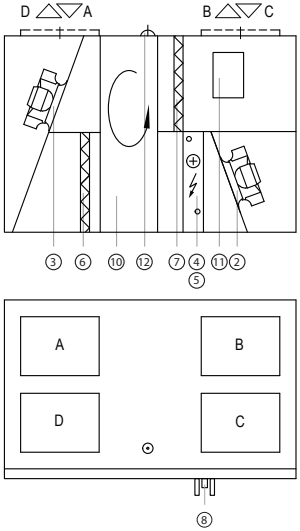
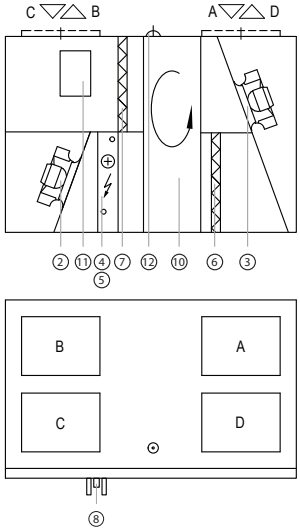
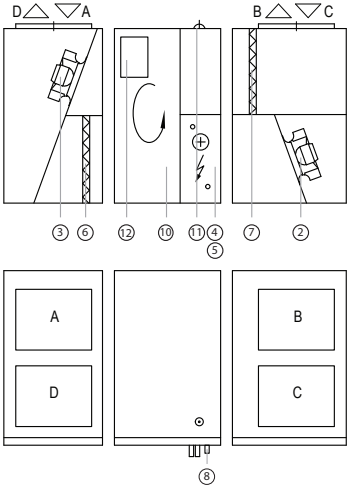



Left inspection side L1



## VERSO R 3000 UV - 4000 UV

Right inspection side R1

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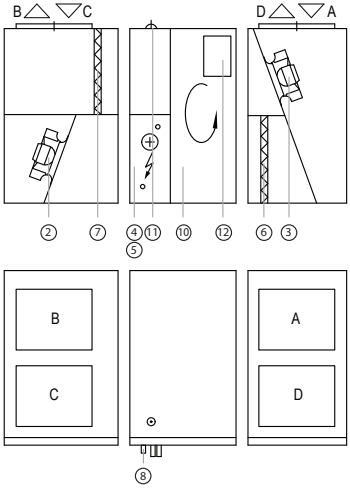


## VERSO R 5000 V HW/HCW/DX

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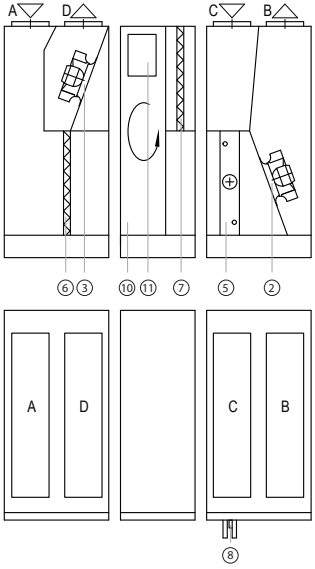
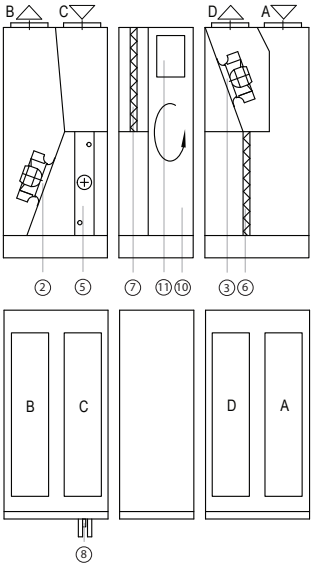



Left inspection side L1



## VERSO R 5000 V HE

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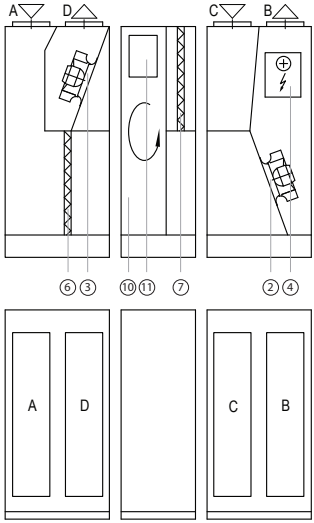
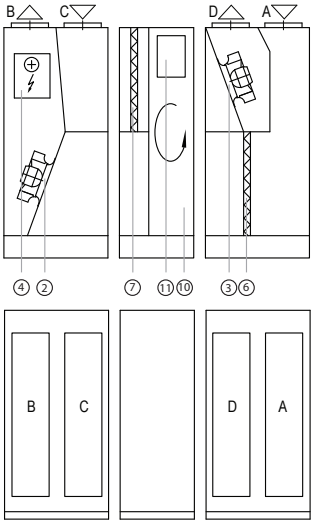
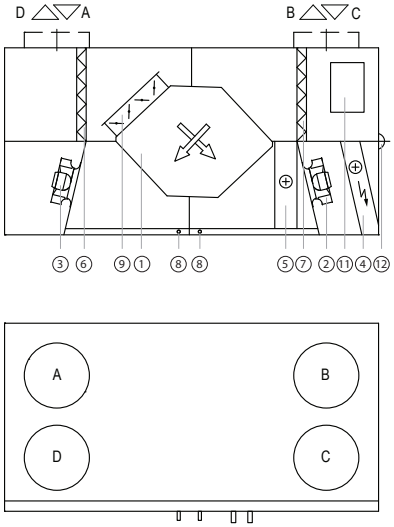



Left inspection side L1

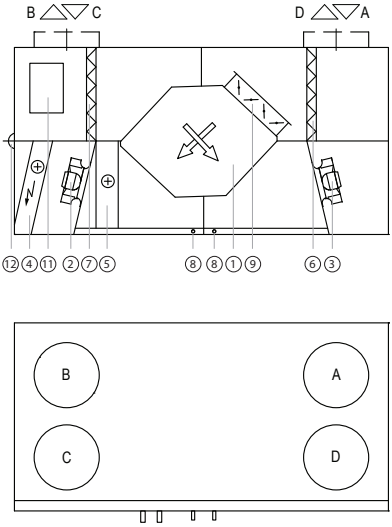



## VERSO CF 1000 UV - 1300 UV - 1700 UV

Right inspection side R1

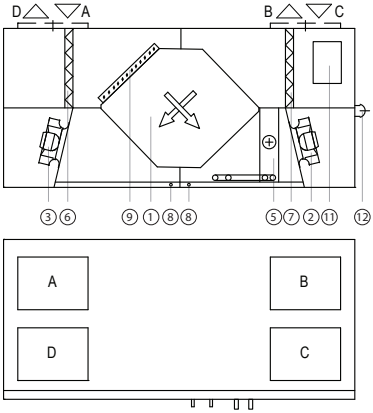



Left inspection side L1



## VERSO CF 2300 UV

Right inspection side R1

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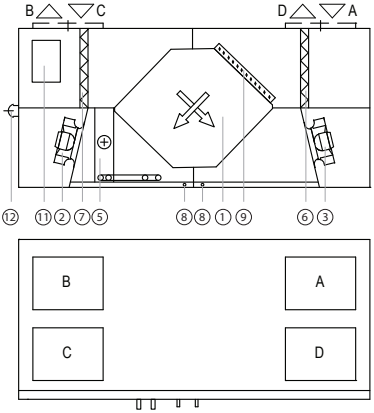
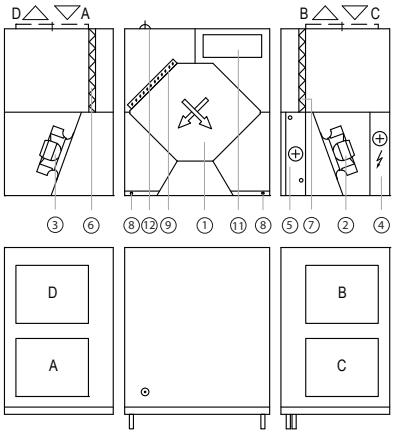



