

**BSK HEAT RECOVERY UNIT
MONTAGE, SERVICE AND USAGE MANUAL**

BRHR-100 V

BRHR-100 H

BRHR-100 S

BRHR-150 V

BRHR-150 H

BRHR-150 S

BRHR-180 V

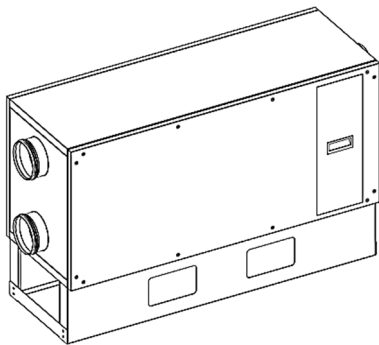
BRHR-180 H

BRHR-180 S

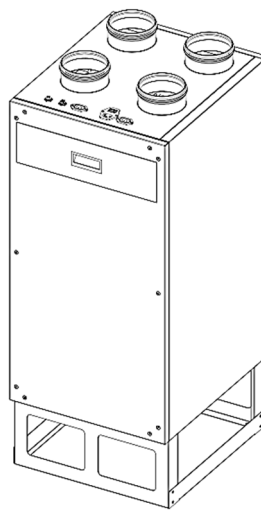
BRHR-325 V

BRHR-325 H

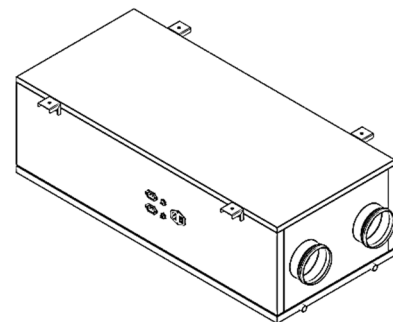
BRHR-325 S



MODEL V



MODEL H



MODEL S

PREFACE

Thank you for choosing the BSK Heat Recovery Units. The purpose of this document is to inform the users of the BSK Heat Recovery Unit about the parts and features of the device, to give information about operation and maintenance.

BSK heat recovery unit ensures high indoor air quality and energy savings at the same time. Heat transfer between the fresh air and the exhaust air is achieved by means of a plastic plate, counter-flow heat exchanger. It ensures high performance and high thermal conductivity, and efficient heat transfer between warm and cold air. The devices are designed to be easy to assemble, use and maintain. They work quietly thanks to the low noise self-motorized fans and noise isolation inside the device. Extensive controls, and accessory options give users the ability to custom fit their needs perfectly.

WARRANTY DETAILS

BSK guarantees that the heat recovery units it produced are of good quality. It ensures repair and exchange during the warranty period for faults which could manifest from structural weld flaws, material defects, or manufacturing problems as well as fans, damper system or electronics. BSK does not accept any liability for damage caused by improper and irresponsible use conditions.

Failings related to all mechanical and electrical components such as fans, motors, and circuitry, caused by defective modules or incorrect assembly are covered by warranty for 2 years, starting from the date of invoice to the customer.

If repairs or modifications to parts have been made without the written permission of BSK or the authorized service, the device will not be covered by the warranty. Repaired device malfunctions, and changed defective parts handled by means of the technical staff appointed by BSK or an authorized service will not void the warranty. Also the replacement of the G4 / F7 cassette filters contained in the device, made by BSK, will be excluded from this scope.

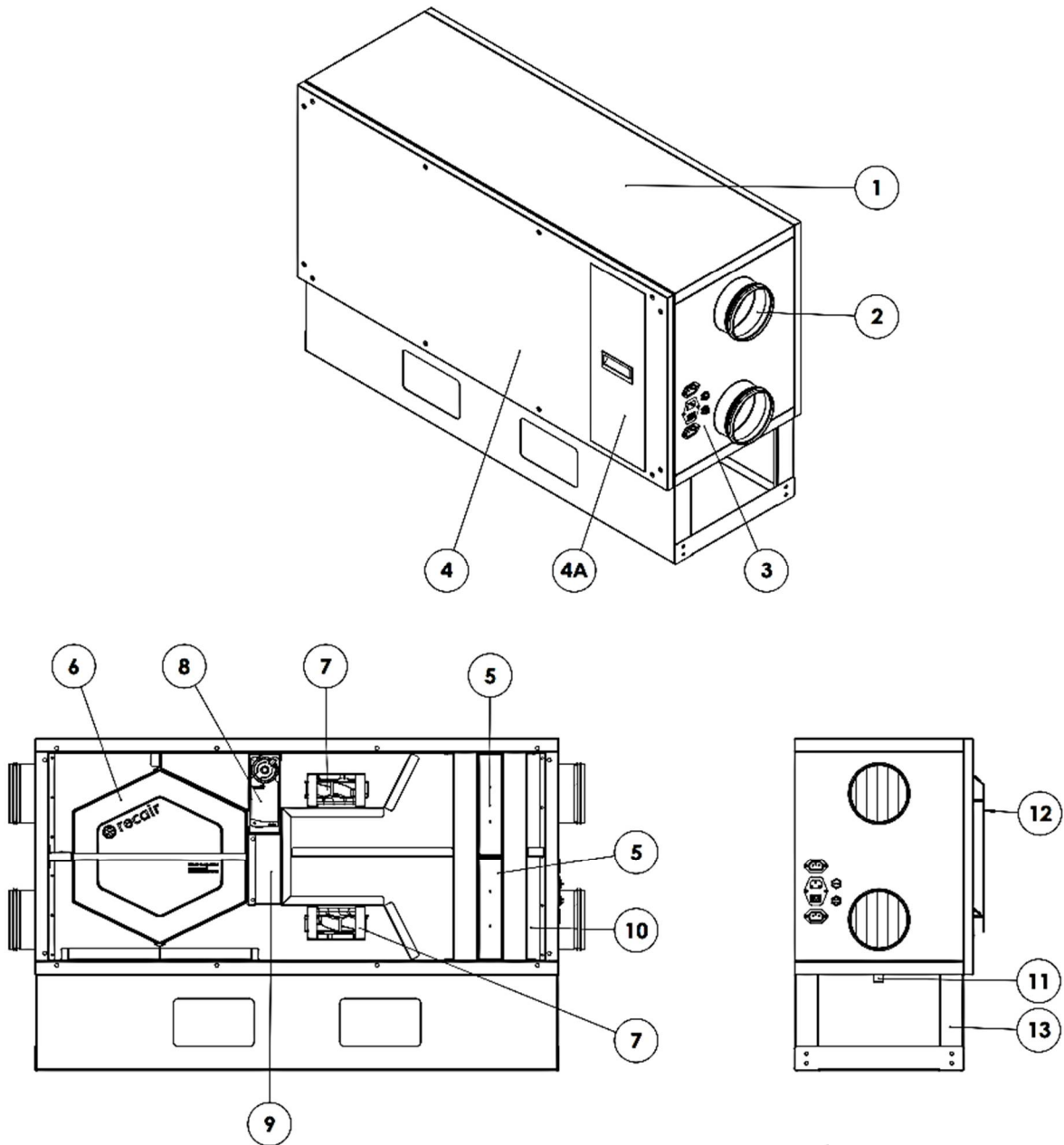
BSK warranty includes the replacement spare parts for fans, damper motor and system, and electronic components. It does not include the wages of service personnel, operation and / or maintenance costs. If the defect is within the coverage of the warranty, all transportation and exchange costs of the device and the technical staff appointment shall be borne by the authorized service, otherwise these costs must be met by the customer.

