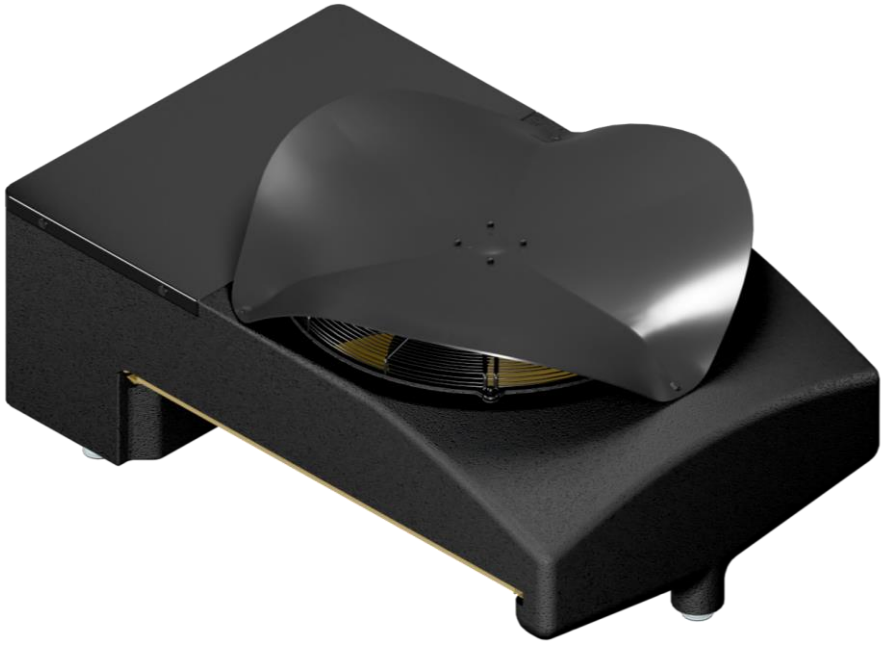
Blackbird Monoblock heat pump

Installation manual ENG



Weheat
Wolverstraat 23
5525 AR Duizel
Nederland

Installation manual – February 2025

English – Original instructions

Preface

About this Document

This manual contains instructions and important information about the installation of the Weheat heat pump.

This manual is intended for the installer of the Weheat heat pump. With this manual previous versions will be superseded.

Ensure that you have fully read and understood the instructions in this manual, before installing the heat pump. For future reference, you can consult the support page for the most up-to-date instructions.

Used Symbols

Symbol	Meaning
⚠ DANGER	This symbol indicates a hazardous situation that **could result** into severe injury or death if the associated instructions are not followed.
⚠ CAREFUL	This symbol indicates a hazardous situation which **could result** into significant injury or death if the corresponding instructions are not followed.
⚠ WARNING	This symbol indicates a hazardous situation that **could result** in injury or damage to the heat pump if the associated instructions are not followed.
WATCH OUT	This symbol provides useful information that is not related to a hazardous situation.
	This symbol indicates a reference to an external source.

Contact Information

For questions about the heat pump or this manual, you can contact:

Wolverstraat 23
5525 AR Duizel
The Netherlands
+31 (0)85 799 00 52
support@weheat.nl
www.weheat.nl

Supported configurations

Monoblock outdoor unit:

- Blackbird P80
- Blackbird P60

Indoor units:

- Hybrid pre-assembled indoor unit WHP
- All-electric pre-assembled indoor unit WEP
- Hybrid compact WHC
- All-electric compact WEC

Table of Contents

1 Safety

1.1 Safety Symbols on the Heat Pump

Symbol	Meaning
	Read the instructions in the manual.
	Warning; fire hazard due to flammable material.

1.2 Safety Warnings

⚠ DANGER

Risk of fire, explosion, and electrocution. Ensure that you have fully read and understood the instructions in this manual before installing, operating, or maintaining the heat pump.

Risk of fire and explosion:

- Never place the Blackbird near an open fire, the refrigerant in the heat pump is flammable.
- Ensure that there is no open fire nearby during service and/or installation operations on the heat pump.
- Under no circumstances shall potential sources of ignition be used when searching for or detecting refrigerant leaks. A halide leak detector (or any other detector using an open flame) shall not be used.

Risk of electrocution:

- The heat pump and indoor unit may only be installed by a qualified installer.
- Do not perform operations on your heat pump or indoor unit not described in this manual.
- Ensure that the cables used for connection show no signs of wear or corrosion.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate earthing (grounding) can cause accidental injury or death.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

⚠ CAREFUL

- Keep sufficient space free around the heat pump for good air circulation.
- Children under 14 years of age and people without sufficient experience and knowledge of the Blackbird should not perform operations on or with the heat pump.
- An installer is always responsible for the installation of the heat pump.
- Always make sure there is a temperature protection before the underfloor heating. In this way the underfloor heating cannot be damaged.

⚠ WARNING

Risk of pinching. Always store the heat pump and indoor unit in a dry area. The packaging loses its mechanical strength when it becomes moist.

Risk of cutting. The fins of the evaporator are sharp and fragile. Do not touch the fins of the evaporator.

Risk of fragmentation. Do not insert objects into the air inlet and outlet.

Risk of burns. Do not touch the heat pump and the pipes during operation. The heat pump can produce water up to a temperature of 70°C.

Risk of product damage:

- Always transport the heat pump in the original packaging. Remove the packaging only when the heat pump is placed on the installation surface.
- Never tilt the heat pump more than 30° relative to the horizontal plane. Oil may leak from the oil reservoir.
- Never climb, sit, or stand on the heat pump or indoor unit.
- Always make sure that the heat pump is evenly levelled across the surface. The heat pump should not be tilted more than 5°.
- Always ensure that the heat pump is not loaded before you place the heat pump on the desired installation surface.
- Always insulate the pipes and ensure that the pipes are no longer than necessary. Frost damage can be prevented by using a frost valve.
- Never operate the heat pump and indoor unit without water in the system.
- Always ensure that the heating water does not contain contamination (such as rust) larger than 0.5 mm, this can lead to a blockage in the heat exchanger.
- Never use glycol with an ethylene content of 50% or higher as antifreeze.
- Never switch off the main power when the outside temperature is below 5°C. The water in the heat pump can freeze. (Never switch off the supplied water pump, even during a longer period of absence.)
- Do not use the heat pump directly to heat swimming pool water, a high chlorine or salt content can affect the heat exchanger.
- Minimal operating temperature of the water circuit is 15°C.

Risk of reduced performance:

- Vent the central heating circuit and ensure that an (automatic) air vent is placed at all highest points of the installation.
- Set the correct pressure before you start the heat pump.
- Always ensure that the top and bottom of the evaporator and the grid of the fan are clean.

Risk of collateral damage:

- Do not slide the heat pump over the installation surface.
- Always ensure that the installation surface of the heat pump is free of dirt and grit.
- Do not connect other equipment to the same circuit as the outdoor unit of the heat pump.

1.3 Propane Protective Zone

1.3.1 Important Safety Notice: Refrigerant R290

The heat pump utilizes refrigerant R290, which is denser than air. In the event of a leak, this refrigerant will settle at lower levels. Therefore, it is crucial to prevent settling of the propane by ensuring proper ventilation at floor level.

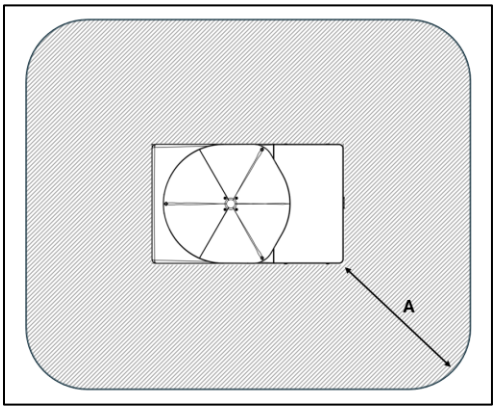
1.3.2 Protective Zone Guidelines

The protective zone is the immediate area surrounding the heat pump that must remain free of any potential hazards. In this zone, no windows, doors, vents, light wells, skylights, or ventilation openings should be present. Additionally, there must be no ignition sources such as wall sockets, light switches, lamps, electrical controls, or any other permanent ignition sources.

1.3.3 Installation

Installation according to EN378. Do not place the heat pump in enclosures which will limit ventilation and airflow around the unit.

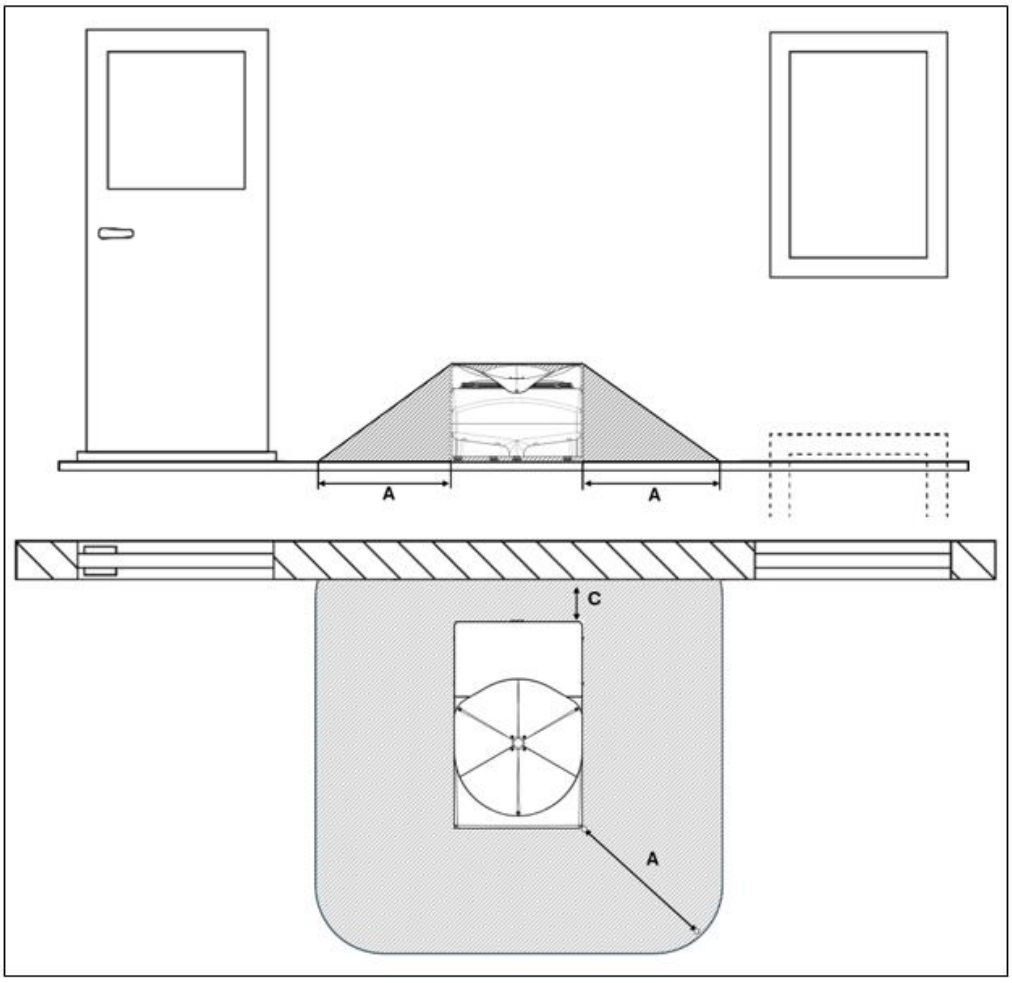
1.3.4 Ground floor installation



A = 1000mm

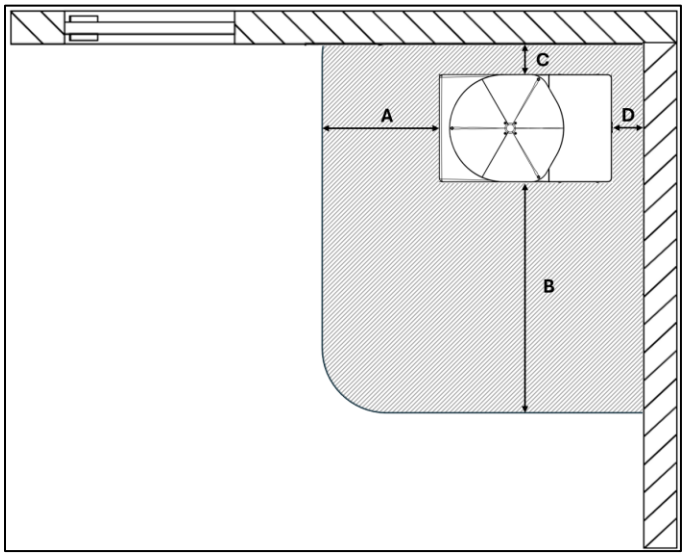
Dimension A is the distance around the heat pump.

1.3.5 Ground floor installation with wall



A = 1000mm
C = 300mm
Dimension c is the minimum distance that must be maintained from the wall (4.1.1 Placing).

1.3.6 Ground floor installation in a corner



A = 1000mm
B = 2000mm
C = 300mm
D = 300mm

1.4 Maintenance and Repair

By design, no maintenance is required on indoor and outdoor units supplied by Weheat. In case of malfunctioning, repair of the indoor and outdoor unit of the Blackbird, for materials supplied by Weheat, are only allowed by authorized Weheat personnel. It is therefore forbidden for non-authorized Weheat personnel to perform repair on Weheat indoor and outdoor unit products. In case of malfunctioning of the outdoor unit during the warranty period, and no in-field repair can take place, the full heat pump will be replaced.

⚠ DANGER

The below maintenance and service actions are strictly forbidden for non-authorized personnel!

- Detection of refrigerants
- Removal and evacuation of the refrigerant
- Charging of the system
- Recovery of the refrigerant

In case the above maintenance and service actions are needed, please contact **Weheat.**

Rules complying with IEC/EN 60335-2-40 must be followed (Besides this, the internal rules and general terms and conditions of Weheat apply.)

- Under no circumstances shall potential sources of ignition be used when searching for or detecting refrigerant leaks. A halide torch (or any other detector using an open flame) shall not be used.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recover from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

- When breaking into the refrigerant circuit to make – or for any other purpose – conventional procedures shall be used. Best practice is followed since flammability is a consideration.
- When removing the refrigerant, the refrigerant charge shall be recovered into the correct recovery cylinders. Compressed air or oxygen shall not be used for purging refrigerant systems.
- When using a vacuum pump, ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.
- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerant system
- Prior to recharging the system, it shall be pressure tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.
- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

2 System Requirements

2.1 Connection Power

To ensure correct operation, we recommend using a:

- 20A type B fuse and a residual current device (RCD) with a 30 mA rating for the heat pump.
- 16A type B fuse for the indoor unit – if electric heater is present.
- Always use different power groups for the indoor and outdoor units
- If different electrical phases are available, connect each power groups to a different phase.

2.2 Available System Volume

To prevent unstable behaviour and to ensure enough energy for an efficient defrost cycle and hybrid defrost-support, it is important that there is always sufficient heat capacity available. This can be achieved in several ways:

- Installation of a buffer tank to increase the system volume to about 60 litres.
- If the house is equipped with underfloor heating, it usually suffices to keep 3-4 underfloor heating groups continuously open and set the possible thermostat valve sufficiently high. Furthermore, it is advisable to connect the circulation pump of the underfloor heating system directly to the designated connection on the indoor unit. In this way we can guarantee a minimal flow of 1 m^3/u with a minimal water temperature of 15^{o}C.

WATCH OUT Bypassing the external temperature protection of the underfloor heating system should never be done to prevent damage to the pipes.

2.3 Installation Surface for Outdoor Unit

The Blackbird must be placed in the open air and there must be sufficient space around the Blackbird to ensure good air circulation (see Figure 1). Furthermore, access to the Blackbird should not be freely accessible to the public and/or (playing) children.

The surface on which the Blackbird is placed must meet the following requirements:

- Horizontal with a maximum deviation of 3°.
- Smooth and flat.
- Clean and free from pollution that might damage the roof.
- Suitable for a continuous load of ≥ 80 kg, excluding snow or other materials.
- No direct contact of the heat pump with grass or any other plants to prevent small animals from nesting in the heat pump.

2.4 Indoor Unit

- Must be installed indoors.
- Must always be installed vertically and level.
- Ambient temperature between 10°C and 35°C.
- Sufficiently sturdy to support the weight of the indoor unit.
- A 230 V power supply preferably within 1.5 meters. The cable can potentially be replaced with a longer one but be mindful of the power rating of the used indoor unit.
- It is not allowed to use the same circuit breaker as the outdoor unit. This prevents overload.
- Connect the circuit breaker of the indoor unit to a different group from the outdoor unit. (This uses 16A at full load)

2.5 Thermostat

The heat pump works with both traditional on/off thermostats and OpenTherm thermostats. For optimal operation, it is recommended to use an OpenTherm thermostat that supports at least the following functions:

- Measured room temperature
- Desired room temperature
- Requested water temperature

However, not all OpenTherm thermostats fully support all functions. Some tested thermostats that work well with the heat pump are:

- Honeywell round modulation
- Honeywell lyric T6/T6R WIFI
- Honeywell EvoHome
- Honeywell Chronotherm Touch modulation
- Tado smart home systems
- Plugwise Anna
- Remeha ISense

For the most up-to-date list, check https://support.weheat.nl/
Be sure to carefully check the specifications of your thermostat.

2.6 Indirect Domestic Hot Water (DHW) Tank for a Heat Pump

To ensure effective and successful control of the water temperature in the Indirect DHW Tank, the Indirect DHW Tank must meet the following requirements. If this is not the case, Weheat cannot guarantee the proper functioning of the heat pump circuit in the Indirect DHW Tank.

- Minimum 2.5 m^2 surface area of the coil for efficient heat transfer.
- A flow rate between 1 and 2 m3/h through the coil, with an optimal flow rate of 1.3 m3/h in both circuits in the case of an all-electric installation.
- Carefully designed coil to heat the entire contents of the tank and avoid cold zones. To accurately control the temperature within the Indirect DHW Tank, at least one, preferably two temperature sensors must be installed.
- In the case of a steel tank, it is advisable to install an anode. This is important to prevent corrosion of the steel material, thereby extending the life of the tank.
- The Indirect DHW Tank must comply with 2014/68/EU.
- In case the installer uses an Indirect DHW Tank which is not recommended by Weheat, the installer is responsible for making sure a successful legionella prevention cycle can be performed.

2.7 3-way valve

- Ensure that when the 3-way valve with spring-return mechanism is in the de-energized state, it directs heat to the central heating (CH) circuit.
- Be sure to carefully check the specifications of the 3-way valve used. A datasheet of the Caleffi 643 3-way valve can be found in section 13.

2.8 Magnetic Line Filter

- To ensure the optimal performance and longevity of your heat pump system, it is crucial to install a magnetic line filter.

