INSTALLATION INSTRUCTIONS

CTS602 HMI BY NILAN

Compact S / Compact S Polar

Gateway

Version 5.10 - 01.06.2023
M24 Compact S GB

NILAN®
OUTSTANDING INDOOR CLIMATE

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General information

Important information

CAUTION
Do not turn on the power supply for the unit until the hot-water tank and central heating circuit is filled with water.

Safety

Power supply

CAUTION
Always disconnect the power supply to the unit if an error occurs that cannot be rectified via the control panel.

CAUTION
If an error occurs on electrically conductive parts of the unit, alway contact an authorised electrician to rectify the error.

CAUTION
Always disconnect the power to supply to the unit before opening the unit doors, for instance for installation, inspection, cleaning and filter change.

Heat pump domestic hot water

CAUTION
Avoid direct contact with the heating system pipes in the heat pump as they can get very hot.

CAUTION
To protect the heat pump against damage, it is equipped with electronic temperature monitoring.

The heat pump must undergo suitable service inspections under applicable legislation and regulations to keep it in good condition and in compliance with safety and environmental requirements.

Responsibility for maintenance of the heat pump rests with the owner/user.

Water quality requirements

Requirements to quality of water

The hot water tank in the Nilan units is made of steel, which has been given a double enamelling, to ensure an extra long service life. In addition, the tank is equipped with a sacrificial anode as extra protection. It is important that the sacrificial anode is replaced regularly.

Most units are equipped with an electronic monitoring sacrificial anode, which gives an alarm on the user panel when it is time to replace it.

In order for the sacrificial anode to function and protect the tank, it is required that the water quality complies with the following:

- Electrical conductivity (EC): Between 30 mS/m and 150 mS/m (millisiemens pr. m) @ 25 °C
- Chloride must be below 250 mg/L @ 65 °C

If the above criteria are not met, the sacrificial anode will not work as intended, after which the tank will be corroded.

Introduction

Documentation

The following documents will be supplied with the unit:

- Quick guide
- Wiring diagram

In the Quick guide you will find important information regarding installation and start-up of the unit. If you require further information regarding, for instance, installation of accessories or additional settings in the software, or if you need an extended user manual, the following documents can be downloaded from the Nilan website:

- Installation instructions
- Software instructions
- User Manual
- Wiring diagram

The instructions can be downloaded from www.nilan.dk.

If you have questions regarding installation and operation of the unit after having read the instructions, please contact your nearest Nilan dealer. A list of Nilan dealers is available on www.nilan.dk.

ATTENTION

The unit must be started up immediately after installation and connection to the duct system.

When the ventilation unit is not in operation, humidity from the rooms will enter the duct system and create condensate water that can run out of the valves and cause damage to floors and furniture. Condensation may also form in the ventilation unit, which can damage its electronics and fans.

From factory, the unit has been tested and is ready for operation.

Unit type

Product description

Compact S is a ventilation unit with heat recovery, that has a built-in heat pump, which is used for the production of domestic hot water, but which is able to heat and cool the home via the ventilation air.

Compact S is designed for air flows of up to 375 m3/h at 100 Pa external counter-pressure.

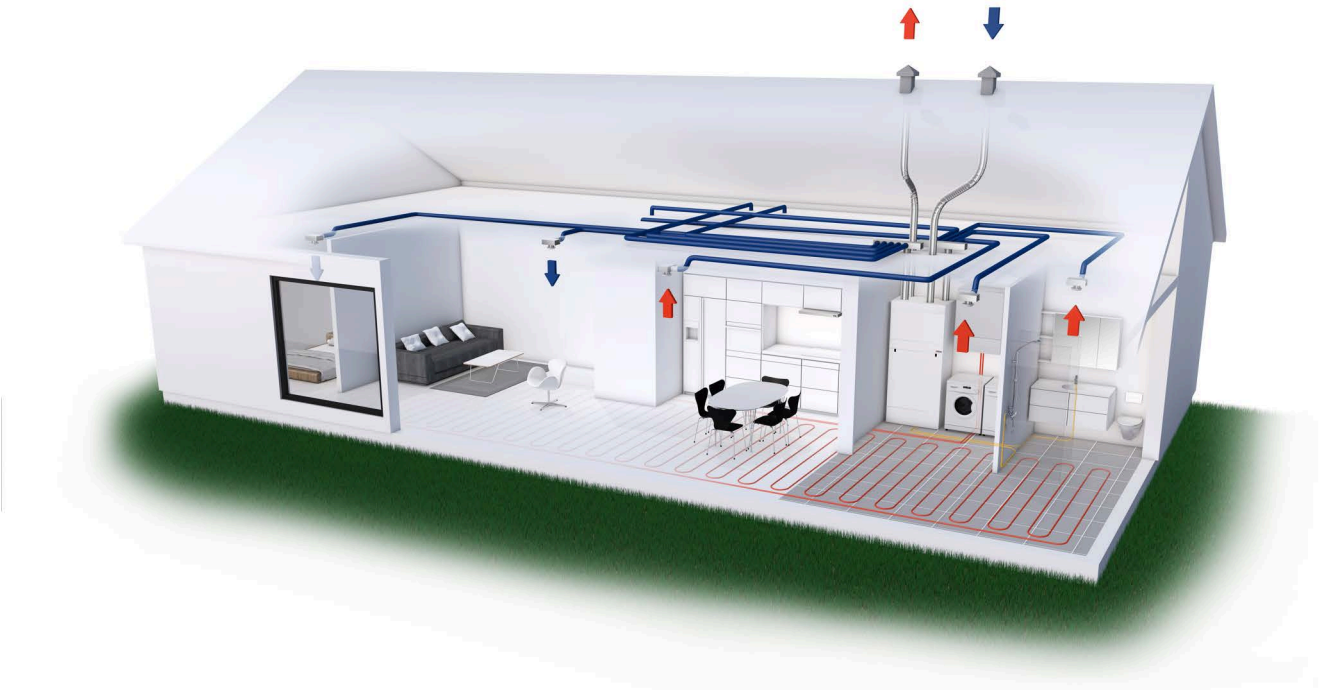
The unit is primarily used in residential construction such as single-family houses and apartments. It ventilates the home by drawing out the moist and bad air via valves in e.g. bathrooms, toilet, kitchen and utility room, and introduces fresh outdoor air in via valves in living rooms such as. living room, bedrooms and family room.

The cold outdoor air is heated via the high-efficiency counterflow heat exchanger by the hot exhaust air. The heat loss that occurs via heat recovery, the built-in heat pump use to produce domestic hot water. All the energy in the exhaust air is utilized, and you have not really seen any heat loss that you experience with an ordinary ventilation unit.

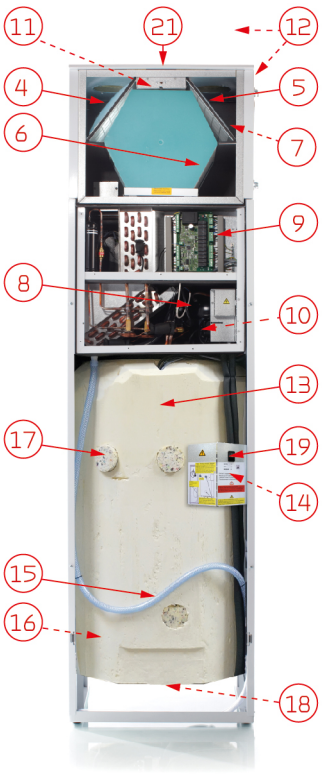
In the winter, the built-in heat pump can heat the supply air up to 34 ° C, and thus contribute to heating the home. When the supply air is heated, at the same time a little heat is deposited in the hot water tank and ensures a constant high hot water temperature.

The heat pump has a reversible cooling circuit, which means that the cooling circuit can be turned and it can cool the supply air in the summer. Compact S can cool the supply air by up to 10 ° C in relation to the outdoor air. Due to the low air exchange, usually 1/2 time per hour, it will not act as an air conditioning system. However, when cooling, moisture in the supply air is removed, which results in a lower humidity in the home. The lower humidity means that it is easier to withstand a slightly higher temperature, which therefore provides good comfort in the home.

When Compact S cools the supply air, the energy is deposited in the hot water tank, and it can thus be said that "free" domestic hot water is produced during those periods.



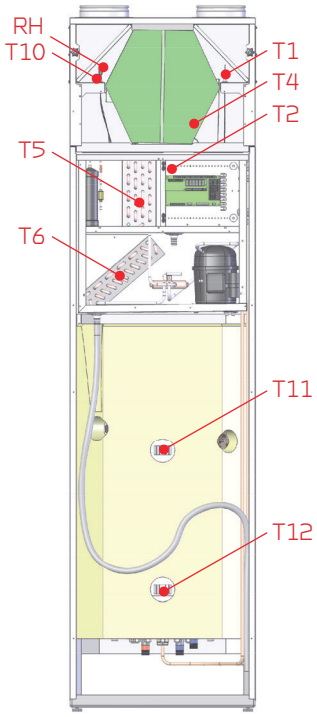
The unit



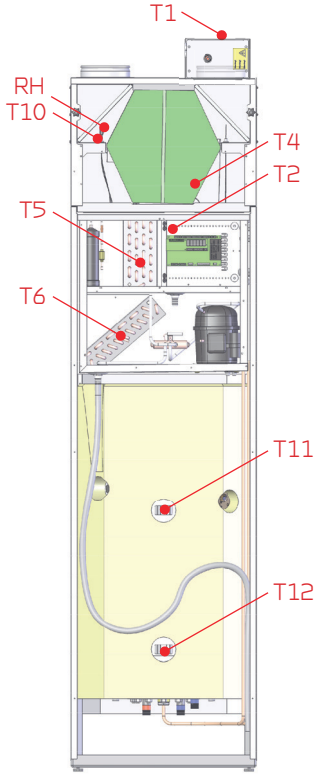
1. Duct connections
2. Additional dust connections (it is possible to move the nozzles from the top of the unit side separately)
3. Filter change cover (loosen the thumb screws and take the door off)
4. Extract air filter
5. Outdoor air filter (pollen filter is placed here if required)
6. Counterflow heat exchanger
7. USB cable (connection of PC)
8. Heat pump
9. Automation CTS602
10. Fans
11. 100% bypass damper
12. Pre-heating element for frost protection (Polar version only)
13. 180 l hot water tank
14. 1,5 kW electrical supplement heater (with overheat protection, click after dropouts)
15. Condensate drain with water trap
16. Supplementary coil (only SOL version)
17. Electronically monitored sacrificial anode
18. Plumbing connections
19. Emergency mode (domestic hot water)
20. Control panel (HMI touch-panel)
21. 8-pin plug