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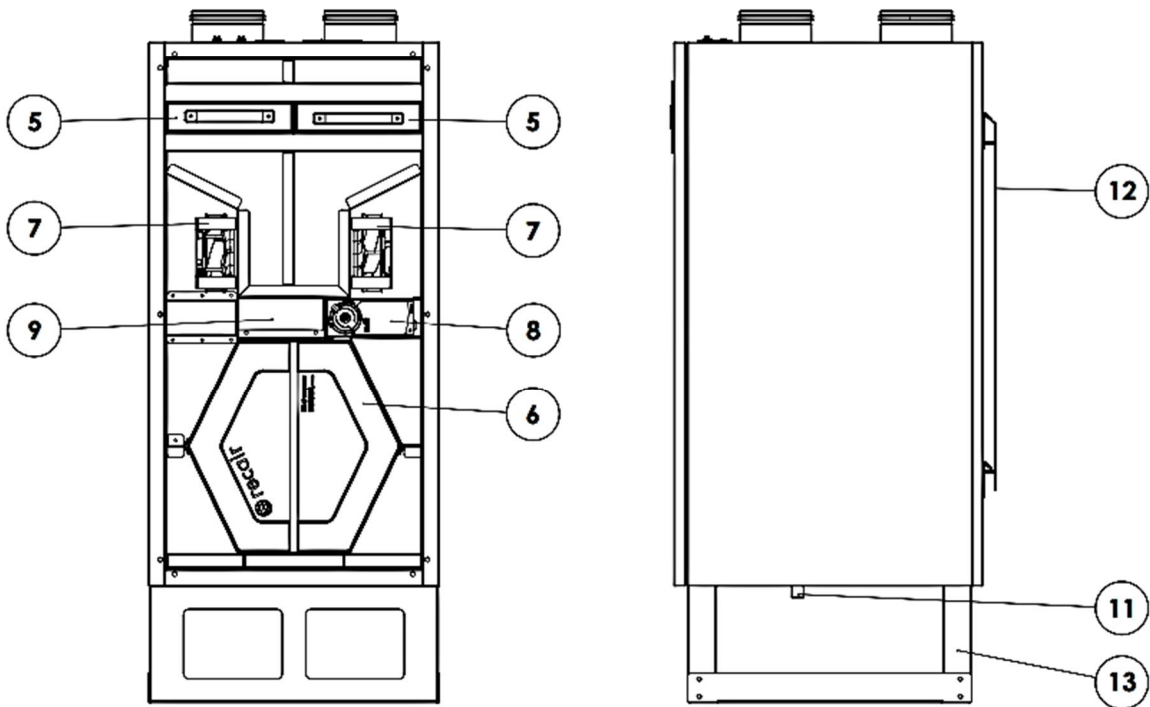
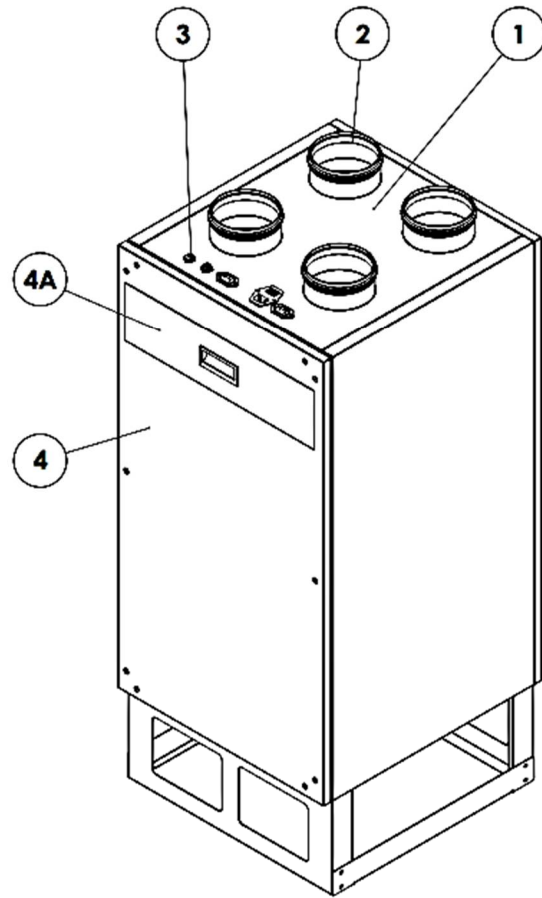
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DEVICE MODELS