## VERSO CF 3500 UV

Right inspection side R1

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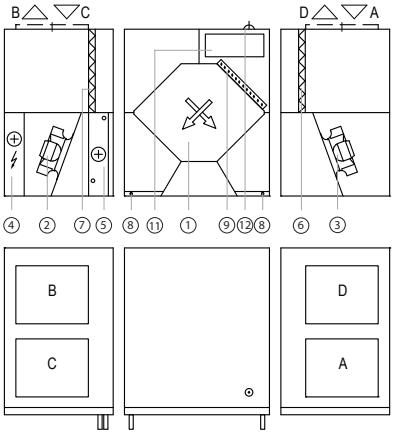


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6 – outdoor air filter

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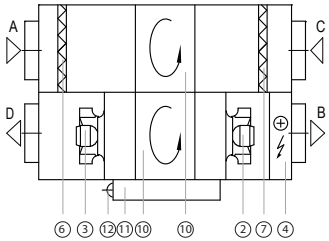
9 – air bypass damper
10 – rotary heat exchanger
11 – C5 controller main board
12 – Input cable location

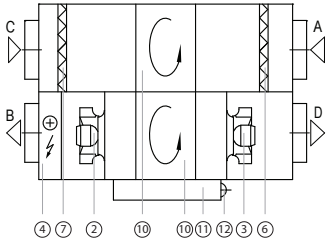
### 3.3. Flat units

**VERSO R 1300 F**

Right inspection side R2/L1




Left inspection side L2/R1




**VERSO R 2000 F**

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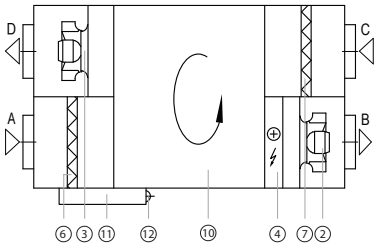
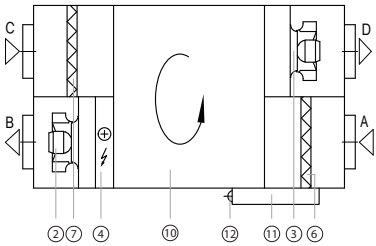
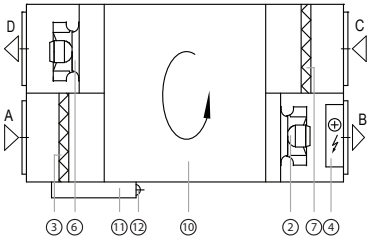



Left inspection side L2/R1

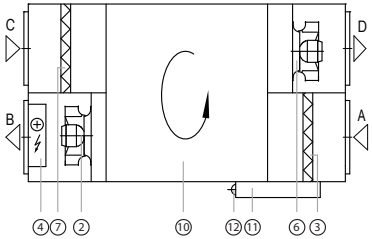



**VERSO R 3000 F**

Right inspection side R2/L1

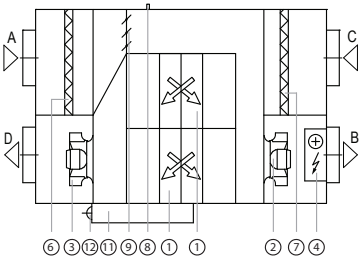



Left inspection side L2/R1

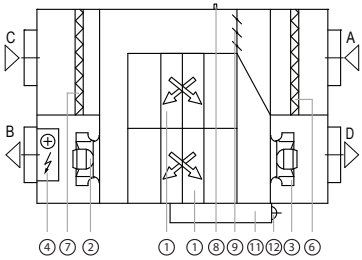


## VERSO CF 1300 F - 1500 F - 1700 F

Right inspection side R2/L1

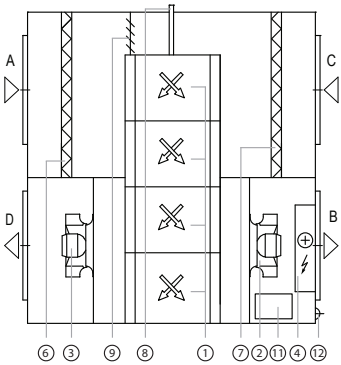



Left inspection side L2/R1

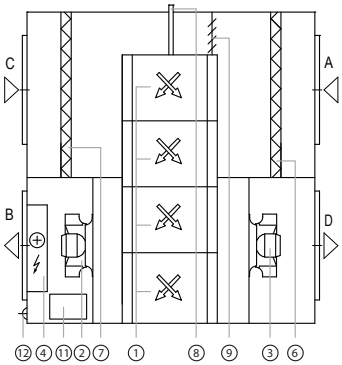



## VERSO CF 2500F

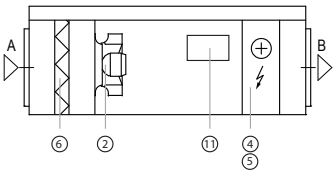
Right inspection side R2/L1



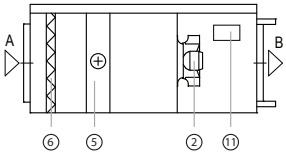

Left inspection side L2/R1




## VERSO S 1300 F - 2100 F




## VERSO S 3000 F




A – outdoor intake air
B – air supplied to the premises
C – air extracted from the premises
D – exhaust air

1 – counter-flow heat exchanger
2 – supply air fan
3 – extract air fan
4 – electric heater
5 – water heater
6 – outdoor air filter

7 – extract air filter
8 – condensate drainage
9 – air bypass damper
10 – rotary heat exchanger
11 – C5 controller main board
12 – Input cable location

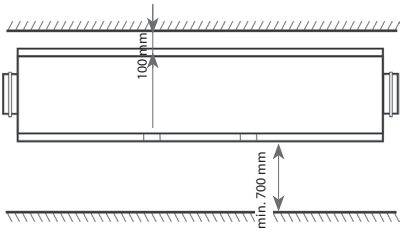
## 4. INSTALLATION

### 4.1. Maintenance space requirements

It is recommended to install the air handling unit in a separate room or in the attic on a hard smooth surface insulated with a rubber mat. The minimum free space in front of the control panel should be not less than 700 mm. The free space over the top of the unit should be at least 300 mm (3.1 a, b Picture). Rubber vibration absorbers must be used when unit is going to be mounted on the wall or ceiling.

