ENERGY SAVE

Installation manual

Air/water heat pump R32 V8 series

AWC 6/9/12/15/19 kW, AWST 6/9/12/15 kW monobloc indoor units
AWH 6/9/12 kW, AWST 6/9/12 kW split indoor units
AW 6/9/12/15/19 kW monobloc outdoor units
AW 6/9/12 kW split outdoor units

v3.1 2024-11-21

Table of contents

1 Introduction

This manual covers the main steps and detailed settings for the installation of the Energy Save air/water heat pumps R32 V8. The manual is intended for personnel involved in the installation of the heat pump as well as the connected equipment.

The following heat pump models are covered in the manual:

Monobloc indoor units	Monobloc outdoor units
AWC-R32-M-V8; 6-19 kW	AW-R32-M-V8; 6-19 kW
AWST-R32-M-V8; 6-15 kW	

Split indoor units	Split outdoor units
AWH-R32-S-V8; 6-12 kW	AW-R32-S-V8; 6-12 kW
AWST-R32-S-V8; 6-12 kW	

We ask that you carefully read the manual and take into account all of the instructions regarding device installation and operation in order to prevent possible damage to the device or personnel.

Before use, read and understand this manual.

Technical data can be changed without notice because of product upgrades. Please look at the rating label on the device for latest technical specifications.

Disclaimer

Proper adherence to the directions provided herein is vital for both the smooth operation of this system, as well as for your safety and the safety of those around you. ES Heat Pumps AB is not responsible or liable for any losses incurred due to misuse or mishandling of this product, which includes, but is not limited to:

- Purchasing, installing, and/or operating this product with the intention of using it outside of its established, technical purpose.
- Carrying out improper work upon the unit, or any of its components, which has not been given explicit, prior consent in the form of writing.
- Installation attempts of this system by anyone other than a properly trained and licensed professional.
- Negligence of properly worn personal protection (safety glasses, gloves etc.) while performing installation, maintenance, or servicing of this product.
- The operation of this system during ambient temperatures which are below or beyond the temperature range intended.

Conformity to safety regulations

If unsure of what installation procedures to use, please contact your local distributor for information and/or advisement. Any accessories used with this product must be official only. Any electrical work must be carried out by certified electricians only. The manufacturer is not responsible for any alterations or modifications that are made without explicit, written approval. The design of this unit complies and conforms to all necessary and relevant safety regulations and is otherwise safe to operate for its intended use.

1.1 Symbols used in this manual

The following attention symbols are used throughout this document, the warning levels explained below.

DANGER

Risk of serious and potentially life-threatening personal injury and/or severe damage to property if the instructions are not followed.

WARNING

Risk of personal injury and/or damage to equipment if the instructions are not followed.

CAUTION

Risk of minor or moderate personal injury. Risk of equipment damage, loss of data, extra work, or unexpected results, if the instructions are not followed.

NOTE

Facts and conditions to be considered.

2 Safety precautions

Safety precautions must meet the requirements that apply to this type of equipment. The following recommendations should be observed in addition to the standard safety regulations that apply to the workplace.

The safety precautions stated in this manual address the most important topics for proper and safe installation and operation of the heat pump. For this reason, follow them carefully.

For further questions contact your installer or technical support from Energy Save. Contact details can be found on the last page of this document, or on the Energy Save website: https://energysave.se/contact/

Personnel

The installer has the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions.

Installation, disassembly, and maintenance of the unit must be carried out by trained and qualified personnel that is well-acquainted with the equipment.

All electrical connections must be done by a professional and in accordance with the electrical standards.

Personal safety

Always wear recommended personal safety equipment, such as safety glasses, safety gloves, ear protection, and protective clothing.

Maintenance must not be carried out on the equipment during operation.

Do not touch the fan grill when the fan motor is running.

Do not touch the fins of the coil with bare fingers, it might cause injury.

WARNING

Electric shock can kill!

Install and earth the unit in accordance with the applicable instructions.

Do not touch live electrical parts with bare skin, wet gloves, or wet clothing.

Ensure your working position is safe.

Equipment

It is forbidden to make any changes to the structure or construction of the equipment since this can lead to personal injury or damage to the units. Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire, or other damage to the equipment.

Water or other form of liquid is strictly forbidden to be poured on or into the equipment. This may cause electric shock or destruction of the units.

Be sure only to use accessories which are specifically designed for use with the equipment. If not provided or agreed upon by Energy Save, the accessories must comply with the specifications given in this manual. The accessories must be installed by a professional.

CAUTION

The power supply to the device must be earthed.

General precautions

CAUTION

Electrical work should only be performed by qualified personnel. To avoid electrical shock, make sure to disconnect the power supply 1 minute or more before servicing electrical parts, and then measure the voltage at the terminals of main circuit capacitors or electrical parts before touching.

Make sure that no voltage is present.

CAUTION

This unit is not allowed to be used by children younger than 8 years. Children should not play with the unit. Cleaning and user maintenance shall not be made by children without supervision. Under supervision and/or with appropriate instructions, children above 8 years or persons with reduced sensory or mental capabilities may operate the unit.

Disposal

This marking indicates that this product should not be disposed of with other household waste, valid throughout the EU. To prevent possible damage to the environment or human health, this product must be recycled responsibly.

To return the device, follow local instructions for return and recycling, or contact the dealer where the product was purchased.

2.1 Warranty

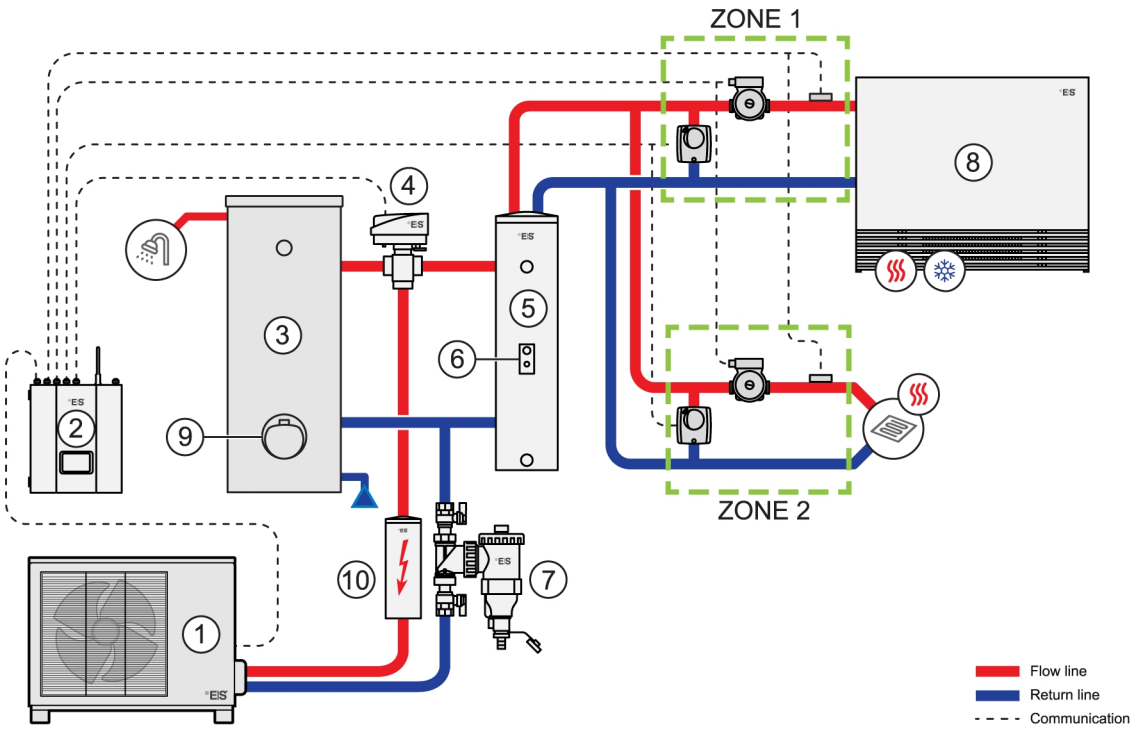
By following the instructions and regulations in this manual and the general installation standards, the units have a 3-year warranty. A 5-year compressor warranty is only valid if the unit is registered within 30 days of installation in the Energy Save registration system, using the registration link provided by your Energy Save distributor. The registration form can also be accessed from http://www.energysave.se/register or by scanning this QR code.