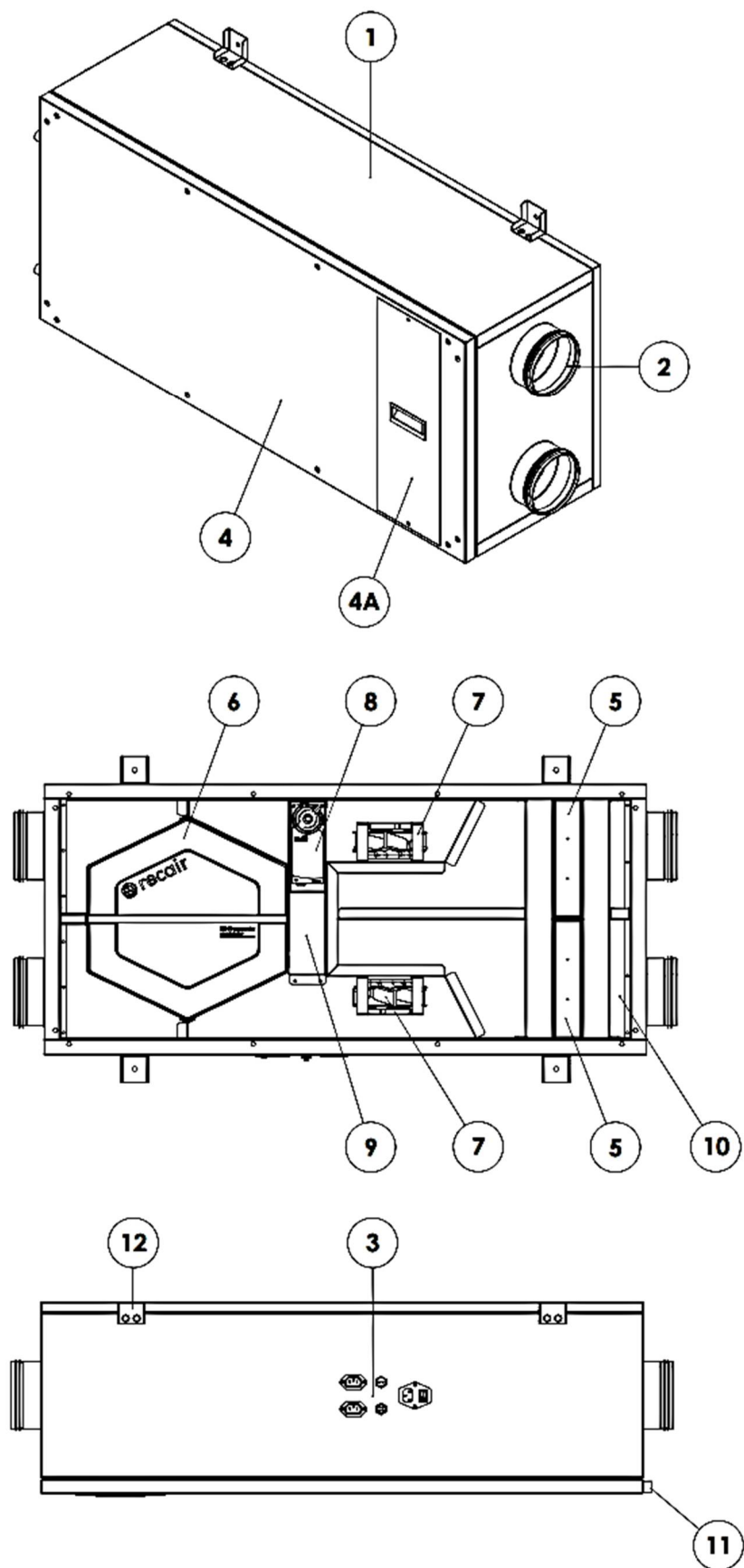
MODEL V



MODEL H



MODEL S



HEAT RECOVERY UNIT'S PARTS

1. Body

The body of the BRHR series heat recovery units is made of galvanized sheet metal.

Inside of the metal frame is covered with acoustic insulation to reduce the noise levels. The inner surfaces of the device are smooth and have no sharp edges.

The device is designed to minimize pressure losses.

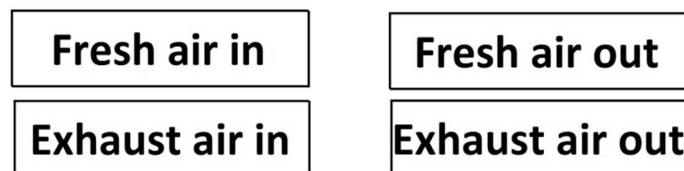
2. Air Connections

All air connection pipes of the device are made of sheet metal and have a round cross-section. Below is a drawing of the air connection pipe. The duct connectors are sealed with double lipped rubber joints $\varnothing 125 / \varnothing 160$ mm depending on the device model.



All air connections should be made with a metal duct with the according diameter of the device model ($\varnothing 125 / \varnothing 160$ mm).

The device needs 4 air connections. These are indicated on the device near air connection pipes with stickers. Because of the different device models and left – right orientations, please refer to the stickers when connecting the pipes;



Fresh air in: Gets the fresh air from outside into the device.

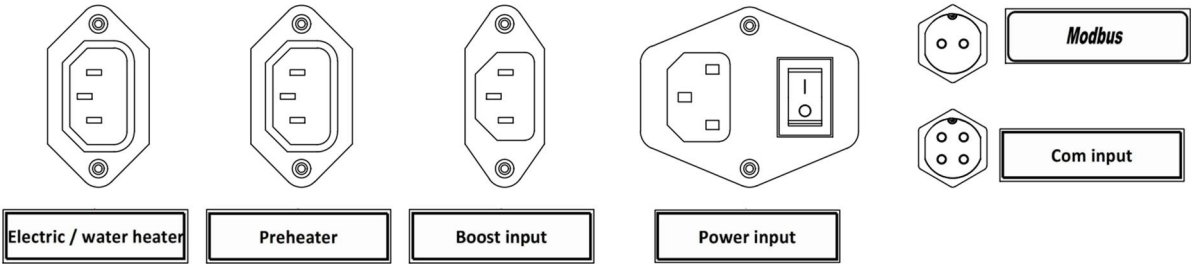
Fresh air out: Gives the heated fresh air to the inside. Also called “supply air”

Exhaust air in: Gets warm inside air into the device. Also called “extract air”

Exhaust air out: Deposits the used, cooled air to the outside

3. Electrical Connections

BRHR units are designed to be plug and play, and all the electrical connections come with pre-connected sockets for this purpose. You do not need to wire connections to the control board, just plug the correct sockets to their respective areas on the device to use accessories.



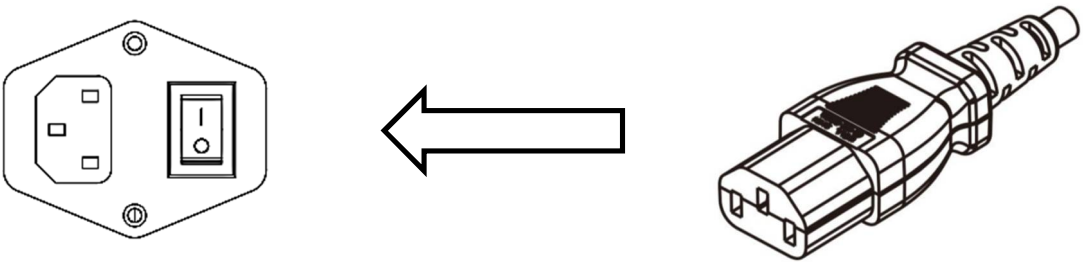
Stickers on the device indicate what the ports are used for.

A. Power Input

This is the main power source of the device. The socket is equipped with an on/off switch. "I" is the ON and "O" is the OFF position.

