User- and installer handbog

Domestic hot water heat pump

MT-WH21

DRAŽICE

We reserve the right for printing errors.

TABLE OF CONTENTS

1. IMPORTANT INFORMATION

Safety information

This manual describes installation and service procedures for implementation by specialists.
This manual must be left with the customer.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. The product is intended for use by experts or trained users and in shops, hotels, light industry, and similar environments. Children must be instructed/ supervised to ensure that they do not play with the appliance. Do not allow children to clean or maintain the appliance unsupervised.

The product shall be installed, commissioned, repaired only by qualified technicians. Incorrect installation can result in damages of properties and injuries to people and animals.

The unit shall be disconnected from the power supply when the cover is off.

Cleaning and maintenance shall not be made by children without supervision.

Do not place flammable materials in contact or close to the unit.

The water system and the air system shall be installed as stated in the manual.

When in service, the unit should not be placed in subzero temperature areas.

When not in service, the unit can be placed in subzero temperature areas, but all the water in the tank or in the condensate drain should be removed before hand.

Hot water can cause serious burns if directly connected to the taps. The installation of a mixing valve is highly recommenced.

The unit should be used only for its specified use. The manufacturer is not liable for any damages due to failure to observe this manual.

Take all the possible precautions to avoid incidents.

The product contains HFC-R134a. Follow the safety instructions, national regulations and take precautions to avoid incidents when working with the refrigerant circuit.

SAFETY INSTRUCTIONS – REFRIGERANT CIRCUIT

Only skilled and trained technicians shall carry out repair and service of the heat pump circuit.

Before opening the refrigerant circuit, discharge the refrigerant to a level that allows safe working conditions.

The refrigerant can be toxic if inhaled or if in high concentrations.

Special attention should be given if the work is carried out with an open flame.

SAFETY INSTRUCTIONS – WATER CIRCUIT

Only authorised and trained techincians shall carry out repair, installation and service of the heatpump.

Only drinking water must be used.

During installation, attention must be paid to the choice of materials and it must be ensured that chosen materials work together without problems in the entire circuit.

Special attention must be paid when using galvanized components and components containing aluminum.

Safety equipment must be installed to prevent over pressure in the system. Always use a safety valve with maximum relief pressure according to the unit nameplate and a stop valve (approved according to local or national heating and plumbing regulations). All pipe work has to be installed according to plumbing and heating regulations.

The discharge pipe of the pressure-relief device (safety valve) must be installed frost free and with a slope away from the device. The pipe must also be left open to the atmosphere.

Temperatures above 90 °C in the heating coil may cause excessive pressures in the refrigerant circuit.

LEAK TEST

After installation entire water system shall always be leaktested before commisioning.

Product Certifications

CE The CE-label is mandatory for most products sold in the EU. No matter where they are manufactured.

IP21 The Classification of the encapsulation of the electrical equipment.

Read the technical manual

Read the operator manual

Symbols

NOTE
This symbol indicates danger to person or machine.

CAUTION
This symbol indicates important information about what you should consider when installing or servicing the installation.

TIP
This symbol indicates tips on how to facilitate using the product.

Serial number

The serial number is placed on the bottom of the unit.

Environmental information

During repair or dismanting of the domestic hot water heat pump, you most follow the environmental regulations and legal requirements in connection with the recycling and disposal of materials.

Contry specific information

Completion of the service interval record is a condition of warranty. For full terms and conditions of the warranty, please see our website:

www.dzd.cz

Recovery

Leave the disposal of the packaging to the installer who installed the product or to special waste stations.

When disposing of the product, the constituent materials and components such as compressors, fans, circulation pumps, and circuit boards, must be disposed of at a special waste station or at a dealer who provides this type of service.

To access the seperate components, refer to the section that shows the contruction of the product. When disposing of the refrigant medium do so according to the instruction of the manual.

Improper disposal of the product by the user results in administrative penalties in accordance with current legislation.

Inspection of the installation

The inspection must be carried out by a suitably qualified person. In addition, fill in the page for the installation data in the check list for the unit on the next side.

Use the following list to comment on the complete installation of the system.

✓	*Description*	*Notes*	*Signature*	*Date*
	Unit circuit flushed			
	System filled and vented			
	Safety valve			
	Check valve			
	Shut-off valves			
	Particle filter			
	Pressure gauge			
	Circulations pump (if required)			
	Pressure reading			
Electrical installation				
	Connections			
	Main/Phase Voltage			
	Outdoor sensor (if required)			
	Room sensor (if required)			
	Thermostat (if required)			
	Safety breaker / fuse			
	Earth circuit-breaker			

Installer information		
Pipe installation	Company name:	
	Installer name:	
	Contact information:	
Electric installation	Company name:	
	Installer name:	
	Contact information:	

Check list before commissioning

Use the following list to comment on the heat pump installation.

Subject		Checked/Notes
	Serial Number (write)	
Transport	Is the product intact after transport?	☐
Manual	Is the manual for the product included?	☐
Placement	Is the product placed stable and upright?	☐
Hot water system	Is the pipe connection installed accordning to the manual?	☐
	Has a safety valve been installed?	☐
	Is the hot water connection installed correctly and checked for leakage?	☐
	Is the circuit vented?	☐
	Does the installation comply with the maximum allowed pressure?	☐
Ventilations system	Is there installed an external filter on the primary system before the heat pump?	☐
Electric installation	Is the electric installation performed according to the manual and national regulations?	☐
	Is the power source 220-240V/50Hz?	☐
	Does the electric cable between the connected units have signal?	☐
	Are the sensors secured in the rigth places?	☐
Operating the heat pump	Is the heat pump on, and the mode set to AUTO?	☐
	Does the heat pump make any unexpected noise?	☐

2. DELIVERY AND HANDLING

Immediately upon receipt, the domestic hot water heater pump must be examined to make sure that it is intact and undamaged. If not, the shipping company must be informed immediately. The recipient has the responsibility for all the shipments unless otherwise agreed.

NOTE
Beaware that the heat pump's center of gravity is placed in the top of the unit. Which can cause the unit to tip easily if not handled carefully.

DELIVERY MODE

The product delivered will only contain the dometic hot water heat pump. All safety equiment needs to be bought and installed seperately according to the countries regulations.

STORAGE

The unit must be stored and transported upright, free of water and within its packaging.

Transport and storage may take place at temperatures between -10 °C and +50 °C. If the unit has been transported or stored at sub-zero temperatures the unit should be left at room temperatures for 24 hours before commissioning.

Tranport

TRANSPORT WITH FORKLIFT

For transport with a forklift, the unit must stand on the associated transport frame. Always lift the unit slowly. Due to the high center of gravity, the appliance must be secured against tipping during transportation.

UNLOADING THE HEAT PUMP

In order to avoid damages, the unit must be unloaded on a flat surface.

HORIZONTAL TRANSPORT

NOTE
The unit should only be transported horizontally for short distances and it is not recommenced for horizontal transport in a trailer as this can cause damage to components.

NOTE
Water connections etc. shall not be used for transportation purposes.

The unit must only be transported on the associated transport frame. This also applies to transport on stairs.

CAUTION
If the unit has been tilted more than 45°, the unit must be left in its normal upright position for at least 24 hours before it is started.

Positioning

CAUTION
The power supply and the hydraulic system must comply with the local regulations.

The installation site should be equipped with a power supply of 220-240V and 50 Hz.

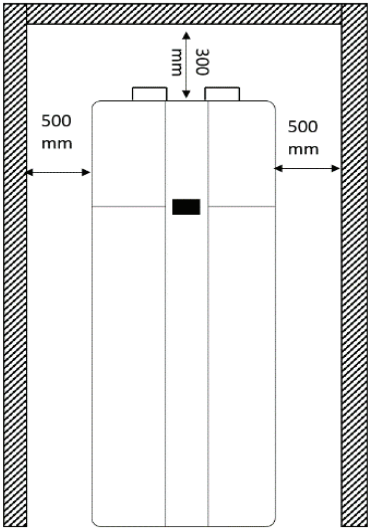
The unit should be placed vertically, with a maximum inclination of 1°. The unit must be well balanced and stable on the ground surface. Use the built-in adjustable pads to level the unit.

The unit must be installed as close as possible to the hydraulic system in order to minimize heat losses in the water pipes. The water pipe outlet should be insulated for the same reason.

CAUTION
The unit should not be placed in direct contact with the sunlight.

The unit can only be installed in a frost-free room and it should follow the criteria:

- Room temperature between 5 °C and 40 °C.
- Drain possibility for condensate, T&P valve and floor drain.
- No abnormal dust concentration in the air.
- Solid base (approx. 500 kg / m^2).
- It is necessary to ensure that there is sufficient space around the unit for maintenance and service.
  - A clearance of 0.5 m around the unit is recommended for easy access.
  - A clearance of minimum 0.15 m around the unit and minimum 0.3 m over the unit is required.



TIP
In case of a ducted unit, the unit should be installed as close as possible to the exterior walls in order to minimize pressure losses in the air ducts.

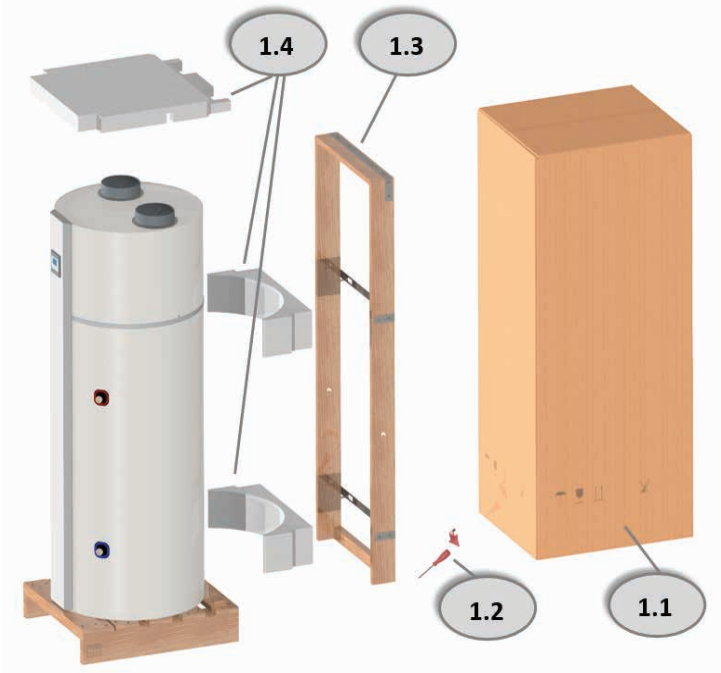
In case the unit is used without exhaust/extraction air ducts, it should be placed in a room with the following characteristics:

- The volume of the room should be more than 30 m^3.
- The room should be well ventilated.
- There should be no other appliances that need air to operate.
- The minimum distances described in Figure 9 should be respected.

SET-UP SEQUENCE

Once the packaged unit is placed in a room as described on page 12 and 13, then it can be prepared following the sequence described below:

1. Remove the packaging from the pallet carefully.
2. Remove the transport fittings from the pallet carefully.
3. Remove the unit off the pallet and place it on the floor.