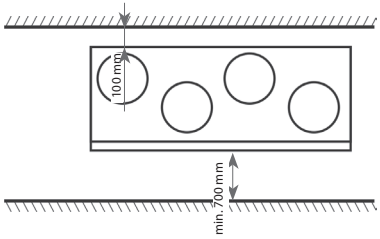
The place for the unit must be selected with allowance for minimum access to the unit for maintenance or service and must comply with safety requirements. Opening for inspection can not be smaller than dimensions of the unit and unit itself must be mounted in a way, that if needed (for example in case of complicated repair) it can be easily dismounted.

**Minimum Maintenance Space for Horizontal Units**



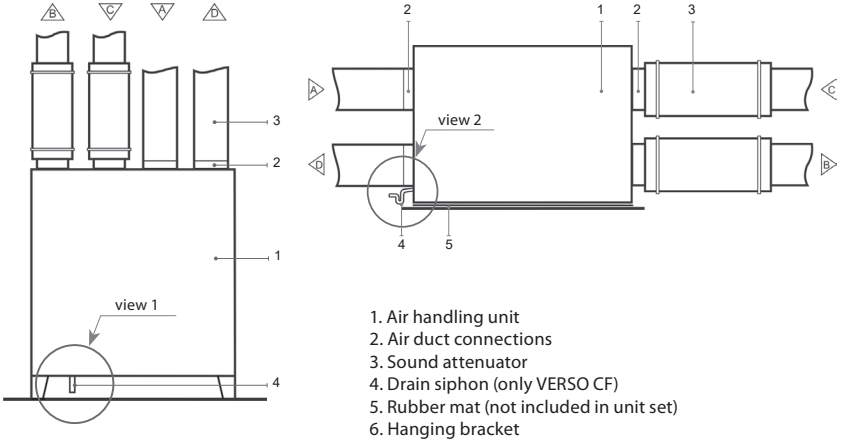

**3.1 a Picture**

**Minimum Maintenance Space for Vertical Units**



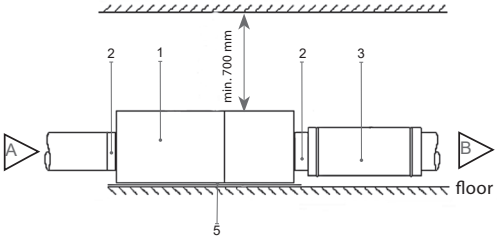

**3.1 b Picture**

**Verso Standard unit Installation Scheme**

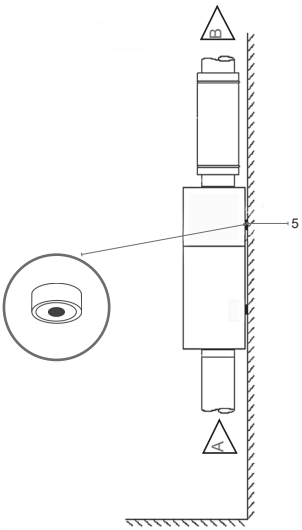



1. Air handling unit
2. Air duct connections
3. Sound attenuator
4. Drain siphon (only VERSO CF)
5. Rubber mat (not included in unit set)
6. Hanging bracket
7. Ceiling holder (Included in the unit set)

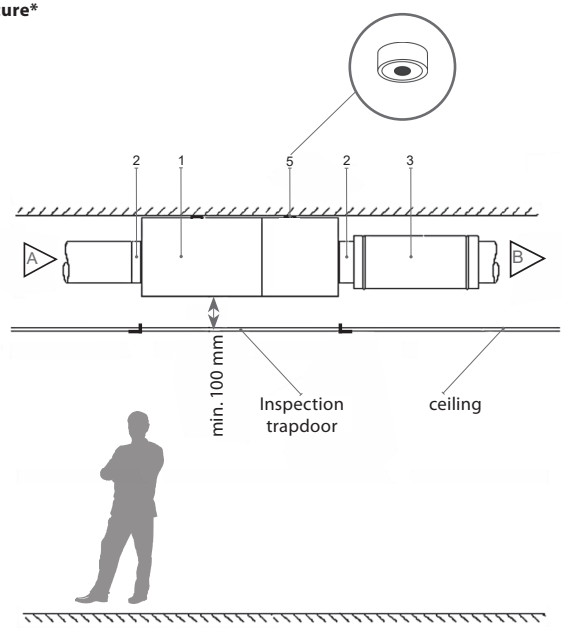
**Verso Standard Maintenance space for unit**




**3.1 c Picture***

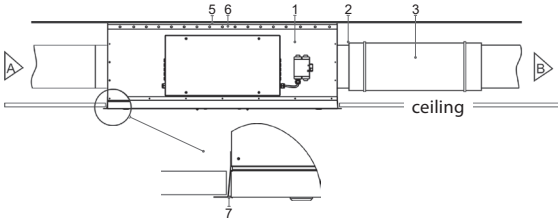



**3.1 e Picture****




**3.1 d Picture**

**VERSO R 1300 F–VERSO R 2000 F**




1. Air handling unit
2. Air duct connections
3. Sound attenuator
4. Drain siphon (only VERSO CF)
5. Rubber mat (not included in unit set)
6. Hanging bracket
7. Ceiling holder (Included in the unit set)

**3.1 f Picture**

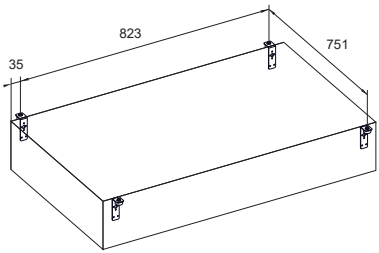
Unit holder is made of 2,5 mm galvanized steel sheets according to EN 10142.

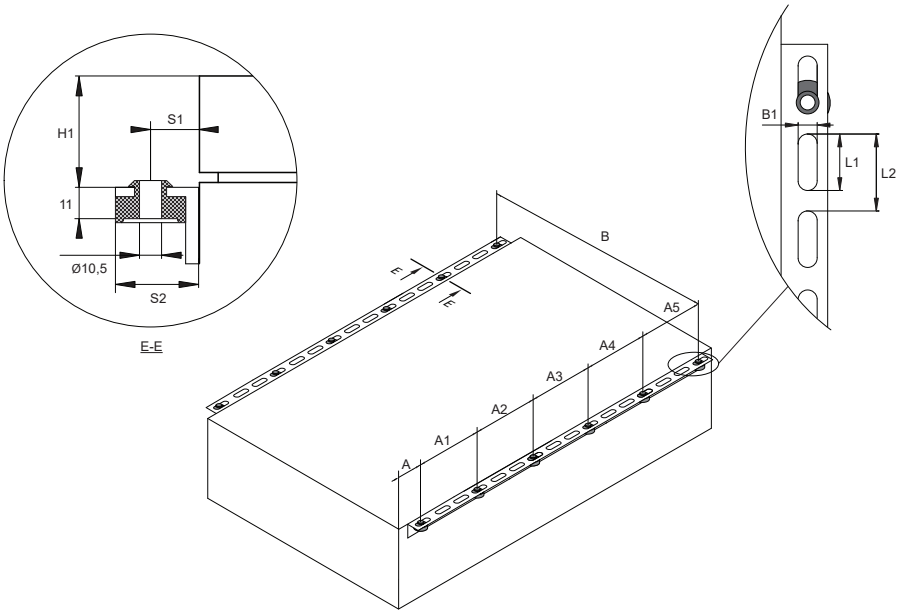
* *Only for VERSO S 1300 F /S 2100 F without internal electrical heater.*