The switch must be on OFF position before all the connections to the device is made.

The socket have a 250V glass fuse.



B. Com Input

Com input port is used to connect the control panel to the device. The units can either have a manual or digital control panel.



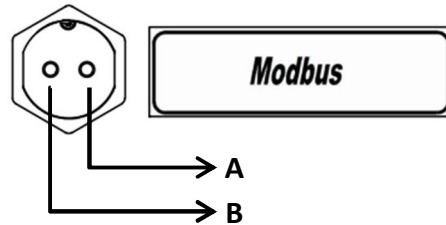
Manual Controller Panel



Digital Control Panel

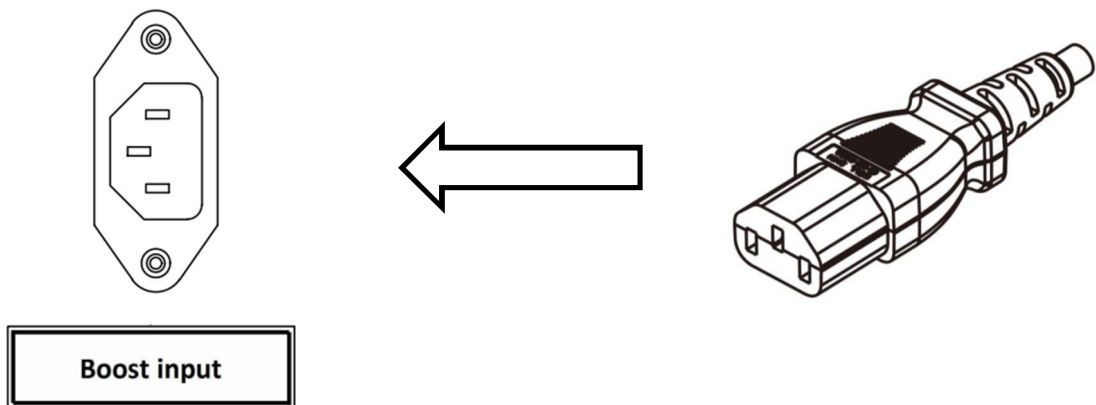
C. Modbus Port

The device can be connected to a building management system (BMS) via the ModBus protocol. The A and B pins of the ModBus port is shown below.



D. Boost Input

An external kitchen hood can be connected to the device via this port. When the connected kitchen hood is turned on, the device will enter Kitchen Mode to help with the ventilation.



To connect, wire the cables of the connector cable (sold separately) to the kitchen hoods main line, after its on-off switch.

You can also connect a regular wall switch instead of a kitchen hood, to be able to use the boost function from that switch.

Cooking Mode (Aspirator boost)

When in Cooking Mode, the device decreases the aspirator fan level to 25% and increases the ventilator fan level to 80% by default. This will increase the air going inside, thus preventing the kitchen hood from generating a negative pressure in the house.

Users can change the aspirator and ventilator fan levels for Kitchen Mode to best suit their needs.

To change the boost levels press ▲ and ▼ together while the device is turned off from the control panel (BSK logo is on the screen). Select “Aspirator Boost” from the menu and set the ASP and VNT levels according to your needs.

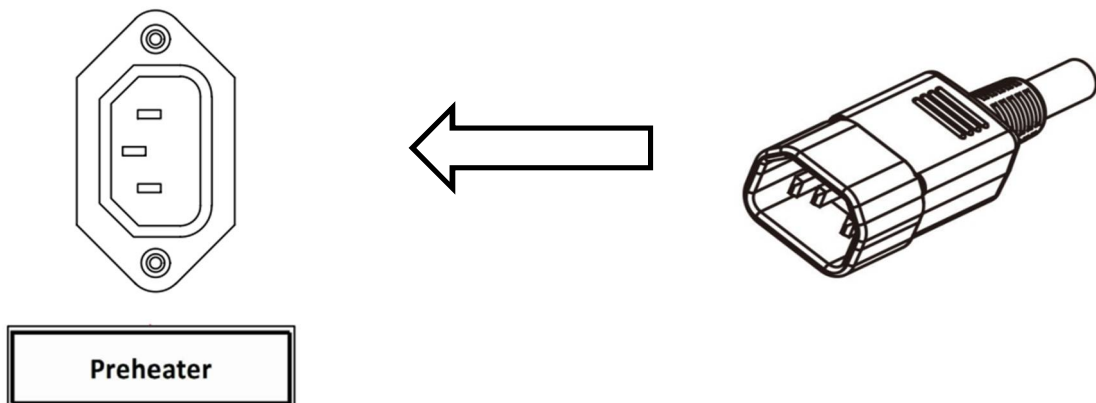
E. Preheater

In cold climates, where weather conditions are often drop below 0°C, it is recommended to use an electrical pre-heater before the fresh air intake to heat up the air, in order to protect the devices insides from frost formation.

Pre-heater will activate if the fresh air intake temperature drops below -3°C. This set temperature cannot be changed.

The heater must be installed at least two diameter distances away from the duct connection of the heat recovery unit.

To connect the pre-heater, plug the pre-heater’s power cord to the corresponding socket on the device.



Defrost Mode

If the outside temperature drops below -3°C , the device will enter defrost mode to prevent ice forming on the inside of the device. The device can enter defrost mode even if there is not a preheater equipped.

When in defrost mode the device will periodically adjust the fans so that potential frost formed inside the device can melt. Defrost mode sets the aspirator fan to maximum (stage 6) while decreasing the ventilator fan to stage 2. This mode will activate 5 minutes for every 1 hour.

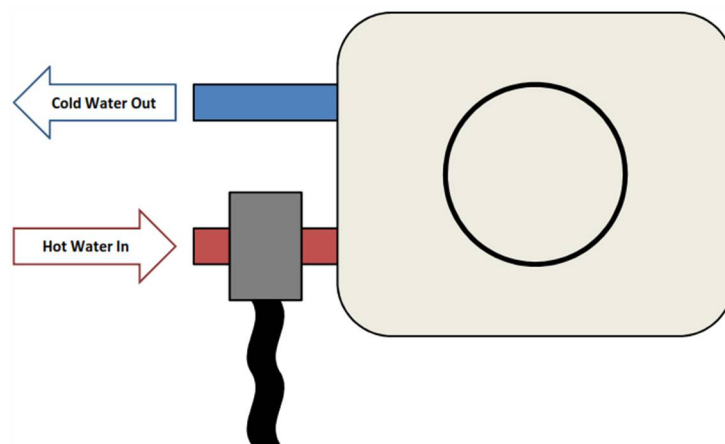
F. Electric / Water Heater

An electric or water heater can be added to the device, after the supply air duct, to further heat the air going inside of the house.