3 System description

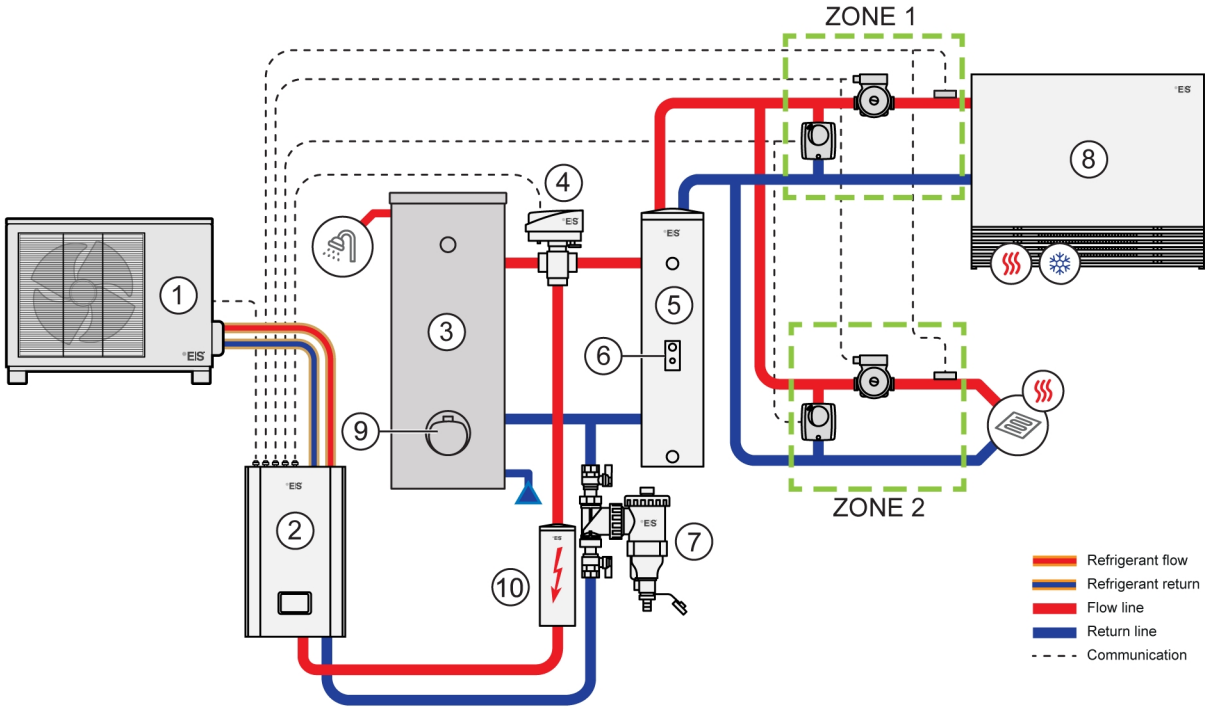
3.1 Main system components

	Component	Manual section
1	Outdoor unit	Section 4.1 "Outdoor unit", page 10
2	Indoor unit	Section 4.1 "Indoor unit", page 10
3	DHW tank	
4	Diverting valve	
5	Buffer tank	Section 4.3 "Buffer tank requirements", page 13
6	Additional heating source for the buffer tank	
7	Dirt and magnetic filter	Section 6.3 "Filters", page 20
8	Distribution heating/cooling circuit	The image shows a fan coil, but any distribution system can be connected.
9	Additional heating source for the DHW tank	
10	Additional in-line heating source	

3.1.1 Monobloc system



3.1.2 Split system



4 System requirements

4.1 Environmental requirements

Indoor unit

The following considerations must be made regarding the placement of the indoor unit:

- The indoor unit must be placed indoors.
- Ensure that the location is dry and well-ventilated.
- Ensure that the environment is completely free from volatile, corrosive, or flammable liquids or gases.
- Ensure that sound from the indoor unit or pipes will not be disturbing to adjacent living spaces such as bedrooms or living rooms.

Outdoor unit

Examples of suitable locations for the outdoor unit:

- Open space
- Corridor
- Balcony
- Roof
- Wall mounted

The following environmental considerations must be made:

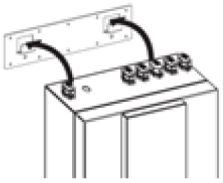
- Ensure that the environment is completely free from volatile, corrosive, or flammable liquids or gases.
- Ensure there is enough space around the unit for ventilation and maintenance (see the space requirements).
- It is recommended to install an awning above the unit, to protect snow from clogging the air inlet and outlet.
- Ensure there is a drainage system around the location, for outflow of condensate water under defrost mode.
- Do not install the outdoor unit near an exhaust from the kitchen, to prevent oil and smoke from entering the heat exchanger.
- Avoid placing the unit near bedrooms and living rooms, as noise from the unit can be disturbing when it is operating.

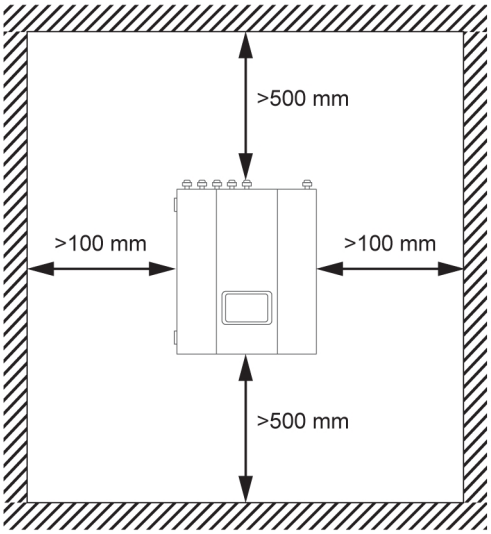
4.2 Space requirements

Ensure there is enough space around the indoor unit for further maintenance. Also ensure that there is enough space around the outdoor unit for sufficient air flow. If the outdoor unit cannot get enough air flow it may lead to increased icing of the unit, lower heating capacity, and lower efficiency.

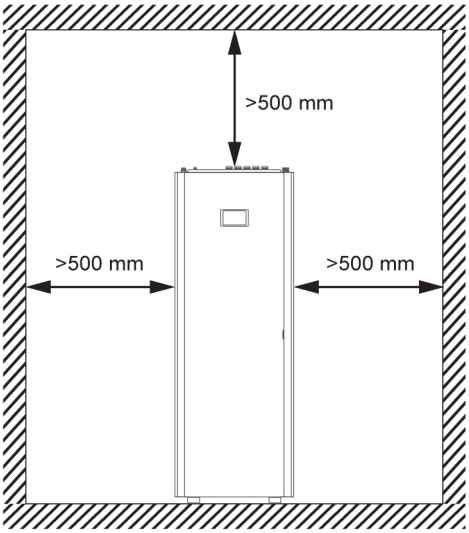
Control box and Hydro indoor units

AWH-R32-S-V8 is equipped with a mounting bracket.