** *Only for VERSO S 1300 F/S 2100 F/R 2000 F/R 3000 F without internal electrical heater.*

## 4.2 Location and dimensions of fixture elements

**Verso S 1300 F**




| Unit | B | A | A1 | A2 | A3 | A4 | A5 | S1 | S2 | H1 | B1 | L1 | L2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | | | | | | | | | | | | |
| VERSO S 2100 F | 1034 | 71,5 | 750 | - | - | - | - | 17 | 30 | 16 | 12 | 36 | 50 |
| VERSO S 3000 F | 1049 | 75 | 1010 | - | - | - | - | 17 | 30 | 16 | 12 | 36 | 50 |
| VERSO R 1300 F | 974 | 82 | 400 | 450 | 400 | - | - | 17 | 30 | 0 | 12 | 36 | 50 |
| VERSO R 2000 F | 1244 | 91 | 400 | 400 | 280 | 400 | 400 | 17 | 30 | 49,5 | 12 | 36 | 50 |
| VERSO R 3000 F | 1243 | 155 | 560 | 730 | 560 | - | - | 16 | 30 | 52 | 13,5 | 43,5 | 70 |
| VERSO CF 1000 F | 1133 | 75 | 770 | 730 | - | - | - | 16,5 | 30 | 49,5 | 13,5 | 43,5 | 70 |
| VERSO CF 1300 F | 1133 | 75 | 770 | 730 | - | - | - | 16,5 | 30 | 49,5 | 13,5 | 43,5 | 70 |
| VERSO CF 1500 F | 1133 | 75 | 770 | 730 | - | - | - | 16,5 | 30 | 49,5 | 13,5 | 43,5 | 70 |
| VERSO CF 2500 F | 2034 | 99 | 500 | 650 | 500 | - | - | 17 | 30 | 52,5 | 12 | 36 | 50 |

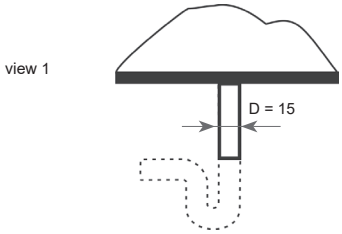
## 5. CONDENSATE DRAIN CONNECTIONS

All condensate drain connections must be correctly trapped. Incorrect trapping can result in flooding within the unit and consequent flooding of the immediate area. Fill the drain trap with water before starting up the unit.

All drain lines should be insulated where passing through any space where damage from condensation drip might occur. If the unit is installed in unheated premises the condensate pipe should be heat-insulated and heated with heating cable.

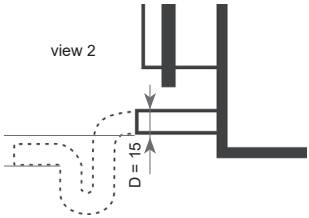
**A condensate pipe and a drain trap**

**Drain scheme of Vertical Unit**




**4 a Picture**

**Drain scheme of Horizontal Unit**

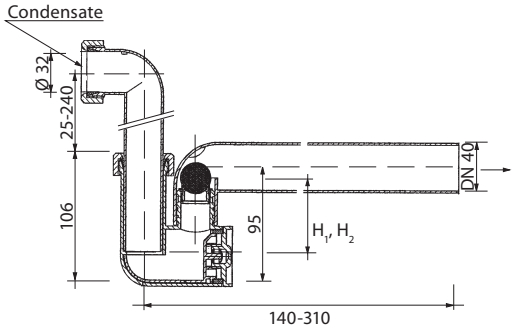


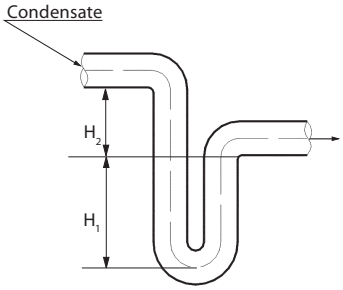

**4 b Picture**

The bend of the water trap can be repositioned by turning it to the right or the left. The drain line from the water trap must be arranged so that it will not damage adjacent unit sections or building elements. If the drain line is run through cold spaces, it should be insulated to prevent freezing. A heating cable may be required.

### 5.1. Water trap installation for a unit section mounted on the suction side

Since the fans in most air handling units are last in the chain of functions and generate sub-atmospheric pressure inside the unit,it is very important to correctly install the water trap. Because of that reason condensate can be hardly eliminated from the air handling unit and the technical premise may get covered with condensate. Height $H_1$ must be at least equivalent in mm to half of the negative pressure inside the unit in mm water gauge. Height $H_2$ must be at least equivalent in mm to the negative pressure inside the unit in mm water gauge.



**Precaution**: The drainage siphon should be mounted on the outlet fitting pipe of every drip tray for complete condensate drainage from the air handling unit and prevention of penetration of offensive odours from an effluent into the ventilation system.

In case of the outdoor operation of the air handling unit, the siphon and the bleeders should be heated with an electric thermal cable (if ambient air temperature $t_{amb}$ < 0 °C). The siphon and the bleeders should be heat-insulated with an insulating material.

### 5.2. Water trap installation for a unit section mounted on the pressure side

Since the fans in most air handling units are not last in the chain of functions and generate over-atmospheric pressure inside the cooling section. In such case the consisted condensate can be easily removed from AHU and there will be no strict requirements for siphon's installation. A drainage siphon is enough with a minimum rake.

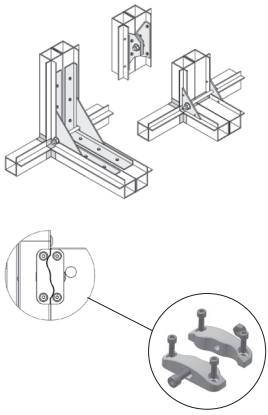
RECOMMENDATION: The drainage siphon must be installed in connection with not less size pipe diameter.

Any drainage systems must not be connected directly to the municipal sewage system. The condensate tray shall be easily accessible for cleaning and disinfection.

### 5.3. Section-to-section joints

Some air handling units are produced from three sections. Separate sections are easy to install on site. Ensure that sections or section assemblies are positioned in their proper sequence and that the unit handing and reference is correct. Sections should be accurately aligned prior to bolting together using the fixings and gaskets provided. The sealing gasket and fastening parts are available with every air handling unit. Incorrect installation will result in air leakage, air blow marks to the unit casings and unacceptable noise. Section connection scheme is shown in 5 Picture.