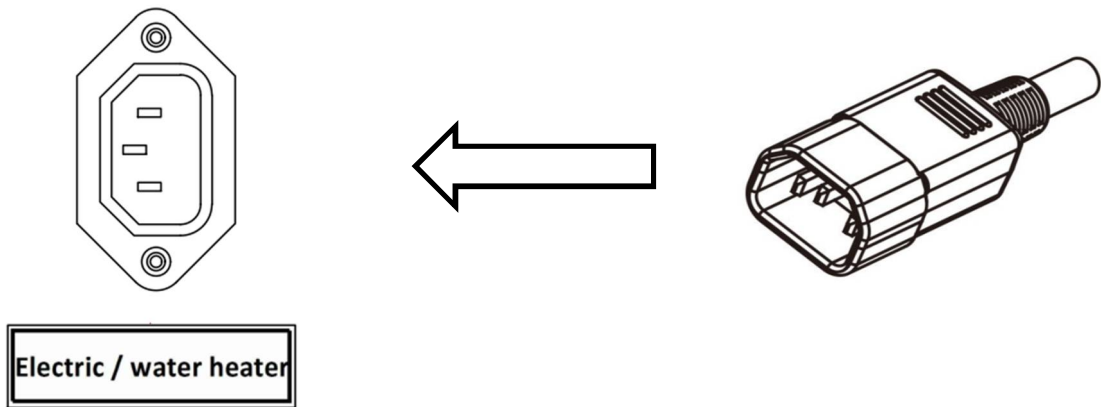
The heater must be installed at least two diameter distances away from the duct connection of the heat recovery unit.

There is an electrical valve on the hot water inlet of the water heater which is used to control the hot water flow into the coil. The cable from this valve should be connected to the “water/electrical heater port” of the device.

Water heater’s pipe heads are threaded with M22 male threads, use respecting female thread connectors to connect the heater to the hot water system.



To connect the electric / water heater, plug the heater’s power cord (if electric heater) or the power cord of the valve (if it is water heater) to the socket on the device.



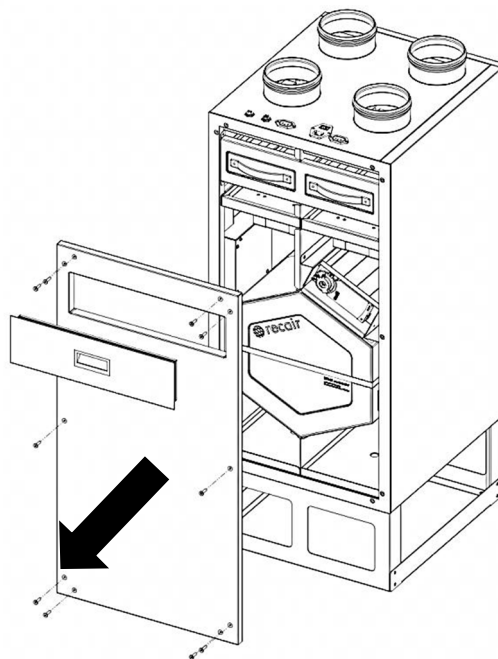
The socket is indicated by the “Electric / water heater” stickers.

To use the heater press MODE/OK on the digital controller until HTR is selected (flashing). Then press ▲ to turn on or ▼ to turn off the heater.

4. Service cover

The units have service doors that can be opened and sealed with hexagonal screws for maintenance and replacement.

To open the cover, unscrew all the bolts on the cover like shown below, with an M5 Allen wrench, and take off the cover.



4A. Magnetic Filter Cover

There is a magnetic filter cover over the service door which can be easily removed to access the filters without completely removing the front panel. More details about filter change can be found on the following section.

5. Cassette filters

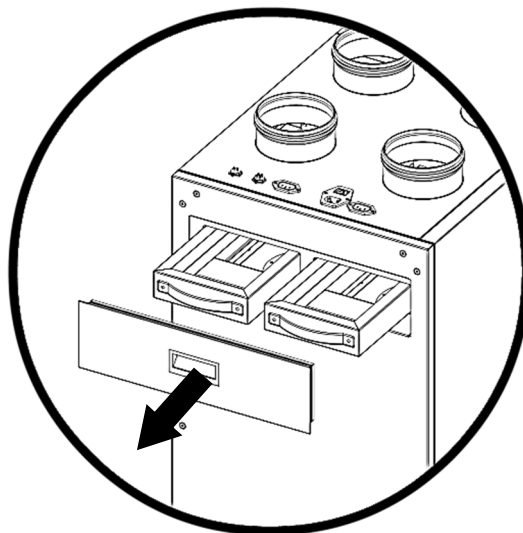
There are 2 filters after both the fresh air inlet and the extract air suction ports which clean the air going into the device to protect the heat exchanger and other commodities from dust and abrasive particles.

Filter full status indicators for various control options are;

- Manual control panel: Filter LED (color red) lights up
- Digital control panel: “Filter Full” warning can be seen on the screen

Manual control panel uses a differential pressure gauge to sense the filter status. When new filters are inserted, the LED will turn-off automatically. Digital control panel will show a filter change screen. When pressed OK, the filter warning will be turned off.

1. To change the filters, open the filter cover. Since it is magnetic, just pull it from its handle. If the unit is **Model S**, there will also be 2 screws for safety, unscrew those before pulling the cover out.
2. Pull the filter from its slot. If the unit is **Model S**, unlock the safety pins first.

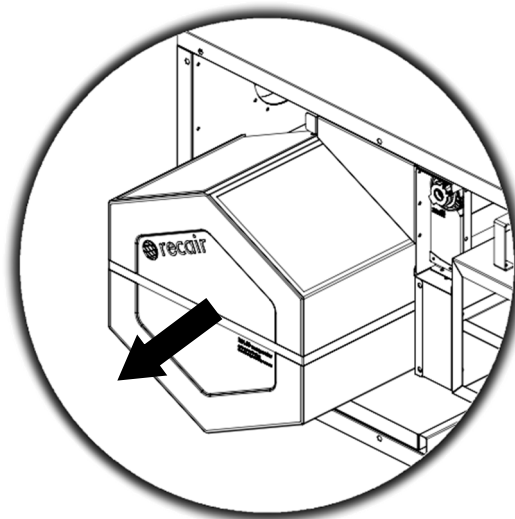


3. After removing the filter, put the new filter back in the slot. If the unit is **Model S**, lock the safety pins back.
4. Put the filter cover back, it should stick to the service cover since it is magnetic.