Temperature sensor overview

Compact S



Compact S Polar

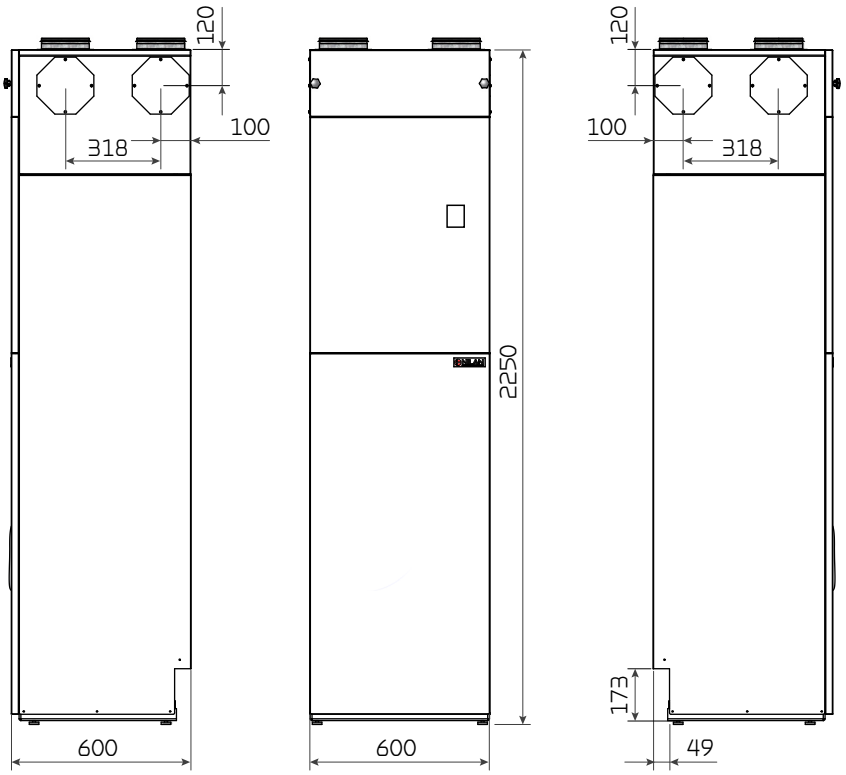


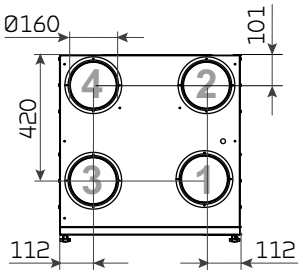
Temperature sensors inside the unit
T1: Outdoor air inside duct connection (before pre-heating element)
T2: Supply air
T4: Extract air after heat exchanger
T5: Condenser
T6: Evaporator
T10: Extract air
RH: Humidity sensor

Temperature sensors outside the unit
T7: Supply air after heating element (accessory)

Temperature sensors in the hot water tank
T11: Top of tank
T12: Bottom of tank

Dimensional drawing Compact S



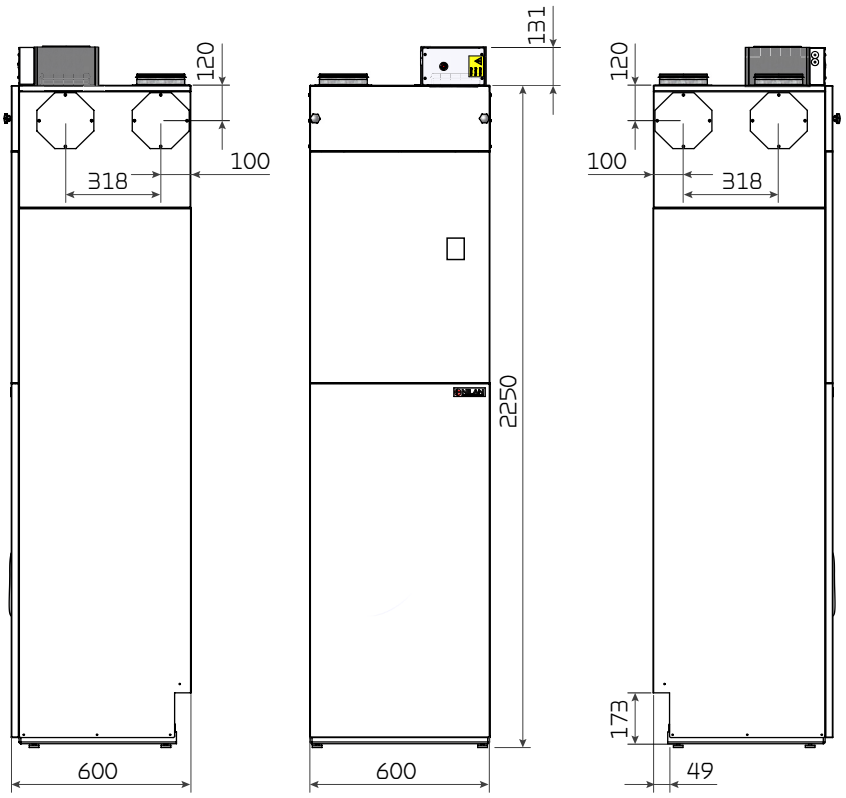


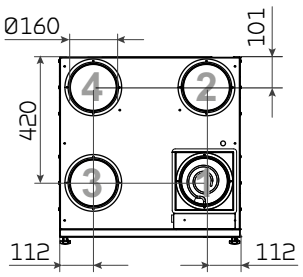
Connections:
22. Outdoor air
23. Supply air
24. Extract air
25. Discharge air

Weight: 162 kg.

All listed measurements are in mm.

Dimensional drawing Compact S Polar





Connections:
26. Outdoor air
27. Supply air
28. Extract air
29. Discharge air

Weight: 162 kg.

All listed measurements are in mm.

Accessories

Electrical pre-heating element for frost protection of the unit

If your ventilation unit is not a Polar version with an integral pre-heating element, we recommend that you purchase an external pre-heating element as frost protection of the ventilation unit.

During prolonged periods of frost, the high efficiency counterflow heat exchanger will ice up. To prevent ice formation, we recommend that you install an electrical pre-heating element.

The pre-heating element consumes limited energy and it ensures efficient heat recovery without periods of defrosting the counterflow heat exchanger. You thereby achieve an overall reduction in energy consumption.

Electrical after-heating element for duct installation

Installing an after-heating element allows you to control the supply air temperature in the following cases:

- You want to use the ventilation air to heat the dwelling
- You want to control the supply air temperature to avoid potential cold draughts and coldness from the ventilation

The electrical after-heating element is for installation in the supply air duct. It would be an advantage to place it within the climate screen. It comes with the necessary sensors and connectors.

CO_2 sensor

If you want to adjust the fan speed level in accordance with the level of use of the dwelling/building (amount of people), you can retrofit a CO2 sensor. Nilan's CO_2 sensors calibrate automatically.

On the control panel, you select the CO2 level you want. If this level is exceeded, ventilation will automatically increase.

Expansion PCB

An expansion PCB extends the functions in the control system so you can control various accessories.

Under "Electrical connection accessories" you will be able to see which accessories require an expansion PCB.

EM-box

If you want to run the cooker hood via the ventilation unit, in some cases there may be insufficient air for cooker hood extraction.

If you install an EM-box, you can regulate the extracted air when the cooker hood is in operation, so that less air is drawn from, for instance, the bathroom and the utility room. This will allow enough air for the cooker hood to extract sufficiently.

The EM-box is fitted with a metal filter that cleans the air in the cooker hood of grease particles efficiently. It thereby protects the ventilation unit.

DTBU damper

If there is insufficient space for mounting an EM-box in the installation, you can achieve the same effect by controlling the extract air with a DTBU damper.

You then have to adjust the duct system yourself with a connection to the cooker hood.

Extension cable HMI user panel for 8-pin plug

The control panel for the ventilation unit is connected to a short cable so that the panel can be mounted in the immediate vicinity of the unit. The panel can also be mounted on the front of the unit.

Is the unit located in a place where you can not immediately see the control panel, e.g. in a closet or on a unused ceiling, you can order a 10 or 20 m extension cable with plugs, so that the control panel can be placed in a place where the user has the opportunity to see it.

It is important that the control panel is located so that the user can see any alarms such as when changing filters i needed.

Cover plate HMI user panel

It is possible to move the HMI control panel away from the unit and place it in a more visible place.

A cover plate can be ordered to cover the hole where the control panel was located.

Safety group

By law, a safety group must be fitted for the cold water connection to the hot water tank.

Nilan offers a safety valve in brass with the following functions:

- Safety valve
- Check valve
- Stop valve
- Drain tab

Safety group with scalding protection

The control has a software scald protection that ensures that the water in the hot water tank does not gets too hot.

If you have a large cooling and / or heating need, it may be necessary to deactivate the software scald protection. The water in the hot water tank can be up to 90 ° C, which is why you need to install a safety group with scald protection.

If a solar panel is used to heat the domestic hot water via the supplementary coil in the hot water tank, a safety group with scald protection must be fitted.

Flexible sound damper

To make it esay to service the unit in the future, we recommend that you fit a flexible connection between the unit and the duct system.

Nilan flexible sound damper absorbs sounds effectively from both the duct system and from roof stacks.

Pollen filter

The ventilation unit comes, as standard, with a plate filter to protect the unit.

If the dwelling is used by anybody with, for instance, pollen allergies, you may benefit from purchasing a pollen filter. This should be placed in the outdoor air intake, which will reduce the pollen count in the dwelling.

Trolley

A Nilan trolley makes it easy to transport the heavy units into the home, without having to carry out heavy lifting yourself with the risk of injury.

A set consists of two lifting carts that are fastened on each side of the unit while it is standing on the pallet. Using the two handles, lift the unit off the pallet and drive it to where it is to be used.

Set-up

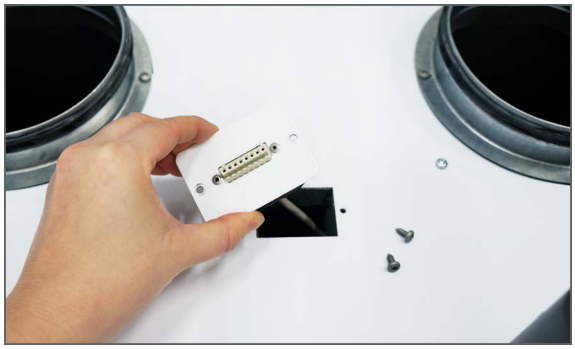
Mounting

Transport into the dwelling

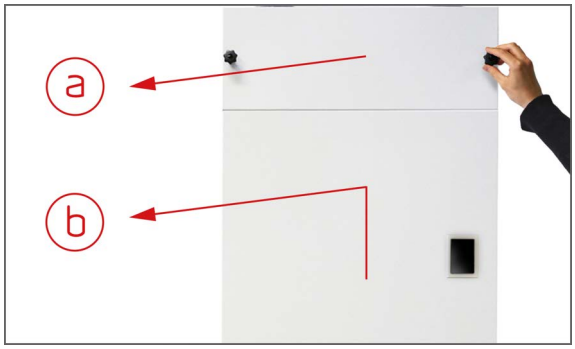
The ventilation unit is delivered assembled and wrapped on a pallet. You can use Nilan lifting trolley, with which the unit can be lifted directly off the pallet and into the building without heavy lifting. If the exchanger box is removed, the unit can be manoeuvred through an ordinary door.