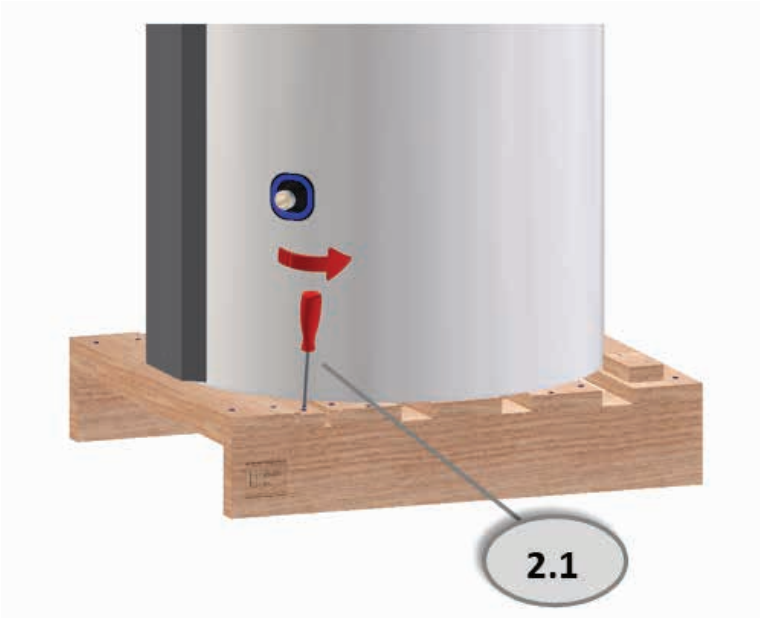
NOTE
The T&P valve is placed on the side of the product and can be damaged if the packaing is not removed carefully.

NOTE
Do not use the pipe connections for transport purposes.

NOTE
Beaware that the heat pump's center of gravity is placed in the top of the unit. Which can cause the unit to tip easily if not handled carefully.

4. Adjust the unit vertically by adjusting the feet.
5. Check that the unit has no damages.
6. Set-up the water circuit (See chapter 4) and fill the tank with water.
7. Set-up the air circuit (See chapter 4).
8. Set-up the electric connections (See chapter 5).

When the unit is supplied with electricity, it automatically starts running in its standard operation according to the factory settings as described in Chapter 6.



3. HEAT PUMP DESIGN AND DIMENSION

Know your product

GENERAL

The heat pump water heater is composed of a water tank, a refrigerant circuit, a cabinet and a display connected to a control board. The main scope of the appliance is to heat water stored in a tank.

OPERATION

The unit is programmed to start heating the water inside the tank when its temperature falls below a predetermined level. The unit stops when the water temperature reaches a set point that can be regulated by the user. In general, the appliance is designed to produce enough hot water to cover the need of a household of 4 persons or more.

There are two ways in which the unit can heat the water:

HEAT PUMP OPERATION

In the operation with heat pump, a refrigeration cycle utilizes the operation of a compressor and the extraction of heat from the air to heat the water in the tank. This is the standard way used to heat the domestic hot water, since it leads to lower electricity consumption, hence also lower running costs.

More information regarding the heat pump operation and the refrigerant circuit can be found in the next paragraph “Refrigerant Circuit”.

ELECTRIC HEATER OPERATION

If needed the the water can be heated using an electric heating element. An electric element is powered to heat the water in a safe, fast and flexible way. However, using the electric heater can become an expensive way to produce hot water. This operation should be used as a back-up or as integration of the standard operation.

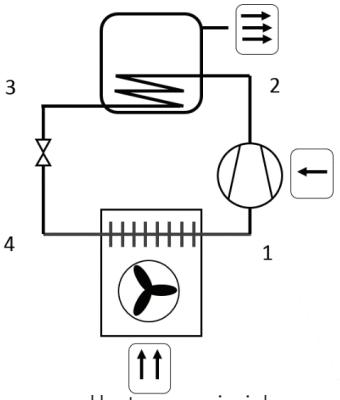
The electric heater can be choosen to be activated when one of the following occur:

- Failure of the heat pump operation.
- Too high or too low air temperatures.
- The quantity of hot water produced is not enough.

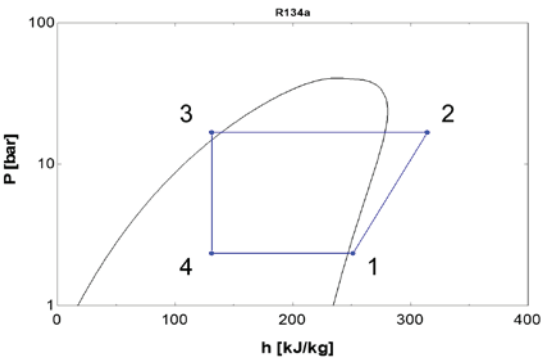
REFRIGERANT CIRCUIT

As depicted in Figure 1 and 2, the heat pump cycle can be divided in four main processes: compression (1-2), condensation (2-3), expansion (3-4), evaporation (4-1) described below.

- At the suction of the compressor (1) the superheated gas refrigerant enters the compressor at low pressure.
- In the compressor, the gas is compressed to a higher pressure and temperature level (2).
- The gas is first de-superheated and condensed in the condenser, exchanging heat with water stored in the tank.



Heat pump principle



Pressure-Enthalpy diagram

- The refrigerant exits the condenser in a subcooled, liquid form (3)
- Through a thermostatic expansion valve the pressure of the refrigerant is lowered to allow its evaporation at lower temperatures (4).
- The refrigerant is evaporated in the fin-coil heat exchanger that uses forced air as heat source (1).
- The process goes on until the power supply to the compressor is stopped.

NOTE

The extensive use of the electric heater leads to higher electricity consumption and it may lead to high electricity bills. The operation with electric heater normally consumes 3 times more electricity than the operation with heat pump.
The energy released to the condenser (2-3) is, in fact, the sum between the free energy extracted from the air in the evaporator (1-4) and the energy supplied to the compressor (2-1). On average, the energy absorbed by the evaporator is more than double of the energy used to run the compressor.

HIGH PRESSURE SWITCH

In order to ensure that the compressor does not run beyond its operating envelope there is a built-in high pressure switch which shuts down the compressor when the pressure in the refrigerant circuit becomes too high. The pressure switch shuts down the compressor if the pressure gets higher than 2.0 MPa.

A list of all components used for its design can be found in the next paragraph "Heat pump design".

DEFROSTING

When the evaporation temperature (T2) falls below 0°C, the evaporator starts to accumulate ice on its fins. In order for the unit to remain reliable and well performing, an automatic defrosting operation is activated.

Defrosting can occur between 60 minutes and 120 minutes from the last defrosting or from the last moment in which the evaporation temperature was above 0°C.

Defrosting can occur with two different strategies according to the conditions of the inlet air.

1. If the air temperature is above 4°C, then the defrosting occurs running both compressor and fan. The fan runs at speed D3 (Fan max speed).
2. If the air temperature is below 4°C, then the defrosting occurs running the compressor and stopping the fan.

Before defrosting is completed, the fan stops for a short period to allow the excess water in the unit to leave the unit from the condensate drain. Defrosting automatically stops when the temperature of the evaporator (T2) becomes higher than the set point (D10).

NOTE
Defrosting when the room temperature is under 5°C can cause the defrost alarm to occur. It is not recommended to place the unit in an area with an ambient temperature of 5°C or below.

NOTE
An higher compressor sound can be detected during the defrostning.

THERMAL SOLAR ENERGY (ONLY ON VERSION WITH COIL)

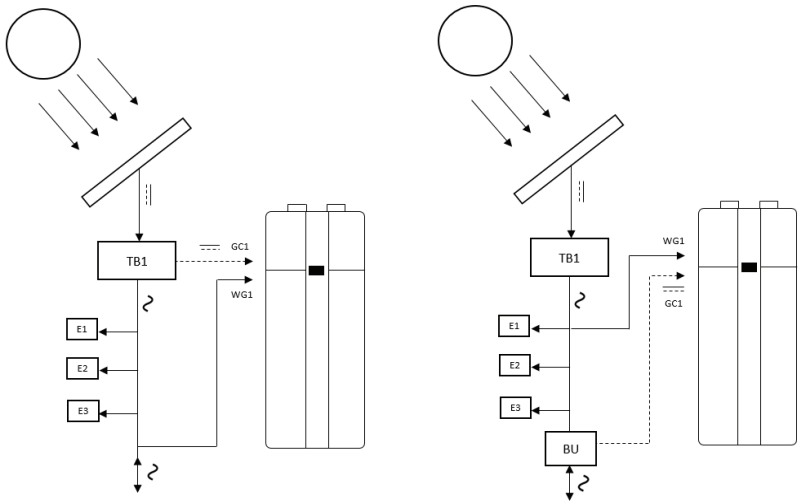
The heat pump have the option to turn on/off an external circulation pump with the help of a relay. This can be used to circulate water from the solar collector (internal spiral) in the tank of the unit.

OBS! this is only available for the units with an internal spiral in the hot water tank.

PHOTOVOLTAIC FUNCTION (ONLY ON VERSION WITH COIL)

The domestic hot water heat pump (DHWHP) can be controlled by a signal from a solar photovoltaic (PV) converter or an energy meter, either as simple start/stop via a potential free contact or by a variable signal.

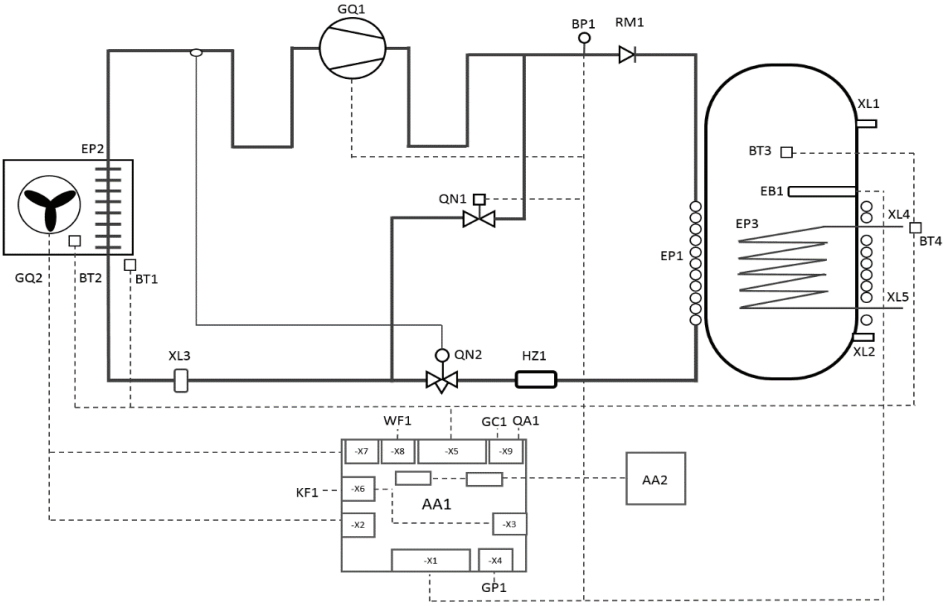
Using the variable signal option, a certain output (DC or mA) from the (PV) inverter or the energy meter corresponds to a given amount of excess power for use in the DHWHP. This excess power can be used to activate either the electrical immersion heater, the heat pump (HP) or both.