Please be aware that Weheat will not provide a warranty for the heat pump system if a magnetic line filter is not installed and operational.

2.9 Orientation circulation pumps

Correct orientation of the water circulation pumps is essential for proper function. Incorrect placement can lead to reduced performance or system damage. Please refer to the image below for guidance.

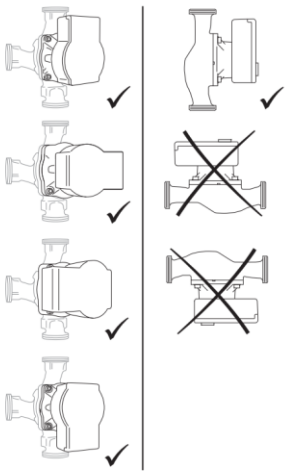


Figure 2-1, Orientation circulation pump

3 Configuration Options

3.1 All-electric

The Blackbird, along with extra necessities, can provide central heating water and hot tap water. To provide tap water, it is necessary to install an Indirect Domestic Hot Water (DHW) Tank in which hot tap water can be stored. For optimal performance, it is essential that the Indirect DHW Tank has adequate heat exchange capacity. It is recommended to use Weheat boiler vessels or ensure the tank has a spiral surface of at least 2.5 m². The switching between central heating water and hot tap water can be done by a 3-way valve or an additional circulation pump with check valves.

WATCH OUT If a 3-way valve is used, the valve should activate the central heating circuit in its resting state.

If desired, the system can also control an electric backup heater up to 3kW. This electric backup heater can serve as a backup system or as an addition to the deliverable power during the coldest days. If necessary, the electric backup heater can also assist in defrosting the Blackbird.

3.2 Hybrid

In a hybrid configuration, the heat pump provides the heating of the house. An external source, such as a Gas-heater, provides hot tap water.

If a Gas-heater is used, it can additionally be used as a backup when the heat pump cannot provide enough power to heat the entire house. In this case, the Blackbird will control the operation of the Gas-heater. The Gas-heater can also assist with the defrost cycle.

4 Installing the Heat Pump

4.1 Placing the Outdoor Unit

⚠ DANGER

Risk of fire and explosion:

- Servicing shall be performed only as recommended by the manufacturer
- Ducts connected to the appliance shall not contain a potential ignition source

⚠ CAREFUL

Risk of crushing:

- Always lift and transport the heat pump with at least two people, even if you are using lifting equipment. The centre of gravity of the heat pump is not in the middle.

⚠ WARNING

Risk of product damage:

- Keep any required ventilation openings clear of obstruction
- Always transport the heat pump in the original packaging. Remove the packaging only when the heat pump is placed on the installation surface.
- Never tilt the heat pump more than 30° relative to the horizontal plane. Misalignment of the compressor can lead to irreparable product damage or a shorter lifespan.

WATCH OUT The unit must be checked for damage and completeness before installing. Any damage or missing parts must be reported.

Ensure sufficient free space around the Blackbird to guarantee adequate air circulation. The minimum free space is shown in Figure 4-1, however, for optimal efficiency, we advise keeping the long sides of the heat pump as clear as possible (>30cm).

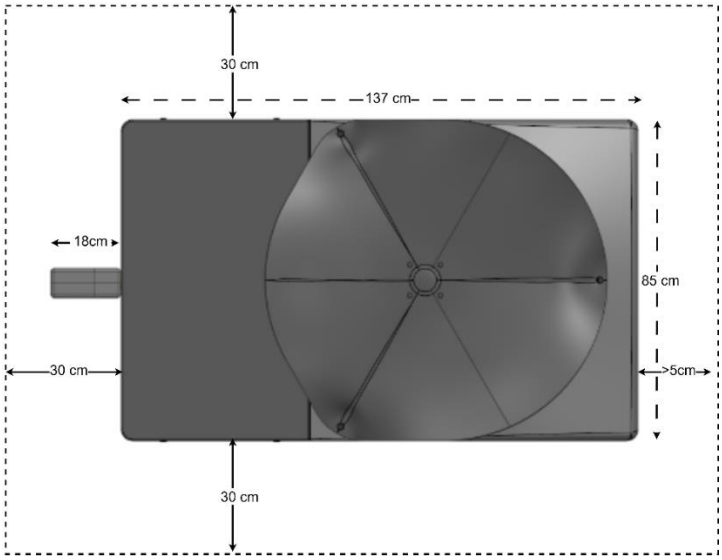


Figure 4-1: Minimum free space around outdoor unit

Place the Blackbird including packaging near the installation surface.
Clean the installation surface. Ensure that there are no sharp objects left that could potentially cause damage to the roof.
Place tiles on the installation surface as indicated in Figure 4-2 to distribute the weight and prevent damage to the roofing.

- To prevent possible freezing of the support feet during harsh weather, please make sure the tiles are not directly underneath the evaporator.
- To decrease noise resonances there is a possibility to place large heavy tiles.

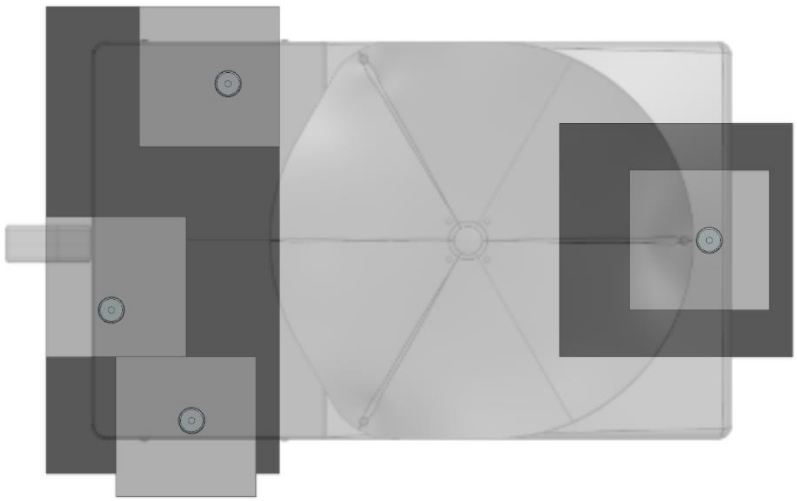


Figure 4-2: Tile Location (Top View) – 4x 30x30 cm tiles (grey) or 3x 50x50 cm tile (black).

Remove the packaging from the outdoor unit.
Place the outdoor unit on the insulating rubber tiles as indicated in Figure 4-2.
Lift the outdoor unit at each of the corners once to release the tension from the spring legs. Check if the outdoor unit can move freely on the spring legs by gently pressing the heat pump down.

4.2 Connecting the Heat Pump

4.2.1 Hydraulic Connection

⚠ WARNING

- The amount of piping used for the installation shall be kept to a minimum
- Pipe work shall be protected from physical damage.

1. Dismantle the two-part couplings from the pre-assembled fittings, which can be seen in Figure 4-4 at the back of the heat pump.
2. Install the separate parts of the two-part couplings into both connections of the condenser using a radiator key, as shown in Figure 4-3.

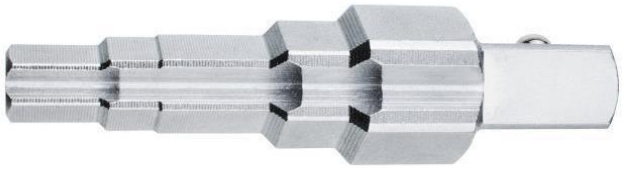


Figure 4-3: Radiator key

3. Connect 1” male supply and return lines to the heat pump as shown in Figure 4-4.

WATCH OUT

   - The top connection is for the supply line to the house (hot water). The bottom connection is for the return line (cold water).
   - Ensure that the first 500 mm of the supply and return lines are flexible, so that the outdoor unit can move freely on the vibration-damping feet. (A rigid connection can cause unnecessary noise and damage to the heat pump and pipework).

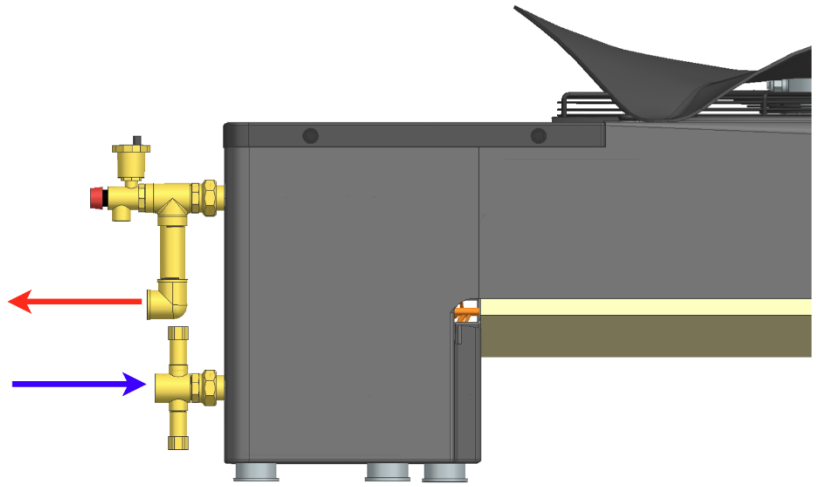


Figure 4-4: Connection of supply and return

4. Insulate the supply and return lines.

- Use the supplied insulation to insulate the fittings at the back of the heat pump. Use the three supplied EPP screws to mount the insulation (see green arrows in Figure 4-5). Tighten these gently (Maximum 0.6 Nm).

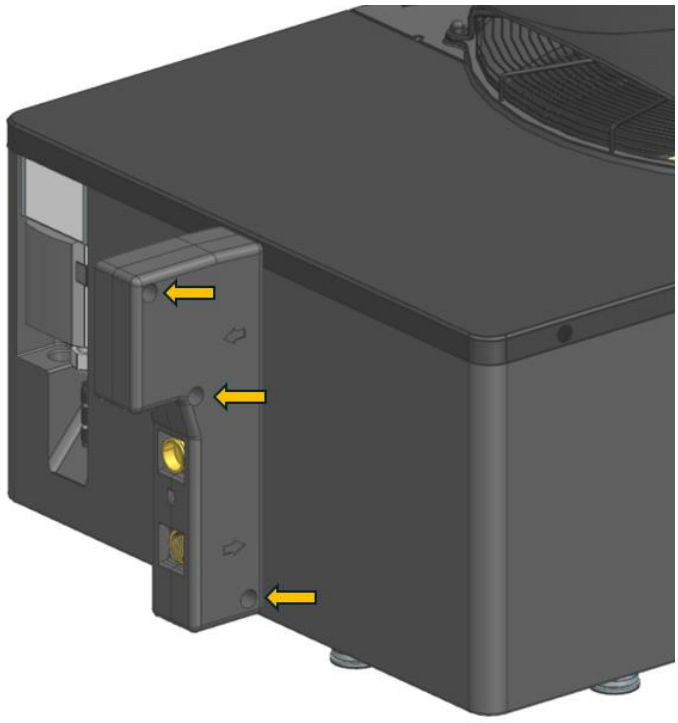


Figure 4-5: Mounting fitting insulation.

4.2.2 Electrical Connection

⚠ WARNING

Risk of collateral damage: Do not connect any other equipment to the same circuit as the heat pump.

- Do not connect any other equipment to the same circuit as the heat pump.
- The appliance shall be installed in accordance with national wiring regulations
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

5. Remove the cover plate of the service switch with a Phillips screwdriver.
6. Connect the power supply (230V -16A) to the service switch as shown in Figure 4-6. Prepare the L/N/PE cable according to the length shown in Figure 4-6, so that the current carrying conductors (L/N) become taut before earthing conductor if the cord slips out of the cable gland. Make sure the service switch is in the 'O'/'Off' position and that the power cable in the fuse box is turned off before you connect the power supply. The used connection cable must at least meet the 60245 IEC 57 standard regarding insulation.

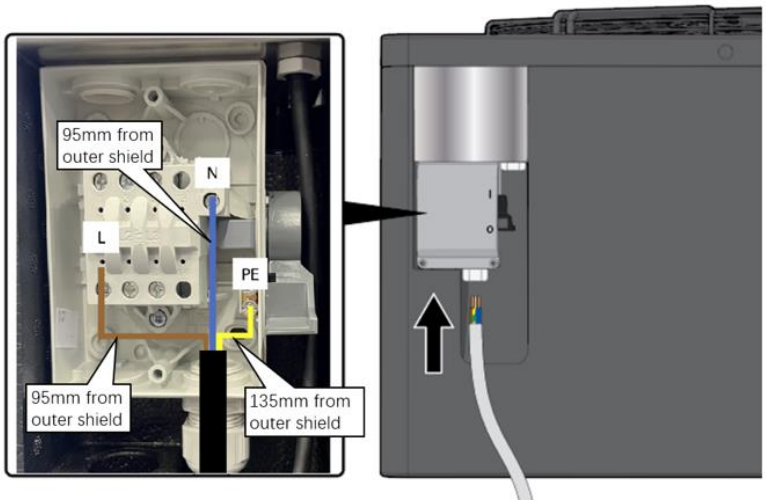


Figure 4-6: Connecting power supply (230V - 20A).

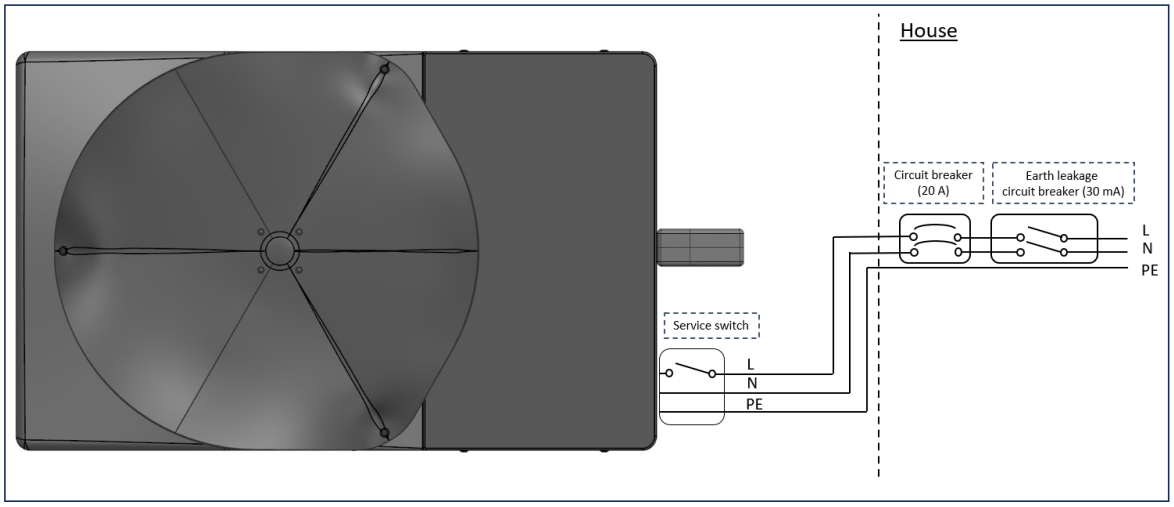


Figure 4-7: Electrical connection scheme for connecting the Blackbird outdoor unit.

7. Connect the communication cable so that it matches the connection on the indoor unit, as shown in Figure 4-8 and Figure 4-9. Ensure that the cable shows no signs of wear.

WATCH OUT The wires in the cable should have a diameter of minimal 2.5 mm^2. This can be XMVK or YMVK.

WATCH OUT In Figure 4-9, 5 wires instead of 3 are used for connecting the communication connector. It should be 3. Use the numbering as indicated in the figure.

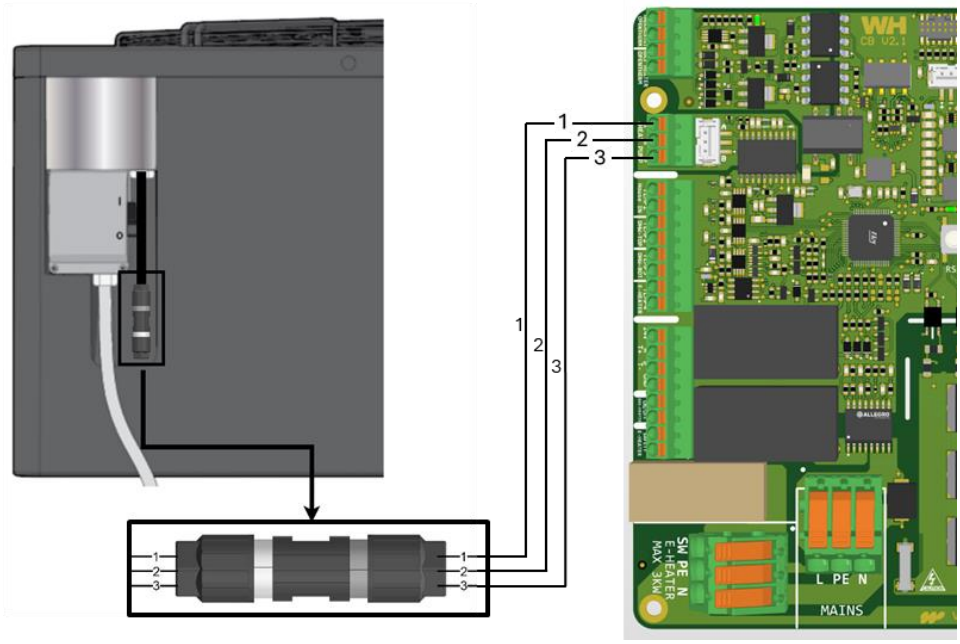


Figure 4-8: Connecting the communication cable to the control bridge.

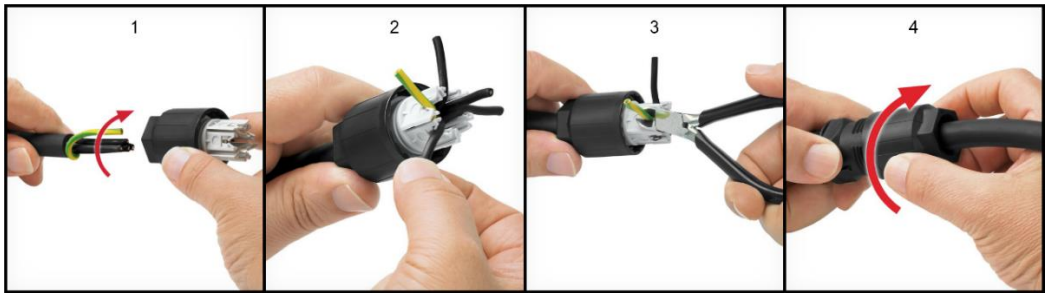


Figure 4-9: [i]Example connection of communication connector

(note that the example uses 5 wires instead of 3)

8. Guide the supply and return lines and the communication cable to the indoor unit installation location. Do not yet turn on the service switch at the back of the heat pump.
9. Note the serial number of the heat pump. This serial number is necessary for commissioning the heat pump at a later stage.