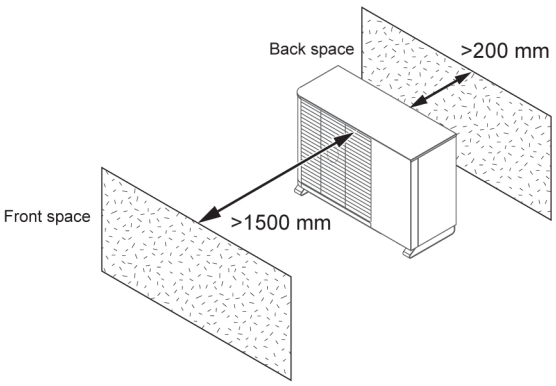


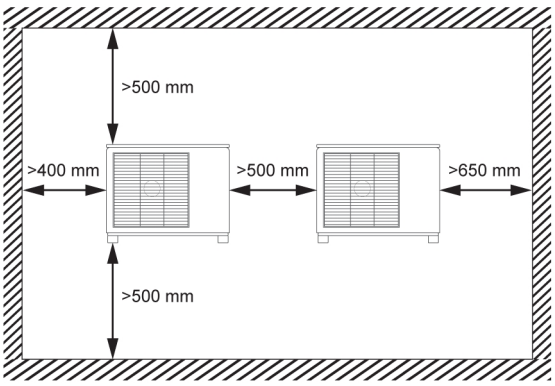


Indoor units with integrated tank

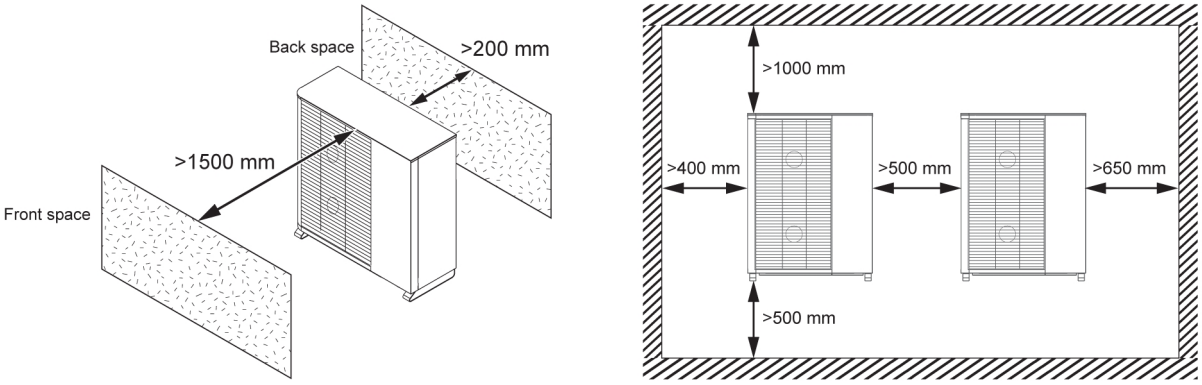


Single fan outdoor units





Double fan outdoor units



4.3 Hydraulic system requirements

System water supply

The water used for the system must comply with local regulations or the following specifications:

- Chloride ion (Cl-) concentration ≤ 300 ppm (300 mg/L)
- Ammonium ion (NH4+) concentration = 0 ppm
- pH value: 6–8
- Heating system pressure: 1–1.8 bar

NOTE

Too low water pressure can cause cavitation on the rotors of the water pumps, which can drastically reduce the life span of the water pumps.

Hydraulic system components

The following components must be in place and installed:

- Magnetic filter and dirt separator filter
- Safety valve (3 bar)
- Expansion vessels
- Buffer tank

NOTE

If the heat pump is being installed into an existing hydraulic system, the system must be cleaned according to standard procedures before installation.

The heating system type must be a closed loop heating system.

Use of glycol in the system

It is generally not recommended to use glycol in the system, due to the following drawbacks:

- Reduced efficiency: Glycol transfers heat less effectively than water. This means the pump has to work harder to circulate the solution, slightly reducing its efficiency (COP).
- Increased water pump power consumption: The higher viscosity of glycol requires more energy to pump it through the system compared to water.
- Increased wear of water pumps: The higher viscosity of glycol compared to water requires the pump to work harder to circulate the solution. This can lead to increased wear and tear on the pump impeller and bearings over time.
- Maintenance needs: The glycol solution needs to be periodically tested and potentially replaced, adding to the maintenance costs.
- Material compatibility: Not all materials are compatible with glycol. Certain plastics and elastomers can degrade over time when exposed to glycol.

Overall, whereas a water-glycol mixture can offer freeze protection, it is important to be aware of potential effects on system materials. Ensuring component compatibility by choosing the correct glycol type and concentration is crucial for optimal system performance and lifespan.

Moreover, if a water-glycol mixture is nevertheless to be used in the system, it is important to make sure the temperature of the mixture does not fall below -10 °C.

DHW production specifications

Maximum freshwater pressure: 7 bar (regulated by pressure valve)

CAUTION

For sanitary hot water, always add a mixing valve before the water tap and set it to proper temperature.

If a DHW tank with coil is used for heating the sanitary water, the coil must have a minimum surface area to ensure normal operation of the heat pump.

The coil must have a minimum surface area of 0.125 m^2 × nominal heating capacity of the heat pump at A7/W35.

Model (outdoor unit)	Min. coil surface area (m^2)
AW6-R32-M-V8 and AW6-R32-S-V8	0.75
AW9-R32-M-V8 and AW9-R32-S-V8	1.13
AW12-R32-M-V8 and AW12-R32-S-V8	1.5
AW15-R32-M-V8	1.88
AW19-R32-M-V8	2.38

Buffer tank requirements

The minimum volume of the buffer tank is 12 litres per kW of heating capacity. The calculation is based on the nominal heating capacity of the heat pump at A7/W35.

Table 14: Required buffer tank sizes based on heat pump model

Model (outdoor unit)	Minimum buffer tank size (l)
AW6-R32-M-V8 and AW6-R32-S-V8	72
AW9-R32-M-V8 and AW9-R32-S-V8	108
AW12-R32-M-V8 and AW12-R32-S-V8	144

Model (outdoor unit)	Minimum buffer tank size (l)
AW15-R32-M-V8	180
AW19-R32-M-V8	228

Conditions when a buffer tank must be installed:

Table 15: Mandatory installation of a buffer tank

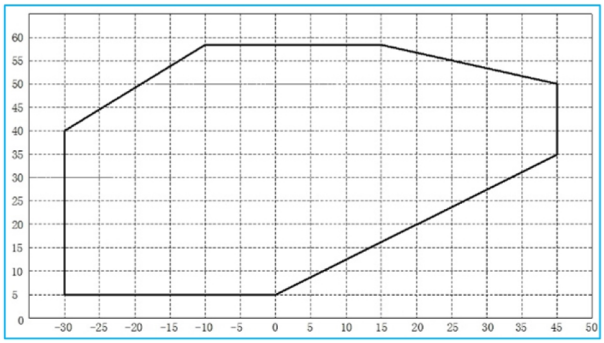
System	Specification
Multiple zone regulation	If more than one heat distribution circuits are used.
Radiator system	If radiators are used as the heat distribution system.
Zone valve regulation	If any kind of shut-off valves are used on the heat distribution system, for example if electronic valves on the distribution system of the floor heating system are used and can be regulated separately from the heat pump controls.
Fan coils for heating or cooling	If fan coils are used for the heat distribution system.