**Section Connection Scheme**

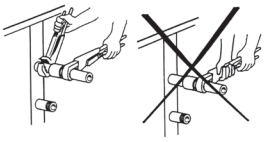


**5 Picture**

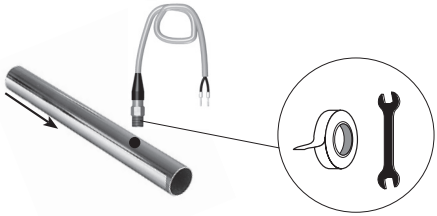
### 5.4. Heating coil connection[1]

Pipe work should be connected in accordance with good engineering practice. All pipe work must be adequatelysupported to ensure that no additional load is stressing the unit. Mounting the pipes on the heating coil, tight the pipes with spanners. As shown in 5.1 Picture.

**Fitting Pipes Connection**



**Sensors Installation**



**5.1 Picture**

[1] *If water heater build in.*

The pipe work should be done in order to ensure the space for maintenance and service work. When carrying out the installation of heater pipes, make sure that hot water supply is completely disconnected. Before start-up of the air handling unit, the heater system should be filled in with water. Glycol is used in the air handling units with coil heat exchanger. Never pour glycol down a drain; collect it in a receptacle and leave it at a recycling centre or the like. Glycol is highly dangerous to consume and can cause fatal poisoning or damage the kidneys. Contact a doctor! Avoid breathing glycol vapour in confined spaces. If you get glycol in your eyes, fush them thoroughly with water (for about 5 minutes).

| | |
|---|---|
| ⚠ | When operating air handling unit in the temperatures lower than 0 °C, it is necessary to use glycol additionally or assure the reversible heating agent temperature more than 25 °C. |

| | |
|---|---|
| ⚠ | Pipework package[1] must include circulation pump, which circulates heating/cooling medium through the coil (smaller circuit) and 3-way mixing valve with modulated actuator. In cases if 2-way valve is used, additionally it must be installed non-return valves to ensure continuous circulation around smaller circuit. PPU must be installed as close to the water coil as possible. |

| | |
|---|---|
| ⚠ | Water heaters in VERSO CF 1000 U/H/V and CF 2300 U/H/V units has automatic air bleed valves, thus it's maximum operating pressure can not exceed 6 bar. |

| | |
|---|---|
| ⚠ | It is important to maintain air heaters and coolers cleanliness; that is to change filters installed in the air handling unit on time. If the air heater or cooler gets dirty, to perform periodical cleaning. |

### 5.5. Ductwork

The air flows in/out air handling unit through ductwork. We recommend using galvanized steel (Zn 275 gr/m$^2$) ductwork, to ensure easy cleaning and durability. It is necessary to use the ductwork system with low air flow rate and small pressure drop to have necessary air volume and low sound level and save the energy. The appropriate sound attenuators will reduce the noise level of the fans in the premises. All ductwork should be insulated with 50–100 mm thickness insulation to avoid the condensation.

***Note:*** *temperature sensor B1 has to be mounted in the supply air duct under electric heater (see the functional diagram in Control System Electrical Installation and Operation Manual). It is necessary to leave space in straight air duct for sensor mounting and guarantee the space for maintenance and service work. Minimal space between the unit and B1 sensor is the space of double air duct diameter.*

| | |
|---|---|
| ⚠ | Ductwork, steelwork and any other services should not be supported off the unit. |

| | |
|---|---|
| ⚠ | It is recommended to install air dampers in the inlet and outlet ducts. For ventilation units with water air heater, it is mandatory to use inlet air closing damper with spring return mechanism. |

## 6. FINAL CHECK BEFORE OPERATING AHU

Before turning on the AHU:

- Check there is no garbage, debris, or tools left inside. Clean the interior of AHU if needed.
- Check that all needed cables, wires and connectors between sections or external components are connected.
- Make sure there is no humidity or condensate on electrical connectors and electrical parts (electronics, motors, frequency inverters). Dry or replace affected components if needed.
- Check that air closing dampers can be fully opened and closed
- Check that all needed air filters are installed
- Check that all piping to the water coils are connected
- Check that condensate drain (if used) is correctly installed. Fill siphons with water.
- Close all the doors, fix all removable covers.
- Inspect ducting system: check there are no fully closed diffusers or regulation dampers; intake and outlet grills are not blocked.

## 7. MAINTENANCE

It is recommended to carry out routine maintenance of the air handling unit, 3–4 times per year. VERSO R 1300 F, 2000 F use the key to open the door. Do not release the door to swing freely, but open it slowly at a 90 degree angle. Be careful while opening, because clogged filters might fall out.

**The inspection must also include:**

1. **Rotary heat exchanger check.** Inspection of the rotary heat exchanger is performed once per year. Free rotation of the rotary heat exchanger, continuity of the rotating belt, absence of damages of the rotor drums and the seal gasket are checked. It is necessary to check the stretch of belt. Free belt will slide and the efficiency of rotary heat exchanger will fall down. To reach maximal efficiency, rotor must turn at least 8 times per minute. Polluted heat exchanger will decrease efficiency. Clean heat exchanger with an air blast or wash with tepid water. Check out water falling on the electric motor.
2. **Plate heat exchanger check.** Inspection and dedusting of the plate heat exchanger is performed once per year (it is removed from the unit and blown with an air blast or washed with tepid water).
   ***Note:*** *plate heat exchanger may be replaced with summer cassette, when recuperation is needless.*
3. **Fans check (once per year).** Polluted fans decrease efficiency.

   ⚠ Before performing any inspection work, check whether the unit is switched off from the electric power supply.

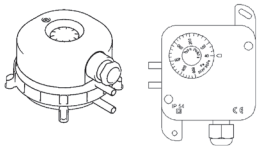
   Fans should be carefully cleaned with textile or soft brush. Do not use water. Do not break balance. Check if direction of fan turns is right, because wrong direction of turns gives only 30% rating. Check if fan freely rotates and is not mechanically damaged, if impeller does not touch suction nozzles, fan does not spread noise, the pressure tubes are connected to the nozzle (if it is required), mounting bolts are screwed.

   The rubber couplings connecting the motor base and the unit should be visually inspected for signs of wear and replaced as necessary.

   Any unusual noise or vibration when the fan is running should be immediately investigated, as this usually an indication of wear or imbalance in the fan system.
4. **Air heater check.** Recommended to perform periodical inspection and cleaning of heater. Check the plates of water air heater. The air heater is cleaned with hoover from supply air side or with air blast from exhaust air side. If it is very dirty, wash with tepid water, which will not make corrosion of aluminium. Check if position of return water temperature sensor is right. Check if electric air heater is properly fixed, wires connections are not damaged and heating elements are not bent. They can be damaged or bent due to uneven heat or uneven and turbulent air direction. Check if electric air heater is clear of unnecessary things and heating elements are not clogged, because this can cause unpleasant smell or in the worst case – dust can start burning. Heating elements can be cleaned with hoover or wet textile.

5. **Air damper check (if it is required).** Not fully opened outside air damper rises up the pressure in the system. Water air heater can freeze if outside air damper does not fully close in not working air handling unit. Mounting and running of air damper should be checked and regulated.
6. **Air filter clogging check.** Change air filters when air filter clogging is indicated. We recommend to change filters at least twice per year: before and after heating season, or more[1].
   Filters are one time used. We do not recommend cleaning them. Stop the air handling unit before changing filters. In the AHU's were panel filters are used, make sure that filters are tightly inserted in it's designated place, when replacing them. Depending on the filter size, in some cases, it is needed to put additional sealing gasket on the filter frame, to ensure that there is no gaps between filter and AHU casing.