4.2.3 Installing Butterfly Hood

The hood has been added to the heat pump to protect it from extreme weather conditions (hail/snow) and to safeguard against dirt/leaves getting between the fans. Place the hood on the heat pump as described in Appendix: Butterfly Assembly' and refer to Figure 4-10 for an overview.

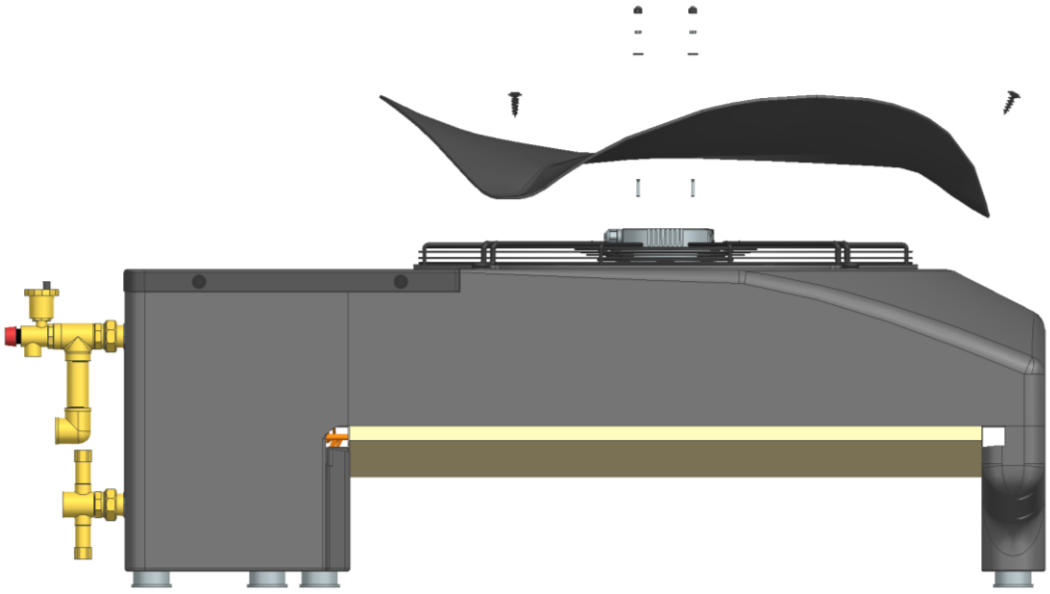


Figure 4-10: Blackbird in combination with the butterfly hood

5 Weheat Indoor Units

Choose an installation location that meets the requirements of **chapter 2.4**.

5.1 Application

The indoor unit serves as a communication bridge between all the components of the heating system, such as:

- Outdoor heat pump unit
- Thermostat
- Gas heater
- Central heating circulation pump
- Domestic Hot Water circulation pump (all-electric systems)
- 3-way valves
- Temperature sensor for the central heating system
- Temperature sensor for Indirect Domestic Hot Water (DHW) Tank (all electric systems)
- Inline or immersion electric heater

5.2 Indoor Unit Introduction and Configurations

Weheat provides two distinct options for indoor units:

- Compact Indoor Unit: Ideal for installations with limited space, it allows installers to choose the location for the circulation pump and the other components, offering high flexibility in installation setup.

- Pre-assembled Indoor Units: Designed for easy installation, reducing installation time significantly. These units feature an inline electric heater serving as a backup heat source. Weheat offers two types of pre-assembled indoor units:

    - WHP – Weheat Hybrid Pre-assembled: Solution designed for hybrid installations.
    - WEP – Weheat all-Electric Pre-assembled: Designed for all-electric solutions.

6 Installation Compact Indoor Unit

6.1 Structure and Function

The compact indoor unit has a compact design, suitable for various installations. It includes a backplate, control board, and casing, with all necessary communications visible through the LED, Weheat app, or portal.

Figure 6-1, Compact indoor unit

6.2 Product Specification

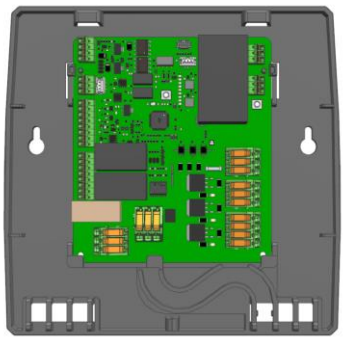


Figure 6-2 - Compact indoor unit

Specification	WEC Compact
Length [mm]	200
Width [mm]	200
Height [mm]	50
Wall Mount	yes
Bracket	no
Distance between mounting holes [mm]	166

6.3 Mounting

The compact indoor unit has 2 mounting holes with distance of 166 mm between them, as shown below:

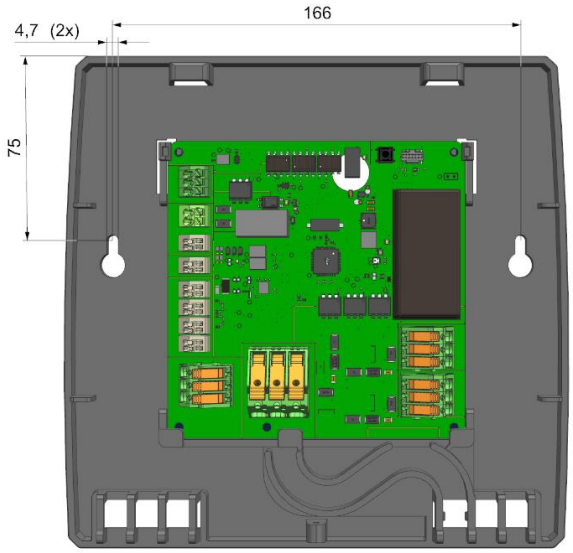


Figure 6-3 - mounting compact indoor unit

6.4 Control Bridge

For the WEC indoor unit, the installer must connect all components to their respective connectors on the control bridge. The connections on the control bridge are shown on the Figure 6-3 below:

⚠ WARNING Before powering the Control Bridge, ensure that all wires are connected at the designated spot, cables that are wrongly connected can permanently damage the Control Bridge, necessitating its replacement.

⚠ WARNING Avoid connecting a device with a power rating above 150W to the 'DHW,' 'CH,' or 'AUX' connector, as these are fuse-protected. A blown fuse will cause permanent damage to the Control Bridge, necessitating its replacement

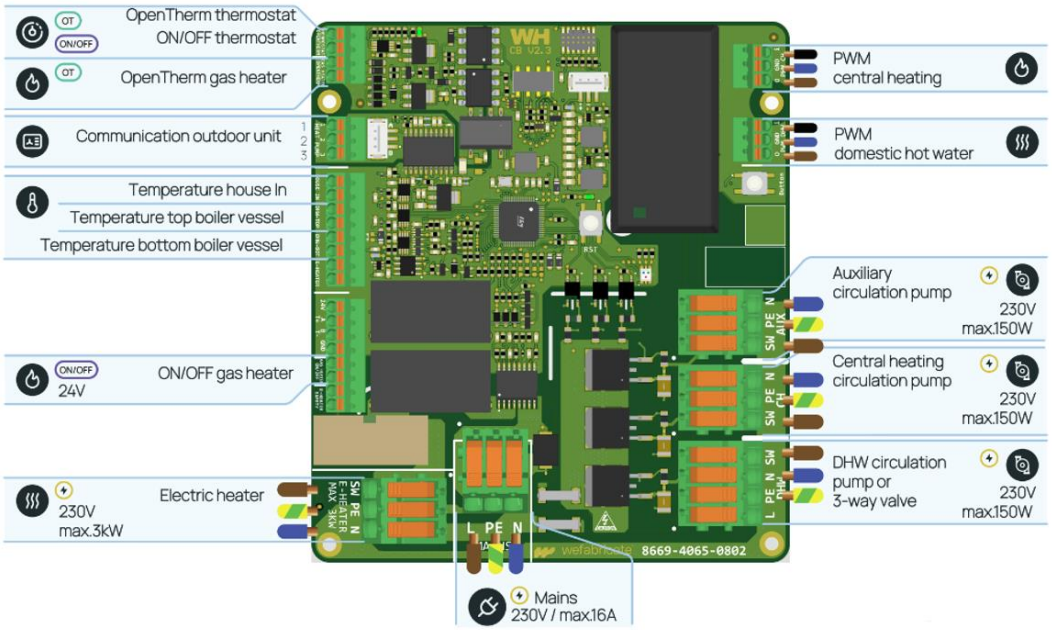


Figure 6-4, Connections Control Bridge

Terminal
Opentherm and On/Off thermostat
OpenTherm gas heater
Outdoor unit communication cable
Water house IN temp sensor
*TOP DHW tank temp sensor
*BOTTOM DHW tank temp sensor
On/off gas heater

Electric heater max. 3kW
Mains
PWM central heating (CH) circulation pump
*PWM domestic hot water (DHW) circulation pump
Auxiliary circulation pump
Circulation pump central heating
*Circulation pump DHW / 3-way valve

*Only used on all-electric installations

6.5 Components

6.5.1 Thermostat

Connect the thermostat to the "**THERMOSTAT OPENTHERM**" terminal. While installing the thermostat, it does not matter which wire is connected to either of the two terminals.

6.5.2 OT Gas Heater and on/off Gas Heater

For connecting a central heating gas heater, two options are possible:

1. **Central heating gas heater with Opentherm (OT) communication:** If certain that the gas heater has Opentherm communication, connect the two wires to "**GAS HEATER OPENTHERM**" terminal. While connecting the gas heater it does not matter which wire is connected to either of the two terminals.

2. **Gas heater without Opentherm communication (on/off control):** If the gas heater does not have Opentherm communication, connect the two wires to "**GAS HEATER ON/OFF**" terminal. While connecting the gas heater, it does not matter which wire is connected to either of the two terminals.

WATCH OUT Make sure to also connect the cable to the on/off terminal in the gas heater side.

6.5.3 Heat Pump

Connect the three wires of the communication cable to the indoor unit's "**HEAT PUMP**" terminal.

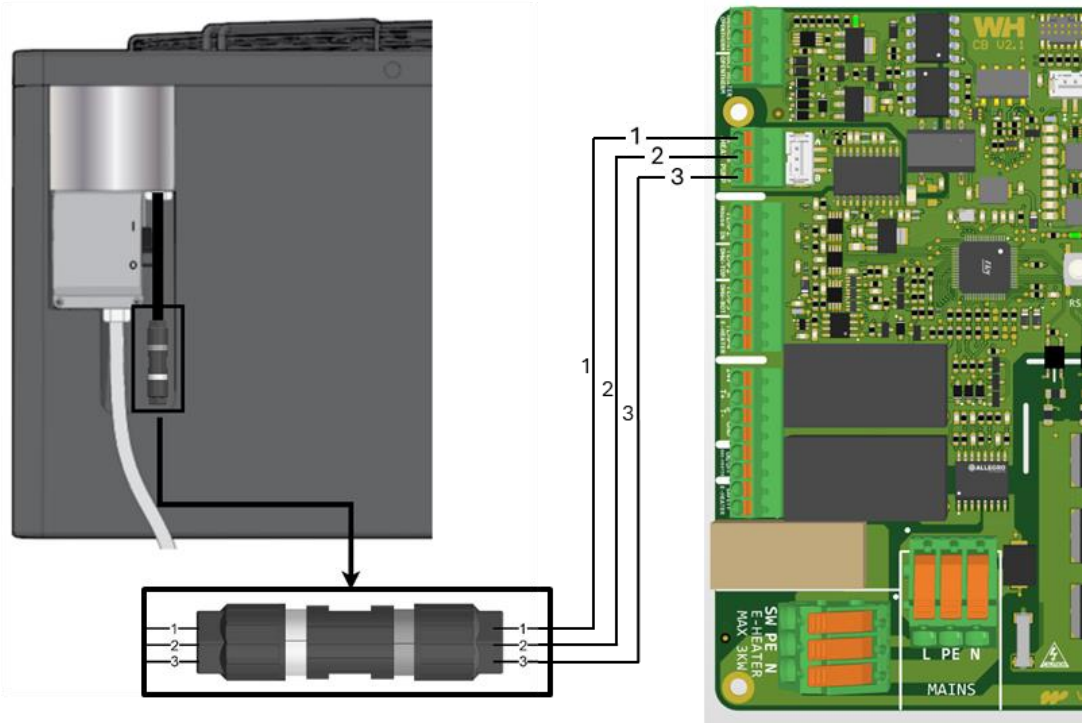


Figure 6-5, communication connector

WATCH OUT Ensure the correct connection of the communication cable by following the scheme at the image above, ensuring that the chosen sequence is followed.

WATCH OUT Ensure the communication connector is fully tightened.

6.5.4 Water House-in Temperature Sensor

This sensor measures the temperature of the water going into the Central Heating system of the house. Connect the Water house-in temperature sensor to the "**HOUSE IN**" terminal on the Control bridge. While connecting the temperature sensor, it does not matter which wire is connected to either of the two terminals.

Place the **Temperature Sensor (TS)** on the Central Heating side of the installation, **after** the circulation pump or 3-way valve, with **at least 50 cm distance** from it to prevent conduction of heat/bad reading of sensor.

Ensure the sensor has adequate contact with the supply pipe by using a clip-on sensor or securing it with two tie wraps. The clip-on sensor is designed for pipes with a diameter of 22 – 28mm.

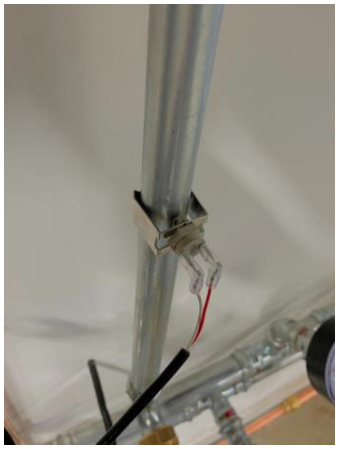


Figure 6-6, Clip-on sensor

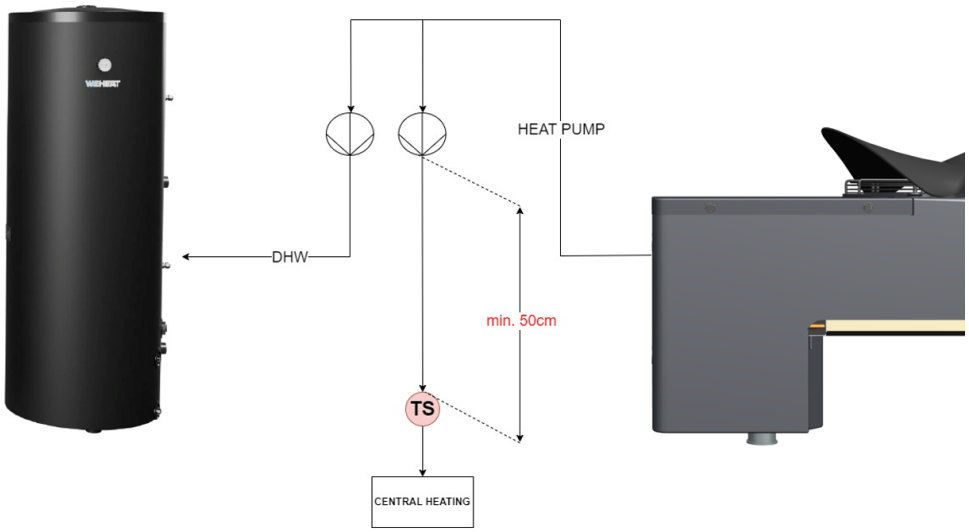


Figure 6-7 - Water house in temp sensor placement

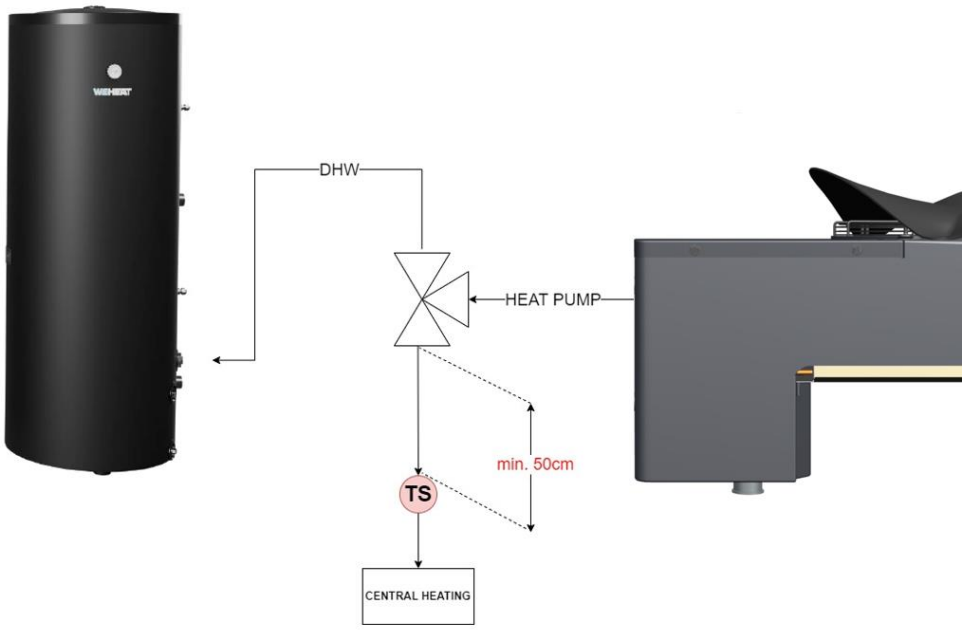
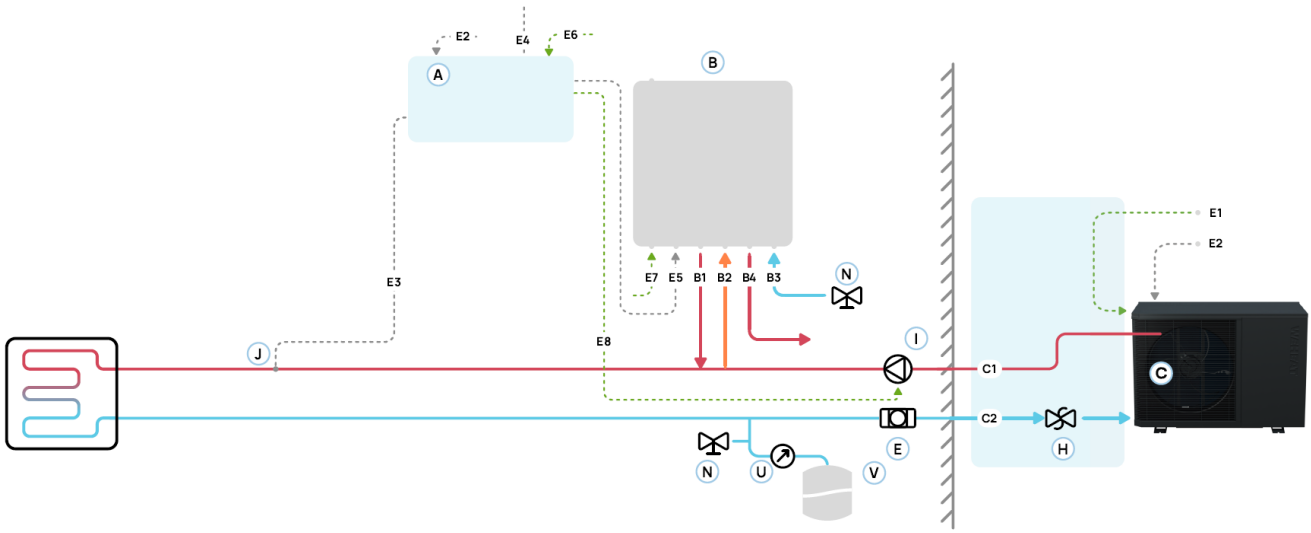
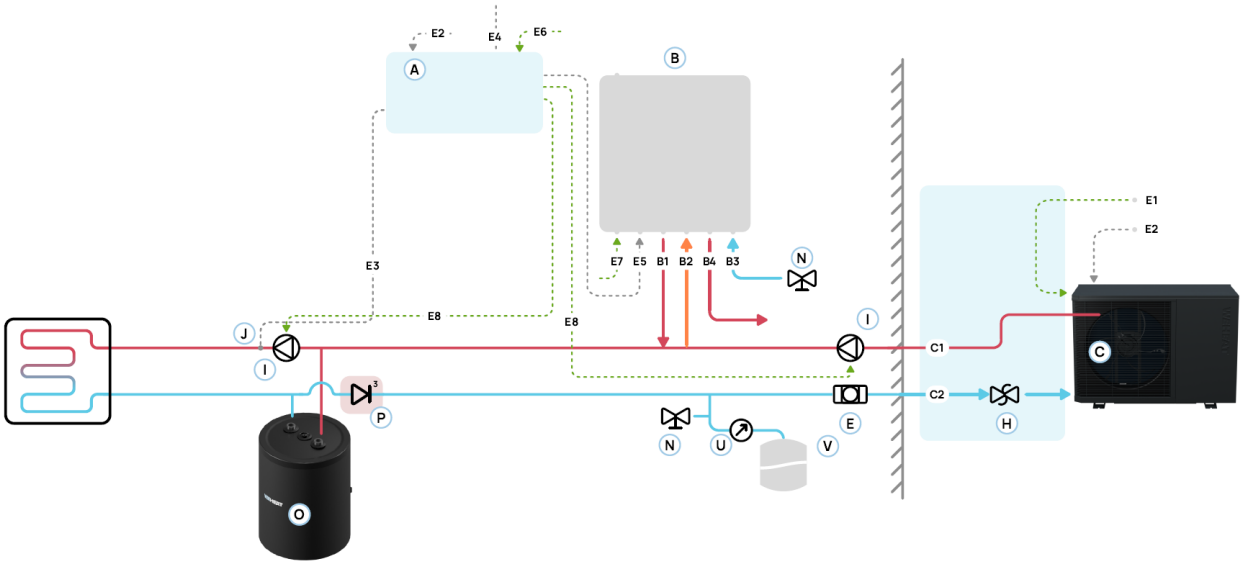