4.4 Working range heating and cooling modes

Heating mode working range

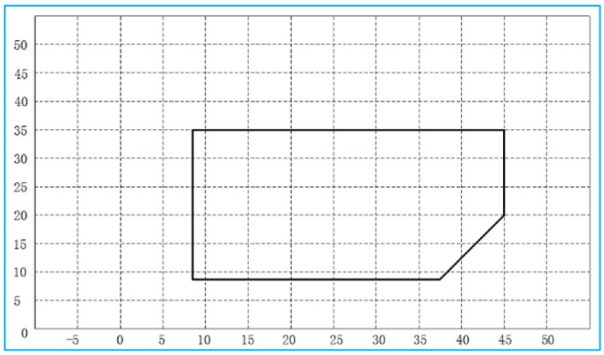
NOTE

Applies for heating and sanitary hot water preparation.



X-axis = Outdoor temperature (°C), Y-axis = Flow temperature (°C)

Cooling mode working range



X-axis = Outdoor temperature (°C), Y-axis = Flow temperature (°C)

5 Preparations before installation

5.1 Preparing the site for installation

When preparing the site for installation work, follow the applicable environmental and safety regulations.

1. Identify any potential risks or challenges. Consider the layout, dimensions, access, power, ventilation, earthing, and environmental factors.
2. Clear the site from any material and obstacles in order to provide adequate space for the whole workflow when it comes to safety and ergonomics.
3. Ensure that the site is free of dust, dirt, grease, oil, or moisture that could damage the equipment or affect its performance.
4. Observe the stated space requirements and plan the placement of the equipment accordingly.
5. Make sure that people in the building are informed about any interruptions of water supply or power during the work.

5.2 Transportation and unpacking

CAUTION

During transportation, loading and unloading, be careful not to damage the equipment, making sure that it is properly secured and protected from shock.

The units must be transported in accordance with the caution labels placed on the packaging. At delivery the entire package and its content must be checked by the installer, ensuring that it was transported in the right way and that there is no visible damage.

Energy Save takes no responsibility for any damages caused by improper handling of the equipment during transport.

5.3 Tools

CAUTION

Tools that are in contact with refrigerants should be stored and used separately. Do not mix tools used with different types of refrigerants.

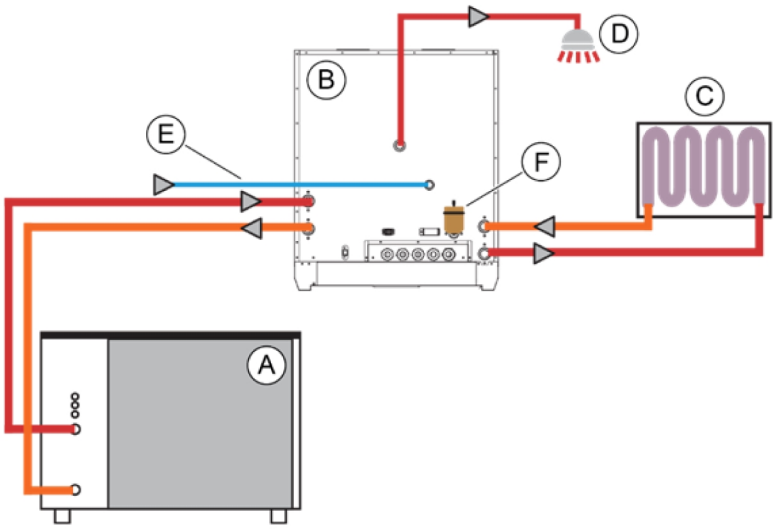
6 Hydraulic installation

NOTE

Hydraulic schemes provided by the Energy Save distributor or Energy Save personnel contain official requirements for the installation of the Energy Save heat pump into a hydraulic system.

6.1 Hydraulic connections

6.1.1 Hydraulic connections for monobloc units



A ES heat pump – outdoor unit
B ES heat pump – AWST model indoor unit
C Heating system – buffer or floor heating system
D Sanitary hot water
E Fresh cold city water
F Automatic purging valve (included in the package)

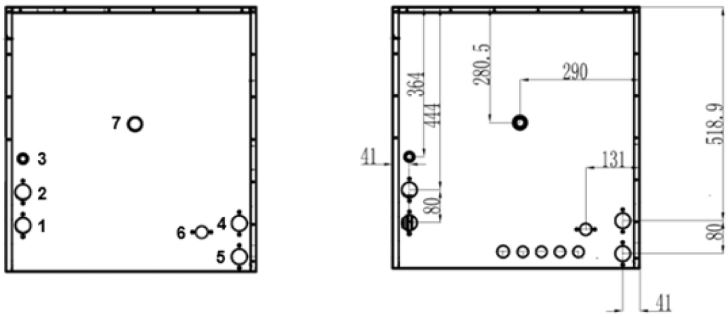
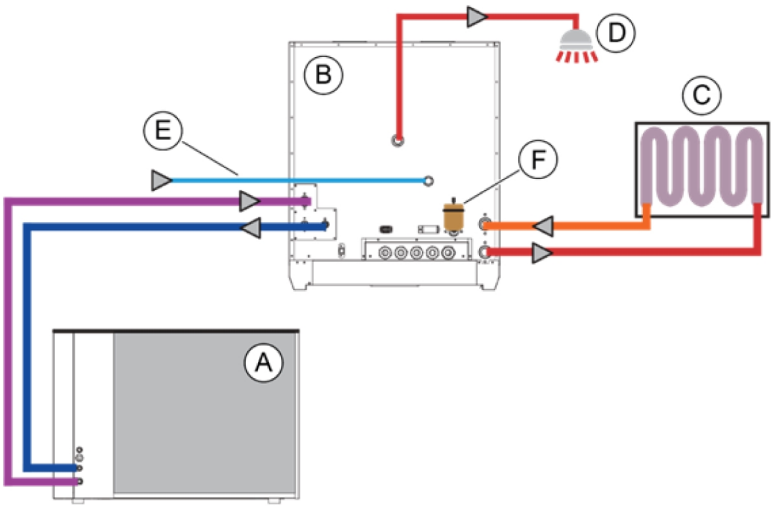


Table 16: AWST-R32-M-V8

MN	Connection	Size	MN	Connection	Size
1	Water outlet – to outdoor unit	G1″	5	Flow line – Heating system	G1″
2	Water inlet – from outdoor unit	G1″	6	Automatic Air purging valve	G1/2″
3	Fresh cold-water inlet	G3/4″	7	Sanitary hot water outlet	G1″
4	Return line – Heating system	G1″			

6.1.2 Hydraulic connections for split units



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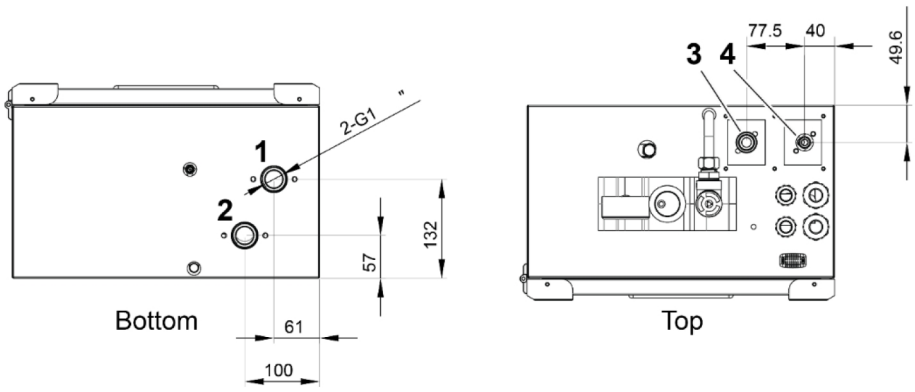


Table 17: AWH-R32-S-V8

MN	Connection	Size	MN	Connection	Size
1	Return line – heating system	G1″	3	Gas line - refrigerant	G5/8″
2	Flow line – heating system	G1″	4	Liquid line - refrigerant	G3/8″