**Pressure sensor**



**6 Picture**

7. **Pressure sensor setting, which indicates impurity of filters.** Pressure sensor is set according to EN 13779:2007 standard: 100 Pa for small systems, 150 Pa for big systems. Remove cover from the pressure sensor and turn the cursor due to proper position. The indicator will turn on when filters will be clogged.

- One of pressure sensors shown in 6 Picture can be mounted in the air handling unit.
- Close the door after pressure sensor regulating process. Be sure that sensor does not indicate impurity of clear filters.

[1] *Clogged filters unbalance ventilation system, air handling unit uses more power.*

## 8. TECHNICAL INFORMATION

| Unit | Hot water | | | Electric | | | Fans input power | Ducts | Height |
|---|---|---|---|---|---|---|---|---|---|
| | Operating current | Supply voltage | Heater capacity | Operating current | Supply voltage | Heater capacity | | | |
| | A | V | kW[1] | A | V | kW | W | mm | kg |
| **VERSO R** | | | | | | | | | |
| 1000 UH/H | 3,3 | 1~230 | 5,7 | 7,3 | 3~400 | 3 | 2*180 | Ø 315 | 196 |
| 1000 UV/V | 3,3 | 1~230 | 5,7 | 7,3 | 3~400 | 3 | 2*180 | Ø 315 | 196 |
| 1300 UH/H | 5,5 | 1~230 | 9,8 | 11,7 | 3~400 | 4,5 | 2*270 | Ø 315 | 203 |
| 1300 UV/V | 5,5 | 1~230 | 9,8 | 11,7 | 3~400 | 4,5 | 2*270 | Ø 315 | 203 |
| 1300 F | 6,7 | 1~230 | 8[2] | 10,7 | 3~400 | 3 | 2*370 | Ø 315 | 144 |
| 1500 UH/H | 6,7 | 1~230 | 10,9 | 12,9 | 3~400 | 4,5 | 2*450 | Ø 315 | 206 |
| 1500 UV/V | 6,7 | 1~230 | 10,9 | 12,9 | 3~400 | 4,5 | 2*450 | Ø 315 | 206 |
| 1700 UH/H | 6,7 | 1~230 | 13,1 | 12,9 | 3~400 | 4,5 | 2*470 | 400x300 | 220 |
| 1700 UV/V | 6,7 | 1~230 | 13,1 | 12,9 | 3~400 | 4,5 | 2*470 | 400x300 | 220 |
| 2000 UH/H | 6,3 | 1~230 | 15,9 | 16,9 | 3~400 | 7,5 | 2*650 | 400*300 | 210 |
| 2000 UV/V | 6,3 | 1~230 | 15,9 | 16,9 | 3~400 | 7,5 | 2*650 | 400*300 | 210 |
| 2000 F | 6,3 | 1~230 | 10,5[2] | 16,8 | 3~400 | 7,5 | 2*670 | Ø 355 | 280 |
| 2500 H | 11,7 | 1~230 | 13,2[2] | 22 | 3~400 | 7,5 | 2*520 | 700*300 | 289 |
| 3000 UH/H | 7,1 | 3~400 | 26 | 19,8 | 3~400 | 9 | 2*850 | 500*400 | 456 |
| 3000 UV/V | 7,1 | 3~400 | 26 | 19,8 | 3~400 | 9 | 2*850 | 500*400 | 456 |
| 3000 F | 7,1 | 3~400 | 16,1[2] | 19,9 | 3~400 | 9 | 2*720 | 500*400 | 289 |
| 4000 UH/H | 9,7 | 3~400 | 26,3 | 31,1 | 3~400 | 15 | 2*1830 | 500*400 | 470 |
| 4000 UV/V | 9,7 | 3~400 | 26,3 | 31,1 | 3~400 | 15 | 2*1830 | 500*400 | 470 |
| 5000 V | 8,1 | 3~400 | 40 | 29,5 | 3~400 | 15 | 2*1215 | 300*1100 | 600 |
| 5000 H | 13,1 | 3~400 | 20,1 | - | - | - | 2*1000 | 1000*500 | 442 |
| 7000 H | 18,1 | 3~400 | 34,9 | - | - | - | 2*1340 | 1200*600 | 765 |
| **VERSO CF** | | | | | | | | | |
| 1000 UH/H | 3,3 | 1~230 | 8,7 | 9,5 | 3~400 | 4,5 | 2*178 | Ø 315 | 269 |
| 1000 UV/V | 3,3 | 1~230 | 8,7 | 9,5 | 3~400 | 4,5 | 2*178 | Ø 315 | 269 |
| 1000 F | 3,3 | 1~230 | 5,2 | 7,3 | 3~400 | 3 | 2*168 | Ø 315 | 173 |
| 1300 UH/H | 5,5 | 1~230 | 10,7 | 11,7 | 3~400 | 4,5 | 2*370 | Ø 315 | 225 |
| 1300 UV/V | 5,5 | 1~230 | 10,7 | 11,7 | 3~400 | 4,5 | 2*370 | Ø 315 | 225 |
| 1300 F | 5,5 | 1~230 | 7,1 | 11,7 | 3~400 | 4,5 | 2*360 | Ø 315 | 175 |
| 1500 F | 6,7 | 1~230 | 7,6 | 12,9 | 3~400 | 4,5 | 2*460 | Ø 315 | 190 |
| 1700 UH/H | 6,7 | 1~230 | 11,7 | 12,9 | 3~400 | 4,5 | 2*465 | Ø 315 | 243 |
| 1700 UV/V | 6,7 | 1~230 | 11,7 | 12,9 | 3~400 | 4,5 | 2*465 | Ø 315 | 243 |
| 2300 UH/H | 6,3 | 1~230 | 13 | 16,8 | 3~400 | 7,5 | 2*660 | 400x300 | 250 |
| 2300 UV/V | 6,3 | 1~230 | 13 | 16,8 | 3~400 | 7,5 | 2*660 | 400x300 | 250 |
| 2500 F | 6,3 | 1~230 | 13,6 | 16,9 | 3~400 | 7,5 | 2*640 | 700x300 | 340 |
| 3500 UH/H | 6,3 | 3~400 | 18,7 | 23,4 | 3~400 | 12 | 2*960 | 500x400 | 500 |
| 3500 UV/V | 6,3 | 3~400 | 18,7 | 23,4 | 3~400 | 12 | 2*960 | 500x400 | 500 |
| **VERSO S** | | | | | | | | | |
| 1300 F | 3 | 1~230 | 6,5 | 15,7 / 24,4 | 3~400 | 9 / 15 | 350 | Ø 250 | 46 |
| 2100 F | 3,3 | 1~230 | 11,7 | 24,7 / 35,6 | 3~400 | 15 / 22,5 | 340 | 700x200 | 73 |
| 3000 F | 3,8 | 3~400 | 35,9 | - | - | - | 629 | 600x400 | 130 |