Figure 6-8 - Water house in temp sensor placement

- Place the **water house-in temperature sensor** J on the supply pipe, after the circulation pump and gas boiler, as illustrated in the image below.



- **For installations with a parallel buffer**, ensure the water house-in temperature sensor J is placed after the auxiliary circulation pump, as illustrated in the image below.



6.5.5 Temperature Sensors Indirect Domestic Hot Water (DHW) Tank

The top and bottom indirect water heater temperature sensors measure the temperature of the domestic hot water in the tank. They ensure the right tap water and legionella prevention temperatures. Proper placement of both the top and bottom temperature sensors is crucial for the proper functionality of the heat pump.

Ensure that the sensors are fully inserted into the dip tube and that the cable glands are securely tightened to prevent any movement of the sensors.

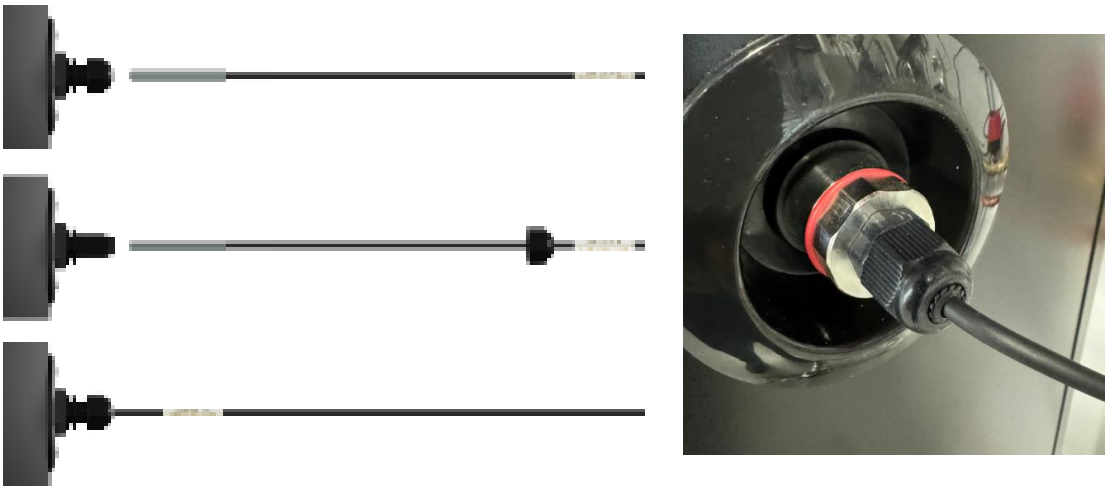


Figure 6--6-9, Temperature sensors boiler vessel

The top sensor of the tank is connected to the "**DHW-TOP**" terminal on the Control Bridge, while the bottom sensor of the tank is connected to the "**DHW-BOT**" terminal on the Control Bridge. While installing a temperature sensor, it does not matter which wire is connected to either of the two terminals.

- Place the upper sensor as high as possible.
- Place the lower sensor between 25% and 50% from the bottom of the tank.

WATCH OUT If the Indirect Domestic Hot Water (DHW) Tank has only one option for placing a temperature sensor, always connect it to "**DHW-TOP**" terminal, regardless of its position in the tank.

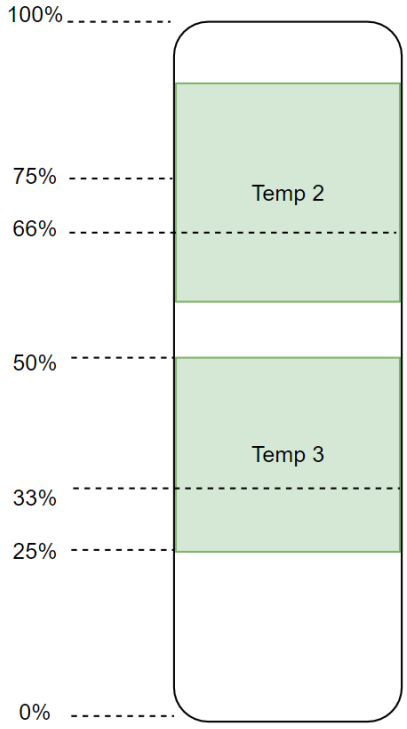


Figure 6-10 – Heat exchanger tank temp zones

6.5.6 Immersion Electric Heater

For all-electric installation with compact indoor units, an immersion heater can be used in the hot water tank as a backup source of heat for DHW in case the primary heating system fails or is insufficient. Connect the heater with a 2.5 mm² cable to the designated terminal "**HEATER MAX 3KW**" in the Control Bridge.

The electric heating element supplied by Weheat, the HEATER MB 3000 OWR1 3.0 KW/230V 6/4" with thermostat, has a 3kW power output, 6/4"M connection, CE certification, and its own safety function. Full specification can be found in chapter 16.

⚠ WARNING When using an electric auxiliary heater, the electrical installation must be capable of supplying at least 2x 16A simultaneously (1x 16A for the outdoor unit and 1x 16A for the indoor unit).

⚠ CAREFUL Weheat does not ensure the triggering of safety warnings for different immersion and inline heaters. Installers are fully responsible for the installation of different electric heaters into the system and for implementing appropriate safety measures.

⚠ CAREFUL Ensure that the electric heating element is **turned on only after** the Indirect Domestic Hot Water (DHW) Tank is filled with water.

6.5.7 Mains Cable

Use the power cable provided by Weheat or any other power cable with 3x2,5mm² cross-section. For compact indoor installation without electric heater, a 3x1,5mm² cross-section cable is sufficient.

⚠ WARNING Ensure the electrical group where the indoor unit is connected to, is different from the one the heat pump is connected to.

6.5.8 Water Circulation Pump

For hybrid installations, the circulation pump that pumps water through the central heating system shall be connected to the "**CH**" terminal of the control bridge.

For all-electric installation with two circulation pumps, the second circulation pump, used for the Domestic Hot Water (DHW) system, can be connected to the "**DHW**" terminal.

WATCH OUT The DHW circulation pump must be connected to "PE", "N" and "**SW**".

Optional: Connecting an additional circulation pump - If you have a parallel buffer tank, you shall connect the additional circulation pump to the "**AUX**" connector of the control bridge. The "**AUX**" connection can also be used to connect an existing underfloor heating or central heating circulation pump; it will then switch on/off with the circulation pump of the heat pump.

WATCH OUT The rated power of the used circulation pump should not exceed 100 Watts.

6.5.8.1 PWM connections

If the circulation pump supports PWM signals, connect it to the corresponding PWM terminal on the Control Bridge. The Control Bridge has a PWM terminal block with three connections: 'i' (input), 'O' (output), and 'GND' (ground).

For Wilo PWM1 pumps:

- Connect the **brown** wire from the circulation pump to the '**O**' terminal on the Control Bridge.
- Connect the **black** wire from the circulation pump to the '**i**' terminal on the Control Bridge.
- Connect the **blue** wire from the circulation pump to the '**GND**' terminal on the Control Bridge.

When the circulation pump is running at 95%, the PWM connections are **not installed correctly**.

6.5.9 Three-way valve

For all-electric solutions, instead of a second circulation pump, a 3-way valve can be used. This valve can either be spring-return or a switching 3-way valve with a 'switching wire' "**SW**". Connect the 3-way valve to the "**DHW**" terminal.

WATCH OUT

- The 3-way valve must be connected to "PE", "N" and "**SW**" terminals.
- Pay attention to the resting position of the 3-way valve, which must lead to the Central Heating system. The valve is energized and controlled during DHW operation only.
- For the **Caleffi 643** z-one valve provided by Weheat follow the scheme below:
  - **Brown** cable (L) – connect to **SW** in the control bridge
  - **Blue** cable (N) – connect to **N** in the control bridge
  - **Green** cable (PE) – connect to **PE** in the control bridge

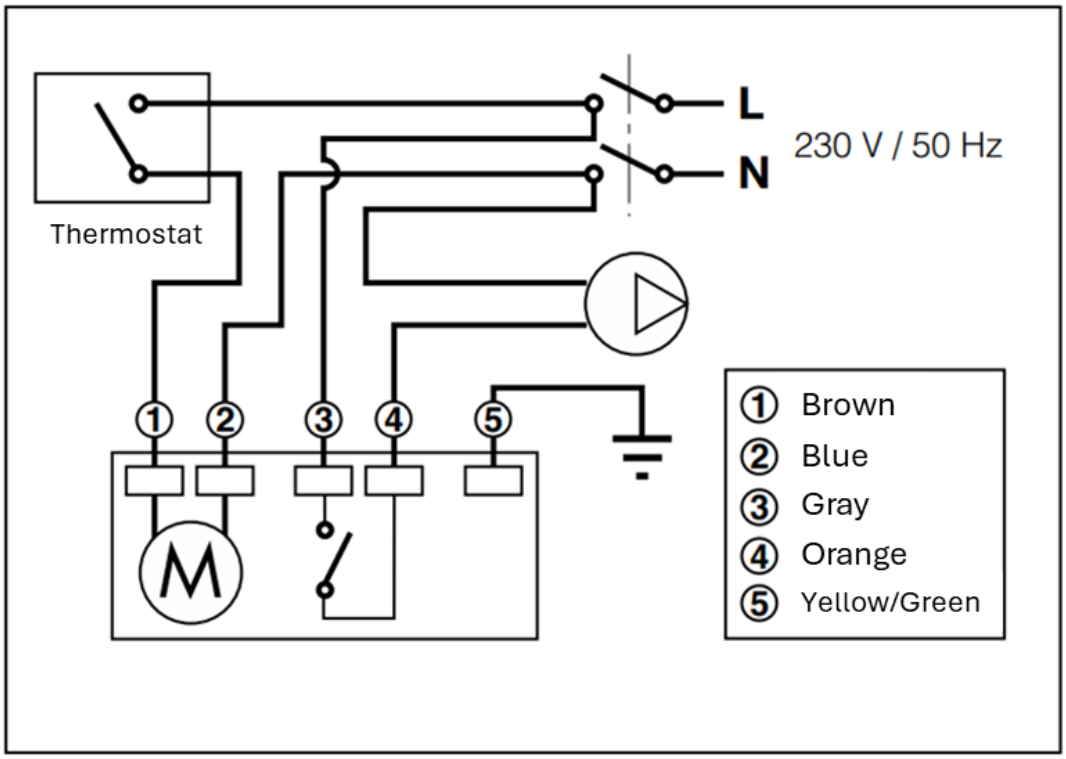


Figure 6--6-11- Caleffi 643 z-one electrical scheme

7 Installation pre-assembled indoor units

7.1 Structure and Function - Hybrid pre-assembled indoor unit

The pre-assembled unit WHP is designed for hybrid installations, featuring:

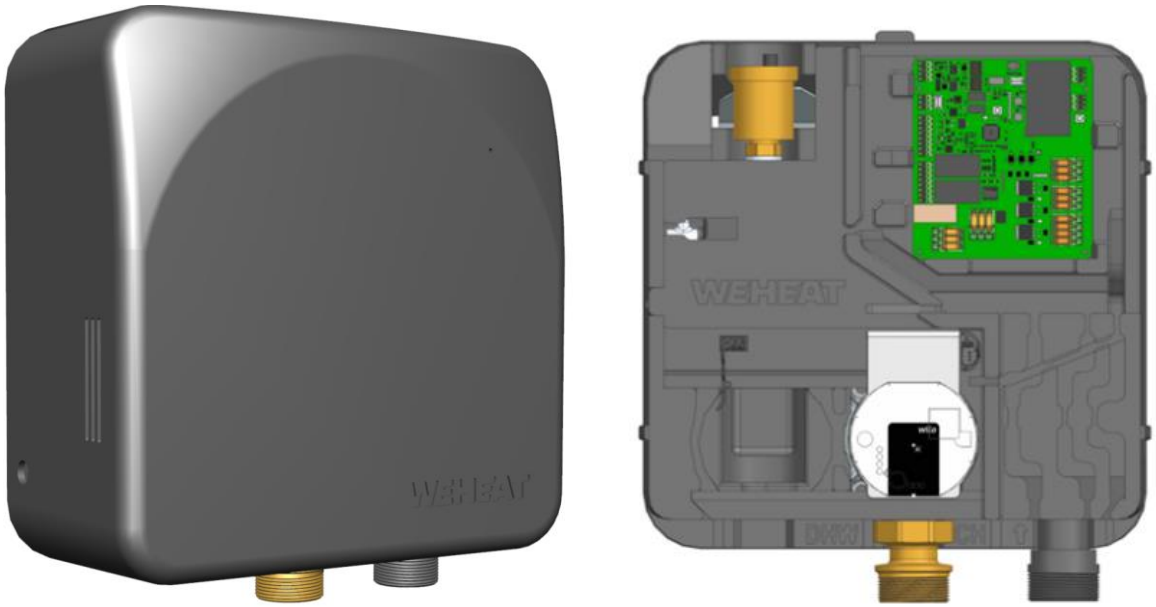


Figure 7-1 – Hybrid pre-assembled unit

- **3 kW Backup Heater:** Act as backup or additional source of heat power.
- **Circulation Pump:** Ensures heat distribution.
- **Control Bridge:** Interfaces with the outdoor unit for control and adjustments.
- **Deaerator:** Removes air bubbles to enable flow and prevent corrosion.
- **Check Valve Adapter:** Prevents water backflow.
- **EPP Insulation:** Retains heat, improving energy efficiency.
- **Dimensions:** 338 x 382 x 153 mm.
- **Mounting Bracket:** For easy and secure installation.

7.2 Structure and Function - All-electric pre-assembled indoor unit

The WEP is the pre-assembled indoor unit designed for all-electric installations, featuring:

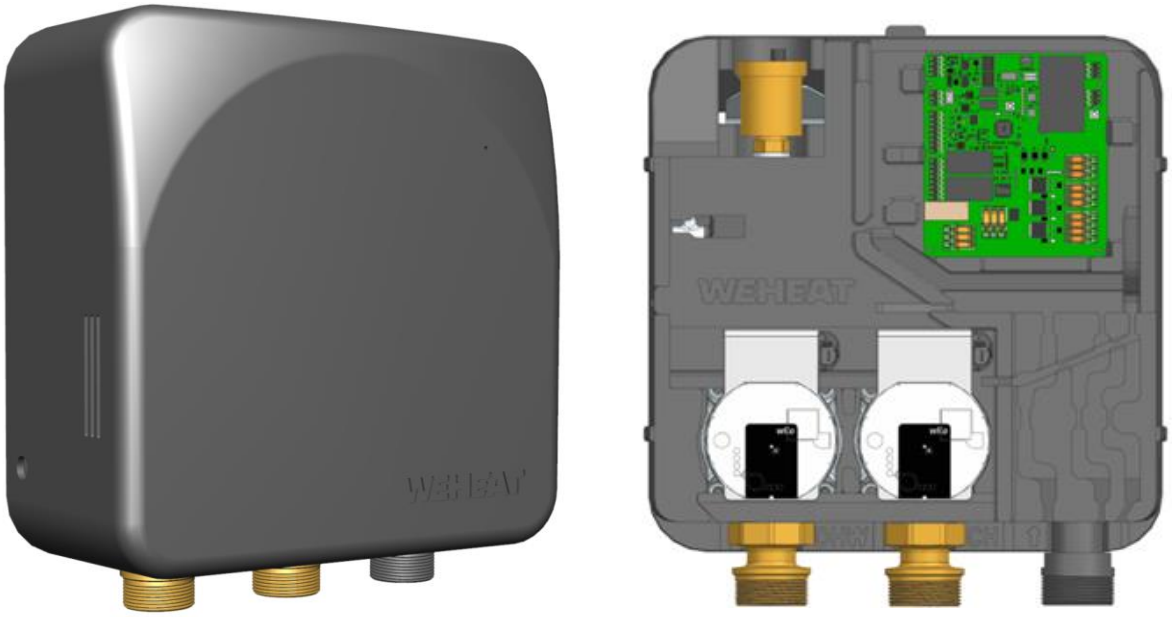
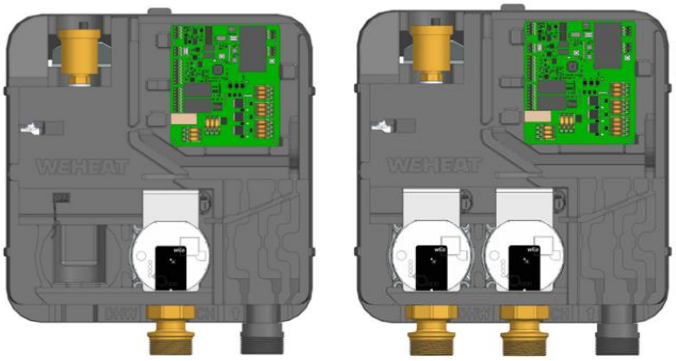


Figure 7-2 – All-electric pre-assembled unit

- **Electric Element:** Act as backup or additional source of heat power.
- **2x Circulation Pumps:** Switch between central heating and hot domestic water supply, eliminating the need for a 3-way valve.
- **Control Bridge:** Interfaces with the outdoor unit for control and adjustments.
- **Deaerator:** Removes air bubbles to enable flow and prevent corrosion.
- **Check Valve Adapters:** Prevent water backflow.
- **EPP Housing:** Retains heat, improving energy efficiency.
- **Dimensions:** Compact size of 338 x 382 x 153 mm.
- **Mounting Bracket:** For easy and secure installation.