Disassembling the exchanger box

It may be necessary to disassemble the exchanger box when servicing fans and other components. It can also facilitate transport if the unit is to pass through a door.



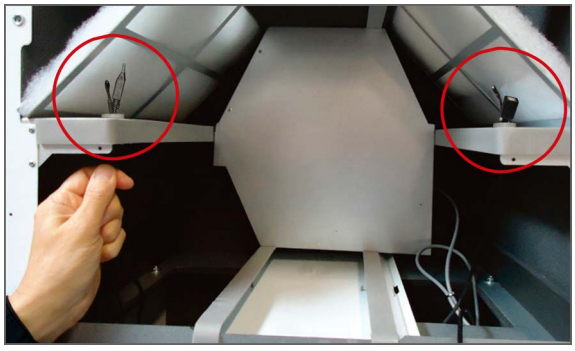
1.Remove the 8-pole plug located at the top of the unit and push it down into the hole.

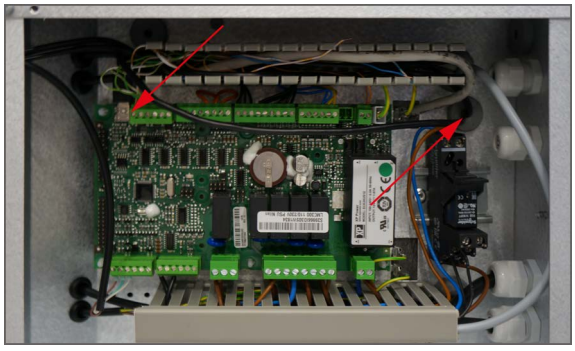


2. Demount the front plate.
a: loosen the thumb screws and remove the filter door.
b: lift up the large door and remove it. Detach the RJ plug from the control panel on the rear side of the large door.
Unscrew the cover plate under the large door and remove it.

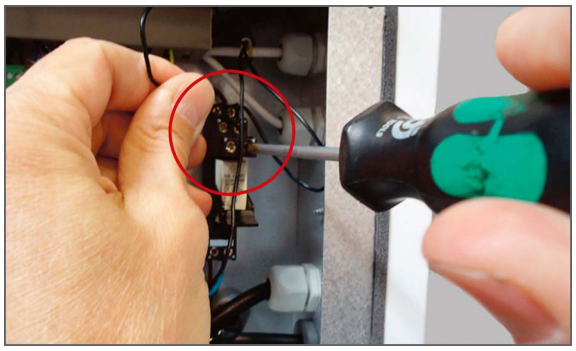
3. Pull out the T4 sensor from the heat exchanger

4. Pull out the heat exchanger from the unit.





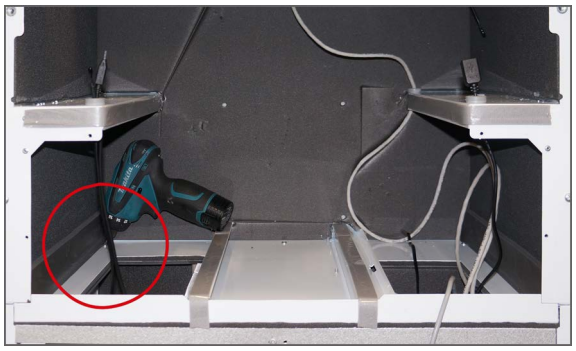
5. Sensor and humidity sensor are pulled down through the tulle in the shelf on the left side of the unit.
ATTENTION! The T1 sensor, which is located in the shelf on the right side (together with the USB connector), must be pulled down through the tulle.



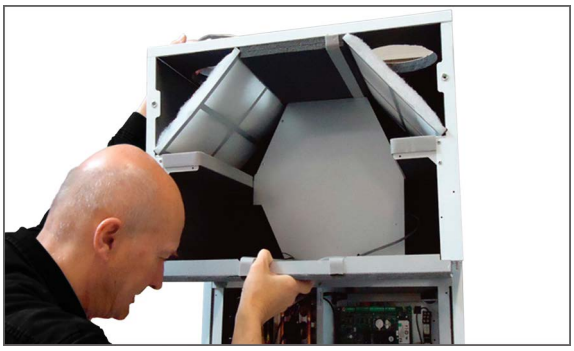
7. Unscrew the 4 wires from the terminals for the bypass motor.

6. The plug of the USB cord is pulled out of the board, after which it can be pulled through the tulle.

8. The bypass box is pulled out.
Then push the 8-pole plug into the duct for the fan part.



9. Remove the 6 pcs. screws on the bottom.



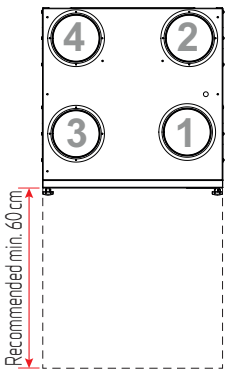
10.The top is lifted by the lower part.

Positioning the unit

ATTENTON

A free space is recommended in front of the ventilation unit of at least 60 cm.
It must be easy to replace filters and e.g. it must be possible to remove the exchanger, replace the fan or other components.

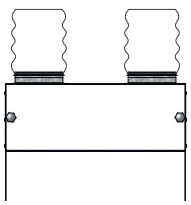
The unit must be level to enable proper drainage from the condensate tray.



ATTENTON

When replacing or servicing certain components, such as fans, you will need to remove the top of the unit. In order to make the top of the unit easily removable, flexible connectors should be fitted between the unit and the ducts.

If flashings are fitted above the unit, these must be easily removable.



The unit makes little noise and it produces only weak vibrations, but you should still take into account potential vibrations that can spread from the unit to individual building components. There should be approx. 10 mm distance to other building components and to permanent fixtures.

Electrical installation

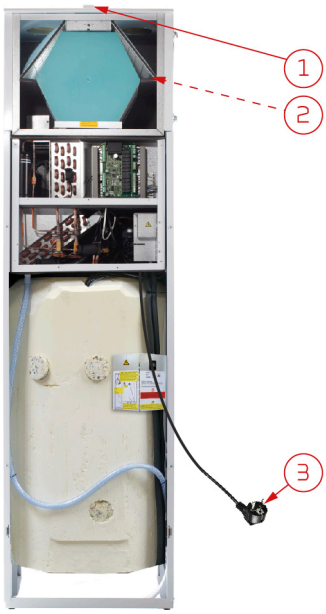
Safety

ATTENTION
All work must be carried out by qualified persons and in compliance with existing legislation and regulations.

ATTENTION
It is important that the power is off, if you do work to the electrical components of the unit.

It is important to check that wires are not damaged or squeezed during connection and use.

Connections overview



Connection of 230V is located behind the unit's large door, the cable can be routed to the back of the unit at the bottom. The connection to the control system via USB cable is situated behind the filter door at the front of the unit. An 8-pole plug is found on top of the unit.

1. 8-pin connector with option to connect user selection1, Modbus and HMI control panel / T1 sensor.
2. Connection of PC via a USB cable.
3. Connection of 230V plug (remember electrical grounding),

Electrical connection unit

Power supply

CAUTION
The power supply is plugged into a 230V socket with a safety switch. It is important that the unit has earth connection.

The ventilation unit is supplied with an EU Schuko plug for 230V power supply.

This means that if you have not installed a shoko socket with side earth or pin earth, an Adapter schuko plug with pin earth must be used.

This Schuko adapter can be plugged into the ventilation unit's Shuko plug and then into a socket with earthing.

Schuko socket with side earth

Schuko socket with pin earth

Example of Adapter Schuko plug with pin earth

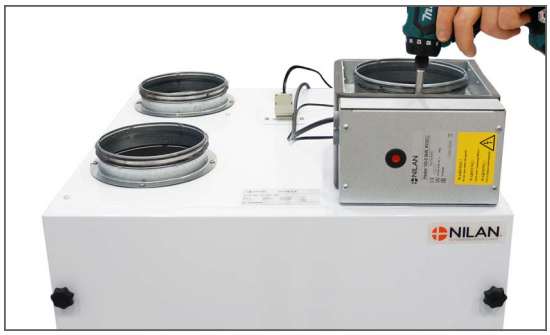
Electrical pre-heating element

If the unit is purchased as a Polar version, the electric preheating surface is mounted on top of or on the side of the unit in the outdoor air duct before the unit with the required temperature sensor.

1. The electric heating surface is located under the unit.

2. Outdoor air spout are removed.

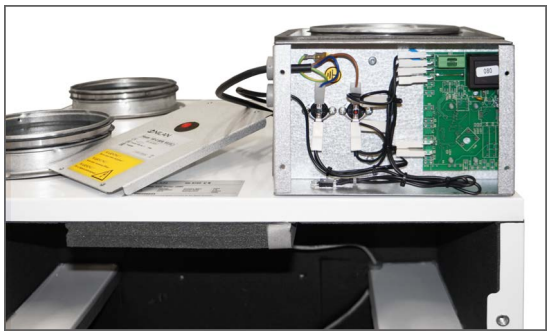
3. The preheating surface is installed at the outdoor air duct connection on the top (standard) or on the side of the unit (in which case the cover plate must be moved to cover the hole in the top). Be sure to place the heating surface so that the cover for the automatic opening can be easily opened.



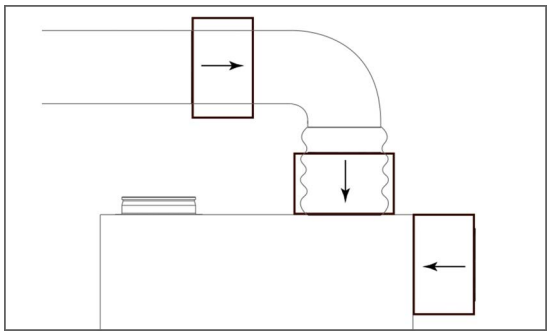
4. The spout is mounted on the heating surface, ready for duct mounting.

5. The temperature sensor for the preheating surface is pushed 8 cm into the tulle. Then, inside the unit, it can be seen hanging just above the outdoor air filter.

6. The T1 sensor is pulled from the 8-pole outlet into the outdoor air duct (30 cm before the preheating surface).



7. The power supply cable is pre-mounted in the unit and the preheating surface connected with Phase (F), Zero (N) and Ground (J).



8. The preheating surface can be mounted on the top or side of the plant, as well as in the duct. The power supply cable is 2 meters extra for duct mounting.

Connecting a Gateway

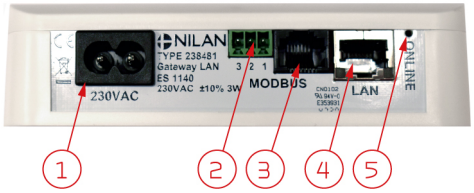
Location on the unit

On Compact S units, the gateway is installed on the filter box on top of the unit.