TB1: DC/AC Inverter

Heat pump design

Process and Instrumentation Diagram



REFRIGERANT CIRCUIT

GQ1: Compressor

GQ2: Fan

RM1: Check valve

EP1: Condenser

EP2: Evaporator

HZ1: Filter drier

QN1: Solenoid valve

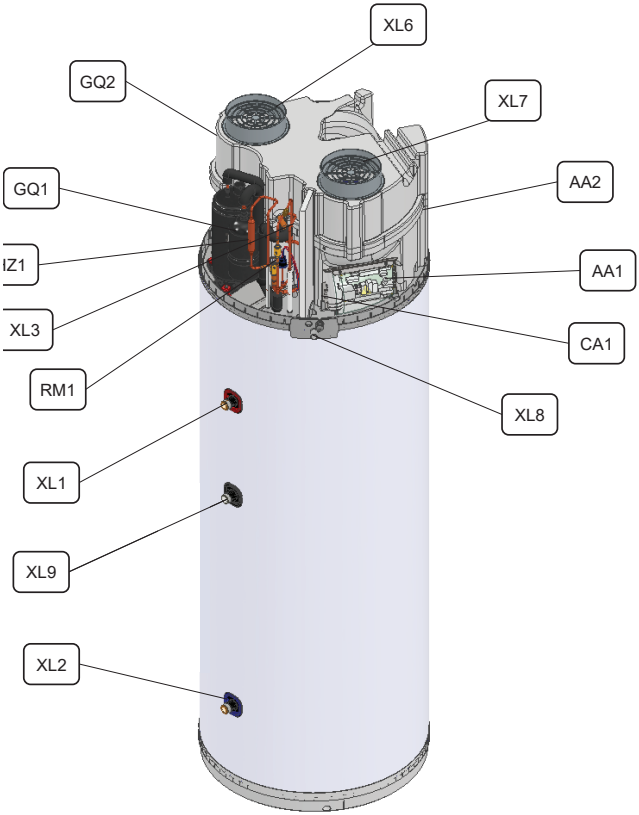
QN2: Thermostatic expansion valve

XL3: Service valve

WATER CIRCUIT

XL1: Water outlet
XL2: Water inlet
XL4*: Coil top
XL5*: Coil bottom
XL6: Air outlet
XL7: Air inlet
XL8: Condensate outlet
XL9*: Hot water circulation
EP3*: Coil
EB1: Electric heater
FR1: Anode
FN1: Thermal protection

The items with * are only avaible on units with coil.



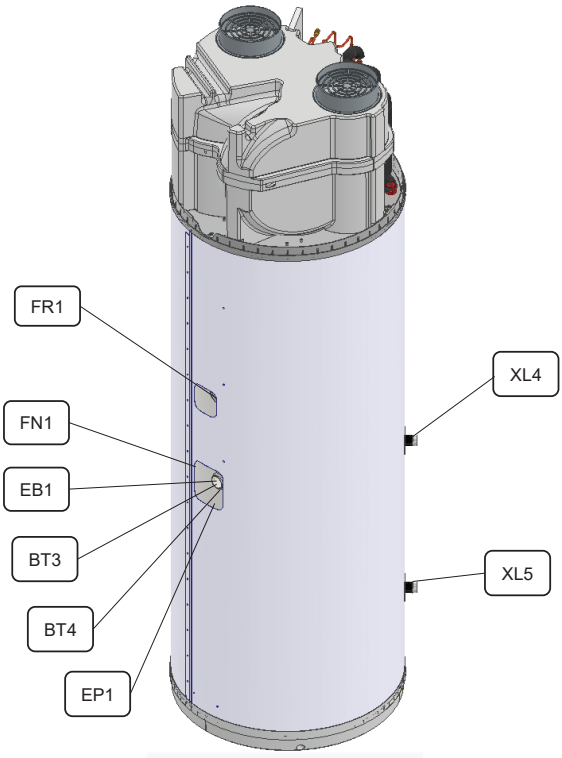
SENSORS

BT1: Air inlet temperature
BT2: Evaporator temperature
BT3: Tank water temperature
BT4*: Additional temperature
BT5*: Additional temperature
(not included)
BP1: Pressostat

ELECTRIC COMPONENTS

AA1: Main printed circuit board
AA2: Display circuit board
WF1: Modbus port
GC1*: Solar 0-3V/10V
QA1*: SG-ready port
GP1*: Additional supply
to pump or damper

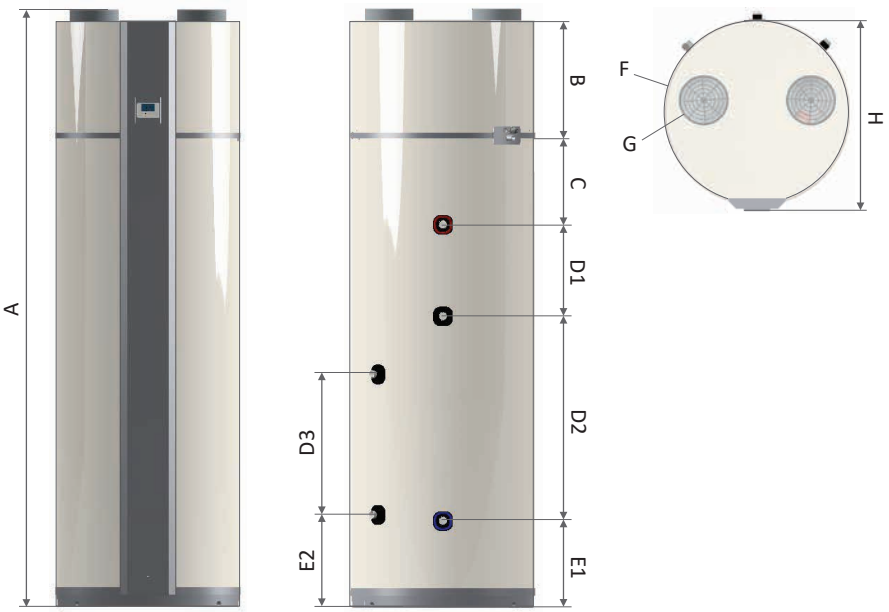
The items with * are only
avaible on units with coil.



Nomenclature according to standard
IEC 81346-1 and 81346-2.

Dimensions

The main technical data are collected in the following figures and table.



Parameter	Unit	190L	260L
Dimensional data			
A – Height	mm	1610	1960
B	mm	385	385
C	mm	280	280
D1	mm	180	300
D2	mm	435	670
D3	mm	375	460
E1	mm	285	285
E2	mm	305	305
F – Diameter	mm	603	603
G - Diameter	mm	160	160
H – Max diameter	mm	620	620
Height required for installation	mm	1700	2040
Weight dry/wet (with coil)	kg	94/284 (100/300)	100/350 (120/370)

4. INSTALLATION OF THE UNIT

Preparing the unit

CAUTION
Read the safety information at the start of the manual before starting work on the unit.

TIP
In very noise sensitive installations it is recommended to install a length of flex pipe between the units connection and the solid pipes installed in the building.

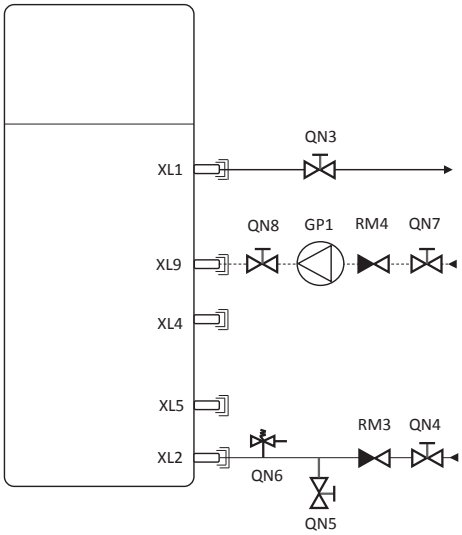
The heat pump must be installed in accordance with local norms and standards. The water used must be potable water.

Material compatibility in the whole system must be ensured. Incorrect material combinations in the water circuit can lead to damage due to galvanic corrosion. As is the case when using galvanized components and components that contain copper.

The pipe sizes for on-site installation shall be based on the available water pressure as well as the expected pressure loss in the pipe system.

As for all pressurized vessels, the heat pump water tank has to have an approved safety valve / Pressure relief valve (pressure setting depending on local rules and regulations) and a non return/check valve on the cold water inlet.

The following figure depicts the suggested configuration on the water system, with the possibility to include a water recirculation circuit. This last connection is optional.



Water connections

Dirt in the pipe work must be avoided. After installation of the external pipes flush the system, before connection of the domestic hot water heat pump.

If no circulation of water is needed, make sure that the circulation connection is properly sealed.

When installing the pipes please ensure that the pipe connections are not excessively stressed. Use a pipe wrench to relax torque forces on the pipe connections.

> **NOTE**
> The water pipe outlet should be insulated to reduce heat losses to the ambient and to reduce the risk of injuries and burns.

LOCATION OF CONNECTING PIPES

Hot water outlet pipe is mounted on the upper connecting branch, XL 2.

If the unit is equipped with the hot water circulation access, the middle connecting branch is used for hot water return, XL9. Inlet of fresh cold water is mounted on the bottom connecting branch, XL1.

SAFETY VALVES

NOTE
The water heater must be fitted with the requiste valves, shuch as a safety valve, shut off valve and non-return valve.

NOTE
An overflow pipe must be routed from the safety valves to a suitable drain. The outlet of the overflow pipe should be visible and clearly away from any eletrical components.

PRESSURE RELIEF VALVE

To protect the hot water tank from excessive pressure during heating of the hot water, there needs to be installed a pressure relief valve on the cold water inlet.

CAUTION
Ensure that a check valve (RM4) is placed between the pressure relief valve and the cold water. Check the illustration on page 23.

CAUTION
Please note that water may drip from the discharge pipe of the pressure-relief valve due to heating of the water.

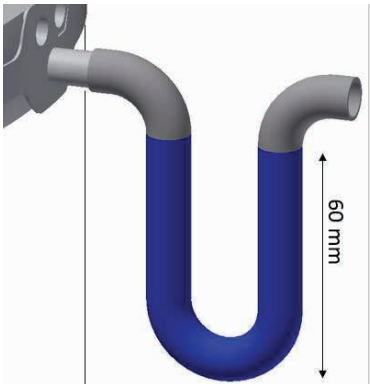
NOTE
If the pressure in the water tank rises to the maximum setting of the pressure relief valve and the pressure relief valve opens. The redundant water discharges. If the pressure relief valve did not open, the water tank would burst.

S COIL CONNECTION (OPTIONAL)

In the unit there can be an extra heat exchanger installed. In the sensor pocket for the thermostat sensor, there can also be placed a sensor to control the external connection e.g. oil burner, wood burner etc. The maximum inlet temperature of the heating coil is 90 °C. If there is risk of inlet temperatures above 90 °C the installer must install an external device preventing high inlet temperature to the heating coil.