7.3 Product specification



Specification	Hybrid WHP	All-electric WEP
Length [mm]	338	338
Width [mm]	382	382
Height [mm]	153	153
Wall mount	yes	yes
Bracket	yes	yes
Distance between mounting holes [mm]	170	170
Distance between mounting holes to water connections [mm]	296	296
Inline Heating Element	Yes	Yes
Power Inlet Heating Element [kW]	3	3
Water Inlet / Heat Pump connection	G6/4"M & G1"F	G6/4"M & G1"F
Central Heating (CH) connection	G6/4"M & G1"F	G6/4"M & G1"F
Domestic Hot Water (DHW) connection	n/a	G6/4"M & G1"F
Circulation Pump	Yes	Yes
Domestic Hot Water (DHW)	n/a	Wilo Para 25/8-75/PWM1
Central Heating (CH)	Wilo Para 25/8-75/PWM1	Wilo Para 25/8-75/PWM1
Automatic air vent	Yes	Yes
Air vent connection	G1/2"F	G1/2"F

7.3.1 Included components:

Components	Hybrid WHP	All-electric WEP
Power cable 3x2,5mm² 2m	1	1
Temperature sensor 4 m cable	0	2
Clip-on temperature sensor	1	1
Wall Bracket Plate	1	1

7.4 Mounting

For mounting the pre-assembled indoor units, a wall bracket is used. This bracket incorporates 7 mm slots 170 mm apart, allowing for the use of 6-8mm plugs. The distance between the wall bracket mounting holes and the end of the water connection is 300 mm, as seen below:

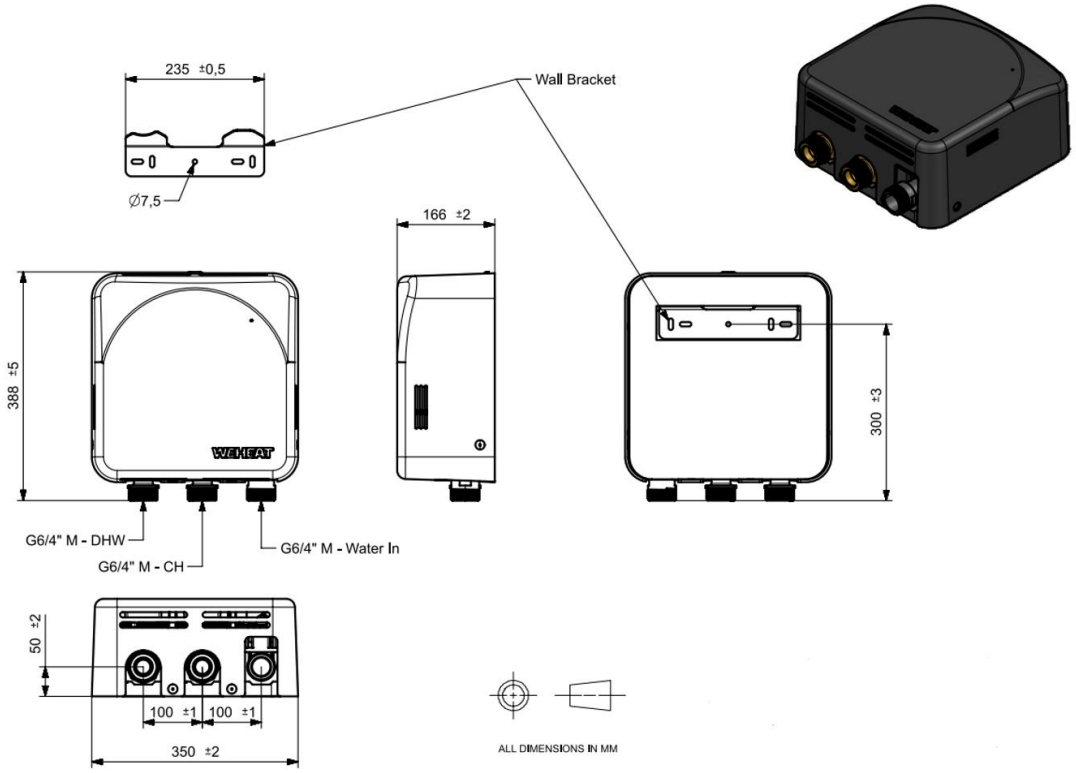


Figure 7-3, Mounting of indoor unit

7.5 Location

To optimize efficiency, it's important to minimize the length of piping between the pre-assembled indoor units and the heat pump, reducing heat loss.

When choosing the installation location, ensure sufficient space around it for maintenance.

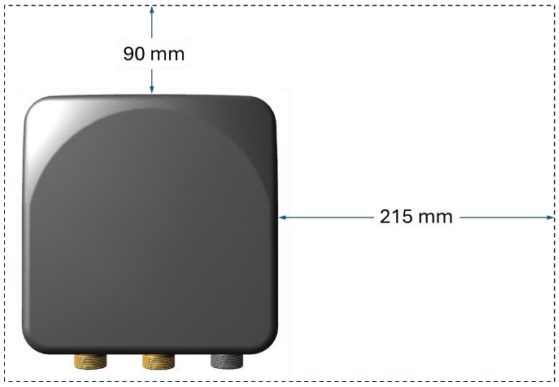


Figure 7-4, Necessary space for placement of indoor unit

Ensure the wall is sufficiently sturdy to support the weight of the indoor unit.

7.6 Control Bridge

All components present in the unit are pre-connected to the control bridge. Other components must be connected to the control bridge during installation:

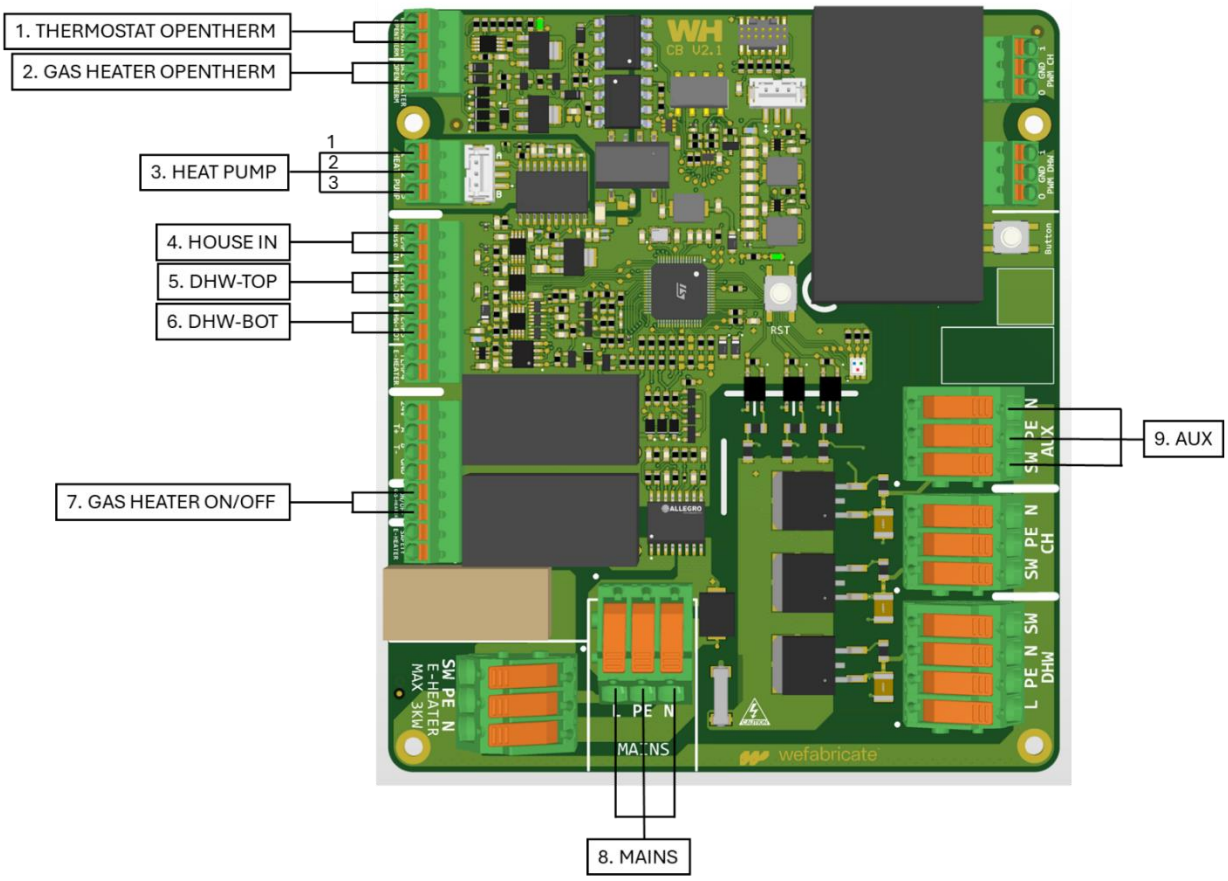


Figure 7-5, Control bridge

#	Terminal
1	Opentherm or on/off thermostat
2	Opentherm gas heater
3	Outdoor unit communication cable
4	Water house IN temp sensor
5*	TOP Indirect water heater temp sensor
6*	BOTTOM indirect water heater temp sensor
7	On/off gas heater
8	Mains
9	Auxiliary circulation pump

*Only used on all-electric installations

7.7 Components

7.7.1 Thermostat

Connect the thermostat to the "**THERMOSTAT**" terminal. While installing the thermostat, it does not matter which wire is connected to either of the two terminals.

7.7.2 OT Gas Heater and on/off Gas Heater

For connecting a central heating gas heater, two options are possible:

1. **Central heating gas heater with Opentherm communication:** If certain that the gas heater has Opentherm communication, connect the two wires to "**GAS HEATER OPENTHERM**" terminal. While connecting the gas heater it does not matter which wire is connected to either of the two terminals.
2. **Gas heater without Opentherm communication (on/off control):** If the gas heater does not have Opentherm communication, connect the two wires to "**GAS HEATER ON/OFF**" terminal. While connecting the gas heater, it does not matter which wire is connected to either of the two terminals.

WATCH OUT Make sure to also connect the cable to the on/off terminal in the gas heater side.

7.7.3 Heat Pump

Connect the three wires of the communication cable to the indoor unit's "**HEAT PUMP**" terminal.

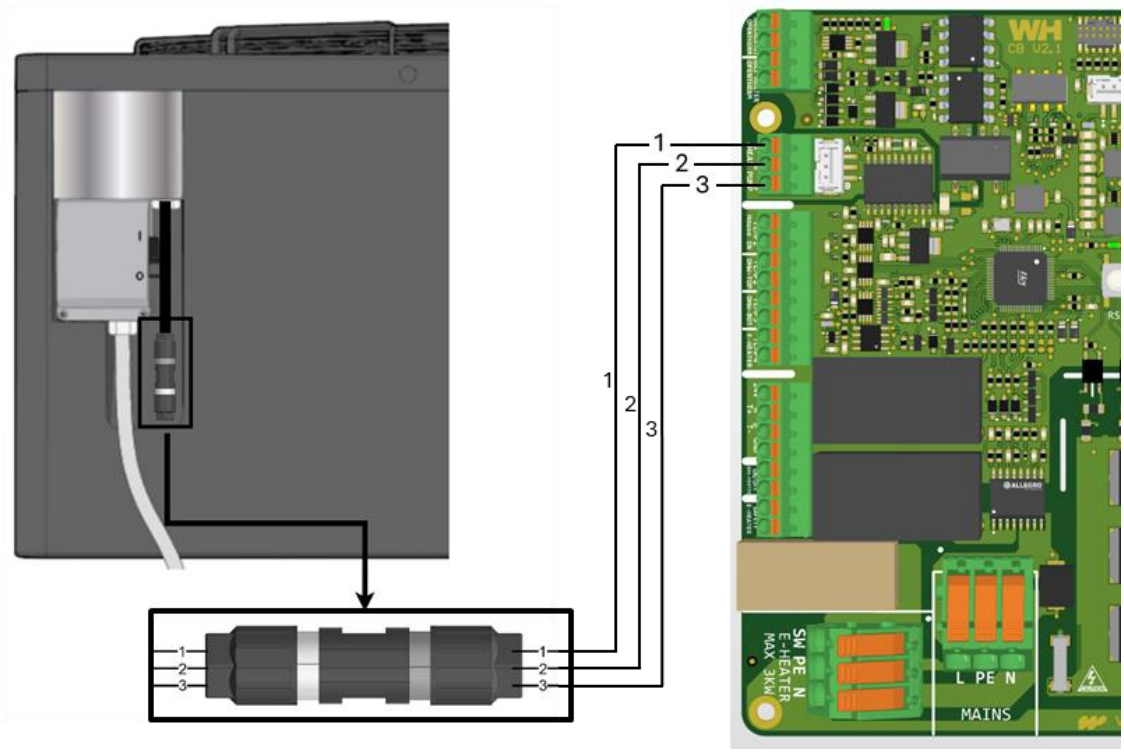


Figure 7-6, Connecting of the communication cable

WATCH OUT Ensure the correct connection of the communication cable by following the scheme at the image above, ensuring that the chosen sequence is followed.

WATCH OUT Ensure the communication connector is fully tightened.

7.7.4 Water house-in Temperature Sensor

This NTC sensor measures the temperature of the water going into the Central Heating system of the house. Connect the Water house-in temperature sensor to the "**HOUSE IN**" terminal on the Control bridge. While connecting the temperature sensor, it does not matter which wire is connected to either of the two terminals.

Place the **Temperature Sensor (TS)** on the Central Heating side of the installation, **after** the circulation pump, with **at least 50 cm distance** from it.

Ensure the sensor has adequate contact with the supply pipe by using a clip-on sensor or securing it with two tie wraps. The clip-on sensor is designed for pipes with a diameter of 22 – 28mm.

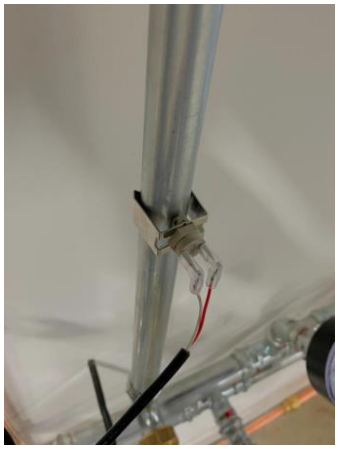


Figure 7-7, Clip-on sensor

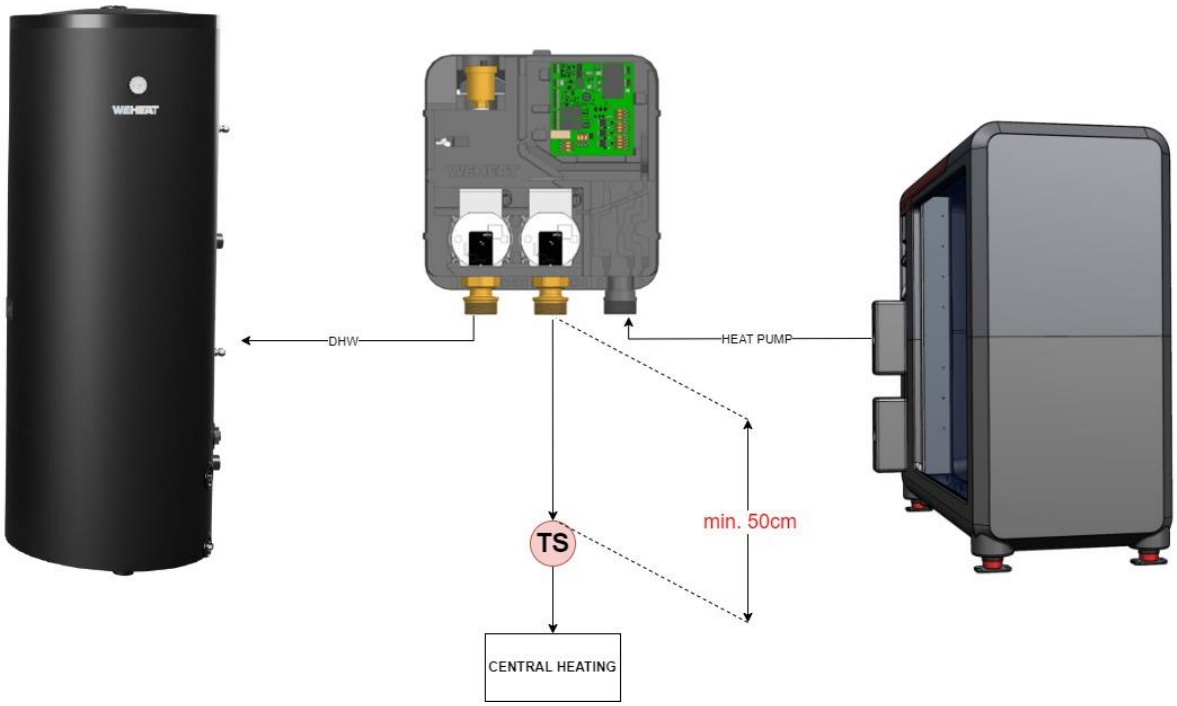


Figure 7-8, Placement of clip-on sensor

- Place the **water house-in temperature sensor** J on the supply pipe, specifically after the circulation pump and gas boiler, as illustrated in the image below.