6. Heat exchanger

Plastic plated, high efficiency, hexagonal counter flow heat exchangers are used in all of the units.

1. To change the heat exchanger, open the service cover and simply pull the heat exchanger from its slot. If the unit is **Model S**, unlock the safety pins first.
2. After removing the heat exchanger, put the new heat exchanger back in the slot. If the unit is **Model S**, lock the safety pins back.
3. Close the service cover and lock the door hatches.



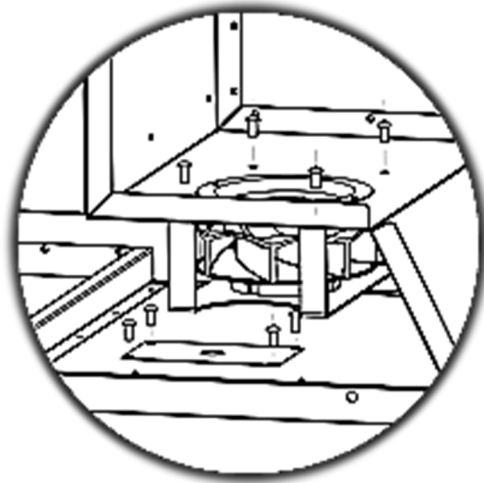
7. Fans

All devices utilize self-motorized, silent, monophonic (220 V) and speed controlled fans.

To change the speed of the fans, turn the fan speed knob on the manual control panel to a desired level.

For digital control panel, press MODE/OK on the main screen to select ASP or VNT. Then press ▲ to increase or ▼ to decrease the fan speed. For more information refer to the digital control panel guide.

1. To change the fans, open the service cover first.
2. There is a small metal protector over the fans cables. Unscrew the bolts holding it with an M5 allen wrench.
3. Unscrew the bolts holding the fan screws with the same wrench.

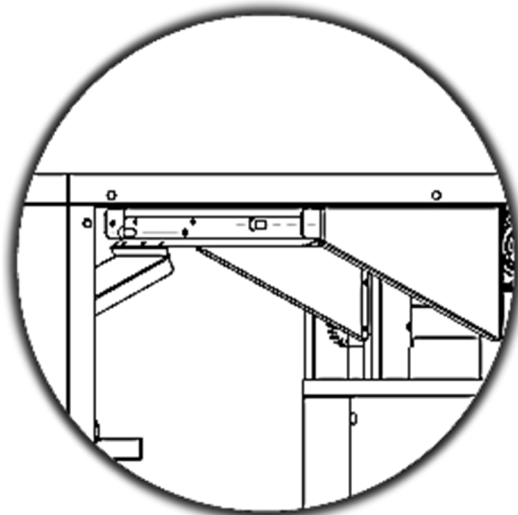


4. Pull the cables from the back of the plate. Disconnect the cables, noting the color and orientation of them.
5. After removing the fan, put the new fan back in the slot.
6. Rewire the cable connections with the correct color orientation.
7. Insert the cable mess back under the metal cover.
8. Close back the service cover.

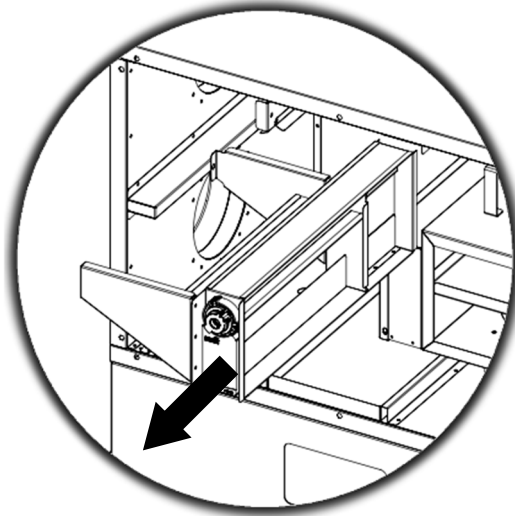
8. Automatic by-pass damper

At the back of the device, inside, there is a canal which by-passes the heat exchanger. By-pass damper opens or closes this canal along with the heat exchanger. (When the canal is closed heat exchanger is open and vice versa). Automatic by-pass damper control allows this canal to be opened and closed.

1. To change the by-pass damper, open the service cover first and then remove the heat exchanger.
2. There is a small metal protector over the fans cables. Unscrew the bolts holding it with an M5 allen wrench. Also unscrew the 2 bolts from the back of the heat exchanger slot.



3. Pull the cables from the back of the plate and disconnect them from their socket.
4. Then simply pull the damper from its slot.



5. After removing the damper, put the new damper back into the same slot. And screw back the bolts.
6. Reconnect the electrical socket, insert the cable mess back under the metal cover and screw it back.
7. Close and screw the service cover back.

Free-cooling mode

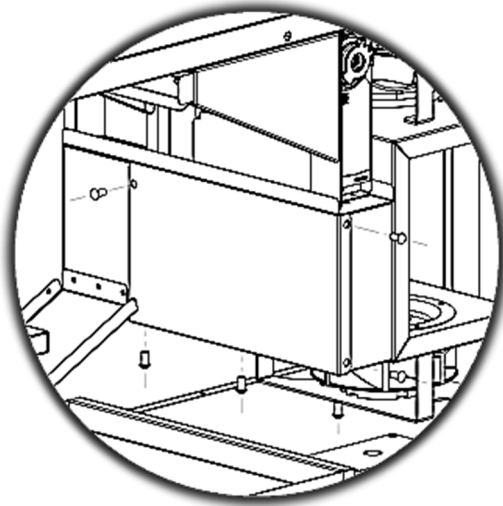
When the outside temperature is warm enough, heat recovery from the inside air is not always necessary. For these situations, usually on seasonal changes, free cooling mode is activated and the air flow is directed from the heat exchanger to the by-pass canal. This will decrease the pressure drop and the load on the fans can work with less energy, improving the power consumption of the device.

This set temperature is 23^oC by default for manual control panel and it cannot be changed. How to change the set temperature for digital control panel is explained on page 7 of the digital control panel manual.

9. Controller card box

All devices have a box on the body which encloses the electronic control card and electric wiring.

1. To change the controller card, open the service cover first.
2. Remove the heat exchanger from the device.
3. Unscrew the controller card box to access the controller card.