CONNECTION OF CONDENSATE DRAIN

While the heat pump is running, condensate will form, which is to be discharged to the sewage drain via the condensate drain pipe, Ø 19 mm connection outside. The quantity of condensate depends on the humidity, the air flow, and the temperature of the air.



NOTE
The condensate connecting branch must be equipped with an air tight water trap and run to a drain. The water trap must contain a standing water column of at least 60 mm.
Neglecting to install a drain trap can lead to damage to the appliance. If the drain trap is not installed correctly, the product warranty is not valid.

COMMISSIONING OF THE WATER CIRCUIT

CAUTION
After installation, check that the entire water installation is tight. This is accomplished by performing a water leak test.

Fill the water tank via the cold water connecting branch. then aerate the water tank by opening one of the hot water taps located at the highest level until air no longer appears at the tapping point.

A few days after the initial setup and start-up, check the installation for leaks in the water installation or blockage of the condensate drain.

NOTE
Is the system not properly aerated the unit will alert an error and possible stop all production.

Air connection

NOTE
The inlet air must not be polluted with aggressive components (ammonia, chlorine etc.) as components parts of the heat pump unit can be damaged. The air also needs to be free of dust and other particles.

Inlet and outlet ducts shall be made of rigid smooth pipes to minimize pressure losses. Please take into account the fan working pressure and the ducts pressure losses during dimensioning of the duct system (see technical data).

The two connections to the heat pump are Ø 160 mm. Install the air ducts near the heat pump, levelled or with a slight incline, in order to avoid ingress of condensed water from the duct system to the heat pump.

All air ducts should be insulated after they have been installed, in order to reduce heat loss and noise level. Insulation has to be applied to protect against external condensation on the cold exhaust duct.

It is recommended to mount a flexible connection between the air duct and duct connection to ease future service of the unit.

TIP
The product is constructed to minimise the sound output, but to ensure maximum noise reduction, it is recommended to install silencer units in between the heat pump and the ventilation system to avoid potential travel of noise from the unit to the ventilation system.

The unit has been designed to operate with different air ducts configurations:

1) NOT-DUCTED UNIT, AMBIENT AIR

The unit extracts heat from the ambient air and lowers the air temperature by 5-15 °C according to the operating conditions. The air is re-directed to the room.

> **CAUTION**
> It is not recomended to install the unit according to this configuration if there is no intent of cooling the ambient air of the surrounding enviroment.

2) PARTIALLY DUCTED UNIT, AMBIENT AIR

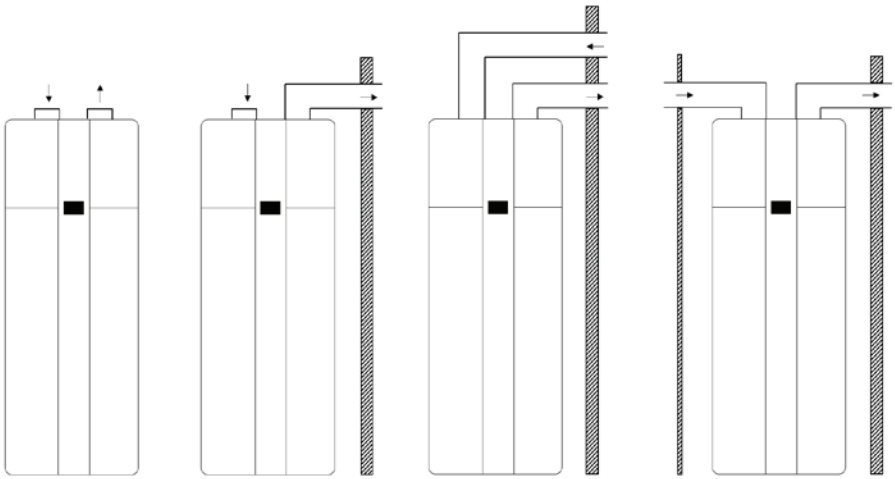
This configuration is normally preferred to configuration 1 since the cold air coming out from the unit is directed out of the house.

3) DUCTED UNIT, EXTERNAL AIR

This configuration minimizes the temperature decrease of the installation site, since there is no contact between the air in the room and the air through the heat pump. It is suggested to place the inlet pipe far from and possibly higher then the outlet pipe, to minimize the recirculation of cold air into the unit.

4) DUCTED UNIT, EXHAUST AIR

This is the configuration that normally minimizes the electricity consumption of the unit. It is particularly suggested if there is no cooling demand on the installation site.

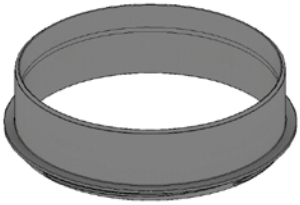


CAUTION
It is recomended to install a airfilter when using the product connected to anything other then outdoor air.

NOTE
Control the fan speed by a hygrostatic sensor if the duct are to be connected to bathrooms, kitchens etc.

DUCT GRID

The appliance is normally supplied with two air duct connections with a plastic net with a protective function.



If the appliance is used as ducted unit it is highly suggested to manually remove the plastic net by using a set of pliers. This operation allows the unit to run more efficiently, since the air pressure losses in the air circuits are minimized.

5. ELECTRIC CONNECTIONS

The unit must be supplied with current at 220-240V and 50 Hz.

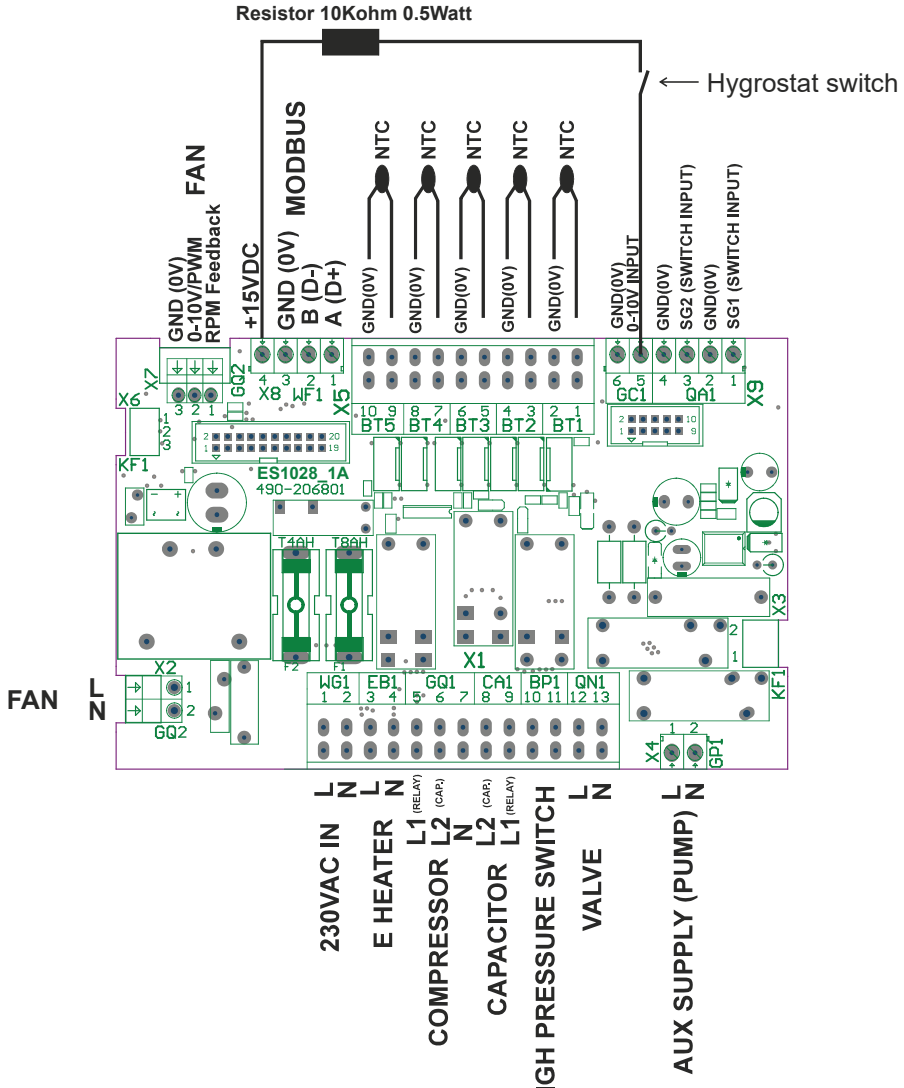
CAUTION
Read the safety information at the start of the manual before starting work on the unit.

CAUTION
Install the unit according to the local regulations and guidelines.

When the unit is connected to the power supply, it will turn on automatically and it will start its operation automatically.

- The first time that the unit is turned on, it will start its operation according to its factory settings.
- If some control settings are modified, the unit will start with the same settings at the previous switch off conditions.

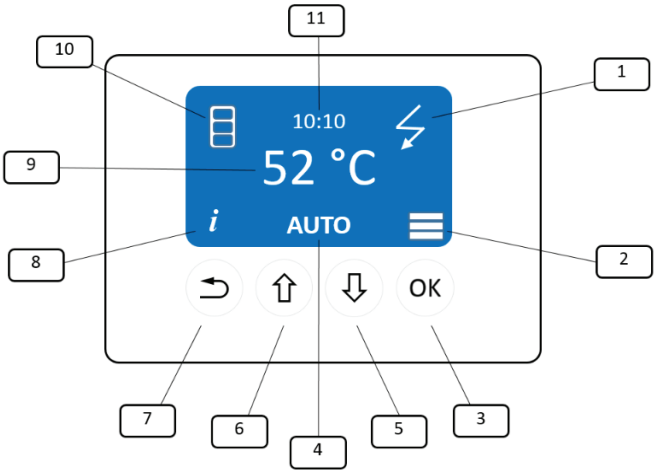
Electric Diagram



6. CONTROL AND OPERATION

Display

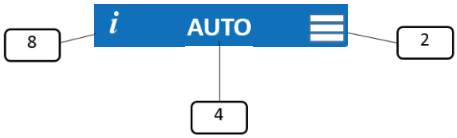
The unit can be controlled from the control panel. From the home view, all the main operational modes, functions, set points and information on the unit can be accessed.



1. Electric heating state (ON/OFF)
2. Main menu (Can be open by pressing OK)
3. OK/Enter
4. Mode (Change with ⇧ or ⇩)
5. Scroll down
6. Scroll up
7. Return back
8. Information (open with ⮌)
9. Temperature set point
10. Heat pump operation (Heat pump, Ventilation, Defrosting)
11. Time

The top part of the screen gives information about the unit operation, time and temperature set point. This part is passive and it is changed automatically.

The bottom part of the screen is active, meaning that the icon on the screen contains other menu items.



This part is divided in three menus:

INFORMATION MENU (8)
Can be accessed by pressing (⮌)

MODE MENU (4)
Can be accessed by pressing (⇧ or ⇩)

MAIN MENU (2)
Can be accessed by pressing (OK)

Submenus:

- Temperatures
- Functions
- General
- Installer

The menu items with * are only awailable in the version with the internal coil.