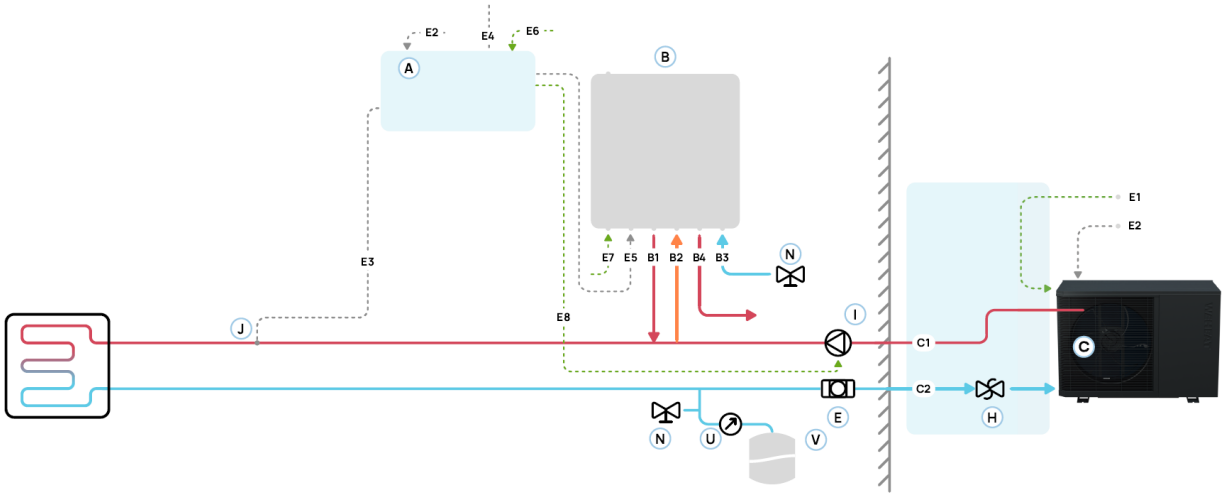


Figure 7-9, Placement of clip-on

- **For installations with a parallel buffer**, ensure the water house-in temperature sensor J is placed after the auxiliary circulation pump, as illustrated in the image below.

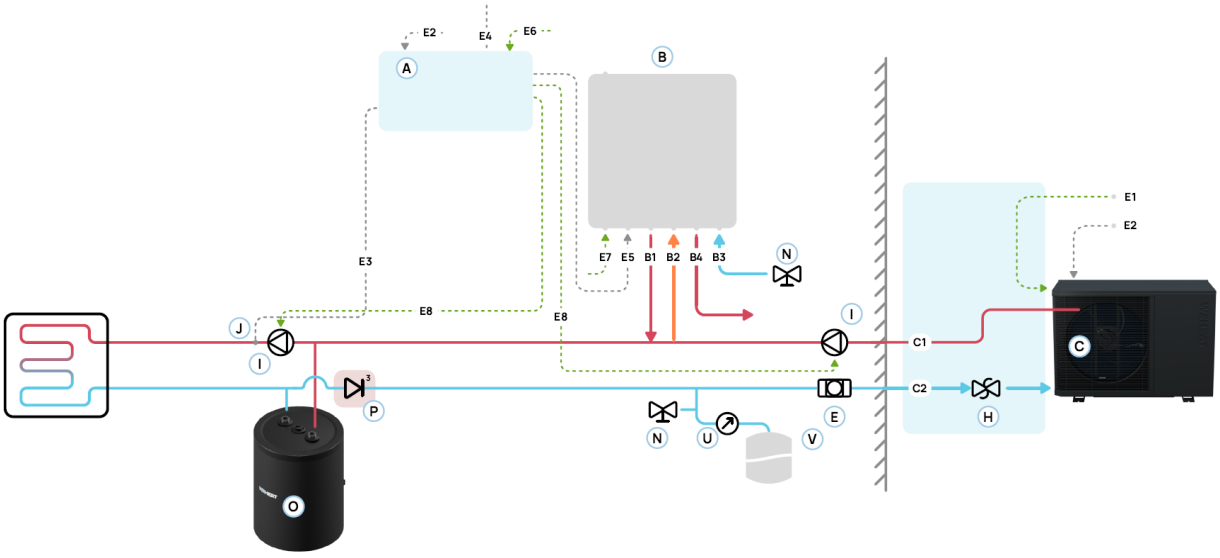


Figure 7-10, Placement of clip-on sensor with parallel buffer

7.7.5 Temperature Sensors Indirect Domestic Hot Water (DHW) Tank

The top and bottom Indirect Domestic Hot Water (DHW) Tank temperature sensors measure the temperature of the domestic hot water in the tank. They ensure the right tap water and legionella prevention temperatures. Proper placement of both the top and bottom temperature sensors is crucial for the proper functionality of the heat pump.

Ensure that the sensors are fully inserted into the dip tube and that the cable glands are securely tightened to prevent any movement of the sensors.

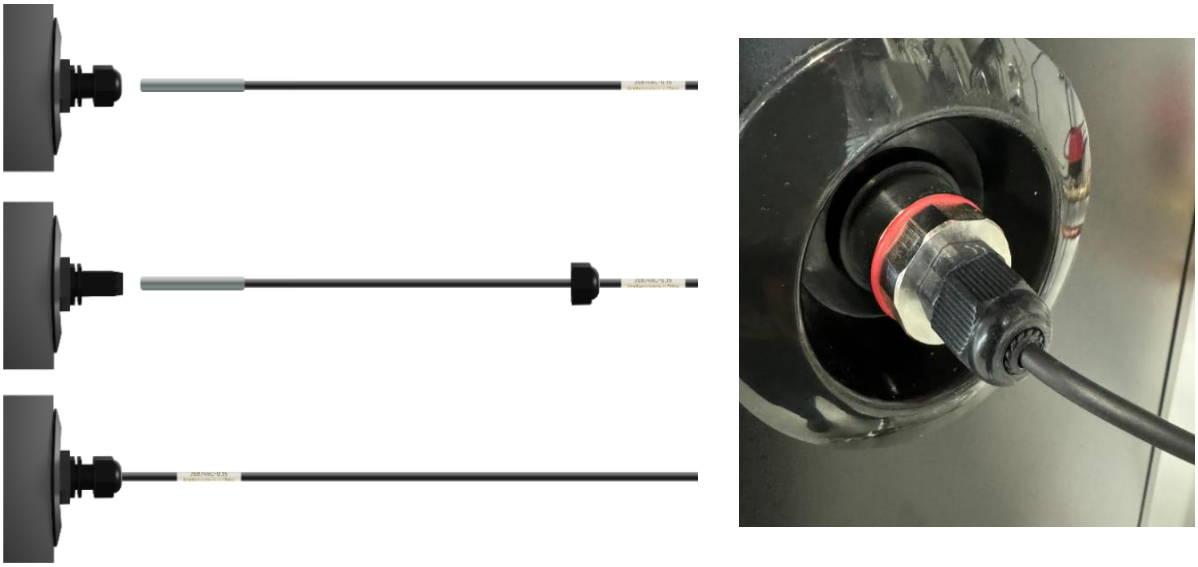


Figure 7-11, Placement of the temperature sensors. Make sure these are well position.

The top sensor of the tank is connected to the "**DHW-TOP**" terminal on the Control Bridge, while the bottom sensor of the tank is connected to the "**DHW-BOT**" terminal on the Control Bridge. While installing a temperature sensor, it does not matter which wire is connected to either of the two terminals.

- Place the upper sensor as high as possible.
- Place the lower sensor between 25% and 50% from the bottom of the tank.

WATCH OUT If the tank has only one option for placing a temperature sensor, always connect it to "**DHW-TOP**" terminal, regardless of its position in the tank.

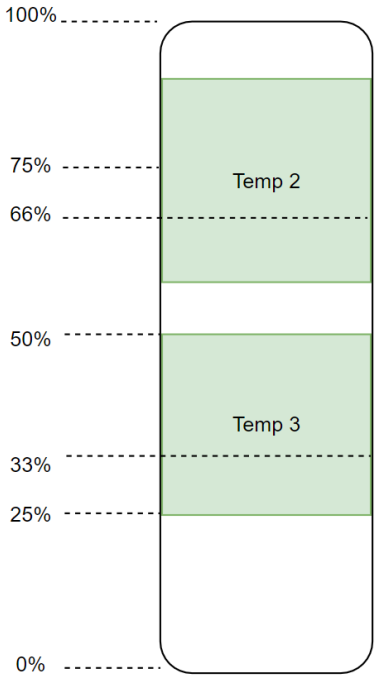


Figure 7-12 – DHW Tank temperature zones

7.7.6 Inline Electric Heater

This heater serves as a backup or additional source of heat in case the primary heating system fails or is insufficient. With a power output of 3 kW, it can provide significant heat when needed.

WATCH OUT Ensure that the system is free of air before turning on the inline electric heater.

⚠ WARNING The electrical installation must be capable of supplying 2x 16A simultaneously (1x 16A for the outdoor unit and 1x 16A for the indoor unit).

7.7.7 Air Release Valve

WATCH OUT Ensure the airbreather is opened during deaeration. After deaeration it is essential to close the deaerator.

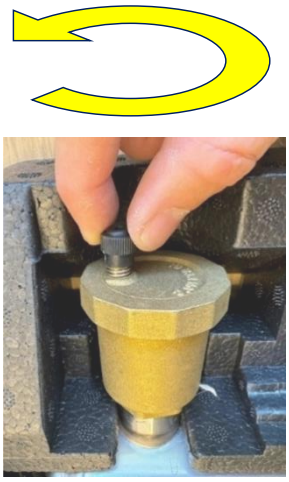


Figure 7-13, Open the deaerator during deaeration. Close this one after deaeration.

7.7.8 Mains Cable

Use the power cable provided by Weheat or any other power cable with 3x2,5mm² cross-section.

⚠ WARNING Ensure the electrical group where the indoor unit is connected to is different from the one the heat pump is connected to.

7.7.9 Water Circulation Pump

Ensure that the right heating system is connected to the right circulation pump. Indication is present on the EPP frame.

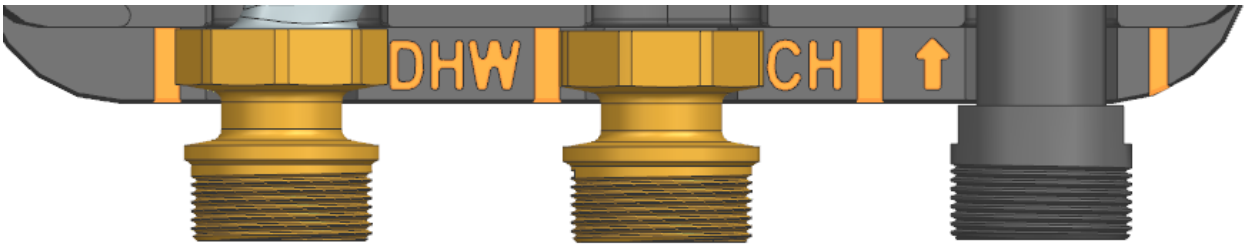


Figure 7-14, Water connections for pre-assembled unit

Optional: Connecting an additional circulation pump - If you have a parallel buffer tank, you shall connect the additional circulation pump to the "**AUX**" connector of the control bridge. The "**AUX**" connection can also be used to connect an existing underfloor heating or central heating circulation pump; it will then switch on/off with the circulation pump of the heat pump.

WATCH OUT The rated power of the used circulation pump should not exceed 100 Watts.

7.7.10 Heat Pump Water Inlet

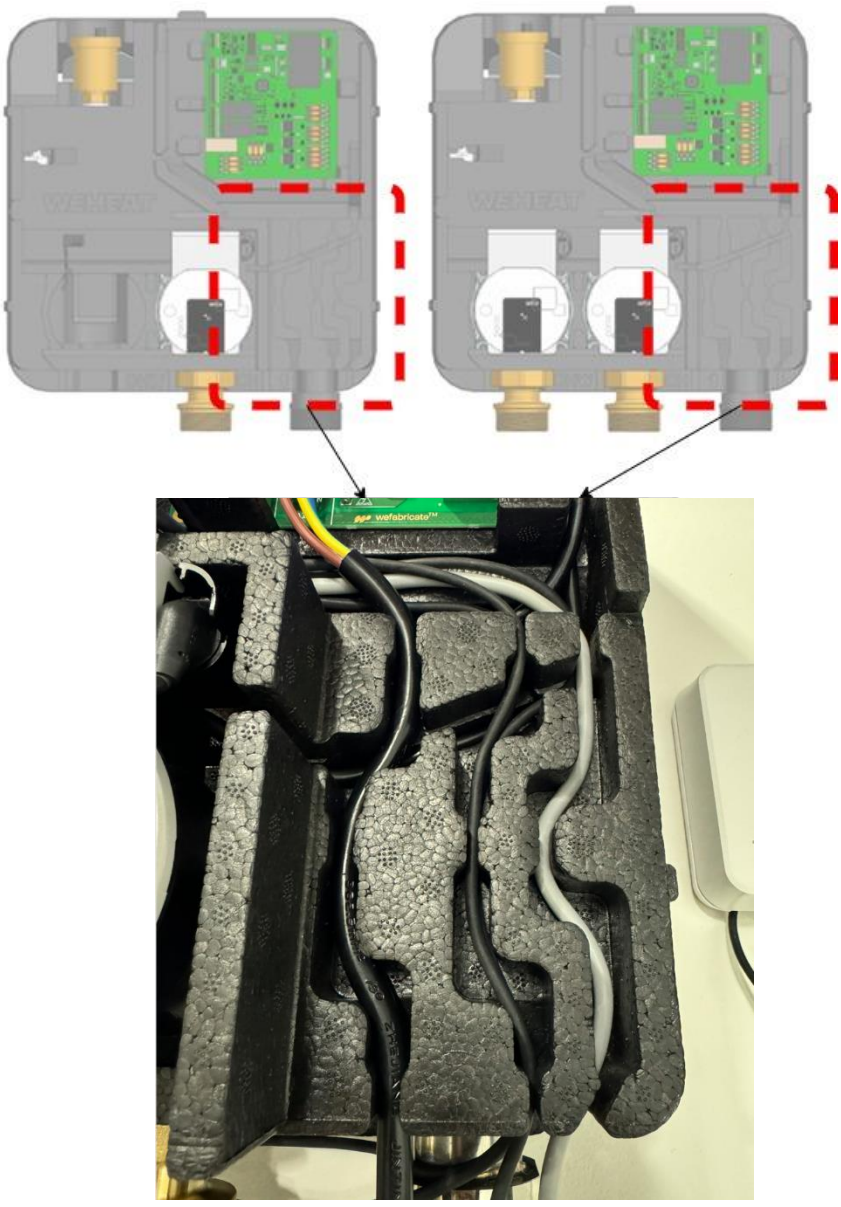
Use a wrench or 44mm key on the flat area at the water inlet to counter the force when installing the 2-piece coupling.

Figure 7-15, Flat surface for wrench usage

7.7.11 Housing Strain Relief

To effectively manage the cables and prevent mechanical stress, utilize the three strain relief channels provided in the indoor unit's housing. Proper usage of these channels is essential for maintaining the integrity and performance of your heat pump system.

- **Left Strain Relief**: Designated for the 2.5mm² mains power cable. This channel is specifically designed to handle the power cable's gauge, ensuring it remains secure and free from strain that could lead to disconnection or damage.
- **Middle and Right Strain Reliefs**: Reserved for the sensor and data cables. These channels provide appropriate separation and organization, preventing interference and ensuring reliable data transmission.



7.7.12 Cover

After completing the installation, always ensure the cover is securely placed to protect the Control Bridge from environmental factors such as dust, moisture, and physical damage. The cover is designed to provide optimal protection and maintain the longevity of the device.

To secure the cover, you can use the two provided screws. These screws can be installed either underneath or on the side of the cover, depending on which option is more convenient and suitable for your setup.

Figure 7-16, Location of EPP cover screws

8 Putting the system into operation

1. **Ensure air escape**:
    a. Check if the cap of the automatic air vent valve on the heat pump appendage set is open.
    b. Check if the cap of the automatic air vent valve on the pre-assembled indoor unit is open.
    c. Ensure all high points of the installation have an air vent valve.
2. **Fill the central heating system**:
    a. Fill with water and ensure the pressure is between 2 and 2.5 bar.
3. **Power the indoor unit**.
4. **Check the LED status of the indoor unit**:

LED Colour	Status
Green - pulsing	Stand-by
Blue - pulsing	Heating
Cyan - pulsing	Cooling
Purple - pulsing	DHW, legionella or electrical heater
Orange – flashing	The indoor unit cannot establish a connection with the outdoor unit. Check the communication cable connection between the indoor and outdoor units.
Orange – pulsating	The outdoor unit could not establish a connection with the internet. To resolve the issue, contact Weheat.
Red – flashing	An error code has been detected by the outdoor unit and is displayed on portal.weheat.nl. Go to the relevant household and click on 'Faults' to find a description of the outdoor unit's error code. This is not necessarily problematic.
Red - blinking	Service request. To resolve the issue, contact Weheat on 085 799 00 52
No LED	Check if the power supply of the indoor unit is correctly connected.

5. **Commission the heat pump:**
    a. Follow the steps in item chapter Commissioning the heat pump
6. **Bleed air:**
    a. Use portal to activate Manual Control > Start > **Bleed air** > Start.
    b. Run Bleed air mode for 10 to 30 minutes
    c. Bleed radiators and floor heating manifolds
7. **Inspect for leaks:**
    a. Check connections and joints for any signs of water leakage.
    b. Refill the system with water. Ensure pressure between 2 and 2.5 bar.
8. **Manual Control for circulation pumps (if air still trapped):**
    a. Use the portal: Manual Control > Start > Advanced > Start > Select all circulation pumps > Send.
    b. Bleed the circulation pumps by untightening the 2-piece coupling, letting water/air to scape.
    c. Bleed the system by opening the overpressure valve on the outdoor unit appendage set. Turn the red cap fill times for 5-10 sec, letting water/air to run.
9. **Refill the system**. Ensure pressure between 2 and 2.5 bar.
10. **Turn off Manual Control in portal**
11. **For safety reasons**, close the automatic air release valves in the house to prevent propane from entering the house in the event of a propane leak.

9 Commissioning the Heat Pump

WATCH OUT To commission the heat pump, the installer must have an account in the Weheat application or portal. In addition, the serial number of the heat pump must be linked to the installer. If this is not the case, please contact Weheat.

1. As a certified installer, you will receive an email invitation to create an installer account. Go to the email and create an account via the provided link.
2. Open the Weheat portal.
    a. The portal is available at portal.weheat.nl.
3. Log in with the installer account login credentials.
4. Go to the menu and select the 'Households' tab.
5. Click on the 'Add Household' button in the 'Households' tab.
6. Request the homeowner's email address and link it to the household.
7. Connect the heat pump to the household using the serial number.
8. Then click on 'Start Commissioning' and go through the series of questions to make the heat pump operational.
9. After the configuration is complete, the Weheat Blackbird heat pump is operational.