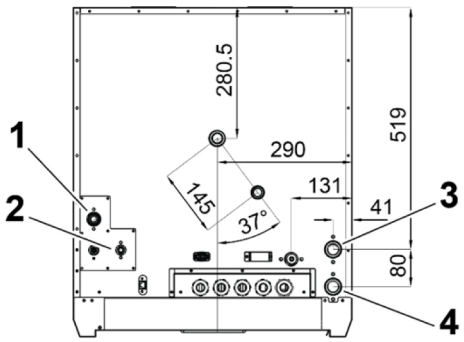


Table 18: AWST-R32-S-V8

MN	Connection	Size	MN	Connection	Size
1	Gas line - refrigerant	G5/8″	3	Return line – heating system	G1″
2	Liquid line - refrigerant	G3/8″	4	Flow line – heating system	G1″

6.2 Piping

6.2.1 Indoor – outdoor piping distance for monobloc units

ES heat pump model	Piping dimensions	Buffer tank in system	Number of elbows	Max piping distance
AW6-R32-M	DN25 / DN32	Yes	6	20 m / 30 m
AWC6/19-R32-M AWST6/15-R32-M	DN25 / DN32	No	6	10 m / 15 m

ES heat pump model	Piping dimensions	Buffer tank in system	Number of elbows	Max piping distance
AW9-R32-M	DN25 / DN32	Yes	6	20 m / 30 m
AWC6/19-R32-M AWST6/15-R32-M	DN25 / DN32	No	6	10 m / 15 m
AW12-R32-M	DN25 / DN32	Yes	6	20 m / 30 m
AWC6/19-R32-M AWST6/15-R32-M	DN25 / DN32	No	6	10 m / 15 m
AW15-R32-M	DN32 / DN40	Yes	6	20 m / 30 m
AWC6/19-R32-M AWST6/15-R32-M	DN32 / DN40	No	6	10 m / 15 m
AW19-R32-M	DN32 / DN40	Yes	6	20 m / 30 m
AWC6/19-R32-M	DN32 / DN40	No	6	10 m / 15 m

6.2.2 Refrigerant piping for split units

Prefilled pipe length: 7.5 m

Maximum pipe length: 20 m

NOTE

The pipe length is defined as the distance between the indoor unit and the outdoor unit (one way).

For information regarding amount and charging of refrigerant, see Section 7.1 "Refrigerant amount", page 25.

Table 20: Outdoor unit refrigerant connections

ES heat pump model	Liquid line dimensions	Gas line dimensions
AW6-R32-S-V8	1/4“	1/2“
AW9-R32-S-V8	3/8”	5/8”
AW12-R32-S-V8	3/8”	5/8”

Table 21: Indoor unit refrigerant connections

ES heat pump model	Liquid line dimensions	Gas line dimensions
AWST6/12-R32-S-V8	3/8”	5/8”
AWH6/12-R32-S-V8	3/8”	5/8”

NOTE

Connection of the 6 kW outdoor unit requires reducing connectors, which come with the units.

Refrigerant piping height difference

Special measures need to be taken for units installed at a higher level than the evaporator in order to facilitate oil return to the compressor.

- There must be syphons in the vertical sections of the suction line **G**.
- The maximum height **h** between syphons must not exceed 4 metres.
- The horizontal sections of the suction line **G** must have a slope of at least 1%.
- The maximum total pipe length is 20 metres (including length for syphons).

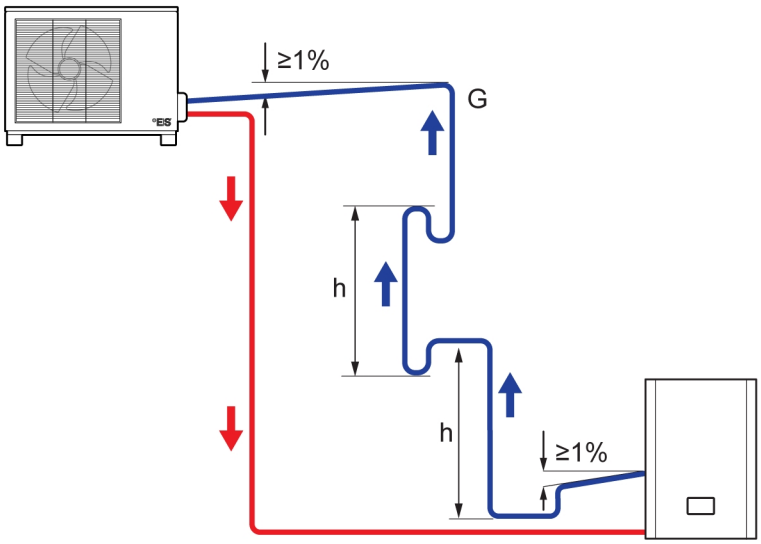


Figure 1: Refrigerant piping

6.3 Filters

On the return line of the hydraulic system a dirt separator and magnetic filter must be installed, se an example in Figure 6.3 "DIRTMAGPLUS filter", page 21.

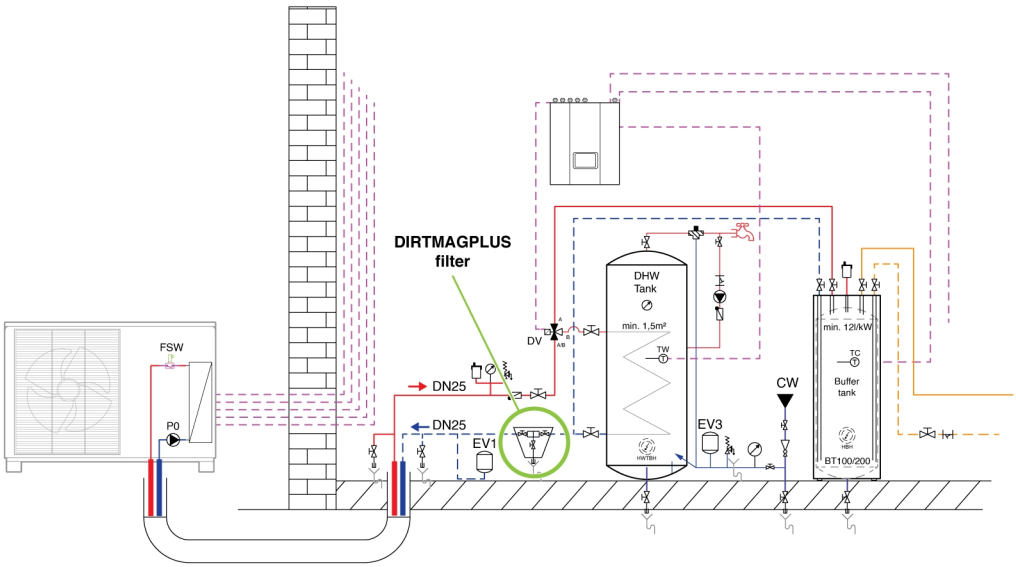


Figure 2: DIRTMAGPLUS filter

6.4 Temperature sensors

The temperature sensors need to be correctly positioned. For reference, always use the hydraulic schemes provided by Energy Save.

NOTE

Which temperature sensors to be used is dependent on the installation type.