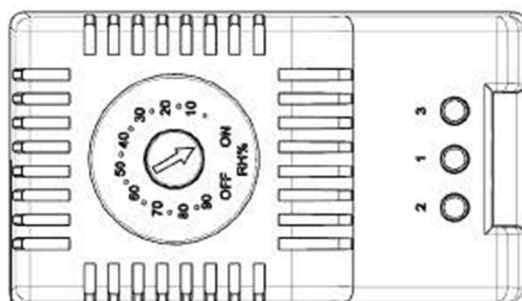
4. Disconnect the cables and wires, making note of the colors and orientation of the cables.
5. Reconnect the wires to the new card with the correct orientation.
6. Screw back the new card to its place.
7. Insert the heat exchanger back and close the service door.

10. Humidity sensor

The devices have a hygrometer located near the extract air duct. This sensor allows the device to switch to Shower Mode (humidity boost) if the humidity level goes above a certain level.

The default factory setting for the sensor is 75%. If desired, the set humidity level can be changed manually to allow the device to switch to shower mode at a different humidity threshold.

Below is a drawing of the hygrometer, to change the humidity level, turn the knob on the top, indicated with an arrow, to a preferred level of relative humidity.



1. To change the hygrometer, disconnect the cables on the device, and make note of the orientation of the cables.
2. Then push down onto the hygrometer to make it loose from its slot.

3. Put the new sensor by inserting it to the slot and push it until a “click” is heard.
4. Reconnect the wirings with respect to the orientation.

Shower Mode (Humidity boost)

When in Shower Mode, the device increases the aspirator fan level to 80% and decreases the ventilator fan level to 25% by default. This will increase the humid air exhausted, thus preventing the moisture from settling in the house.

Users can change the aspirator and ventilator fan levels for Shower Mode to best suit their needs.

To change the boost levels press ▲ and ▼ together while the device is turned off from the control panel (BSK logo is on the screen). Select “Humidity Boost” from the menu and set the ASP and VNT levels according to your needs.

11.Drainage

There is a collector tray made of galvanized sheet metal, to collect the condensing water droplets which can be formed inside the device. The drainage pipe has been taken out to be able to connect to the waste water system.

The drainage pipes must be connected to the waste water line before the device is started. The connection is made with a Ø19 mm pipe.

The drain must never be led to the gutter, because this can predict water damage when it freezes outside

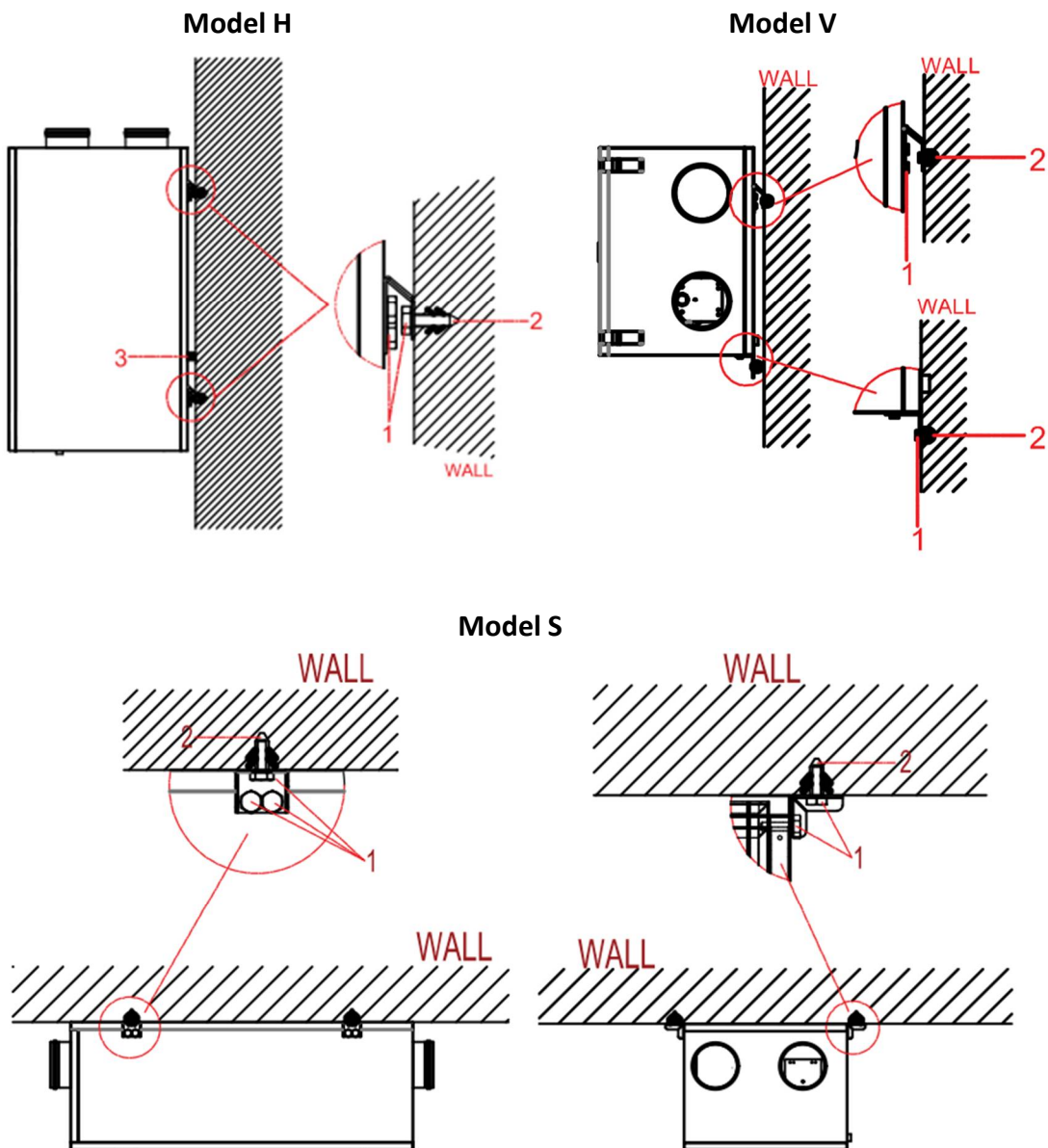
The connection of the drain must always have a water lock to prevent smells from the waste water line.



12. Montage Part

Model H and V: You can use model V on the floor or you can hang it on the wall. To hang it to the wall, you must use its montage part. You can see the montage part and montage details in the drawing.

Model S: You must hang model S on the ceiling with its montage part. You can see the montage part and montage details in the drawing.