[1] *Parameters of hot water 60–40 °C.*

[2] *Water duct air heater (DH). Order extra.*

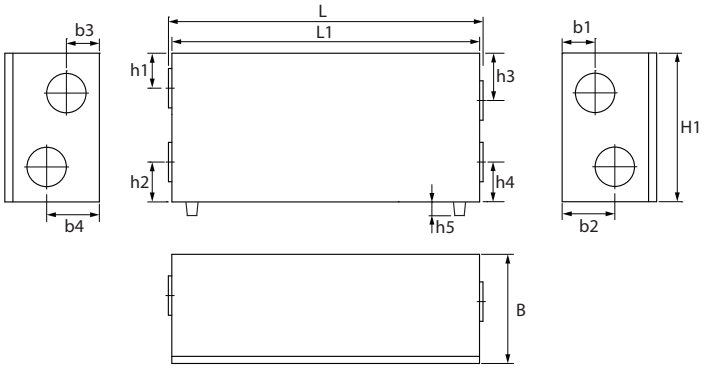
### Filters

| Unit | Filter type | Supply | | Exhaust | |
|---|---|---|---|---|---|
| | | Class | BxHxL, mm | Class | BxHxL, mm |
| **VERSO R** | | | | | |
| 1000 UH/H/UV/V<br>1300 UH/H/UV/V<br>1500 UH/H/UV/V | Compact | F7 | 800x400x46 | F5* | 800x400x46 |
| 1300 F | Compact | F7 | 410x420x46 | F5* | 410x420x46 |
| 1700 UH/H/UV/V<br>2000 UH/H/UV/V | Compact | F7 | 800x450x46 | F5* | 800x450x46 |
| 2000 F | Compact | F7 | 560x420x96 | F5* | 560x420x96 |
| 2500 H | Bag | F7 | 792x392-10x500 | F5* | 792x392-10x500 |
| 3000 UH/H/UV/V<br>4000 UH/H/UV/V | Compact | F7 (x2) | 525x510x46 | F5* (x2) | 525x510x46 |
| 3000 F | Compact | F7 | 560x540x96 | F5* | 560x540x96 |
| 5000 V | Compact | F7 (x2) | 650x630x92 | F5* (x2) | 650x630x92 |
| 5000 H<br>7000 H | Bag | F7 (x2) | 592x592-8x500 | F5* (x2) | 592x592-8x500 |
| **VERSO CF** | | | | | |
| 1000 UH/H/UV/V<br>1300 UH/H/UV/V<br>1700 UH/H/UV/V | Compact | F7 | 800x400x46 | F5* | 800x400x46 |
| 1000 F<br>1300 F<br>1500 F | Compact | F7 | 550x420x46 | F5* | 550x420x46 |
| 2300 UH/H/UV/V | Compact | F7 | 800x400x46 | F5* | 800x400x46 |
| 2500 F | Compact | F7 | 888x420x96 | F5* | 888x420x96 |
| 3500 UH/H/UV/V | Compact | F7 (x2) | 525x510x46 | F5* (x2) | 525x510x46 |
| **VERSO S** | | | | | |
| 1300 F | Compact | F7 | 558x287x46 | - | - |
| 2100 F | Compact | F7 | 858x287x46 | - | - |
| 3000 F | Compact | F7 (x2) | 450x480x96 | - | - |

* *Class F7 is available on request.*

## 9. UNIT DIMENSIONS

### 9.1. Horizontal units

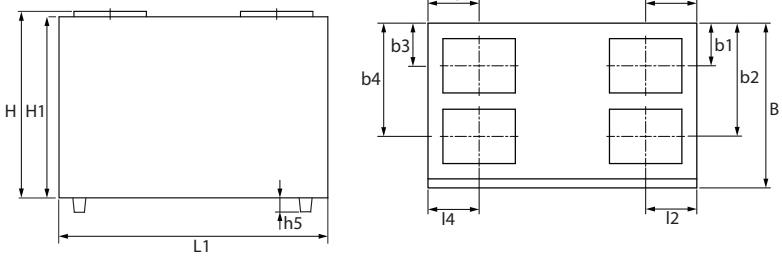



| Unit | Inspection side | Dimensions, mm | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Width B/B1 | Length[3], L/L1 | Height, H/H1 | h1 | h2 | h3 | h4 | h5 | b1 | b2 | b3 | b4 |
| **VERSO R** | | | | | | | | | | | | | |
| 1000 UH/H<br>1300 UH/H<br>1500 UH/H | Right R1 | 906 | 1505/1355 | 905 | 247 | 246 | 247 | 246 | - | 252 | 624 | 624 | 252 |
| | Left L1 | 906 | 1505/1355 | 905 | 247 | 246 | 247 | 246 | - | 624 | 252 | 252 | 624 |
| 1700 UH/H<br>2000 UH/H | Right R1 | 910 | 1547/1485 | 1000 | 270 | 270 | 270 | 270 | - | 234 | 624 | 624 | 234 |
| | Left L1 | 910 | 1547/1485 | 1000 | 270 | 270 | 270 | 270 | - | 624 | 234 | 234 | 624 |
| 2500 H | Right R1 | 1000 | 1606<br>(618, 370, 618) | 1000 | 269 | 269 | 269 | 269 | - | 500 | 500 | 500 | 500 |
| | Left L1 | 1000 | 1606<br>(618, 370, 618) | 1000 | 269 | 269 | 269 | 269 | - | 500 | 500 | 500 | 500 |
| | Right R2 | 1000 | 1606<br>(618, 370, 618) | 1000 | 269 | 269 | 269 | 269 | - | 500 | 500 | 500 | 500 |
| | Left L2 | 1000 | 1606<br>(618, 370, 618) | 1000 | 269 | 269 | 269 | 269 | - | 500 | 500 | 500 | 500 |
| 3000 UH/H<br>4000 UH/H | Right R1 | 1150 | 2100<br>(650, 700, 750) | 1150 | 303 | 303 | 303 | 303 | - | 323 | 827 | 827 | 323 |
| | Left L1 | 1150 | 2100<br>(650, 700, 750) | 1150 | 303 | 303 | 303 | 303 | - | 827 | 323 | 323 | 827 |
| 5000 H | Right R1 | 1300 | 1872<br>(751/370/751) | 1300 | 340 | 340 | 340 | 340 | 150 | 650 | 650 | 650 | 650 |
| | Left L1 | 1300 | 1872<br>(751/370/751) | 1300 | 340 | 340 | 340 | 340 | 150 | 650 | 650 | 650 | 650 |
| | Right R2 | 1300 | 1872<br>(751/370/751) | 1300 | 340 | 340 | 340 | 340 | 150 | 650 | 650 | 650 | 650 |
| | Left L2 | 1300 | 1872<br>(751/370/751) | 1300 | 340 | 340 | 340 | 340 | 150 | 650 | 650 | 650 | 650 |
| 7000 H | Right R1 | 1500 | 1892<br>(751, 390, 751) | 1520 | 400 | 400 | 400 | 400 | 125 | 750 | 750 | 750 | 750 |
| | Left L1 | 1500 | 1892<br>(751, 390, 751) | 1520 | 400 | 400 | 400 | 400 | 125 | 750 | 750 | 750 | 750 |

| Unit | Inspection side | Dimensions, mm | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Width B/B1 | Length[3], L/L1 | Height, H/H1 | h1 | h2 | h3 | h4 | h5 | b1 | b2 | b3 | b4 |
| **VERSO CF** | | | | | | | | | | | | | |
| 1000 UH/H<br>1300 UH/H<br>1700 UH/H | Right R1 | 910 | 1960/1810 | 905 | 242 | 242 | 242 | 242 | - | 253 | 625 | 625 | 253 |
| | Left L1 | 910 | 1960/1810 | 905 | 242 | 242 | 242 | 242 | - | 625 | 253 | 253 | 625 |
| 2300 UH/H | Right R1 | 910 | 2060/2000 | 905 | 239 | 239 | 239 | 239 | - | 250 | 648 | 648 | 250 |
| | Left L1 | 910 | 2060/2000 | 905 | 239 | 250 | 239 | 250 | - | 648 | 250 | 250 | 648 |
| 3500 UH/H | Right R1 | 1150 | 2500 | 1150 | 303 | 303 | 303 | 303 | - | 827 | 323 | 827 | 323 |
| | Left L1 | 1150 | 2500 | 1150 | 303 | 303 | 303 | 303 | - | 827 | 323 | 827 | 323 |