Go to portal and proceed with steps 6 to 10 from item Putting the system into operation.

9.1 Important Compliance Note

To ensure compliance with regulatory standards and to minimize exposure to electromagnetic fields, it is **mandatory** to always maintain a minimum distance of **20 cm** from the device. Failure to follow this guideline may result in exposure levels exceeding the permissible limits.

10 Sound

10.1 Legislation and Regulations

Since April 1, 2021, noise requirements for outdoor installations for heating and cooling, such as heat pumps and air conditioners, have been tightened. These measures are intended to reduce noise nuisance for neighbors and encourage the development of quieter equipment.

10.2 Sound Pressure at Property Boundary

According to the Building Decree 2012 (Article 3.8, paragraph 2), the following maximum sound pressure levels apply to outdoor installations:

- Daytime (07:00 - 19:00): Maximum 45 dB(A) at the property boundary.
- Evening and Night (19:00 - 07:00): Maximum 40 dB(A) at the property boundary.

These values are measured at the property boundary with neighbors and apply when the installation operates at full capacity.

The method for determining the noise level is established in the Building Decree 2012 Regulation (Appendix 8). This includes on-site noise measurements under maximum operating conditions, based on the intended use of the installation.

This means that the installation must be placed at a sufficient distance from neighbors or be shielded to meet the standards. If the installation does not meet the noise requirements, additional measures must be taken, such as a sound-insulating enclosure or other acoustic provisions, which are then considered part of the installation.

10.3 Sound Power Levels

Since 2012, specific noise standards for heat pumps have been in force within the European Union, established in the Ecodesign Directive (2009/125/EC). These standards set limits on the sound power of heat pumps, depending on their nominal heat output:

- Heat pumps up to 6 kW: Maximum sound power: 65 dB(A)
- Heat pumps from 6 kW up to 12 kW: Maximum sound power: 70 dB(A)
- Heat pumps from 12 kW and above: Maximum sound power: 78 dB(A)

Sound power, expressed in decibels dB(A), indicates how much noise a heat pump produces. This value is independent of distance and environmental factors and is determined under standardized test conditions (EN 12102-1). Since 2015, it has been mandatory to display the sound power of heat pumps on the energy label so that consumers are informed about the noise production of the device.

10.4 Sound Pressure vs. Sound Power

Sound power is the total amount of noise a heat pump produces, expressed in decibels (dB(A)). This is a fixed characteristic of the device and is measured under standardized conditions. Sound power is an objective measure of the noise emissions from the source itself, independent of the distance to the listener. It is typically indicated with the LwA value (A-weighted sound power), where the measurement is corrected to account for the sensitivity of the human ear.

In contrast, **sound pressure** refers to the noise level observed at a specific distance from the heat pump. This level varies depending on factors such as the distance from the source, reflections from surfaces, and environmental conditions. Sound pressure is usually expressed as LpA (A-weighted sound pressure level).

	LwA (dB(A))	LpA at 1 meter (dB(A))	LpA at 5 meter (dB(A))
Quiet conversation	30	24	10

Library	40	34	20
Fridge	50	44	30
Pc fan	55	49	35
Airco outside unit	65	59	45
Vacuum cleaner	80	74	60
Lawn mower	90	84	70

10.5 Impact of Placement

When installing the heat pump, there are several factors that require careful consideration to prevent potential noise disturbances. It is the installer's responsibility to take the following points into account to reduce any noise nuisance related to the installation:

- **Stable Surface:** Preferably place the heat pump on a stable, solid surface to minimize vibrations and limit noise transmission to the surroundings.
- **Placement on a Wooden Roof:** If the heat pump is installed on a wooden roof, distribute the load over the largest possible surface area. Ideally, position the unit on the strongest parts of the structure, such as beams or the supporting framework along the edges. Furthermore, introducing weight underneath the heat pump can help with reducing vibrations.
- **Use of Vibration Dampers:** Install vibration dampers under the heat pump to effectively absorb vibrations and prevent the transmission of structural noise to the building.
- **Condensate Drainage:** Ensure that water released during the defrost cycle can drain easily. This prevents accumulation and refreezing at low temperatures, which can cause damage or additional noise.
- **Flexible Water Connection:** Connect the heat pump hydraulically with flexible pipes. This prevents stress Vibrations from the heat pump being passed through to the house.
- **Check for Free Movement:** After installation, verify that the heat pump can move slightly. This ensures that the vibration dampers function properly and that there is no direct contact with fixed structural parts that could transmit noise.
- **Distance to walls:** Do not place the heat pump too close to walls or other hard surfaces. Keep in mind that walls and hard surfaces can reflect sound, which may amplify it in a specific direction. **Distance to living spaces:** If possible, avoid placing the heat pump directly next to sensitive areas such as living rooms or bedrooms.
- **Distance from Living Spaces:** Avoid placing the unit directly next to sensitive areas, such as living rooms or bedrooms, if possible.

By considering both the sound power of the heat pump and the specific installation conditions, you can minimize noise disturbances for both yourself and your neighbors.

10.6 Sound Modes

Our heat pumps are equipped with advanced sound settings that allow both installers and end users to flexibly manage noise levels. With five sound modes and an adjustable Night Schedule function, the heat pump can be optimally configured to balance comfort, performance, and environmental requirements. The following settings are available in the consumer app and the installer portal:

Modus 1	Lowest power – minimal noise production.
Modus 2	Lower noise production – ideal for residential environments with strict noise regulations.
Modus 3	Reduced power – suitable for situations where lower noise levels are desired.
Modus 4 – *Standard*	Nominal power – balanced noise production and performance.
Modus 5	Maximum heating capacity – highest noise production.

Note: In a lower noise mode, the heating capacity of the heat pump is intelligently limited to minimize noise exposure. In modes 2-5, the maximum noise level of the heat pump will increase as the outdoor temperature drops. Using a quieter mode may result in the heat pump not providing enough power to maintain the desired indoor temperature.

10.6.1 Night limit Functionality

The night limit function allows you to set the heat pump to minimize noise production during specific hours, such as at night. You can activate the quiet hours schedule for up to 20 hours per day. Enabling the night limit function restricts the maximum output of the heat pump by limiting the compressor's power. During these hours, the heat pump operates at a lower capacity than during the day to reduce noise production. This feature is ideal for residential environments where nighttime noise disturbance needs to be minimized.

With the introduction of new sound modes, we offer a wider range of control options, which also means a corresponding increase in possible noise levels the heat pump can produce. It is essential to determine the most suitable noise level for your specific situation. Additionally, this noise level can be adjusted separately for nighttime operation.

The perceived noise of a heat pump depends significantly on its placement (e.g., next to the house, on a roof) and how it is installed. Moreover, it is important to consider the distance to property boundaries when setting and adjusting the available sound modes. By using the advanced sound settings, you agree to use the new

sound modes correctly and take full responsibility for setting the heat pump to a level that suits your specific situation.

10.6.2 Use of the Sound Mode

We recommend starting with sound mode 5. In this mode, the heat pump can deliver its maximum capacity to effectively heat your home.

If the noise level in mode 5 is not satisfactory, you can gradually lower the mode step by step. Allow the heat pump to run in each selected mode for at least 24 hours to ensure it still provides enough power to keep your home warm. It is advisable to test this during colder outdoor temperatures to get an accurate assessment of performance.

If your home does not reach the desired temperature after 24 hours, switch to a higher sound mode. Keep in mind that a lower sound mode in cold weather may result in insufficient heating.

10.7 Sound Data

The table below presents the sound data for the **Blackbird P80**. It includes both the maximum measured sound power levels (**Lwa-max**) and the maximum values in silent mode (**Lwa-max Silent**), providing a clear overview of performance in different usage scenarios.

Additionally, the sound pressure levels are specified for various distances, measured under standard conditions at an outdoor temperature of **7°C**. This offers insight into how the sound propagates depending on the distance from the heat pump.

Blackbird P80 – Sound power			
Mode*	LwA-max**	LwA-max night limit**	LwA-max A7**
	dB(A)	**dB(A)**	**dB(A)**
Mode 5	70.0	65.0	70.0
Mode 4 * **	65.0	64.0	64.0
Mode 3	64.0	61.0	61.0
Mode 2	61.0	57.0	58.0
Mode 1	57.0	0	57.0

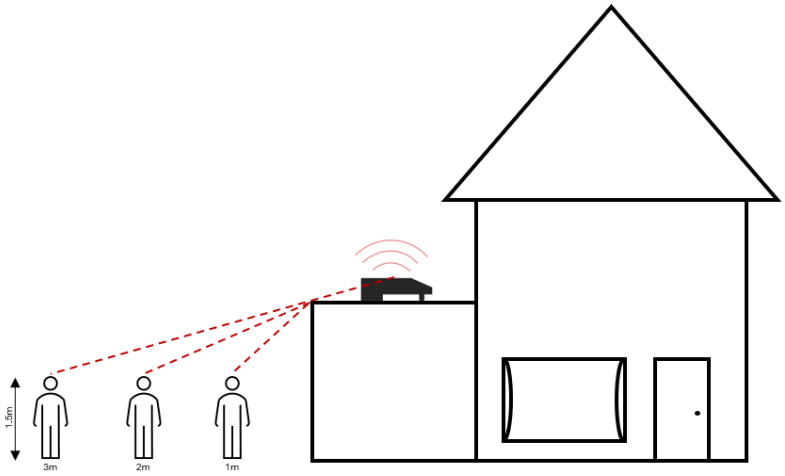
*Measurements conducted according to EN12102-1

**Sound pressure determined at maximum power and an outside temperature of 7 degrees.

***Standard sound mode

10.7.1 Example Scenario for Sound Pressure Determination

The Blackbird is unique and specifically designed for flat roof installation on a garage, carport, etc. To optimally represent this scenario, the situation below has been calculated using the LBP-Sight tool. In this example, the Blackbird is placed on an extension measuring 3m wide, 3m deep, and 3m high. The heat pump's sound source is positioned in the center of the extension. As shown in the table below, the sound pressure increases as the distance grows.



Blackbird P80				
Mode*	LwA-max A7**	**Sound pressure at 1m******	**Sound pressure at 2m********	**Sound pressure at 3m********
	dB(A)	**dB(A)**	**dB(A)**	**dB(A)**
Mode 5	70.0	45,0	45,0	44,0
Mode 4 * **	64.0	39,0	39,0	38,0
Mode 3	61.0	36,0	36,0	35,0
Mode 2	58.0	33,0	33,0	32,0
Mode 1	57.0	32,0	32,0	31,0

*Sound modes as described in the Sound Mode section

**Measurements performed according to EN12102-1, without using the night limit

***Factory default sound mode

****Distance from the extension of the house, calculated using the LBP-Sight tool (for an extension attached to a house in an open field, margin not included)

The situation described above is an example setup for the Blackbird. Every situation is unique and should be calculated separately. For this, we recommend using the government’s calculation tool or platforms such as geluidslabel.com.

10.8 Calculation Tool

To determine the optimal placement of the heat pump, you can use the **calculation tool** provided by the government. This tool is designed to assess, based on acoustic calculations, whether a planned installation complies with the established noise regulations. It takes into account several factors, such as:

- **Type of Housing:** The tool distinguishes between different situations, such as detached houses and apartments.
- **Outdoor Unit Placement Location:** Consider placement at ground level, on an extension, or on the roof. When installed on a roof, the height is also factored into the sound pressure calculations. A heat pump placed on a roof can often be positioned closer to the property boundary.
- **Distances to Property Boundaries and Nearby Objects:** The exact positioning relative to the property boundary and surrounding buildings or objects is considered.
- **Presence of Noise-Reducing Measures:** Such as fences, walls, or other barriers that can dampen the sound.

De calculation tool can be found with the following link Rekentool warmtepompen.

Placement Configurations in the Calculation Tool

1. **Detached House, Outdoor Unit on Ground Level (Gg_1):**
   Placement directly on the ground next to the house can cause sound reflections from nearby hard surfaces, such as walls and paving. Using sound barriers like screens or fences can reduce these reflections and lower the sound pressure level at the property boundary.
2. **Detached House, Outdoor Unit on Extension Attached to the House (Gg_2):**
   When placed on an extension, walls of both the main house and the extension can reflect sound, increasing noise levels in certain directions. It's important to position the unit's outlet so that it does not face sensitive areas directly and to use sound-absorbing materials to minimize reflections.
3. **Detached House, Outdoor Unit on Structure at the Back of the Property (Gg_2A):**
   Placement on a separate structure, such as a shed at the back of the garden, can be beneficial for sound distribution if sufficient distance from the property boundary is maintained. However, nearby structures may reflect sound, increasing sound pressure in specific areas. Strategically placing noise barriers and adjusting the outlet direction are crucial to limit noise disturbances.
4. **Detached House, Outdoor Unit on the Roof (Gg_3):**
   Installing the unit on the roof can result in wider sound dispersion due to fewer direct obstacles. However, sound can travel further and potentially reach higher parts of neighboring buildings. Roof structures can amplify or resonate sound, especially with lightweight materials. Using vibration dampers and sound-absorbing materials can help minimize these effects.
5. **Apartment Buildings, Outdoor Unit on the Façade or Roof (Ap):**
   When installed on the façade or roof of an apartment complex, the height and proximity to other apartments can influence noise levels. Sound can be transmitted through the façade or roof structure to adjacent units. It's essential to position the outdoor unit to minimize noise disturbances for residents and neighbors, for example, by using noise-damping mounting systems and avoiding placement near bedrooms.

For each placement method, it's important to consider the specific environmental factors and the construction of the house or building. We recommend following the previously mentioned noise reduction measures when installing the heat pump.

11 Installation Diagrams

All installation schemes can be found at: https://portal.weheat.nl/nl/installation-schematics

12 Attachment: Assembling the Butterfly hood

1. Remove the protective film from the butterfly hood.
2. Insert 4x threaded rods into the fan motor (hex key 2.5mm - max 2Nm).