Menu structure

INFORMATION MENU

The information menu can be opened pressing button (⮌) from the home view. This menu gives all the operational information of the unit. The available information are divided in five groups:

i - Information menu	T - Temperatures	T1	Air inlet temperature
		T2	Evaporator temperature
		T3	Top Tank
		T4	Bottom tank
		T5	Additional sensor
	V - Ventilator	V1	Fan speed
		V2	Volt signal
	I - Generel unit information	I1	Compressor hours
		I2	Electric heater hours
		I3	Fan hours
		I4	Average air temperature
		I5	Average evaporator temp.
		I6	Compressor start/stop
		I7	Elec. comsumption
		I8	Total elec. comsumption
		I9	Heating capacity
		I10	Hot water production
		I11	Elec. resistance comsump.
	R - Relays	R1	Extra* Relay
		R2	Solenoid valve
		R3	Fan speed
		R4	Compressor
		R5	Electrical heater
	Er - Errors	Er1	T1 Error
		Er2	T2 Error
		Er3	T3 Error
		Er4	T4 Error*
		Er5	T5 Error*
		Er6	Compressor error
		Er7	Evaporator error
		Er8	Evaporator low temp.
		Er9	Evaporator high temp.
		Er10	Filter

TEMPERATURES
Here is shown the current temperatures for the air inlet, the air outlet (evaporator), the top of the hot water tank, the bottom of the tank and if an additional sensor is installed then the temperature for said sensor is shown here too.

VENTILATOR
Here the ventilator speed is shown in % and the actual input signal in GC1 (0-10V) from the PV or hygrostat is shown in Volts.

GENERAL INFORMATION
Here your can find the generic unit information regarding the compressor, electrical heating element, average temperatures and electricity consumption.

The electricity consumption which is shown, is since last Reset All.

RELAY INFORMATION
Here is shown the relay information for the operation of the fan, the compressor, the electrical heating element, the solenoid valve (defrost function) and the extra relay in case of the operation with for example a circulation pump.

ERRORS
Here is shown the current error / alarms.

Go the chapter 8 for futher information regarding troubleshooting.

MODE MENU

There are different strategies to heat the water which can be selected from the main control panel.

Press 5 or 6 (⇧ or ⇩) from the home view.

The possible modes of operation to choose from are found in the following table:

Mode menu		
	P1	AUTO
	P2	ECO
	P3	BOOST
	P4	BACKUP
	P5	SILENT
	P6	HOLIDAY

P1 - AUTO

The heat pump heats the water when required, normally using the heat pump operation. The unit starts when the water temperature T3 is more than 5°C below A1 (T AUTO) and it stops when this temperature is reached. If the air temperature is out of the feasible limits, the water is heated with the electric heater.

TIP
The eletrical heater will only turn on in backup mode.

P2 - ECO

The heat pump consumes as low energy as possible. The heat pump has a lower water temperature set point A2 (T ECO). The heat pump heats the water to a lower temperature compared to the other operations.

P3 - BOOST

The heat pump and the electrical heater operate simultaneously when possible.
The unit starts when the water temperature T3 (BT3) is more than 5 °C below A3 (T BOOST) and it stops when this temperature is reached. If A3 (T BOOST) is higher than D33 (T HP max) the compressor stops when the temperature D33 (T HP max) is reached.

The remaining temperature lift is accomplished with only the electric heater if the condistions D34 - T AIR BOOST is upheld.

CAUTION
When BOOST mode is selected, the unit runs in BOOST with electric heater only if the air temperature T1 is below D34 Air T boost.

P4 - BACKUP

This is an emergency mode. When an error occur, preventing the operation of the heat pump, the water cannot be heated. On the display the possibility to activate the BACKUP mode is asked to the user.

In BACKUP mode the water is heated up by the electric heater at a lower temperature than the desired one.
The Legionella control is active in any case.
The unit starts when the water temperature T3 is more than 5 °C
below D12 (BACKUP T) and it stops when this temperature is reached.

P5 - SILENT

The fan speed decreases to the minimum in order to minimize the sound emission of the unit in operation. The unit starts when the water temperature T3 is more than 5 °C below T1 (T AUTO) and it stops when this temperature is reached.

P6 - HOLIDAY

The heat pump is turned off and only the LCD display is active. The heat pump does not start when water heating is required. The compressor is OFF except during LEGIONELLA control in which it can be activated.

The HOLIDAY mode is connected to the Hot on time function B4 (Hot on time). After the HOLIDAY period is completed, the unit goes back to the previous mode of operation.

TIP
The unit can be turned off by switching to HOLIDAY mode.

MAIN MENU

Adjusting setpoints in this menu requires a good understanding of the unit operation.

It is highly recommended to read and understand the descriptions of the following menu items. Changing some of these set points can have large effects on how the appliance operates and performs.

Main Menu	Temperatures	A1	Temperature in AUTO
		A2	Temperature in ECO
		A3	Temperature in BOOST
	Functions	B1	Fan setting
		B2	Fan speed
		B3	Low tariff
		B4	Hot on time
		B5	PV Function*
		B6	Solar*
		B7	Floor*
		B8	Floor T*
		B9	Cooling*
		B10	Cooling T*
	General	C0	Reset
		C1	Info
		C2	Time
		C3	Date
		C4	Day
		C5	Language
		C6	Contrast

The table for the main menu contiues on page 38.

SUBMENUS

TEMPERATURES

The temperature setpoint for the modes AUTO, ECO and BOOST can be adjusted here.

FUNCTIONS

Under functions the advanced settings can be adjusted. For example the fan speed, PV, SG and Low tariff functions.

GENERAL

Here you will find the the option to reset the user setting, adjust the time, date, language or read the current software version.

INSTALLER

In order to access the Installer Menu, a 4-digits password needs to be entered. The password is: 2016.

TEMPERATURES

The temperature set points can be changed under the menu point "temperatures". Different temperature set points can be adjusted according to the relative mode of operation.

A1 - T AUTO

The temperature level at which the unit heats the water when the AUTO mode is selected. The unit starts if the temperature of the water in T3 falls 5 °C below the set point.

Temperature for AUTO mode
Range: 50 to 60 °C
Factory setting: 53 °C

A2 - T ECO

The temperature level at which the unit heats the water when the ECO mode is selected. The unit starts if the temperature of the water in T3 falls 5 °C below the set point.

Temperature for ECO mode
Range: 50 to 55 °C
Factory setting: 50 °C

A3 - T BOOST

The temperature level at which the unit heats the water when the BOOST mode is selected. The unit starts if the temperature of the water in T3 falls 5 °C below the set point.

Temperature for BOOST mode
Range: 50 to 65 °C
Factory setting: 55 °C

FUNCTIONS

The functions are similar to the modes of operation but they cannot be accessed directly from the home view and they can vary from unit to unit.

In addition, since SOLAR, FLOOR and COOLING (called extra functions) can not be used simultaneously, the choice of these functions should be made from the Installer menu (D26 Extra function). In the function menu, only one of these extra function is normally shown. The function menu is described in the following table.

B1 - FAN SETTINGS

OFF: The fan switches off when the heat pump does not run.

Single speed: The fan is always running at a single fixed speed (B2 Fan speed), both when the heat pump is operating and when it is not.

Fan setting
Range: OFF, Single speed or 2 Speeds
Factory setting: OFF

2 speeds: The fan is always in operation but it runs normally at a higher speed D6 (Fan AUTO Speed) when the heat pump starts operating and at (B2 Fan speed) when it is not operating.

B2 - FAN SPEED

The main fan speed regulation for the ventilation function. There are three ventilation level that can be selected: LOW D5 (Min Fan Speed), MEDIUM D4 (Fan medium speed) HIGH D3 (Max fan speed).

Fan speed

Range: Low, medium or high
Factory setting: high

B3 - LOW TARIFF

Standard: The low tariff allows the electric heater and the heat pump to run only during periods with low electricity prices, according to the menu item that regulate the program of the low tariff D17/ D18 (Low tariff weekday/weekends). The unit runs only during pre-defined hours of the day. If the PV function (B5) is active, this allows the electric heater and the heat pump to run outside the low tariff period.

Low Tariff

Range: OFF, Standard, Optimal 1 or Optimal 2.
Factory setting: OFF

Optimal 1: This function allows the maximum exploitation of the lower electricity price during the night periods between 00:00 and 05:00.

Optimal 2: This function allows the maximum exploitation of the lower electricity price during the night periods between 00:00 and 05:00. During the day, the unit works according to Low Tariff periods D17 and D18.

B4 - HOT ON TIME

The unit can be programmed to deliver hot water from 1 to 30 days from the moment in which the function is activated and the HOLIDAY mode is selected. The unit switches to AUTO MODE in the desired number of days. If OFF is selected, the function is not active.

Hot on time

Range: OFF or ON
Factory setting: OFF

B5 - PV FUNCTION*

If this function is activated, the heat pump and the electric heater can start only if the input voltage in GC1 (0-10V) is higher than D20/D21 (PV min Voltage HP/EL) for longer than D22 (PV min time).

*PV function**
Range: OFF, ECO or storage
Factory setting: ECO

OFF: The PV function is not active.

PV ECO: The PV function allows for water heating only with the heat pump until temperature set point defined by the MODE of operation is reached.

PV Storage: The PV function allows for water heating to the maximum temperature level, giving priority to the operation of the heat pump if the BOOST or BACK UP mode is not active. The heat pump operates alone until the max allowed temperature for the heat pump operation D33 (T HP Max) is reached. The electric heater operates only from D33 to the maximum allowable temperature D9 (Water T max).

B6 - SOLAR*

The Solar function allows the water to be heated up by the solar collector, activating a water pump controlled by the extra relay (GP1). The pump starts when T5 > T3 + D24 (Solar DT min). The pump stops if the temperature in the tank goes above D23 (Solar T max) or if T5 is below T3.

*Solar function**
Range: OFF or ON
Factory setting: OFF

B7 - FLOOR*

The floor heating function activates an external circulation pump. If the temperature at the bottom of the tank T4 (T water b) is higher than the setting menu D25 (Floor T start) the floor heating function is activated. If the extra temperature T5 (T Extra) is higher than the floor heating temperature (B8 T floor) the circulation pump (Extra relay GP1) stops.

*Floor**
Range: OFF or ON
Factory setting: OFF

B8 - FLOOR T*

The desired floor heating temperature with hysteresis of 1K.

*Floor T**
Range: 15 to 40 °C
Factory setting: 35 °C

B9 - COOLING*

The cooling function can be activated. See installer menu D28 (Cooling type).

*Cooling**
Range: OFF or ON
Factory setting: OFF

B10 - COOLING T*

The air temperature set point (°C) below which the heat pump stops, when the unit is in the Cooling function.

*Cooling T**
Range: 10 to 30 °C
Factory setting: 21 °C

GENERAL

The general section collects all the standard settings that have little or no effect on the heat pump operation, exept for the menu item Reset.

Activating the Reset function brings all the set points to the factory settings value.

C0 - RESET

The set points in the user menu are reset. The more advanced settings can be reset only from the installer menu. The information as number of hours of the compressor and fan cannot be reset.

Reset
Range: OFF or ON
Factory setting: OFF

C1 - INFO

The software version is displayed.

C2 - TIME

The time can be adjusted here.

C3 - DATE

The date can be adjusted here.