Description		Position
TR	Room temperature sensor – for heating curve compensation according to the room temperature setting.	Leaving area. Recommended height appr. 1.5 m from floor.
TW	Sanitary hot water temperature sensor	Upper half of the DHW tank.
TC	Heating / cooling temperature sensor	Upper half of the buffer tank. Flow line after the 3-way valve (if no buffer).
TV1	Mixing circuit 1 temperature sensor	After the circulation pump for circuit 1
TV2	Mixing circuit 2 temperature sensor	After the circulation pump for circuit 2

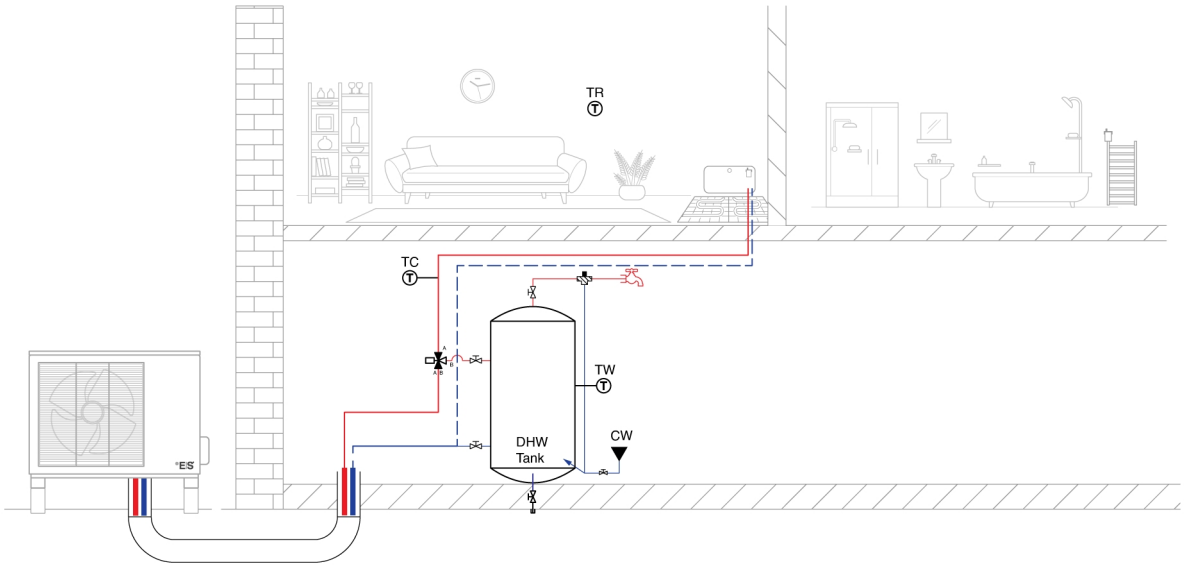


Figure 3: Temperature sensor positioning, example 1

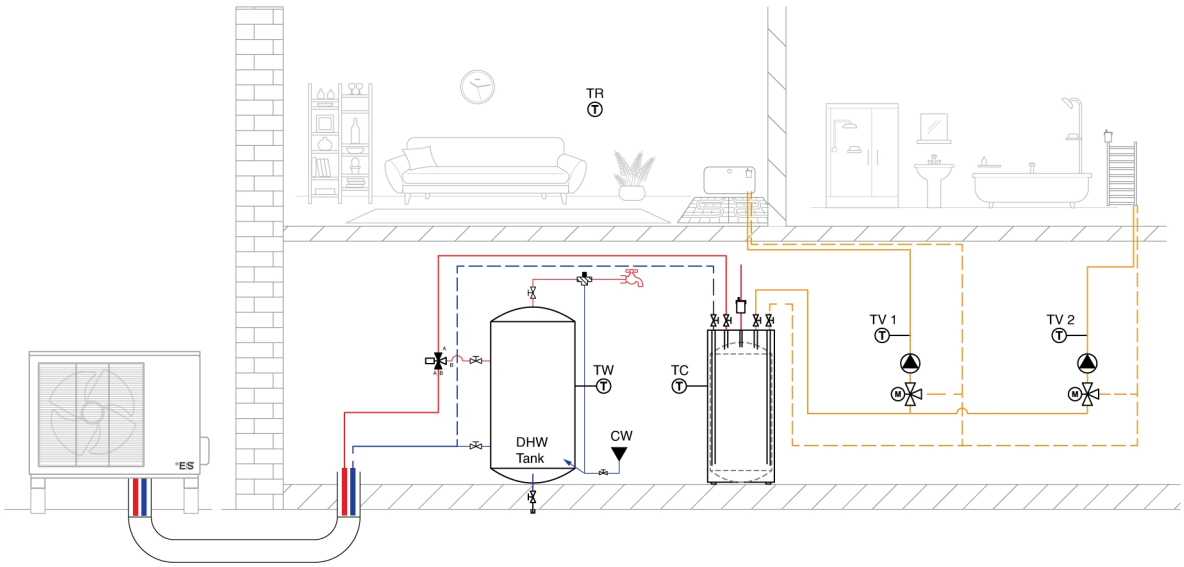
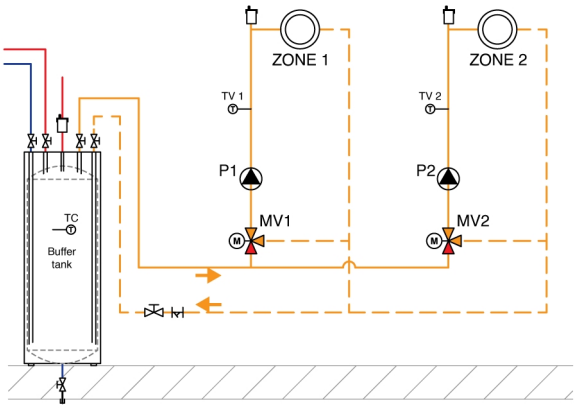


Figure 4: Temperature sensor positioning, example 2

6.5 Mixing valve for the heating/cooling circuit

The heat pumps can control two heating and/or cooling mixing circuits. Required temperature sensors for two mixing circuits are included in the package. When controlling two circuits a buffer tank must be used in the hydraulic system.

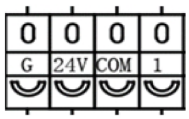
For each circuit (zone) the mixing valve must be enabled in the menu ***Zone 1*** (if used for circuit 1) and ***Zone 2*** (if used for circuit 2).

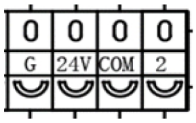
Description		Scheme
MV1	Mixing valve for Zone 1	
P1	Water pump for Zone 1	
TV1	Temperature sensor for mixing circuit 1	
MV2	Mixing valve for Zone 2	
P2	Water pump for Zone 2	
TV2	Temperature sensor for mixing circuit 2	

6.5.1 Type of mixing valve

The heat pumps use proportional actuators – 24 V DC power supply and 0 to 10 V DC controlling signal.

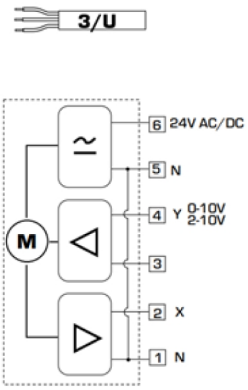
Zone 1 (heating / cooling circuit 1)		Zone 2 (heating / cooling circuit 2)	
G	= N (0VDV)	G	= N (0VDV)
24 V	= 24 V DC	24 V	= 24 V DC
COM	= N (0VDV)	COM	= N (0VDV)
1	= Signal 0–10 V DC	2	= Signal 0–10 V DC

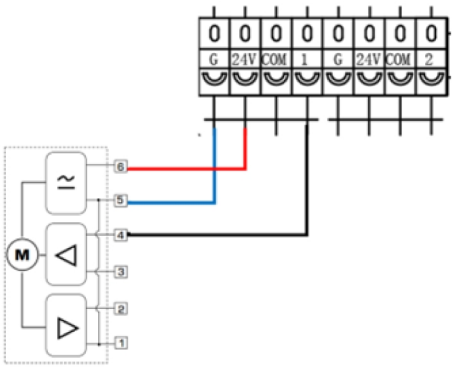




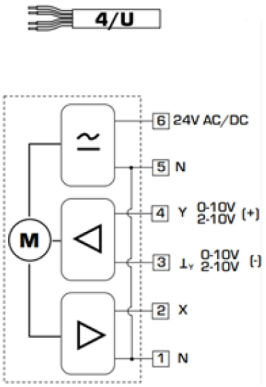
Example: Wire connection of a ESBE ARA 639 mixing valve actuator.