The gateway arrives from the factory already connected to the Modbus connection of the unit.

A wire for a 230V connection is included. Connect this to an external power socket.

Connections overview Gateway



1. 230V connection (wire included)
2. Reserved for future connections
3. Connection to the Modbus connection of the unit
4. Connection to the user's internet router
5. Light to check connection

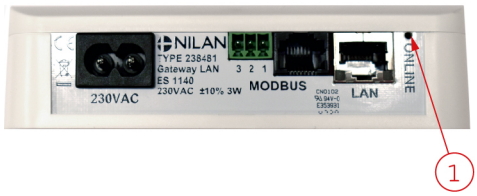
Electrical connection

Using the supplied cable, connect the Gateway to 230V.

Connecting to the internet

Using an RJ45 cable, you connect the gateway to a router with internet connection (cable not supplied by Nilan).
Once the gateway is connected to a power supply and connection to the router has been established, you will have a secure cloud connection. You can now use the Nilan User APP to communicate with the gateway.

Checking connections



The ONLINE indicator makes it possible for you to check the connections by using the following code:

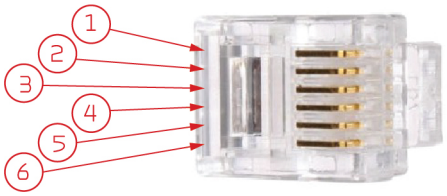
- When connecting 230V - the light will flash for 5 sec.
- When connecting Modbus communication - the light flashes continuously
- When connecting a Router - the light comes on and stays on
- When connecting a Router without Modbus communication - the light does not come on

HMI Control panel

Moving the control panel

The control panel is from the factory mounted in the front of the unit. It is important that the control panel is located in a visible place so that the user can follow the unit operation and become aware of any alarms. Therefore, it may be necessary to move the control panel to another location.
A cover plate can be purchased for mounting in the hole in the front of the unit where the control panel is located from the factory.
The wires from the 8-pin plug, for connection of the HMI control panel, are placed loose in the unit and must be connected to the circuit board (according to the wiring diagram), where the wires from the front-connection are removed.
Nilan offers a connection cable with RJ12 plugs of 10 m and 20 m, respectively. It is also possible to customize a cable up to 50 m in length. A standard LAN cable is used for this.

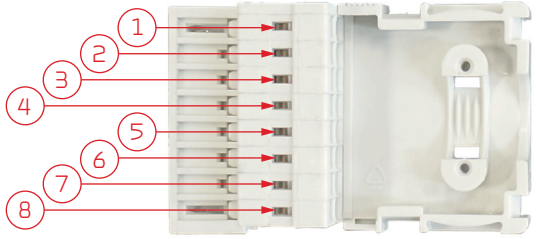
Mounting the RJ12 plug



1. Empty
2. Empty
3. Green (A2)
4. Green/white (B2)
5. Brown (12V)
6. Brown/white (GND)

Use a RJ12 crimping tool

Mounting in the 8-pin plug



1. Brown/white (GND)
2. Green/white (B2)
3. Green (A2)
4. Empty (User selection 1)
5. Empty (User selection 1)
6. Empty (Modbus A1)
7. Empty (Modbus B1)
8. Brown (12V)

Wall bracket

Mount the HMI panel on the wall using the integrated wall bracket.

The panel should be placed in a visible spot so it is possible to change settings and to monitor warnings or alarms regarding operation of the unit.

The wall bracket is located at the back of the panel. You can detach it by loosening the bracket at the bottom of the panel. You can then remove it.

Mount the wall bracket on the wall using 2 screws.

Click the RJ12 plug into place at the bottom of the HMI panel. The wire can run down along the wall, into the wall or through the groove at the back of the panel.

Electrical connection accessories

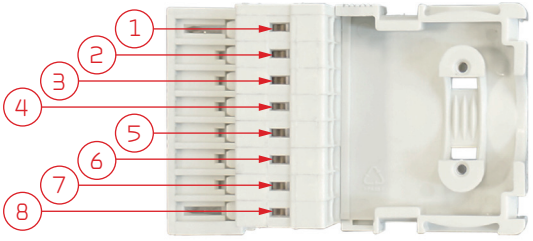
User selection 1

User selection 1 is connected via the 8-pin plug mounted on top of the unit.

The user selection functions are used to override normal operation. The input signal must come from a potential-free switch. When closed, the function is activated with the settings selected in the control panel under Service / User selection.
Some examples of the situations in which the user selection functions are used:

Cooker hood	If you choose to run the cooker hood over the ventilation unit, the cooker hood sends a potential-free signal to the ventilation unit when it is switched on. When this happens, the ventilation unit increases the air volume to the set level, so that enough air is extracted through the hood.
Fireplace/wood burning stove	Normally, the ventilation is balanced with a small negative pressure in the home, so that no moisture is forced into the building's construction. It is a disadvantage if you light up your fireplace / wood stove, as the smoke will then enter the home instead of out of the chimney. When you switch on the fireplace/burning stove, you can activate the user function with a potential-free switch, which ensures that there is an overpressure in the home, so that the smoke smokes out of the chimney as it should.
Extended operation	If the ventilation unit is used in an office or school where the ventilation is reduced outside the opening hours, it may be necessary to turn it up briefly if, for example when a meeting is held in the evening. There you can then have a switch that is activated and the ventilation is increased e.g. for an hour before it then goes back into operation.

Connection via the 8-pin plug:



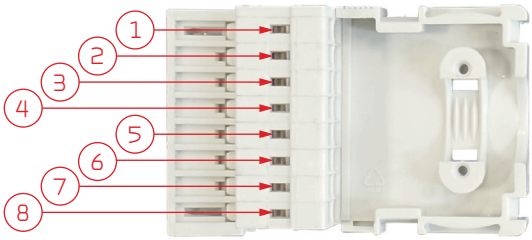
Pin 4: GND
Pin 5: User selection 1

Modbus

The CTS602 controller has an open Modbus RS485 communication, that allows you to communicate with it and control the ventilation unit via external control systems.

We refer to the software manual and the Modbus protocol for further information about settings and registers.

Connection via the 8-pin plug:



Modbus is connected in following pins:
1. GND
6. A1 (Modbus +)
7. B1 (Modbus -)

External electrical pre-heating element

It is possible to purchase an external electrical pre-heating element for frost protection of the ventilation unit.

The electrical pre-heating element is mounted in the outdoor air duct before the unit with the necessary temperature sensor.

If it is desired to see the actual outdoor air temperature on the control panel, the temperature sensor T1 / T8 must be led out into the duct before the pre-heating element.

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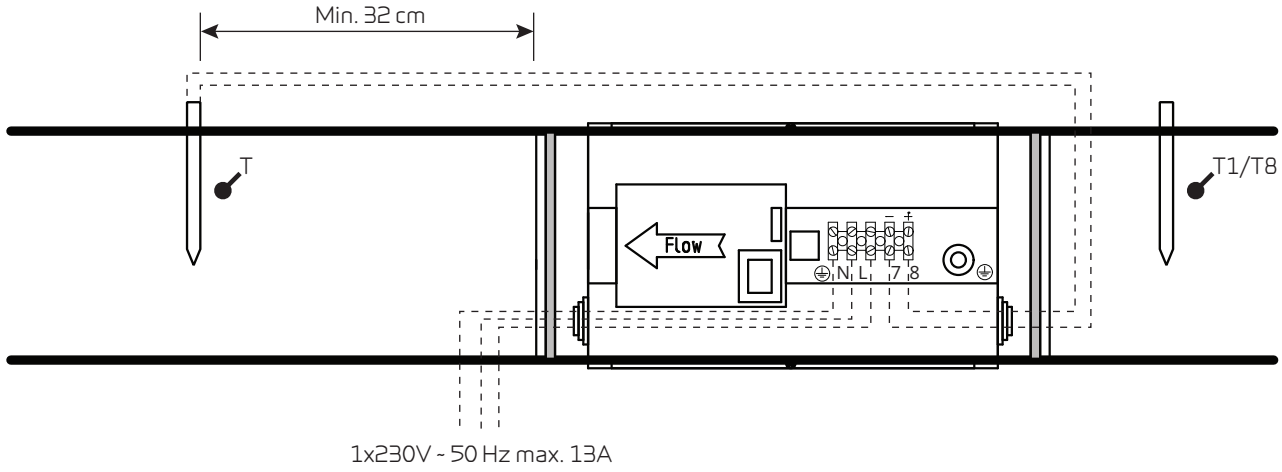


It is important that the sensor is placed at least 32 cm from the pre-heating element to achieve correct regulation.

The pre-heating element has a three-step safety system that prevents overheating.

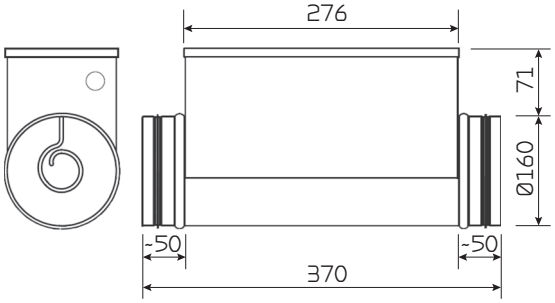
1. An operating thermostat regulates the heating and ensures that the supply air temperature does not fall below -1 °C
2. Should the temperature exceed 50 °C, a max. thermostat switches off the pre-heating element. (If installed vertically with downward airflow, the pre-heating element switches off at 70 °C)
3. A safety thermostat switches off the pre-heating element if the temperature exceeds 100 °C. Then, you must reset it manually.

Minimum airflow at Ø160: 110m^3/h.

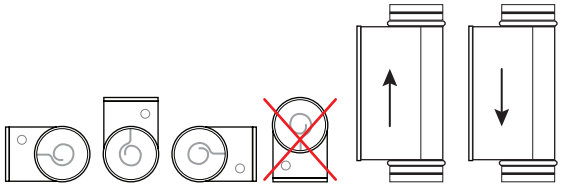
ATTENTION

The heating element must be insulated with a fire retardant insulation material. The cover of the Connection Box, however, must not be insulated.