C4 - DAY

The day of the week can be selected.

Day
Factory setting: Monday

C5 - LANGUAGE

More languages can be selected.

Language
Factory setting: English

C6 - CONTRAST

The contrast of the screen can be adjusted.

Contrast
Range: 0 - 10
Factory setting: 5

INSTALLER

The installer menu should only be accessed only by qualified personnel. Some of the set points that can be adjusted from this menu can have large effects on the unit performance depending on the type of commissioning and installation.

Installer	D0	Reset All
	D1	Alarms
	D2	Modbus
	D3	Fan max speed
	D4	Fan medium speed
	D5	Fan min. speed
	D6	AUTO Speed
	D7	Minimum air temperature
	D8	Maximum air temperature
	D9	Maximum water temperature.
	D10	Defrosting temp. stop
	D11	Max evaporater temperature
	D12	Backup temp. stop
	D13	Legionella
	D14	Legionella temperature
	D15	Legionella day
	D16	Forced operation
	D17	Low Tariff, weekday
	D18	Low Tariff, weekend
	D19	Light Saving Time
	D20	PV min Voltage HP*
	D21	PV min Voltage EL*
	D22	PV min time*
	D23	Solar T max*
	D24	Solar DT min*
	D25	Floor T start*
	D26	Extra function*
	D27	Smart grid function*
	D28	Cooling*
	D29	External control*
	D30	Filter timer start/stop
	D31	Filter timer
	D32	Filter Reset
	D33	Max temperature HP.

D34	T Air BOOST
D35	Fan Type

D0 - RESET ALL

All the set points are reset to original factory settings. Also the Information menu and the installer set points are modified.

Reset All

Range: OFF or ON
Factory setting: OFF

D1 - ALARMS

The alarms of the unit can be checked here.

D2 - MODBUS

Access to modbus address, baud rate, parity and the ability to modify advanced setpoints using a datalogger.

Modbus

D2.0 - Address
Range: 1-247
Factory setting: 30

D2.1 - Baud Rate
Range: 9600 - 19200
Factory setting: 19200

D2.2 - Parity
Range: Even, Odd or None
Factory setting: Even

D2.3 - Write Enable
Range: OFF/ON
Factory setting: ON

D3 - FAN MAX SPEED

The maximum fan speed can be regulated. This is the highest limit at which the fan can run both when the ventilation function is active and when the heat pump is in standard operation.

Fan max speed

Range: 0 - 100 %
Factory setting: 70 % (outdoor)

D4 - FAN MEDIUM SPEED

The medium fan speed can be adjusted.

Fan medium speed

Range: 0 - 100 %
Factory setting: 50 % (outdoor)

D5 - FAN MIN. SPEED

The minimum fan speed can be adjusted.

Fan min. speed

Range: 0 - 100 %
Factory setting: 40 % (outdoor)

D6 - AUTO SPEED

The automatic speed of the fan (%) when the heat pump is running in AUTO and ECO mode can be regulated. This is a nominal value while the fan speed may automatically vary its speed at a higher level, depending on the operating conditions.

AUTO speed
Range: 0 - 100 %
Factory setting: 57% (indoor) / 48% (outdoor)

D7 - MIN AIR TEMPERATURE

The minimum air temperature allowed during the operation of the heat pump can be regulated here. If T1 is below Air T min the electric heater starts and it works alone until the set point is reached. (Even if the air temperature increases in the meanwhile).

Min air temperature
Range: -7 to 10 °C
Factory setting: -7 °C

D8 - MAX AIR TEMPERATURE

The maximum air temperature allowed during the operation of the heat pump can be regulated here.

Max air temperature
Range: 30 to 40 °C
Factory setting: 40 °C

D9 - MAX WATER TEMPERATURE

The maximum allowed temperature in the tank.

Max water temperature
Range: 55 to 65 °C
Factory setting: 65 °C

D10 - DEFROSTING TEMP. STOP

The temperature of T2 at which the defrosting function stops. The defrosting function is automatic and it occurs not more often than once every hour.

Defrostning temp. stop
Range: 0 to 10 °C
Factory setting: 4 °C

D11 - MAX EVAPORATOR TEMPERATURE

The maximum evaporator temperature allowed during the operation of the heat pump can be regulated here. If T2 has a higher temperature than the set point, then use electric heater. This function is active 10 minutes after the compressor start.

Max evaporator temperature
Range: 10 to 40 °C
Factory setting: 40 °C

D12 - BACKUP TEMP. STOP

The water temperature at which the unit stops the backup mode with only the electric heater.

Backup temp. stop
Range: 0 to 65 °C
Factory setting: 35 °C

D13 - LEGIONELLA

The legionella function can be activated. The legionella function does not switch the heat pump on, but just continues the heat up cycle to a higher temperature D14 (Legionella T).

Legionella
Range: OFF or ON
Factory setting: OFF

The legionella operation works only with the heat pump until 60°C. The remaining temperature lift is accomplished with the electric heater alone.

D14 - LEGIONELLA TEMPERATURE

The legionella temperature set point can be regulated.

Legionella temperature
Range: 60 to 65 °C
Factory setting: 60 °C

D15 - LEGIONELLA DAY

The legionella week day can be set.

Legionella day
Range: Monday to Sunday
Factory setting: Sunday

D16 - FORCED OPERATION

The forced operation of the heat pump can be activated here. The heat pump starts even if there is not need for hot water. When the maximum temperature allowed by the heat pump is reached the unit will stop. This function is to use for testing purposes. It becomes OFF again after one heat up cycle is completed.

Forced operation
Range: OFF or ON
Factory setting: OFF

D17 - LOW TARIFF WEEKDAY

The start and stop time of the low electricity tariff period for weekdays. Three periods can be selected.

Low tariff weekday
Range: 0 to 23
Factory setting: 0
Range: 0 to 23
Factory setting: 0
Range: 0 to 23
Factory setting: 0

D18 - LOW TARIFF WEEKEND

The start and stop time of the low electricity tariff period for weekends. Three periods can be selected.

Low tariff weekend
Range: 0 to 23
Factory setting: 0
Range: 0 to 23
Factory setting: 0
Range: 0 to 23
Factory setting: 0

D19 - LIGHT SAVING TIME

Light Saving Time can be deactivated.

Light saving time
Range: OFF or ON
Factory setting: ON

D30 - FILTER TIMER START/STOP

The filter function helps making sure that the filter is always changed before damage or lowered performance occur.

D20 - PV MIN VOLTAGE HP*

The minimum voltage (V) required to start the HP when the PV function is active.

*PV min voltage HP**
Range: 0 - 10
Factory setting: 0

D21 - PV MIN VOLTAGE EL*

The minimum voltage (V) required to start the electric heater when the PV function is active.

*PV min voltage EL**
Range: 0 - 10
Factory setting: 0

D22 - PV MIN TIME*

The minimum time at which the input voltage from the PV panel should be above the set point D20/ D21 (PV min Voltage HP/EL) in order to start the electric heater or heat pump when the PV function is active. D22 also regulates the minimum heat pump operational time when started by the PV function.

*PV min time**
Range: 1 - 120 min
Factory setting: 15 min

D23 - MAX TEMP. SOLAR*

The maximum allowed temperature in the solar collector.

*Max temperature solar**
Range: 55 to 89 °C
Factory setting: 89 °C

D24 - MIN TEMP. DIFFERENCE SOLAR*

The minimum temperature difference between solar collector and tank.

*Solar DT min**
Range: 1 to 5 °C
Factory setting: 5 °C

D25 - FLOOR TEMP. START*

The temperature (°C) that needs to be in the tank to allow the floor function to be active with hysteresis of 1K.

Floor Temp. start
Range: 25 to 45 °C
Factory setting: 35 °C

D26 - EXTRA FUNCTION*

The desired extra function is selected here. The possible functions are Solar, Floor or Cooling. Once the function is activated, move to the function menu and adjust the set point as desired.D27 - Smart grid*

*Ekstra function**
Range: OFF, Solar, Floor or Cooling
Factory setting: OFF

D27 - SMART GRID*

OFF: The SG ready function can be activated by the installer here. Three possible modes can be selected. This function allows the start of the heat pump from an external access (See QA1 in Figure 16). SG ready is not active if there is not external input (SG1 OFF, SG2 OFF).

*Smart grid**
Range: OFF, SG BOOST, SG ECO or SG BLOCK
Factory setting: OFF

SG BOOST: The heat pump and electric heater must start, if below the max water temperature allowed in the tank. Both Heat Pump and Electric heater are forced to operate (SG1 ON and SG2 ON).

SG ECO: The heat pump operates minimizing costs, only the heat pump is activated (SG1 OFF, SG2 ON).

SG BLOCK: The unit can be stopped even if there is a need for hot water (SG1 ON, SG2 OFF).

D28 - COOLING*

The fan and heat pump run until the additional temperature T5 placed in the room environment is below a certain level.

*Cooling**
Range: Cooling 1 or Cooling 2
Factory setting: Cooling 1

The water temperature can only reach the maximum temperature allowed in the tank D33 (T HP max). The cooling function activates a three-way damper, which directs the cold exhaust air to a room with cooling requirements. The two functions operate the damper in opposite directions.

Cooling 1 (2). If the T5 is higher than B10 T Cooling, the extra relay that operates the damper (GP1) switches ON (OFF).

If the T5 is lower than B10 (T Cooling), the extra relay that operate the damper (GP1) switches OFF (ON).

D29 - EXTERNAL CONTROL*

OFF: Normal operation.

Hygrestat: The fan always runs according to the input signal in GC1 (0-10V) from an external hygrostat, CO2-sensor or similar appliances.

*External control**
Range: OFF, Hygrostat, Ventilation max or start/stop.
Factory setting: OFF

- If the voltage is between 0 - 3.0 V the fan speed is D5 (Fan min speed).
- If the voltage is between 3.0 - 8.0 the fan speed is D4 (Fan medium speed).
- If the voltage is higher than 8 V the fan speed is D3 (Fan max speed).

Fan max: If the ventilation function is already selected, a signal higher of 2V to GC1 leads to maximum air flow.

Fan min: The minimum fan speed is determind by the settings of B1.

Start/stop: If GC1 receives a signal higher than 2V, the unit operation is stopped.

TIP
Defrost functionality is separate from the above and will control the fan speed independet from the external controls.

D31 - FILTER TIMER

If the filter function is ON then the timer of the filter can be selected. This set point determines the number of months after which the filter alarm is displayed.

D32 - FILTER RESET

Once the air filter has been replaced, activate this function to reset the filter timer.

D33 - MAX TEMPERATURE HP

The maximum water temperature that can be reached by the heat pump.

D34 - T AIR BOOST

When the BOOST mode is activated, the heating element will only be activated when the air temperature T1 (BT1) is below the T Air BOOST setpoint.

T Air BOOST
Range: -7 to 40 °C
Factory setting: 5 °C

T35 - FAN TYPE

In case the fan needs to be replaced, check wheather the existing fan is of the same make and model as the spare part.

Fan Type
Range: 1 to 2
Factory setting: 1 or 2

In case the spare part and the orginal fan are different, change the setting acoording to the new fan.