[3] *(L1,L2) – when the device from the sections.*

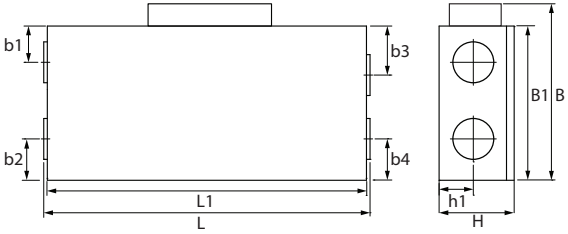
## 9.2. Vertical units




| Unit | Inspection side | Dimensions, mm | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Width B/B1 | Length[3], L/L1 | Height, H/H1 | l1 | l2 | l3 | l4 | h5 | b1 | b2 | b3 | b4 |
| **VERSO R** | | | | | | | | | | | | | |
| 1000 UV/V<br>1300 UV/V<br>1500 UV/V | Right R1 | 906 | 1355 | 980/905 | 250 | 250 | 250 | 250 | - | 253 | 651 | 253 | 651 |
| | Left L1 | 906 | 1355 | 980/905 | 250 | 250 | 250 | 250 | - | 253 | 651 | 253 | 651 |
| 1700 UV/V<br>2000 UV/V | Right R1 | 910 | 1485 | 1030/1000 | 282,5 | 282,5 | 282,5 | 282,5 | - | 235,5 | 625,5 | 235,5 | 625,5 |
| | Left L1 | 910 | 1485 | 1030/1000 | 282,5 | 282,5 | 282,5 | 282,5 | - | 235,5 | 625,5 | 235,5 | 625,5 |
| 3000 UV/V<br>4000 UV/V | Right R1 | 1150 | 2100<br>(750, 700, 650) | 1181/1150 | 328,5 | 328,5 | 328,5 | 328,5 | - | 323 | 827 | 323 | 827 |
| | Left L1 | 1150 | 2100<br>(750, 700, 650) | 1181/1150 | 328,5 | 328,5 | 328,5 | 328,5 | - | 323 | 827 | 323 | 827 |
| 5000 V HW/HCW/DX<br>5000 V HE | Right R1 | 1405 | 1900<br>(700, 500, 700) | 1400 | 150 | 546 | 150 | 546 | 150 | 702,5 | 702,5 | 702,5 | 702,5 |
| | Left L1 | 1405 | 1900<br>(700, 500, 700) | 1400 | 150 | 546 | 150 | 546 | 150 | 702,5 | 702,5 | 702,5 | 702,5 |
| **VERSO CF** | | | | | | | | | | | | | |
| 1000 UV/V<br>1300 UV/V<br>1700 UV/V | Right R1 | 910 | 1810 | 980/905 | 253 | 253 | 253 | 253 | - | 253 | 651 | 253 | 651 |
| | Left L1 | 910 | 1810 | 980/905 | 253 | 253 | 253 | 253 | - | 253 | 651 | 253 | 651 |
| 2300 UV/V | Right R1 | 910 | 2000 | 935/905 | 281 | 281 | 281 | 281 | - | 250 | 653 | 250 | 653 |
| | Left L1 | 910 | 2000 | 935/905 | 281 | 281 | 281 | 281 | - | 250 | 653 | 250 | 653 |
| 3500 UV/V | Right R1 | 1150 | 2500 | 1181/1150 | 329 | 329 | 329 | 329 | - | 323 | 827 | 323 | 827 |
| | Left L1 | 1150 | 2500 | 1181/1150 | 329 | 329 | 329 | 329 | - | 323 | 827 | 323 | 827 |

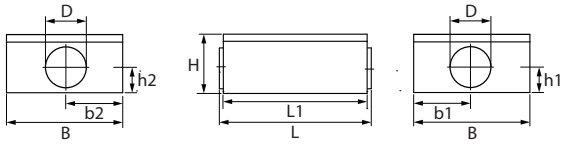
[3] *(L1,L2) – when the device from the sections.*

## 9.3. Flat units




| Unit | Inspection side | Dimensions, mm | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | B/B1 | Length, L/L1 | Height, H/H1 | h1 | b1 | b2 | b3 | b4 |
| **VERSO R** | | | | | | | | | |
| 1300 F | Right R2/L1 | 1050/940 | 1510/1360 | 480 | 220 | 250 | 245 | 250 | 245 |
| | Left L2/R1 | 1050/940 | 1510/1360 | 480 | 220 | 250 | 245 | 250 | 245 |
| 2000 F | Right R2/L1 | 1318/1210 | 2203/2060 | 527 | 263 | 305 | 305 | 305 | 305 |
| | Left L2/R1 | 1318/1210 | 2203/2060 | 527 | 263 | 305 | 305 | 305 | 305 |
| 3000 F | Right R2/L1 | 1318/1210 | 2220/2160 | 648 | 324 | 303 | 303 | 303 | 303 |
| | Left L2/R1 | 1318/1210 | 2220/2160 | 648 | 324 | 303 | 303 | 303 | 303 |
| **VERSO CF** | | | | | | | | | |
| 1000 F<br>1300 F<br>1500 F | Right R2/L1 | 1210/1100 | 1795/1650 | 527 | 263 | 275 | 275 | 275 | 275 |
| | Left L2/R1 | 1210/1100 | 1795/1650 | 527 | 263 | 275 | 275 | 275 | 275 |
| 2500 F | Right R2/L1 | 2045/2000 | 1910/1850 | 528 | 263,5 | 500 | 500 | 500 | 500 |
| | Left L2/R1 | 2045/2000 | 1910/1850 | 528 | 263,5 | 500 | 500 | 500 | 500 |

## 9.4. Units VERSO S




| Unit | Dimensions, mm | | | | | | |
|---|---|---|---|---|---|---|---|
| | B/B1 | Length, L/L1 | Height, H/H1 | h1 | h2 | b1 | b2 |
| **VERSO S** | | | | | | | |
| 1300 F | 700 | 925/893 | 350 | 152 | 152 | 350 | 350 |
| 2100 F | 1000 | 953/893 | 350 | 152 | 152 | 500 | 500 |
| 3000 F | 1015 | 1227/1160 | 555 | 250 | 250 | 507,5 | 357,5 |

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