Dimensional drawing:



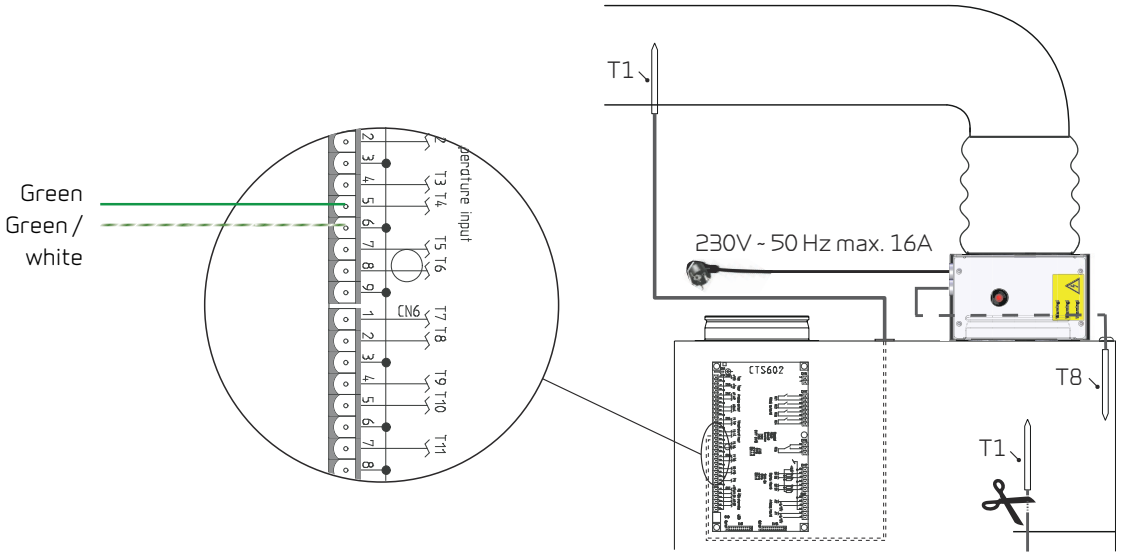
Positioning options:



External electrical pre-heating element for mounting on top or side

If your ventilation unit is not a Polar version with an integral pre-heating element, it is possible to purchase an external electrical pre-heating element for frost protection of the ventilation unit.

The electrical pre-heating element is mounted in the outdoor air duct on top or side before the unit with the necessary temperature sensor.



From the factory the temperatur sensorT1 has been mounted under the outdoor air filter in the unit. Cut off the temperatur sensor T1 and mount the new temperatur sensor T1 according to the enclosed electrical diagram. The new temperatur sensor T1 is mounted in the outdoor air duct before the pre-heating element.

It is important that the sensor is placed at least 32 cm from the pre-heating element to achieve correct regulation.

The pre-heating element has a three-step safety system that prevents overheating.

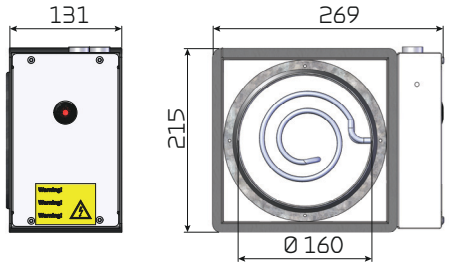
An operating thermostat regulates the heating and ensures that the supply air temperature does not fall below -1 °C
Should the temperature exceed 50 °C, a max. thermostat switches off the pre-heating element. (If installed vertically with downward airflow, the pre-heating element switches off at 70 °C)
A safety thermostat switches off the pre-heating element if the temperature exceeds 100 °C. Then, you must reset it manually.

Minimum airflow at Ø160: 110m^3/h.

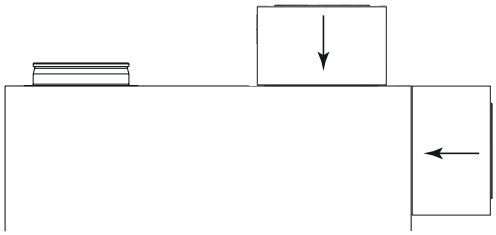
ATTENTION
The heating element must be insulated with a fire retardant insulation material. The cover of the Connection Box, however, must not be insulated.

ATTENTION
When installing the pre-heating element, please ensure that you turn it so you can still easily open the electrical junction box. .

Dimensional drawing:



Positioning options:



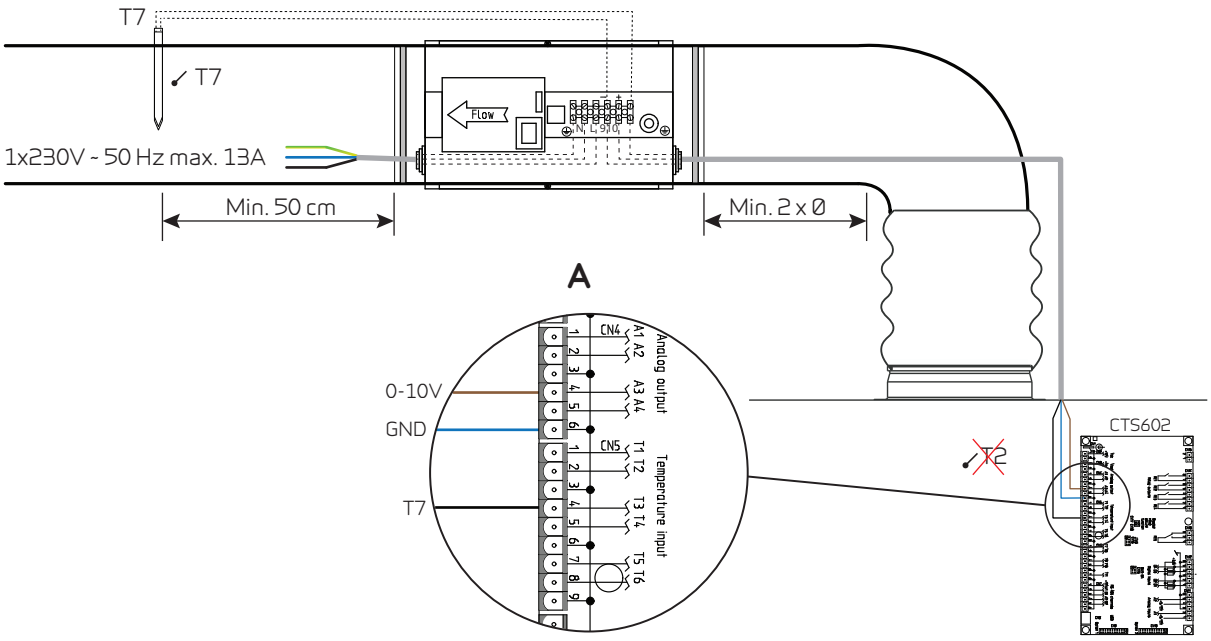
Electrical after-heating element

An after-heating element is necessary if you want to control the supply air temperature.

The electrical after-heating element can be purchased for installation in the supply air duct. The required sensor, Expansion PCB and connectors to the ventilation unit are included..

ATTENTION

The T7 temperature sensor is mounted after the heating element. The T2 sensor must be disconnected from the circuit board, and the T7 sensor must then be connected to where the T2 sensor was previously connected.



A

Connection on the CTS602 circuit board:

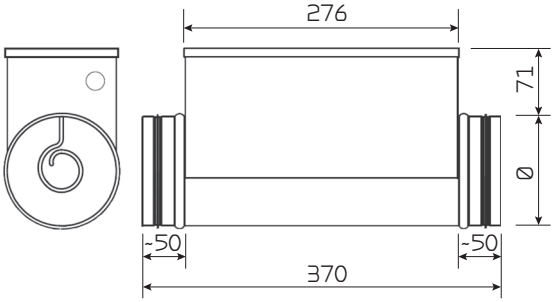
0-10V (Brown) - GND (Blue) T7: Temperatur sensor (Black)

Run the wires along the duct and through a grommet on the unit down to the circuit board. Connect the wires in accordance with the wiring diagram.

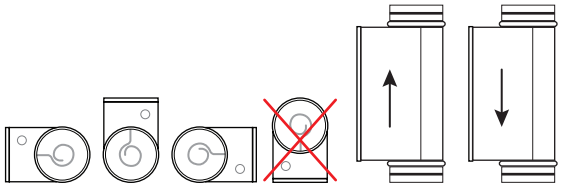
ATTENTION

You must ensure that the heating element is insulated with a fire retardant insulation material. The cover of the Connection Box, however, must not be insulated.

Dimensional drawing: Ø125/Ø160/Ø200



Positioning options:



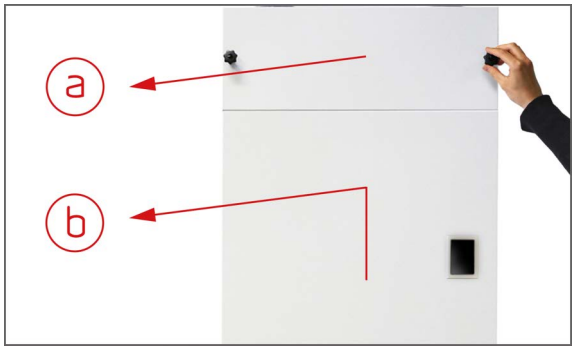
ATTENTION

The heating element must be activated in the Software under Service

CO_2 sensor

If there is a large load change in the home / building, it is advantageous to install a CO2 sensor to control the air exchange. The CO2 sensor measures the CO2 level in the exhaust air, and regulates the ventilation level accordingly.

The CO2 sensor is mounted in the unit as illustrated below:



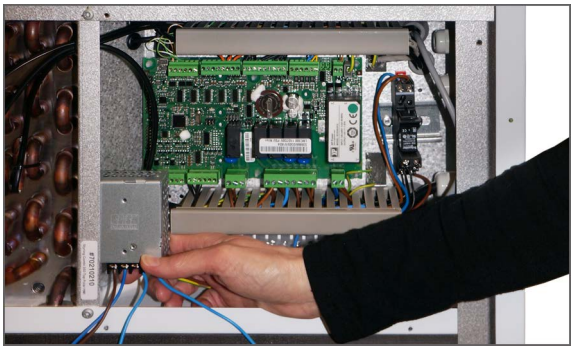
1. Demount the front plate
a: Loosen the thumb screws and remove the filter change cover.
b: Lift up the large door and remove it. Detach the RJ12 plug from the control panel on the rear side of the large door.

2. Remove the screws and demount the cover plate.

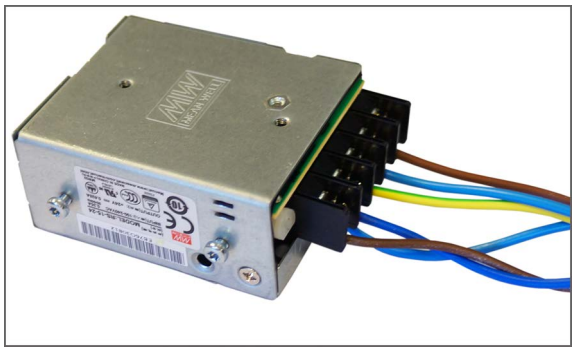
3. Remove (pull out) the T4 sensor in the heat exchanger.