1 = EBM fan

2 = Ziehl-Abegg fan.

7. SERVICE AND MAINTENANCE

CAUTION
Read the safety information at the start of the manual before working on the unit.

CAUTION
Observe local rules and regulations regarding potential periodically inspection of the heat pump by skilled personnel.

CAUTION
When repairing or dismantling the domestic hot water heat pump, follow the environmental regulations and legal requirements in relation to recycling and disposal of materials.

NOTE
Service and maintenance should only be carried out by qualified personal. Repairs to the refrigerant circuit should only be done by verified refrigerant technicians.

General inspection

Check the following:

1. Condition of the casing
2. Electrical connections
3. Pipe connections

Correct any fault before continuing.

Refrigerant system and fan

Check the following:

1. Carefully remove the top cabinet of the unit
2. Relocate the cables from the top part of the EPS housing
3. Remove the top part of the EPS housing of the unit.
4. Clean the evaporator and fan with a brush or a bottle brush.
5. Ensure no blockage in the drain

NOTE
Be careful not to remove balancing weights on the fan wheel during this process, as this will cause fan imbalance and lead to a higher noise level as well as wear and tear on the fan.

NOTE
Be carefull using cleaning spray. They may contain chemicals that can damage EPS parts. If in doubt, check the spray on a small part of EPS.

TIP
Check and replace the air filter if it is installed.

CONDENSATION AND CONDENSATE DRAIN

Together with inspecting and cleaning of the fan, the condensate drain shall be cleaned of dirt.

1. Pour some water in the lower half of the EPS part
2. If the water does not flow/drain. Then clean the drain.

Hot water heater

Check the following:

1. Expansion relief valve
2. Discharge pipe
3. Anode

PRESSURE RELIEF VALVE

Check that the valve is working, by pressing the lever/turning the handle on the expansion relief valve while checking that water discharges.

NOTE
The pressure relief valve must be operated regularly to remove lime deposits and to verify that it is not blocked.

Please note that water may drip from the discharge pipe of the expansion-relief valve due to heating of the water.

DRAINING OF THE HOT WATER HEATER

The unit needs to be drained to change the anode.

1. Close the cold water supply
2. Close the hot water supply
3. Attach a hose to the drain valve
4. Place the end of the hose near a floor drain.
5. Open the drain valve

Disassembly & Decommissioning

The following must be done during decommissioning:

- Disconnect the unit from the power mains - i.e. the electrical cables are removed.
- Drain the hot water heater.
- Remove the water and heating pipes.
- Remove the air ducts and close all supply and extract air dampers so that no condensation forms in the ducts.

The unit has to be decommissioned in the most environmentally proper manner. When the product is discarded, please observe the local municipal waste removal regulations.

8. OPERATIONAL DISRUPTION

In addition check out the following questions before contacting an installer:

- Is the cold water supply open?
- Has the periodic cleaning of evaporator, condensation drain and fan as described in the maintenance section been followed?
- Has any of the safety features disengaged the heat pump/electrical immersion heater?
- Has external short-circuiting of terminals disengaged the heat pump?
- Has factory resetting been tested?

If it is not one of the above errors, please contact:

- In the warranty period (0-2 years): The installer, from which the unit was purchased.
- After the warranty period (> 2 years): The installer from which the unit was purchased or partners of the manufacturer.

TIP
When contacting the installer be ready with the information on the type plate.

THE PRODUCT DOES NOT SUPPLY HOT WATER

= The unit is not connected to the power supply
  = Make sure the display turns ON
= Alarms from the controller stop the operation of the unit
  = Check the alarms in the Info menu Er
= Low water temperature set points
  = Increase all temperature set points in menu A Temperatures
= Low airflow in evaporator
  = Clean the evaporator and the air ducts
= Fan does not work
  = Make sure that the fan is connected to the PCB or substitute the component.
= SG Ready function is active
  = Switch OFF SG Ready function
= Themal switch FN1 opens and stops the power supply to the electric heater
  = Restore the original conditions of the thermal safety switch FN1.

HIGH SOUND EMISSIONS

- Too high maximum fan speed
  - Reduce the fan maximum speed in the Installer menu
  - Activate the SILENT mode
- Obstruction of the air ducts.
  - Remove the obstruction
- Dirt on fan or evaporator.
  - Clean the evaporator and the fan. Do not use cleaning spray that can be damage the EPS housing
- Components vibration
  - Make sure all components as compressor and solenoid valve are well fastened and placed as instructed by the manufacturer.

THE HEAT PUMP WILL NOT START

- Thermal fuse turns on/off (clik sound)
- Wrong power and voltage supply 13/16A (230 V)
- No sound emission from the compressor, no heating of hot water and no pressure difference when the heat pump is on means the compressor is blocked.
- Humming sound from the compressor.
  - The capacitor is faulty or the wiring is disconnected.

If one or all of the above aplies do the following:

1. Ensure that the wiring is identical and placed right.
2. Change the capacitor
3. Change the compressor.

DEFROST ALARM

Pop up window will show on the display, but the unit will not stop production.

Occur frequently with the Err C Evap (cold evaporator).

- Airflow a lot lower then normal operation, could be caused by high pressure drop i the airvent or low ventilation velocity.
  - Raise the airflow.
  - Ensure that the installation is done correctly
- The installation area have to low of a ambient temperature (< 5 °C)
  - Check that the T2 sensor is placed in the evaporator.
  - Raise the ambient temperature to over 5 °C
- The condensation drain not connected or blocked.
  - Ensure the condensation drain is correctly installed
  - Flush the drain to remove any blockage.
- The defrost valve error

= Ensure the valve is working, if not change the solenoid vale.

When the problem have been resolved, reset the alarm in D0.

SAFETY BREAKERS

In the event of a failure on the electrical immersion heater, the safety breakers will shut down the unit. If the set value (80°C) is exceeded, the electrical immersion heater will disconnect. The electrical immersion heater can be reactivated when the temperature is below 80°C.

To do this, the power to the unit must be switched off and the front panel dismantled. Then the reset buttons in the center of the breakers can be pressed. This must only be performed by skilled personnel.

Morever, an additional thermal safety breaker switches off the compressor in case the compressor surface reaches temperatures above 160°C

Trouble shooting - Error Codes

Code	*Problem description*	*Unit reaction and possible solution*
Er1 - Er5	Temperature sensor T1, T2, T3, T4 or T5 is showing a value outside the expected area.	If Er3 occur the unit will stop all production of hot water. If Er4 or Er5 occur the unit will continue in normal operation. To solve the problem, try the following: 1. Check that the temperature sensor is placed right. 2. Ensure that wire is not damaged and connected correctly 3. -30 °C means no connection. 4. Change the sensor.
Err HP (Er6)	Pressure switch opens in the refrigerant circuit when there are excess pressure. Possible cause:	Possible solution:
	• If there is no value shown from the pressure gauge on the display it can indicate there are no connection, or maybe the wire is damaged.	• Ensure that the wiring is connected correctly and not damaged. Does that not help, do the following: = Change the sensor = Change the PCB
	• Temperature sensor T3 not placed in the boiler.	• Ensure that the sensor is placed correct.
	• Not enough water in the boiler	• Fill the boiler
	• Temperature setpoint to high	1. Ensure that A1 (T Auto) is set to 53,5 °C or reduce the A1 and A3 setpoint in comparison to the installation. 2. Ensure that D33 (THP max) is not set to high in comparison to the installation. Standard setpoint for D33 is 60 °C
	• Try resetting the power supply. If the error reoccur during the time the compressor is turned off, then it is PCB error.	• Change the PCB.

Code	*Problem description*	*Unit reaction and possible solution*
Err Evap (Er7)	The temperature sensor T2 is highere then T2 - 2 °C for more then one hour. Which means no refrigerant effect/no flow in the refrigerant circuit. Possible cause:	 Possible solution:
	• Compressor blocked = Clik sound is the thermal fuse turning on and off. (Compressor outlet should not exceed 110 °C) = Wrong power supply 13/16A = Compressor emits an uneven sound. = No heating effect on the hot water = No pressure difference when the heatpump turns on.	1. Ensure that the wiring is identical and placed right. 2. Ensure that the correct power supply is used. 3. Replace the compressor
	• Obstructed flow (filter/TCV blocked) = High temperature difference before and after the filter. = Is it the TCV which is the problem, then there will be a low temp. after the TCV, A high kompressor temperature. (the bulb can be moved to a an area with a highere temperature to test the function of the TCV).	• Change the filter or TCV
	• The TCV won't shut. = Small temp. difference before and after the TCV. = Temp. difference before and after the compressore is less then 10-15 °C = Low temp. difference before and after the condensator and evaporator	1. Ensure that the bulb is placed correctly after the evaporator. 2. Change the TCV

Code	*Problem description*	*Unit reaction and possible solution*
	• Magnet valve leakage = Temperature higher before evaporator then after (in the refrigerant circuit) = Temp. difference before and after the compressore is less then 10-15 °C = Won't happen dayligt but weekly.	1. Ensure that the wiring is identical and placed right. 2. Change the magnet valve
	• T2 placed wrong = Err2 error	1. Ensure the sensor is placed correctly. 2. Ensure that the wiring is identical and placed right. 3. Change the sensor.
	• Únik chladiva = Horký kompresor = Velmi nízký topný výkon = Nízká teplota po TCV = Naměřen nízký tlak chladiva	1. Najděte netěsnící součást 2. Evakuační systém 3. Vyměňte součásti 4. Doplňte chladivo
Err C Evap (Er8)	Temperature sensor T2 is lower then then -25 °C. Possible cause:	The unit will stop all production of hot water. Possible solution:
	• Airflow to low = High temp. difference between T1 and T2 = Low effect output = Cold evaporator = Cold after the TCV	1. Ensure that the plastic net on the in/outlet of the ventilation is clipped out if airvents are used. 2. Raise the ventilators RPM (D5/D6) or minimize the pressure drop in the air duct. 3. Raise the defrost setpoint D10 from 4 to 10 °C. 4. Set the min. ambient temperature (D7) to 5 °C. (the heating element will now turn on when the inlet air temp. is under this setpoint)
	• Ventilator not runing = No air flow = No sound emission	1. Ensure that the wiring is identical and placed right. 2. Change the ventilator

Code	*Problem description*	*Unit reaction and possible solution*
	• Magnet valve / bypass valve = Magnet is missing a screw. = Condensation drain blocked (water in the buttom of the evaporator)	1. Ensure that the wiring is identical and placed right. 2. Replace the screw if it is missing.
	• Ambient temperature low = Condensation drain blocked (water in the buttom of the evaporator) = Air inlet to cold. The unit is placed in an eviroment which is too cold.	1. Remove blockage from the condensation drain. 2. Set the min. ambient temperature (D7) to 5 °C. (the heating element will now turn on when the inlet air temp. is under this setpoint)
	• Defrost blocked = Condensation drain blocked (water in the buttom of the evaporator)	1. Remove blockage from the condensation drain.
Err H Evap (Er9)	The maximum allowed evarporator temperature is reached. Possible cause:	 Possible solutions:
	• Wrong placement of the T2 sensor = Normal heating of hot water = T2 Error (Er2)	1. Ensure the sensor is placed in the evaporator. 2. Ensure that the wiring is identical and placed right. 3. Change the sensor.
	• Refrigerant leakage = Can only occur on hot summer days = Low Temp. after the TCV and high airflow and temperature on the vent input. = Low effect = High compressor temp. = Low evaporator pressure	1. Ensure there is no leakage by checking the solder joints and fix them if there are any. 2. If leakage from the condensation/anode the aluminiums pipes will corrode, and the only solution will be a new unit.
	• Hot sommer day = Vent output over 30 °C	• Turn the ventilator velocity down to cool the air more. This will result in a lower evaporator temperature in the refrigerant circuit.
Er10	The air filter needs to be replaced.	The unit will run as normal. 1. Change the air filter 2. Reset the code/timer.