ESBE ARA 639 – 3 cables	Connection to ES heat pump (for controlling the first heating / cooling circuit)



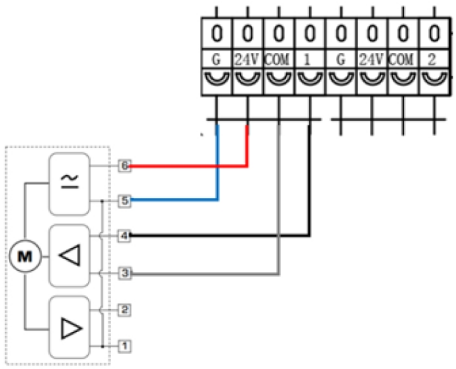


ESBE ARA 639 – 4 cables



Connection to ES heat pump

(for controlling the first heating / cooling circuit)



7 Refrigerant charging (split units)

The refrigeration circuit should be operated according to the proper procedures. The flammability of the refrigerant should also be considered. See also Section 17.2 "Inspections", page 83.

CAUTION

Before handling the refrigerant read and follow the precautions stated in the applicable Safety Data Sheet for the product.

CAUTION

The R32 refrigerant storage tank should be placed separately in an environment with ambient temperature of -10 °C to +50 °C and good ventilation. Warning labels should be placed in the area or on the tanks.

CAUTION

Ensure that the refrigeration system has been earthed before charging.

CAUTION

Make sure that the charging of refrigerant is done with the correct amount based on the information stated on the unit label. Overfilling is prohibited. The refrigerant is to be introduced as liquid only.

NOTE

Label the system when the charging is finished (or not yet completed).

7.1 Refrigerant amount

The heat pump is prefilled with R32 refrigerant that is sufficient for a pipe length of 7.5 metres. If the piping is longer than 7.5 metres, then add 30 grams of refrigerant for each additional metre. Maximun allowed pipe length is 20 metres.

7.1.1 Compressor oil

Oil is added on extended pipe lengths. The oil amount that is present in the compressor is sufficient for a pipe length of 20 metres. The compressor oil is a polyvinylether oil (PVE) type FW68S.

NOTE

Do not use other oil types than the recommended for compressors designed for R32.

CAUTION

Before handling the oil read and follow the precautions stated in the applicable Safety Data Sheet for the product.

8 Cable connections

CAUTION

All electrical connections must be done by a professional and in accordance with the electrical standards.

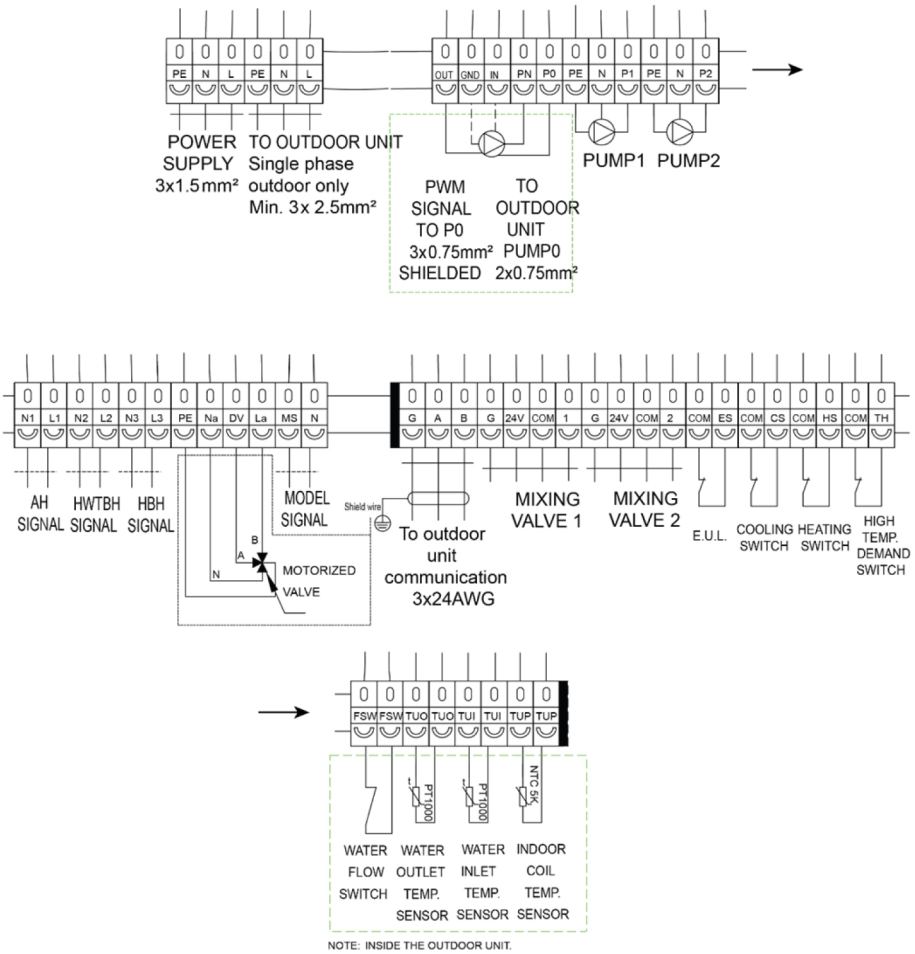
CAUTION

It is mandatory to use a suitable fuse for the heat pump and make sure the power supply to the unit corresponds to the specifications.

Also, a RCD (residual-current device) / GFCI (ground fault circuit interrupter) must be added before the fuses for the heat pump.

8.1 Cable connections for indoor unit

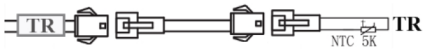
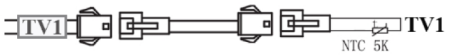
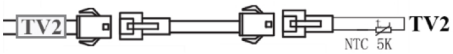
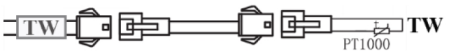
8.1.1 AWC-R32-M-V8; 6-19 kW



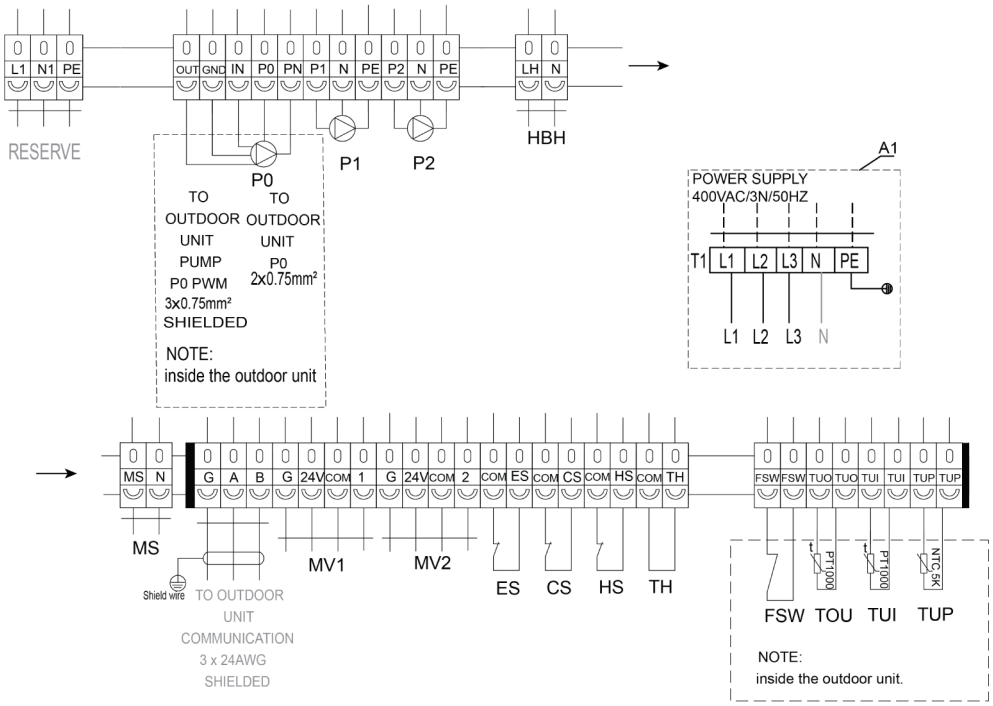
	Connections	Description
Power supply 230 V 50 Hz, 3×1.5 mm²	PE, N, L	Power supply for the indoor unit
To outdoor unit, single phase anti-freeze el. heater Min. 3×2.5 mm²	PE, N L	Connection to electrical heater for heat exchanger (230 V). Recommended is to use a separate fuse and supply it directly to the heat exchanger electrical heater in the outdoor unit.
To outdoor unit pump P0	P0, PN	Connection to 230 V power
PWM signal to P0	OUT, GND, IN	Connection for speed control of the P0 pump (not mandatory).
Pump 1	PE, N, P1	Circulation pump for heating/cooling circuit Zone 1 PE = Earth; N = Neutral; P1 = 230 V AC
Pump 2	PE, N, P2	Circulation pump for heating/cooling circuit Zone 2 PE = Earth; N = Neutral; P2 = 230 V AC