4. Remove the heat exchange by pulling the strap (do nut cut the strap).

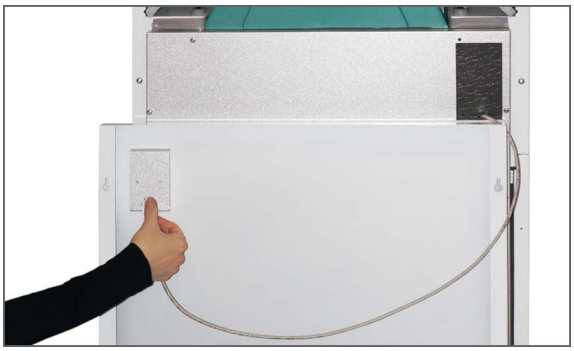
5. Mount the CO2 sensor in the metal shelf underneath the filter of extract air, using self-threading screws (included in the CO2 sensor kit).



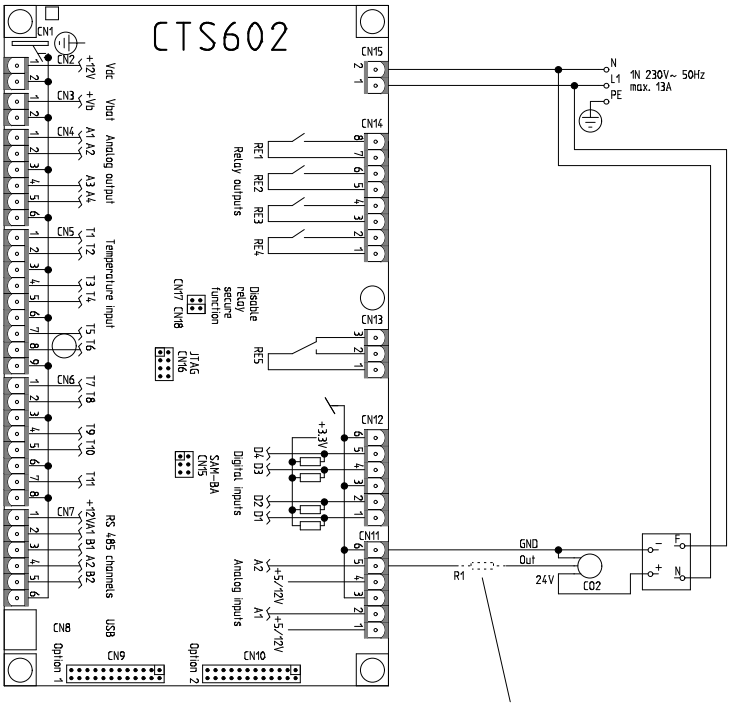
6. Run the wire from the CO2 sensor through the cable grommet to the automation.
Mount the power supply box in the box for automatic (pre-drill 2 holes for the screws included in the CO2 sensor kit).



7. Connects as shown in the electrical diagram below



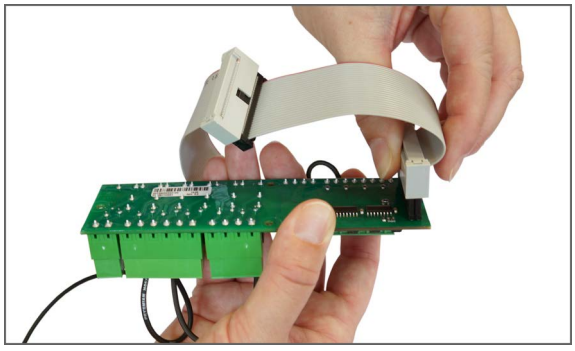
8. Reinstall the counterflow heat exchanger. Remember to reinstall the T4 sensor.
Mount cover plate again and afterwards front plate.
Remember to reconnect RJ12 plug in control panel.



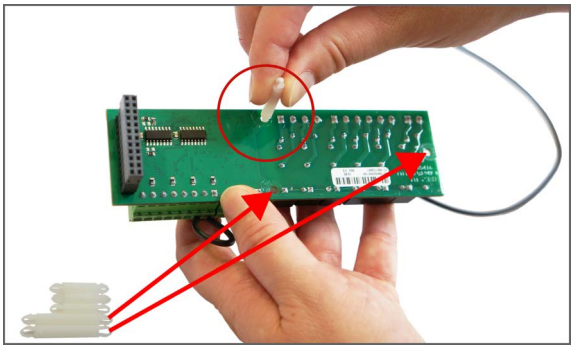
For SW version 2.00x or less, the resistor must be mounted in series with a black signal cable
For SW version 2.01x and above, do not mount a resistor.

Installation of expansion PCB on CTS602 circuit board

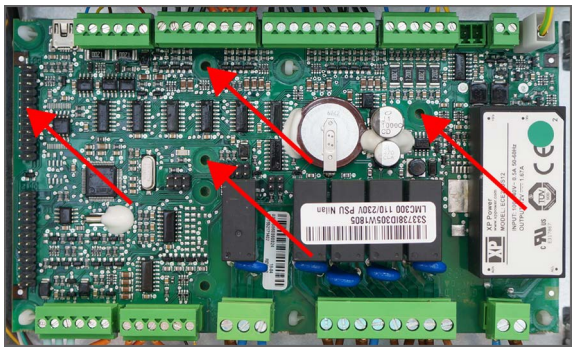
With an expansion PCB, it is possible to expand the functions within the control system. It makes it possible for you to add accessories as shown on the following pages.



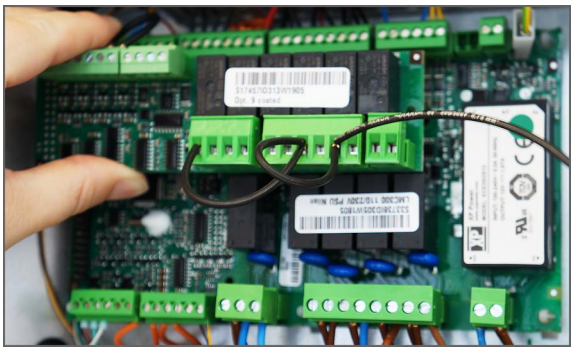
1. Demount the shown bus cable from the expansion PCB.



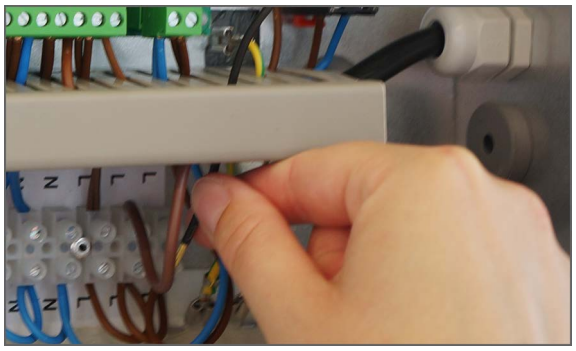
2. Mount the large circuit board supports in the 3 holes on the expansion PCB.



3.Connect the expansion PCB to CN9. Mount the circuit board supports in the holes provided for this on the CTS602 Light circuit board.



4. Mount the expansion PCB on the CTS602 Light circuit board.



5. Connect the wires up in accordance with the wiring diagram.

ATTENTION

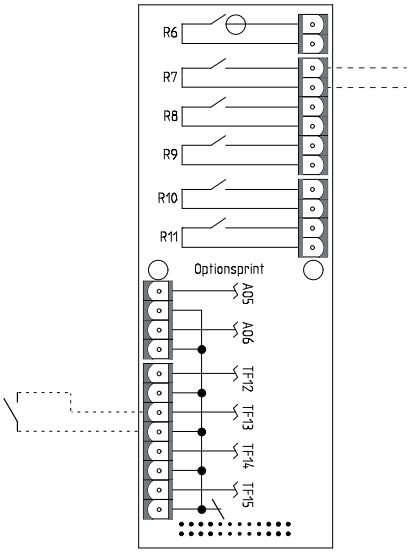
The expansion PCB and the connections must be installed by a certified electrician.

The expansion PCB is an accessory for the CTS602 circuit board. Nilan does not supply external components.

User selection 2

With User selection 2, the same options are achieved as with User selection 1. In addition, you get the option of a relay output that can control e.g. a damper or whatever need one may have to control an external function.

User selection 2 potential-free input is connected to TF13 and User selection 2 output is connected to relay R7 on the PCB board.



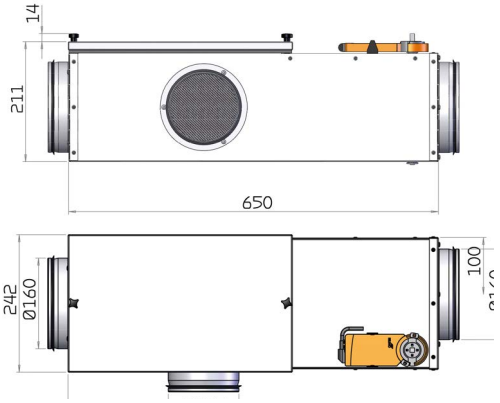
EM-box (damper option)

If it is desired to run the cooker hood over the ventilation system, it may in some cases be difficult to get enough air for the cooker hood.

With an EM box installed and when the cooker hood is in operation, you can regulate the extraction so that less air is extracted out of the other rooms, e.g. bathroom and utility room so that there is enough air for the cooker hood to extract sufficiently.

The EM box is equipped with a metal filter that effectively cleans the cooker hood air of grease particles, as extra protection for the ventilation unit.

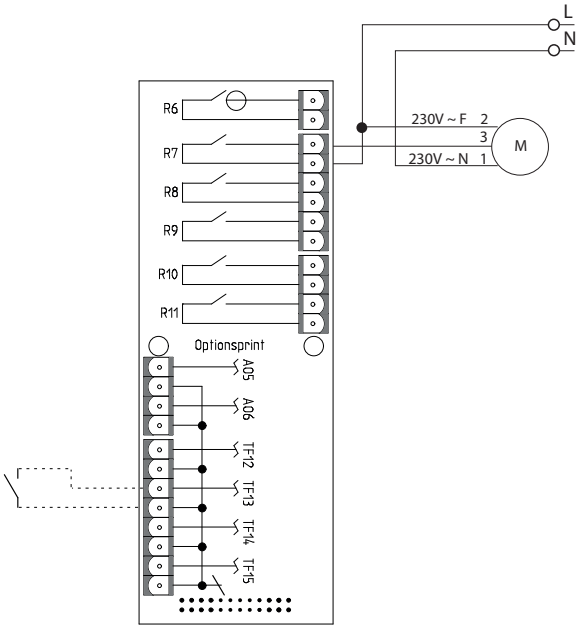
Dimensional drawing:



The system works as follows:
When the cooker hood is switched on, User selection 2 is activated. The ventilation unit increases the ventilation and at the same time sends an output signal to the EM box that it must close the damper for extract air from the other rooms. However, the damper does not close completely in, there will still be extraction from the other rooms, just reduced.

When balancing, the small stop blocks on the damper must be set so that the basic ventilation is maintained from the other rooms.

The EM-box solution is connected to the PCB board via the following electrical diagram:



DTBU (damper option)

If it is desired to run the cooker hood over the ventilation system, it may in some cases be difficult to get enough air for the cooker hood.