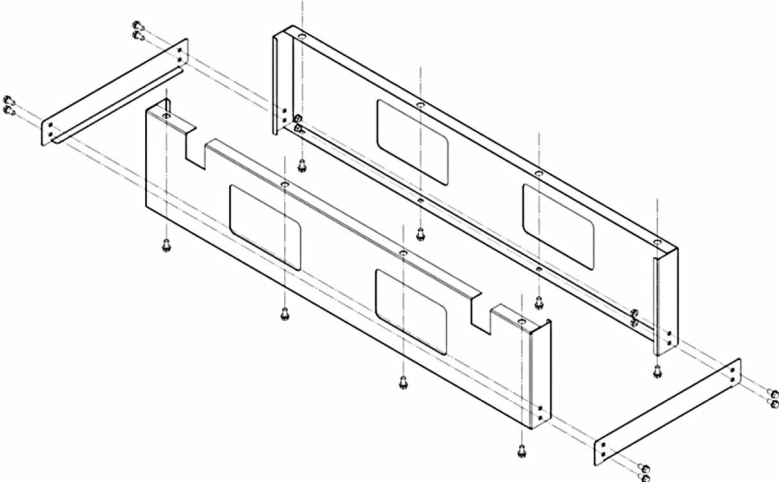
1. Screw
2. Screw anchor
3. Vibration chock

13. Foot

This part is available in the H and V model. For S model, there isn't any foot. If the device is hang on a wall, there is no need to use this part.

Assemble the foot as shown below and put the device on top of it.

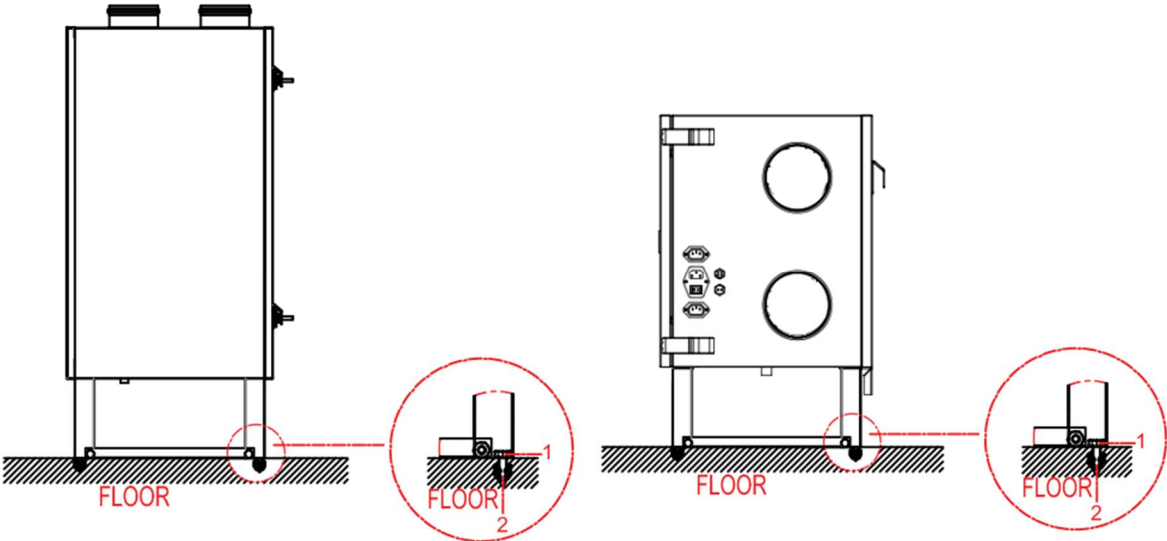
All nuts and bolts are size M6.



Foot must be placed under the device as shown in the following drawings.

Model H

Model V



- 1. screw
- 2. screw anchor

GENERAL WARNINGS

- Installation and commissioning of the device must be done by qualified personnel.
- The heat recovery device should not be disassembled in any case. Only authorized service personnel can disassemble and repair. Otherwise, electric shocks or injuries may result.
- All protective materials (stretch, etc.) placed on the device to prevent damage during transportation must be removed before the device is switched on. These materials can be inside or outside of the device.



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- This appliance is not to be used in heated swimming pools, cold storage rooms, environments where humidity and heat are very different. It is not used in environments exposed to rain. (Otherwise, you may be exposed to electric shocks, and your device will not operate correctly.)
 - Do not use this device in corrosive environments such as acids and in corrosive environments. (oil mist, paint, toxic gases etc ...) Do not use the device in flammable media (containing explosive gas).
 - These devices operate at 230V - 50 Hz.



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- The fixing of the device should be done well and securely.
 - Do not apply force to electrical connections and control box while lifting the device.
 - Connect waste water lines to the pipes of the drain pans.
 - When connecting the device, be careful of the service spaces, otherwise the filter changes and the device cannot be interfere with the fan motors.
 - The drain pipes must be connected to the waste water lines before the device is started.
 - If the control panel displays a warning about filter, you should clean or change your filter.
 - Check that the drain line is properly installed.
 - The fresh air inlet (exterior part) of the device with exhaust should be such that it does not miss the rainwater into the appliance.
 - This device should be used in a temperature range of -10 ° C to +40 ° C, where the relative humidity is below 60%. It is recommended to use an electric heater when the appliance is to be humidified at the fresh air intake. Failure to get fresh air into the desired properties can lead to a reduction in the amount of oxygen in the room and discomfort. In such cases, the indoor air quality sensor can be placed on the suction side.



- Apparatus (switch, fuse, cable etc.) to be used with the system must be selected from the staff with the quality certificate and the high strength.
- Make sure that the power supply of the device is suitable for the power supply with the appropriate cable and thermally protected switch.
- Make sure that the device is not in electrical contact with air ducts and building steel constructions. Otherwise, electrical leaks and fire may occur.
- A circuit breaker working with the fuse and switch system must be placed on the mains connection to the device.
- Electric heaters must be used with the heat recovery device automatic controller. In the automatic controller, the small relay contacts for controlling the resistances are of low amperage capacity and are intended for dry contact (open / close). It is necessary to check the contactors to operate the resistances to be controlled by this contact. (A separate panel should be made for the electric heater and the contactor, switch, fuse must be installed.)
- Switch off the electrical connections before interfering with the appliance.
- Make sure the fan motor is not running before opening the service doors. Do not open the service lid while the fan is running. Before removing the fan during service, unplug the power cord and remove it from the power outlet.
- There should not be foreign substances in the cell.
- Clean the G4 filters and heat exchanger with compressed air. Do not clean with flammable gases or water.
- Clean G4 filters with compressed air at least every 45 days depending on ambient conditions. After cleaning five times, replace filters with new ones.
- During installation of the devices to the duct system; sharp turns in the canal system, sudden contraction or expansion in multiple canvases and canal diameters should not be allowed.