9. TECHNICAL DATA

Parameter	Unit	190 (Coil)	260 (Coil)
Volume (net)	L	190	260
Gross weight	kg	108 (122)	112 (132)
Netto weight, dry	kg	94 (110)	100 (120)
Netto weight, wet	kg	284 (310)	350 (370)

Electrical data			
Power supply	V / Hz	230 / 50	
Fuse	A	13 (10)	
Electric connections	-	L1, N, E	
Electric element power	W	1500	
Auxiliary power (HP)	W	1,61	

Cooling and water circuit			
Refrigerant type	-	R134a	
Refrigerant quantity	g	1200	1280
GWP	-	1430	
CO2 equivalent	ton	1,7	1,8
Refrigerant circuit	-	Hermetically sealed	
Protection rating	-	IP21	
Water connections – Stainless	mm	22 - Compression fittings	
Water condensate connection	mm	Ø19	
Nominal insulation thickness	mm	50	
Corrosion protection	-	Stainless steel	

Airflow		
Nominal air flow rate (variable range)	m^3/h	450 (0-800)
Maximum fan power consumption	W	85
Max external static pressure	Pa	200
G - Air duct connections	mm	160
Minimum volume of room installation	m^3	30

Parameter	Unit	190 (Coil)	260 (Coil)
Operating limits			
Max air temperature	°C	40	
Min air temperature	°C	-7	
Max operating temperature	°C	65	
Max pressure, water heater	bar / MPa	10 / 1.0	
Max water supply pressure	bar / MPa	10 / 1.0	
Max temperature heat pump*	°C	60	
Max operation temperature, T&P valve	°C	95	
Max operating pressure, T&P valve	bar / MPa	7 / 0.7	
Operating pressure, pressure relief valve on cold inlet	bar / MPa	6 / 0.6	
Pre charge operating pressure, expansion vessel	bar / MPa	3 / 0.3	
Max operating pressure, expansion vessel	bar / MPa	10 / 1.0	
Operating pressure, pressure reducing valve	bar / MPa	3 / 0.3	

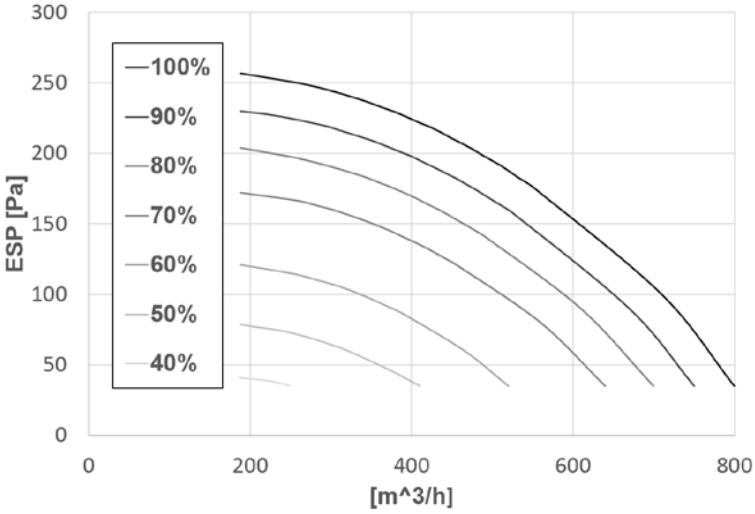
Performance data		
Outdoor air at 7°C (EN16147)		
COP	-	3.69
Heat up time	hh:mm	09:12
Stand-by heat losses	W	20
Sound power (ducted)	dB(A)	49
Volume at 40 °C	L	347

Indoor air at 20°C (EN16147)		
COP	-	4.20
Heat up time	hh:mm	07:09
Stand-by heat losses	W	21
Sound power	dB(A)	55.6

[1]) Hot water temperature, with use of only the heat pump.
[2]) No yet supjected to thirdparty testning.

Fan curve

In order to assure an efficient operation, it is suggested to keep the external pressure drops below 200 Pa.



10. ENERGY LABEL

Technický list

Tepelné čerpadlo pro ohřev teplé užitkové vody

Nařízení EU 2017/1369	Nařízení EU 812/2013
Směrnice 2009/125/ES	Nařízení EU 814/2013
Zkouška podle normy	EN16147 : 2017
	EN12102-1 : 2017

Obchodní značka	Dražice
Položka M.T. číslo	8255191611
Model / identifikátor	084109 MT-WH21-019-F

Profil zatížení	**L**	
Třída energetické účinnosti	**A+**	
Energetická účinnost – průměrné klimatické podmínky	**146**	**(%)**
Roční spotřeba elektřiny – průměrné klimatické podmínky	**703**	**(kWh/rok)**
Energetická účinnost – chladnější klimatické podmínky	**131**	**(%)**
Roční spotřeba elektřiny – chladnější klimatické podmínky	**779**	**(kWh/rok)**
Energetická účinnost – teplejší klimatické podmínky	**165**	**(%)**
Roční spotřeba elektřiny – teplejší klimatické podmínky	**620**	**(kWh/rok)**
Nastavení teploty termostatu	**54**	**(°C)**
Hladina akustického výkonu – v interiéru	**49**	**(dB)**
Hladina akustického výkonu – venku	**---**	**(dB)**
Inteligentní ovládání (0 = ne, 1 = ano)	**0**	
Mimo špičku (0 = ne, 1 = ano)	**0**	
Objem zásobníku	**193**	**(l)**
V40 – objem smíšené vody při 40 °C	**247**	**(l)**

DRAŽICE

Revize	Datum
2	25.02.2025

Technický list

Tepelné čerpadlo pro ohřev teplé užitkové vody

Nařízení EU 2017/1369	Nařízení EU 812/2013
Směrnice 2009/125/ES	Nařízení EU 814/2013

Zkouška podle normy	EN16147 : 2017
	EN12102-1 : 2017

Obchodní značka	Dražice
Položka M.T. číslo	8255191612
Model / identifikátor	084110 MT-WH21-019-FS

Profil zatížení	**L**	
Třída energetické účinnosti	**A+**	
Energetická účinnost – průměrné klimatické podmínky	**146**	**(%)**
Roční spotřeba elektřiny – průměrné klimatické podmínky	**703**	**(kWh/rok)**
Energetická účinnost – chladnější klimatické podmínky	**131**	**(%)**
Roční spotřeba elektřiny – chladnější klimatické podmínky	**779**	**(kWh/rok)**
Energetická účinnost – teplejší klimatické podmínky	**165**	**(%)**
Roční spotřeba elektřiny – teplejší klimatické podmínky	**620**	**(kWh/rok)**
Nastavení teploty termostatu	**54**	**(°C)**
Hladina akustického výkonu – v interiéru	**49**	**(dB)**
Hladina akustického výkonu – venku	**---**	**(dB)**
Inteligentní ovládání (0 = ne, 1 = ano)	**0**	
Mimo špičku (0 = ne, 1 = ano)	**0**	
Objem zásobníku	**187**	**(l)**
V40 – objem smíšené vody při 40 °C	**234**	**(l)**

DRAŽICE

Revize	Datum
2	25.02.2025

Technický list

Tepelné čerpadlo pro ohřev teplé užitkové vody

Nařízení EU 2017/1369	Nařízení EU 812/2013
Směrnice 2009/125/ES	Nařízení EU 814/2013
Zkouška podle normy	EN16147 : 2017
	EN12102-1 : 2017

Obchodní značka	Dražice
Položka M.T. číslo	8255261611
Model / identifikátor	084111 MT-WH21-026-F

Profil zatížení	**XL**	
Třída energetické účinnosti	**A+**	
Energetická účinnost – průměrné klimatické podmínky	**150**	**(%)**
Roční spotřeba elektřiny – průměrné klimatické podmínky	**1115**	**(kWh/rok)**
Energetická účinnost – chladnější klimatické podmínky	**127**	**(%)**
Roční spotřeba elektřiny – chladnější klimatické podmínky	**1320**	**(kWh/rok)**
Energetická účinnost – teplejší klimatické podmínky	**174**	**(%)**
Roční spotřeba elektřiny – teplejší klimatické podmínky	**961**	**(kWh/rok)**
Nastavení teploty termostatu	**54**	**(°C)**
Hladina akustického výkonu – v interiéru	**49**	**(dB)**
Hladina akustického výkonu – venku	**---**	**(dB)**
Inteligentní ovládání (0 = ne, 1 = ano)	**0**	
Mimo špičku (0 = ne, 1 = ano)	**0**	
Objem zásobníku	**260**	**(l)**
V40 – objem smíšené vody při 40 °C	**347**	**(l)**

DRAŽICE

Revize	Datum
2	25.02.2025

Technický list

Tepelné čerpadlo pro ohřev teplé užitkové vody

Nařízení EU 2017/1369	Nařízení EU 812/2013
Směrnice 2009/125/ES	Nařízení EU 814/2013
Zkouška podle normy	EN16147 : 2017
	EN12102-1 : 2017

Obchodní značka	Dražice
Položka M.T. číslo	8255261612
Model / identifikátor	084112 MT-WH21-026-FS

Profil zatížení	**XL**	
Třída energetické účinnosti	**A+**	
Energetická účinnost – průměrné klimatické podmínky	**150**	**(%)**
Roční spotřeba elektřiny – průměrné klimatické podmínky	**1115**	**(kWh/rok)**
Energetická účinnost – chladnější klimatické podmínky	**127**	**(%)**
Roční spotřeba elektřiny – chladnější klimatické podmínky	**1320**	**(kWh/rok)**
Energetická účinnost – teplejší klimatické podmínky	**174**	**(%)**
Roční spotřeba elektřiny – teplejší klimatické podmínky	**961**	**(kWh/rok)**
Nastavení teploty termostatu	**54**	**(°C)**
Hladina akustického výkonu – v interiéru	**49**	**(dB)**
Hladina akustického výkonu – venku	**---**	**(dB)**
Inteligentní ovládání (0 = ne, 1 = ano)	**0**	
Mimo špičku (0 = ne, 1 = ano)	**0**	
Objem zásobníku	**252**	**(l)**
V40 – objem smíšené vody při 40 °C	**331**	**(l)**

DRAŽICE

Revize	Datum
2	25.02.2025

DRAŽICE

Družstevní závody Dražice - strojírna s.r.o.
Dražice 69, 294 71 Benátky nad Jizerou
Česká republika, IČO: 45148465
nibe@nibe.cz
www.nibe.cz

OE08.956 - 2502