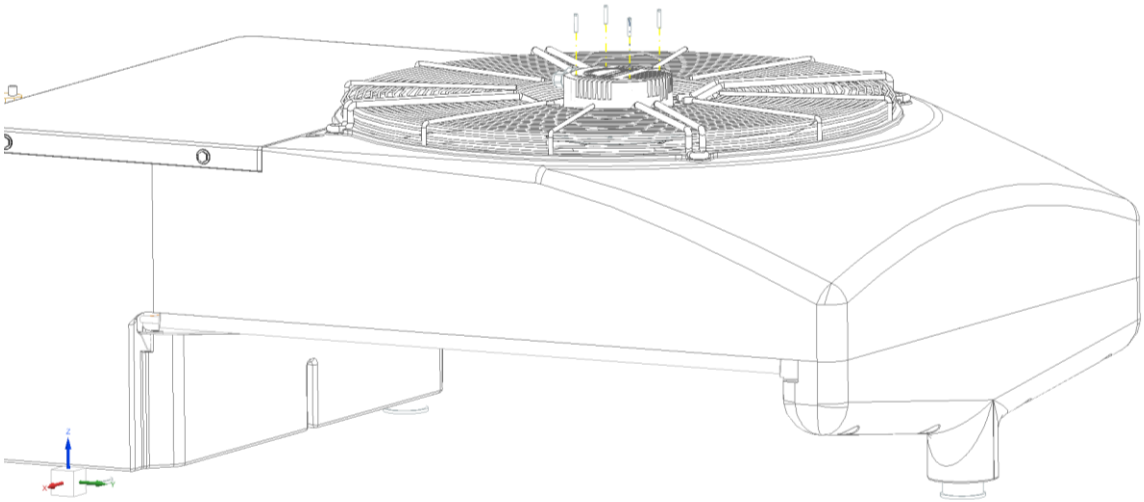


Figure 12-1: Step 2 - Insert threaded rods

3. Place the butterfly hood over the threaded rods (ensure correct orientation).

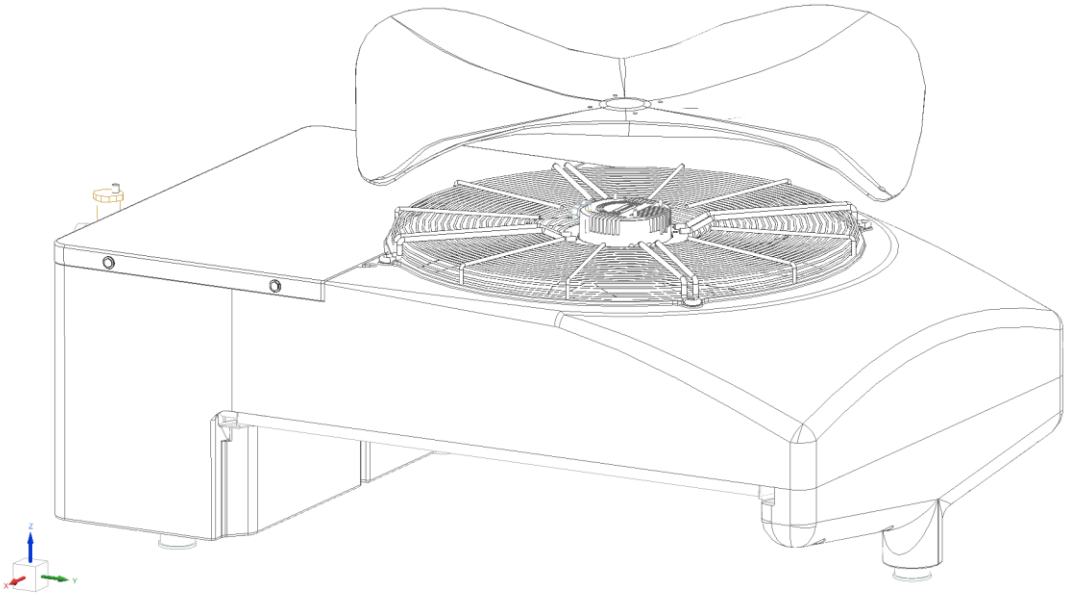


Figure 12-2: Step 3 - Placing the butterfly hood

4. Install plastic rings (4x) + nuts (wrench size 8 - max 2Nm) + nut caps (4x).

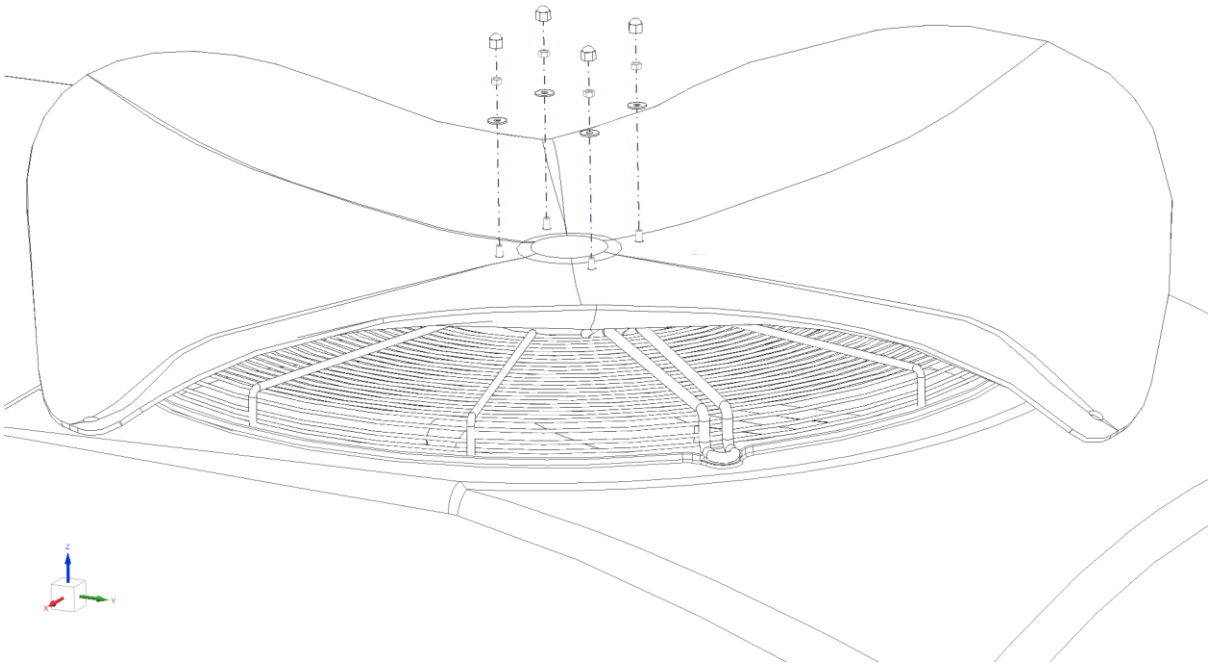


Figure 12-3: Step 4 - Attaching nuts

5. Attach 3x EPP screws at the corners (wrench size 13 - max 2Nm).

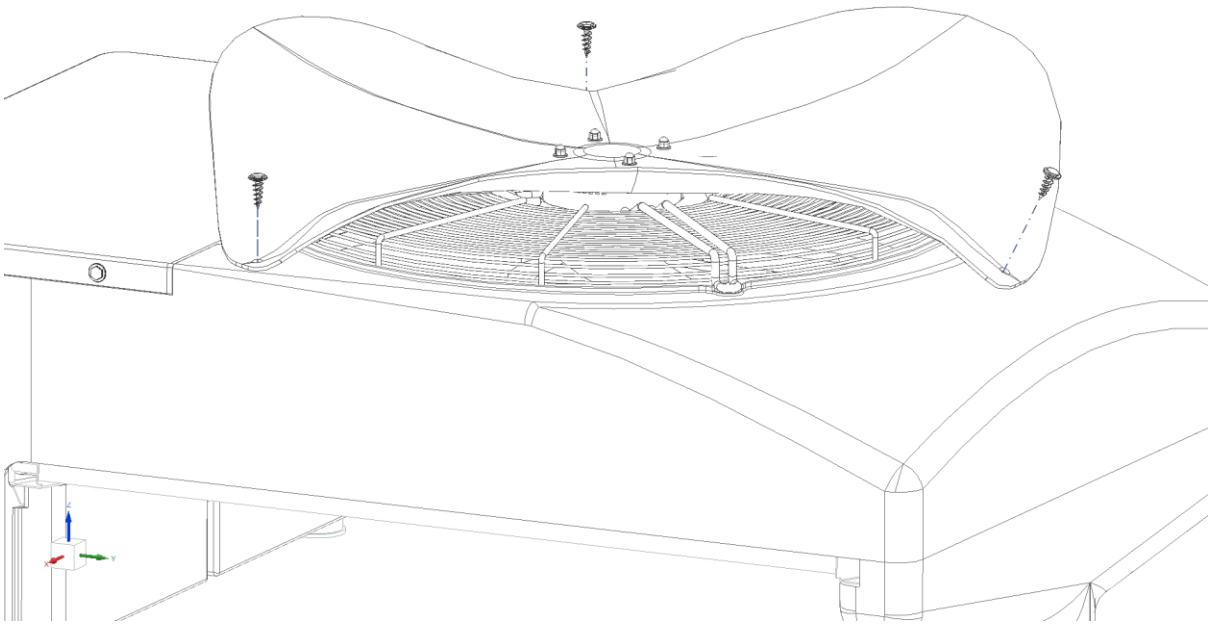
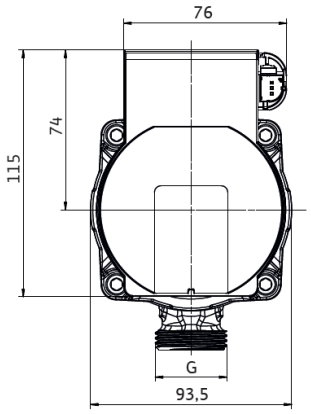
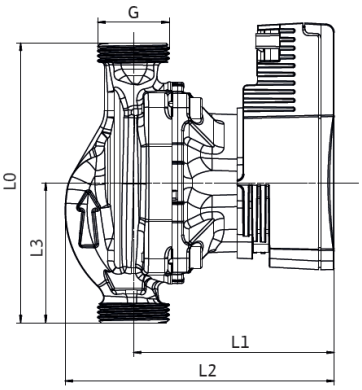


Figure 12-4: Step 5 - Placing EPP screws

13 Technical Specifications for Circulation Pumps





Para 15-130/7-50/iPWM or LIN
Technical datasheet

wilo

Technical data (type)	
Approved liquids (other liquids upon request)	
Heating water (as per VDI 2035)	yes
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	yes
Min. fluid temperature T_{min}	-10 °C
Max. fluid temperature T_{max}	95 °C
Min. ambient temperature T_{min}	-10.0 °C
Max. ambient temperature T_{max}	70.0 °C
Maximum operating pressure *PN*	10 bar
Min. suction head (to avoid cavitation at suction port at water pumping temperature)	
Minimum suction head at 50 °C *m*	0.5 m
Minimum suction head at 95 °C *m*	4.5 m
Motor data	
Energy efficiency index (EEI)	≤ 0.21

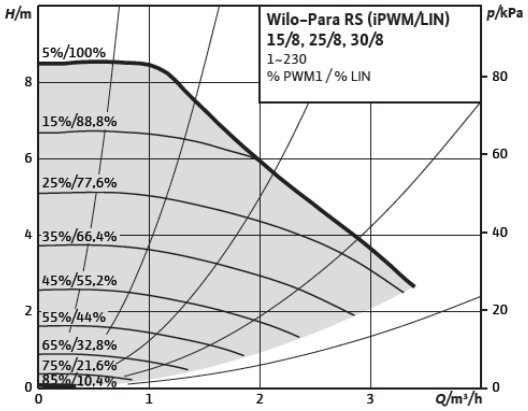
Pump operation in high ambient / fluid temperature may affect hydraulic performance. 0°C or negative water temperature implies to have adapted frost protection mixture. For further information please contact Wilo.

Technical data (type)	
Mains connection	1~230V +10/-15%, 50/60Hz
Approvals and markings	CE / EAC / UA
Insulation class	F
Motor protection	integrated
Power consumption $P_{1\,min}$	2 W
Power consumption $P_{1\,max}$	75 W
Max current I_{max}	0.66 A
Protection class	IPX4D
Power consumption in standby mode *P1*	≤ 0.5 W
Materials	
Pump housing	Cast iron with cataphoresis treatment
Impeller	PP-GF40
Shaft	Stainless steel
Bearing	Carbon

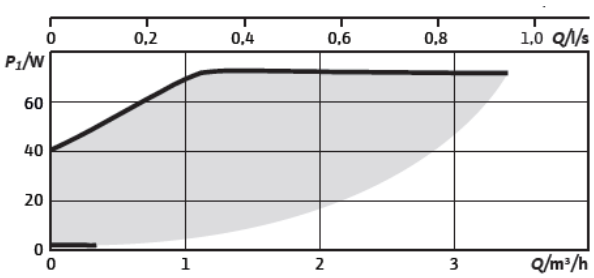
Pump operation in high ambient / fluid temperature may affect hydraulic performance. 0°C or negative water temperature implies to have adapted frost protection mixture. For further information please contact Wilo.

Pump curve

External control via PWM 1



Name	Para 25-130/6-43/SCU-12
Connection input	G 1½
Connection output	G 1½



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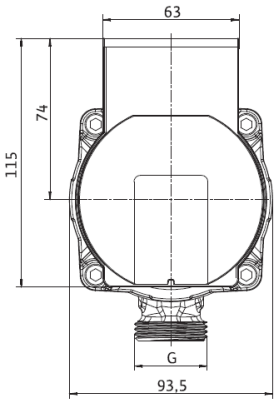
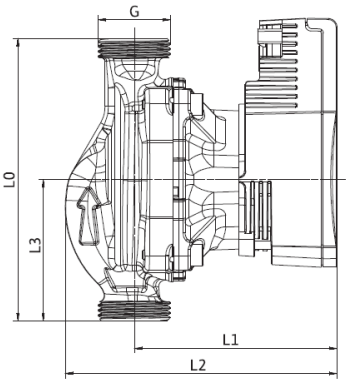




Para 15-130/6-43/SCU

Technical datasheet

wilo

Technical data (type)	
Approved liquids (other liquids upon request)	
Heating water (as per VDI 2035)	yes
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	yes
Min. fluid temperature T_{min}	-10 °C
Max. fluid temperature T_{max}	95 °C
Min. ambient temperature T_{min}	-10.0 °C
Max. ambient temperature T_{max}	70.0 °C
Maximum operating pressure *PN*	10 bar
Min. suction head (to avoid cavitation at suction port at water pumping temperature)	
Minimum suction head at 50 °C *m*	0.5 m
Minimum suction head at 95 °C *m*	4.5 m
Motor data	
Energy efficiency index (EEI)	≤ 0.20

Pump operation in high ambient / fluid temperature may affect hydraulic performance. For further information please contact Wilo.

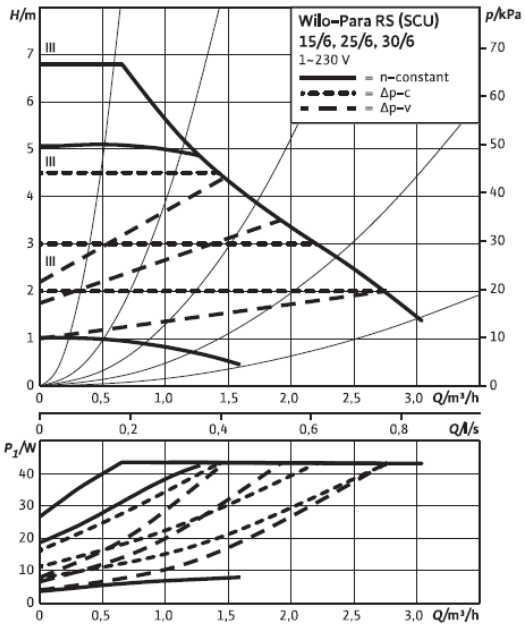
Technical data (type)	
Mains connection	1~230V +10/-15%, 50/60Hz
Approvals and markings	CE / EAC / UA
Insulation class	F
Motor protection	integrated
Power consumption $P_{1\,min}$	3 W
Power consumption $P_{1\,max}$	43 W
Max current I_{max}	0.44 A
Protection class	IPX4D
Power consumption in standby mode *P1*	≤ 0.5 W
Materials	
Pump housing	Cast iron with cataphoresis treatment
Impeller	PP-GF40
Shaft	Stainless steel
Bearing	Carbon

Pump operation in high ambient / fluid temperature may affect hydraulic performance. For further information please contact Wilo.

Name	Para 25-130/6-43/SCU-12
Connection input	G 1½
Connection output	G 1½

Pump curve

Wilo-Para RS SCU 15/6, 25/6, 30/6

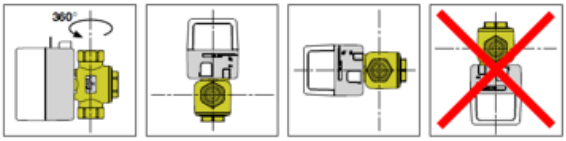


WEHEAT

14 Technical Specifications 3-way valve Caleffi 643

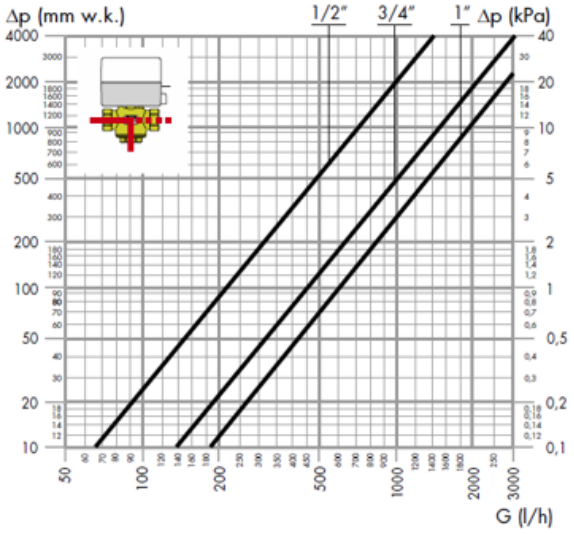
Installatie

- Het ventiel kan zowel verticaal als horizontaal worden gemonteerd met de bediening in elke willekeurige positie, **behalve omgekeerd**.



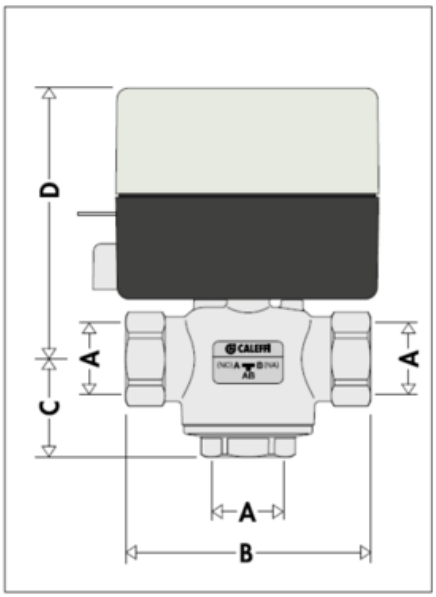
- Bij installatie in een kast moet deze goed geventileerd worden.
- Het driewegventiel kan niet worden omgebouwd tot een tweewegventiel en omgekeerd.
- Wanneer de zoneventielen geïnstalleerd worden, dient men rekening te houden met de correcte stromingsrichting zoals in onderstaande schema's.
- Het tweeweg zoneventiel kan zowel op de toevoer als op de retour worden gemonteerd; men dient wel rekening te houden met de stromingsrichting die met een pijl op het ventiellichaam wordt aangegeven.

Hydraulische eigenschappen



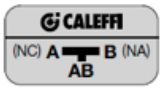
Werkingstoestanden van het ventiel

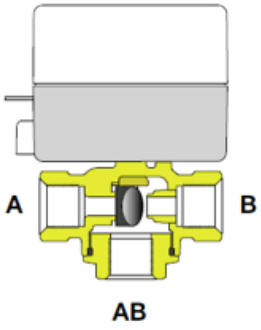
	3-weg
Voeding OFF	"A" gesloten 'B' open 'AB' open
Voeding ON	"A" open 'B' gesloten 'AB' open
Manueel geopend	"A" open 'B' open 'AB' open



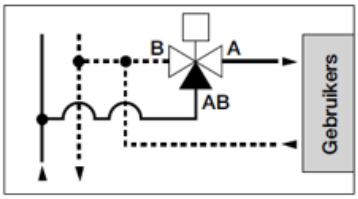
A	B	C	D	Massa (kg)
1"F	88	46,5	94	1,20

3-weg
(als er geen aanvoer is, is A gesloten)

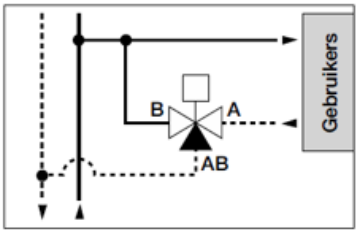




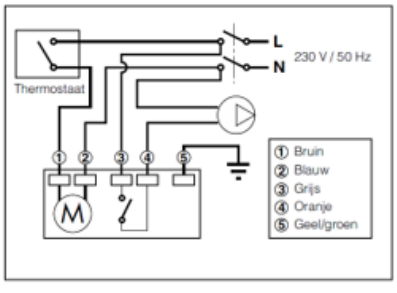
Drie-weg zoneventiel AB met verdeelfunctie in de aanvoer en ON/OFF bediening



Drie-weg zoneventiel AB met mengfunctie in de retour en ON/OFF bediening



Elektrische aansluitingen



Technische gegevens

Ventiellichaam

Materialen

Lichaam:	messing, EN 12165 CW617N
Bedieningsas:	roestvrij staal
Afsluiter:	EPDM

Prestaties

Vloeistof:	water, glycoloplossingen
Maximumpercentage glycol:	30%
Temperatuurbereik:	0 tot 90°C
Max. vloeistoftemperatuur:	110°C
Max. werkingsdruk:	16 bar
Schroefdraadaansluitingen:	1/2", 3/4", 1" F (ISO 228-1)

Servomotor

Materialen

Blok en deksel:	PC G10

Prestaties

Synchroonmotor	
Normaal gesloten	
Voeding:	230 V - 50/60 Hz
Opgenomen vermogen:	6,5 W; 7 VA
Openingstijd	70÷75 s
Sluitingstijd:	5÷7 s
Capaciteit extra microschakelaar:	0,8 A
Beschermingsgraad:	IP 20
Maximale omgevingstemperatuur:	40°C
Volgens richtlijnen:	EN 60730-1 • EN 60730-2-14 2006/95/EG • 2004/108/EG
Kabel:	5x0,75 mm² - lengte 95 cm

Omgevingscondities (ventiel + bediening)

Temperatuurbereik vloeistof:	0 tot 90°C
Omgevingstemperatuur:	
Werking:	0÷40°C EN 60721-3-3 Cl. 3K3, max. vochtigheid 85%

15 Technical Specifications Immersion Heater

TECHNICAL INFORMATION:

Intended and technical use :

* Heat exchangers in both types stainless steel and emailed tank with capacity of 140-200 liters
* Solar collectors as an alternative heat source
*Reliable heat source in photovoltaic installations
*The heater has an independent second safety system 85°
*Heater contain a mechanical reset button
*Meets the most rigorous safety standards

Note: The heaters are made of AISI 316 stainless steel
If the tank or/and other parts in the tank are made from other steel grades, electrocorrosion may occure.

Power	**3000W**
Voltage	**230V**
Temperature Range	**30°C–70°C**
Thread of the flange	**6/4"**
Element lenght	**344 mm +/-10**
Tightness class	**IP44**
Flange material	**steel AISI**

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