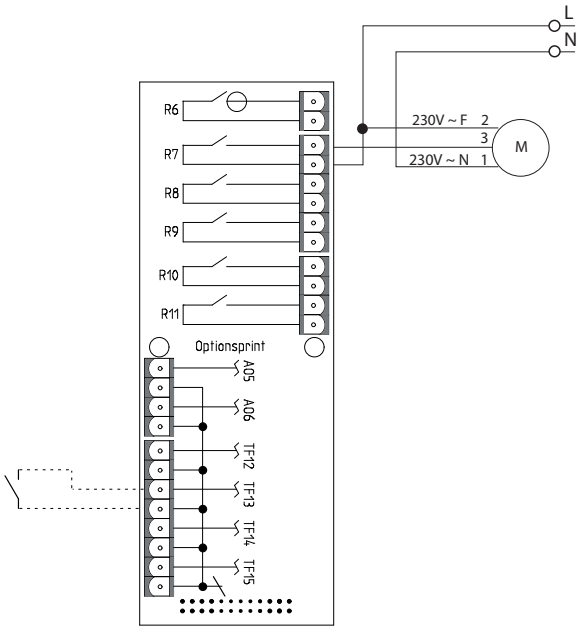
To solve that challenge, an EM-box solution can be used. However, if there is not enough space in the installation for an EM box, you can alternatively connect a DTBU damper in the duct system, which has the same function, except that it does not have a built-in dirt filter. However, a filter box with a steel filter can be purchased, which can be mounted in the duct system in a suitable place.

The DTBU damper regulates the extract air so that less air is extracted out of the other rooms, e.g. bathroom and utility room so that there is enough air for the cooker hood to extract sufficiently.

The system works as follows:
When the cooker hood is switched on, User selection 2 is activated. The ventilation unit increases the ventilation and at the same time sends an output signal to the DTBU damper that it must close the damper for extract air from the other rooms. However, the damper does not close completely in, there will still be extraction from the other rooms, just reduced.

When balancing, the small stop blocks on the damper must be set so that the basic ventilation is maintained from the other rooms.

The DTBU damper is connected to the PCB board via the electrical diagram.



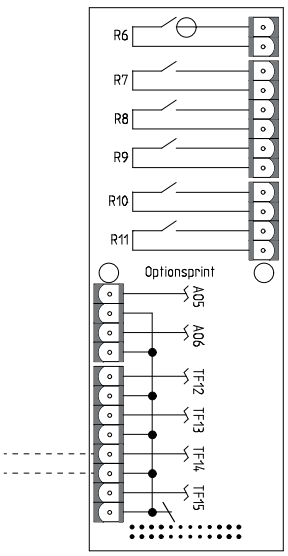
Fire thermostat / external fire automation system

The ventilation unit can be connected up to an external fire thermostat that will stop the ventilation unit in the event of fire. The same port can be used for connection of an external fire automation system.

The control system identifies a broken input signal as fire, and stops. It will only restart once connection to the fire thermostat has been established or the external fire automation system starts signaling again. This must be done manually via the control panel.

When you connect up an external fire automation system, it will be necessary for the ventilation unit to restart automatically. You can set for this to happen on the control panel. Please consult the software instructions for further information.

The connection is made on the expansion PCB via the electrical diagram.

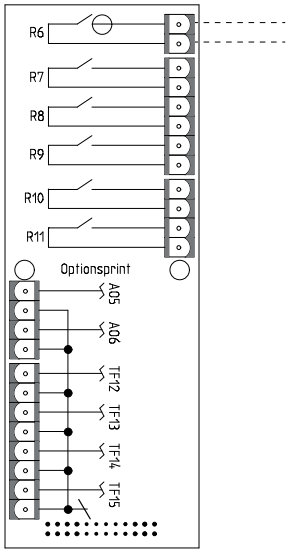


ATTENTION
If this function is not used, a jumper must be established on the expansion PCB. Otherwise there will be a fire alarm in the control system.

Joint alarm

It may be difficult to notice alarms if the unit is located in a place where access is difficult or infrequent, and if the control panel is located in the same place.

An external alarm indicator in the form of an electric bulb or an acoustic signal can be connected to the ventilation unit and announce when an alarm occurs. This could, for example, be when filters need replacing.



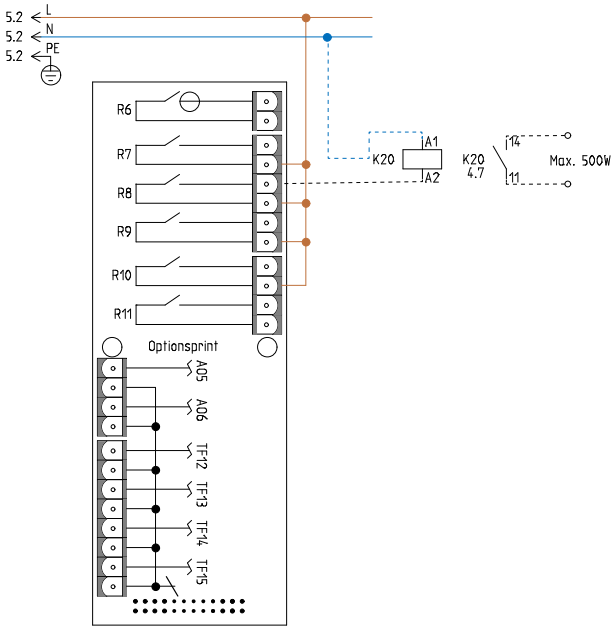
External heat supply

The unit can control an external heat supply, such as electric radiators or an underfloor heating system. This feature is used in the cases where the unit contributes to the heating of the house via a heat pump and/or a after-heating element.

The room temperature is monitored by the unit's control system, which only releases the external heat supply if it cannot heat the home/house to the desired room temperature.

External heating supply is connected to the expansion PCB via relay R8, and the settings are set in the control panel.

Read the software manual to see which settings to set.



Plumbing installation

Condensate drain

Important information

Compact S is supplied with a reinforced 20 mm condensation drain pipe with built-in water lock.

ATTENTION

The condensate drain should be installed with an even fall of at least 1 cm per m to the nearest drain.

Similarly, the overflow from the safety valve must be led to a prominent drain.

ATTENTION

If the unit is assembled outside the climate screen, it is important to secure the condensate drain against icing with a proper insulating.
If necessary, a heating cable can be added.

Frost protection of the unit is the installer's responsibility.

The connection of the water trap must be air-tight, otherwise air will be sucked into the unit and condensate water will not be able to run out. It could cause water damage if the condensate tray overflows and condensate water runs out of the unit.

After installing the water trap, its function is tested as follows (the unit must be connected to the duct system):
Fill the condensate tray with water, close the door and start the unit at the highest fan speed level. Allow it to run for several minutes. Open the door and check that there is no more water in the condensate tray.

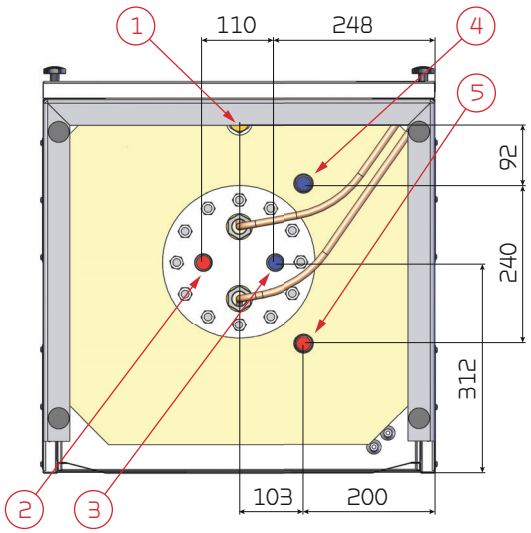
ATTENTION

The water trap is integrated in the hose that runs from the condensate tray to the drain and is mounted from the factory. The hose may under no circumstances be cut.

Hot water tank

Connection overview

Compact S front



Compact S back

Connections:

1. Connection for 3/4" circulation pipe
2. Hot water outlet 3/4"
3. Cold water intake 3/4"
4. Return supplementary coil 3/4"
5. Supply supplementary coil 3/4"

All listed measurements are in mm.

Supplementary coil is only standard on Compact S SOL models.

The coil is located in the bottom, and has an external diameter of 22 mm and is 8,500 mm long, equivalent to 0.6 m^2.

Connection

ATTENTION
All work must be performed by qualified personnel and in accordance with relevant legislation and regulations.

Nilan's hot water tanks are double-enamelled, ensuring long life. The efficient foam insulation protects against unnecessary heat loss.

All connection nozzles for water have 3/4" thread and are located in the tank bottom.

The tank is also fitted with an electronically-monitored sacrificial anode that automatically displays a warning on the display when it needs changing.

CAUTION
Changing the anode when notified on the display is important. Failure to do so can cancel the guarantee on the hot water tank.

The tank is fitted with supplemental electric heating deactivated by default and activated via the control panel if required.

ATTENTION
The supplemental electric heating must not be activated before the water tank is full of water.

Requirements to quality of water

The hot water tank in the Nilan units is made of steel, which has been given a double enamelling, to ensure an extra long service life. In addition, the tank is equipped with a sacrificial anode as extra protection. It is important that the sacrificial anode is replaced regularly.

Most units are equipped with an electronic monitoring sacrificial anode, which gives an alarm on the user panel when it is time to replace it.

In order for the sacrificial anode to function and protect the tank, it is required that the water quality complies with the following:

- Electrical conductivity (EC): Between 30 mS/m and 150 mS/m (millisiemens pr. m) @ 25 °C
- Chloride must be below 250 mg/L @ 65 °C

If the above criteria are not met, the sacrificial anode will not work as intended, after which the tank will be corroded.

Hot water circulation

Hot water circulation can be established by fitting a non-return valve and a circulation pump for domestic water to the tank's circulation connector.

If hot water circulation is not established, the connector must remain closed with the factory-mounted shut-off plug.

ATTENTION

Hot water circulation can lead to a significant heat loss in the pipes, diverting a good proportion of the heat pump's output. To avoid this, circulation pipes and the hot water loop must be insulated with at least 30 mm mineral wool.

It is advisable to set a timer so that the circulation pump is not running constantly.

Supplementary coil

All units ordered as a SOL models have integral supplementary coil, see connections list.

The supplemental coil is intended for solar heating systems, though it can also be connected to other heat sources, e.g. a heat pump.

ATTENTION

If a solar collector or other heat source is connected to the supplementary coil, it is recommended to install a scald protection on the hot water outlet.

Softened water

If it is wished to soften water with salt in a Nilan hot water tank, the following must be observed:

- The conductivity must be between 30 mS/m og 150 mS/m (millisiemens per m)
- The chloride content must be under 250 mg/L

If the above criteria are exceeded, the anode current will be too high, the anode will break down too quickly and the water will begin to smell bad.

CAUTION

De-mineralised water (double ion exchange) must not be used, as the tank will quickly corrode. De-mineralised is also referred to as desalinated and de-ionised water.

Plumbing connections accessories

Sikringsgruppe

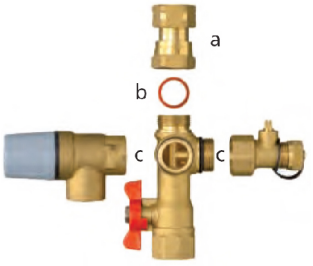
ADVARSEL
Sikkerhedsgruppe skal installeres i forbindelse med varmtvandsbeholdere.

Ved opvarmning til 60 °C udvider vandet sig med 2%. En trykbeholder vil kunne sprænge, hvis ikke sikkerhedsventilen lukker overskydende vandmængde ud. Derfor vil sikkerhedsventilen kunne dryppe under opvarmningen.

Montering:
a. Dobbeltomløberen påmonteres vandvarmerens koldtvandsrør, så pilene vender ind imod vandvarmeren (i strømningsretningen). Pakning mod vandvarmeren foretages som en gevindpakning.

b. Pakning imellem dobbeltomløberen og aggregatet foretages ved hjælp af fiberpakningen.

c. Gummiringen (O-ringen) monteres på aggregatet, så den kan fungere som tætning mellem sikkerhedsventil, aggregat, så ventilen låses.



Overløbsrøret skal udmunde synligt, og udstrømning skal kunne ske farefrit over afløb.

OBS
Vand udvider sig ved opvarmning, derfor vil sikkerhedsventilen dryppe.

OBS
Det påhviler installatøren at instruere forbrugeren om sikkerhedsventilens placering og funktion, samt at denne jævnligt, mindst 2 gange årligt, skal afprøves for at undgå tilgroning.

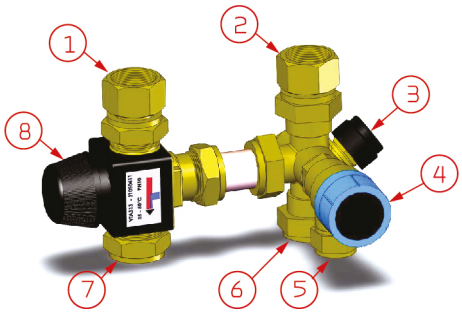
Safety group with anti-scald protection

In the control, a temperature limit for the domestic hot water of 65°C is set as standard. This setting prevents scalding of the users when the hot water tap is opened.

When the unit is in cooling mode, the energy is deposited in the hot domestic water tank instead of leading it out of the house. This also means that if the hot water temperature exceeds 65°C, the unit stops cooling the supply air. If there is a larger need for cooling, the temperature limit can be raised to 80°C, but then a scalding fuse must be fitted under the hot water tank, which prevents users from scalding when they open the hot water tap.

The scald protection mixes the hot water with cold water so that the temperature is lowered and scalding is avoided. This extended the period during which Compact can cool.

CAUTION
If a solar panel is connected to the hot water tank, an anti-scald device must be mounted.



1. Hot water from the hot water tank
2. Cold water to the hot water tank
3. Stop tap cold water
4. Pressure relief valve
5. The overflows from the safety valve are led to a prominent drain
6. Cold water supply
7. Domestic hot water for the dwelling
8. Mixing valve for domestic hot water for the dwelling (can be set between 35 - 60 °C)

Ventilation installation

Duct system

Legislation

ATTENTION
All work must be carried out by qualified persons and in compliance with existing legislation and regulations.

Ducts

There are two systems you can use to lead air through the dwelling.

Spiral ducts
Spiral ducts are made from metal and are cut to size using an angle grinder. They are then connected using ducting bends and manifolds and are fitted in accordance with the blueprint. The ducts are typically placed on the tie beams where they are fixed with perforated band, or they are suspended using suspension band. Avoid unnecessary bending of the ducts.

To prevent sound transmission from room to room, you should install a silencer for each room.

The ducts must be insulated to prevent heat loss and condensation. In some cases this can be avoided if the ducts are run through the standard insulation or inside the climate screen.

NilAIR tubes
NilAIR tubes constitute a flexible system that is easy to install. You can easily cut the tubes to size with a Stanley knife and then situate them in accordance with the blueprint without having to use bends and manifolds. You install a manifold box after the unit and run the tubes from the box out to the individual rooms.

When using NilAIR tubes, you do not have to install silencers for each room. The sound-damping effect of the tubes ensures that sounds and noise will not be transmitted from room to room.

If you install the tubes outside the climate screen, you must insulate them to avoid heat loss and condensation. This is simpler than using spiral ducts as NilAIR tubes are easily led through the standard insulation.

NilAIR tubes are more flexible than spiral ducts and you can therefore run the tubes in places that are unsuitable for ordinary spiral ducts.

ATTENTION
If the unit's cooling function is activated, it is recommended to condensate-insulate the supply air ducts and NilAIR boxes.

Ventilation unit

Nilan recommends installation of flexible connections between the ventilation unit and the duct system.

This is to avoid vibrations from the unit being transmitted to the duct system. It will also make it easier to move the unit, which may be necessary during future services of the unit.

Nilan can supply Soundflex tubes that you can use as flexible connections between the ventilation unit and the duct system. They will also reduce sounds from the system considerably.

The Soundflex tubes are insulated against condensation. It may, however, be necessary with further insulation in order to comply with local requirements with regards to insulation of duct systems.

Extract air

Install the extract air valves in high-humidity rooms and place them strategically where they can extract humid and vitiated air from the dwelling/building most efficiently.

High-humidity rooms are, for example:
- Bathroom
- Lavatory
- Kitchen
- Utility room

Supply air

Install supply air valves in living areas. Place them strategically so they cause minimum discomfort. It is, for instance, not recommended that you install supply air valves in areas where people are inactive, as the supply air may be experienced as draughty.

Living areas may be, for example:
- Living room
- Family room
- Bedroom
- Study

Roof terminals

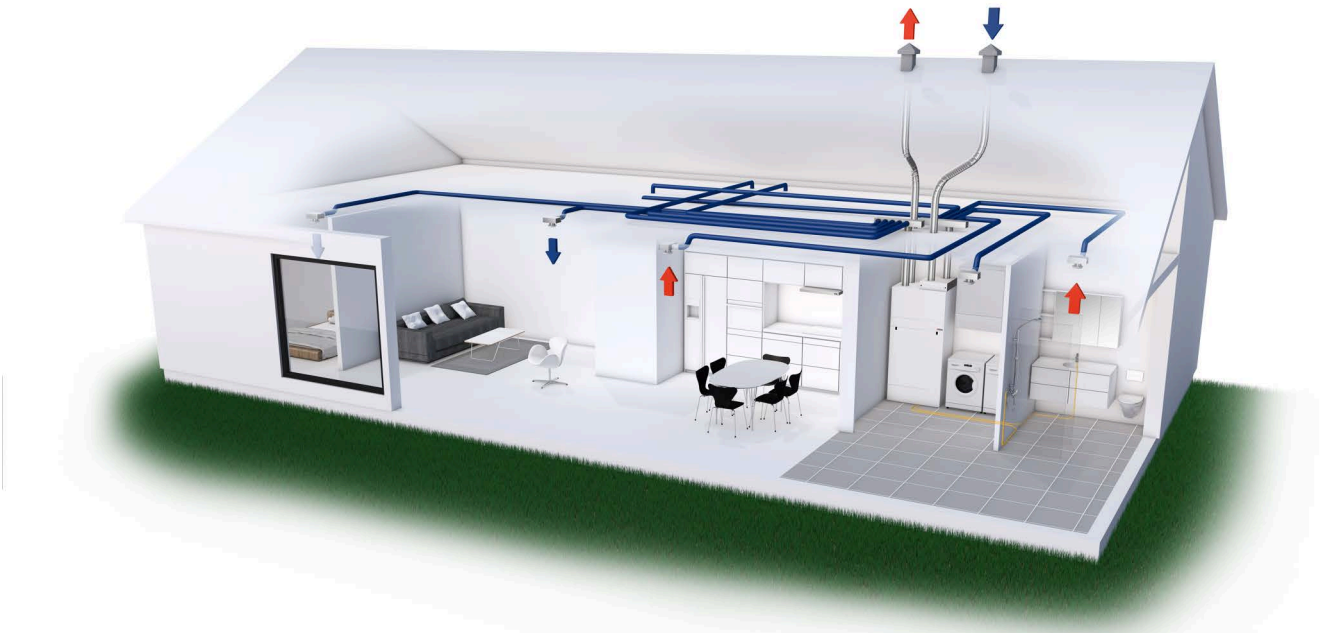
The position and design of air intake and air discharge should limit pressure oscillations in the ventilation unit caused by wind. Their position should also prevent birds and other animals from getting in. Finally, the position and design should ensure that air intake and the connected duct system are kept free of plants and foreign objects.

You must place the air intake so that the risk of a short-circuit from the discharge air is minimised, and with attention to the prevailing wind direction.

The air intake should be placed at least 50 cm above the roof surface. On black, flat roofs the distance from the roof to the underside of the intake should be at least 1 m. This will ensure that warm air is not drawn into the building during summer. Air intakes should be placed on the northern or eastern sides of pitched roofs.

You should also install a silencer between the unit and the roof stacks to prevent noise disturbance to your surroundings.

Installation example



Balancing

Important information

ATTENTION

To ensure the ventilation system operates optimally, it is important that it is balanced correctly. We recommend that experts do this.

It is important to measure the total supply air and the total extract air. The system must have a minimum vacuum, which means it draw out more air than it blows in. This will prevent dampness from being forced into the constructions of the building.

Troubleshooting

Emergency mode

Emergency mode domestic hot water

If an error occurs in the control system or components in the Compact S, and the unit therefore stops, it will not be able to produce domestic hot water.

If the installer is not able to come right away or the error happens outside the opening hours, and you therefore cannot contact the installer, there is a possibility to get hot water by setting the unit into emergency mode.

The button for emergency mode is located behind the large door.

The emergency mode has three settings:

I - Auto:
The supplemental electric heating is controlled by the unit control system (standard setting)

0 - Off:
The supplemental electric heating is turned off, and cannot be turned on via the unit control system

II - Manuel:
The supplemental electric heating is turned on, and cannot be turned off via the unit control system (do not turn it on if there is no water in the tank)

CAUTION
In manual emergency mode, the water temperature can reach 75 °C, which can cause scalding, if you are not careful when switching on the hot water.

Domestic hot water

Errors and solutions domestic hot water

Problem	Possible cause	Solution
The unit produces insufficient domestic hot water.	The filters may be blocked so that insufficient air is reaching the unit. This can occur if the filters are not changed frequently. This can occur if the unit has been operated during the building process and the filters are filled with dust and dirt.	Change the filters and, if necessary, change the filter change period to a shorter Interval.

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