	Connections	Description
AH signal	N1, L1	Back-up heating signal for heating and DHW N1 = Neutral; L1 = 230 V AC **NOTE** Only for low power switching – relay coil.
HWTBH signal	N2, L2	Back-up heating signal for DHW only N2 = Neutral; L2 = 230 V AC **NOTE** Only for low power switching – relay coil.
HBH signal	N3, L3	Back-up heating signal for heating only N3 = Neutral; L3 = 230 V AC **NOTE** Only for low power switching – relay coil.
Motorized valve	PE, Na, DV, La	Diverting valve output La = constant power (230 V AC); Na = Neutral; DV = Signal output during DHW mode (230 V AC)
To outdoor unit communication	A, B, G + shield	Modbus communication to outdoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)
Mixing valve 1	G, 24 V, COM, 1	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 1 = 0....10 V DC;
Mixing valve 2	G, 24 V, COM, 2	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 2 = 0....10 V DC;
Cooling switch	COM, CS	Digital contact for controlling cooling mode
Heating switch	COM, HS	Digital contact for controlling heating mode
Water flow switch	FSW, FSW	Connection to outdoor unit (cable included in the package)
Water outlet temp. sensor	TUO, TUO	Connection to outdoor unit (cable included in the package)
Water inlet temp. sensor	TUI, TUI	Connection to outdoor unit (cable included in the package)
Coil temp. sensor	TUP, TUP	Connection to outdoor unit (cable included in the package)

8.1.2 Temperature sensors AWC-R32-M-V8; 6-19 kW

TR	Room temperature	
TV1	Mixing circuit 1 temperature	
TV2	Mixing circuit 2 temperature	
TC	Heating / cooling system temperature	
TW	Sanitary hot water temperature	

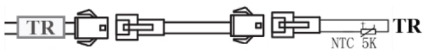
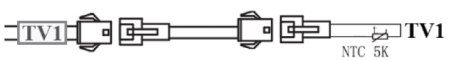
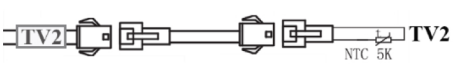
8.1.3 AWST-R32-M-V8; 6-15 kW

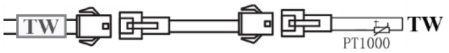


	Connections	Description
Power supply Recommended cable 5×2,5 mm²	L1, L2, L3, N, PE	Power supply for the indoor unit
RESERVE	PE, N1, L1	
To outdoor unit pump	P0 P0, PN	Connection to 230 V power
PWM signal to P0	OUT, GND, IN	Connection for speed control of the P0 pump (not mandatory)
Pump 1	P1, N, PE	Circulation pump for heating/cooling circuit Zone 1 PE = Earth; N = Neutral; P1 = 230 V AC

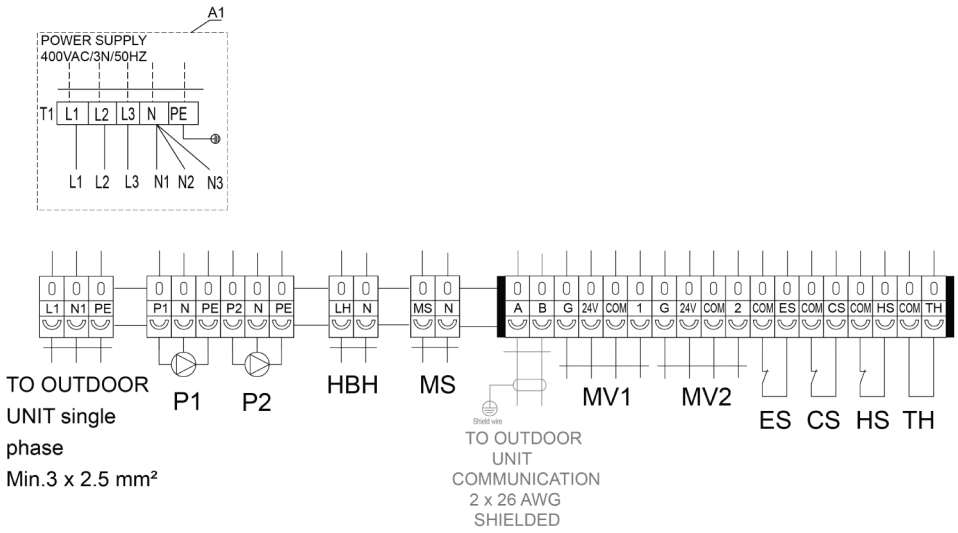
	Connections	Description
Pump 2	P2, N, PE	Circulation pump for heating/cooling circuit Zone 2 PE = Earth; N = Neutral; P2 = 230 V AC
HBH	LH, N	Back-up heating signal for heating only N = Neutral; LH = signal 230 V AC **NOTE** Only for low power switching – relay coil.
MS (mode signal)	MS, N	Gives signal when unit is selected mode (heating or cooling according to the settings). MS = 230 V AC, N = Neutral
To outdoor unit communication	A, B, G + shield	Modbus communication to outdoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)
Mixing valve 1	G, 24 V, COM, 1	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 1 = 0....10 V DC;
Mixing valve 2	G, 24 V, COM, 2	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 2 = 0....10 V DC;
ES (electrical utility lock)	COM, ES	Digital contact for electrical utility lock
CS (cooling switch)	COM, CS	Digital contact for controlling cooling mode
HS (heating switch)	COM, HS	Digital contact for controlling heating mode
TH (high temperature switch)	COM, TH	Digital contact for high temperature switch
Water flow switch	FSW, FSW	Connection to outdoor unit (cable included in the package)
Water outlet temp. sensor	TUO, TUO	Connection to outdoor unit (cable included in the package)
Water inlet temp. sensor	TUI, TUI	Connection to outdoor unit (cable included in the package)
Coil temp. sensor	TUP, TUP	Connection to outdoor unit (cable included in the package)

8.1.4 Temperature sensors AWST-R32-M-V8; 6-15 kW

TR	Room temperature	
TV1	Mixing circuit 1 temperature	
TV2	Mixing circuit 2 temperature	

TC	Heating / cooling system temperature	
TW	Sanitary hot water temperature	

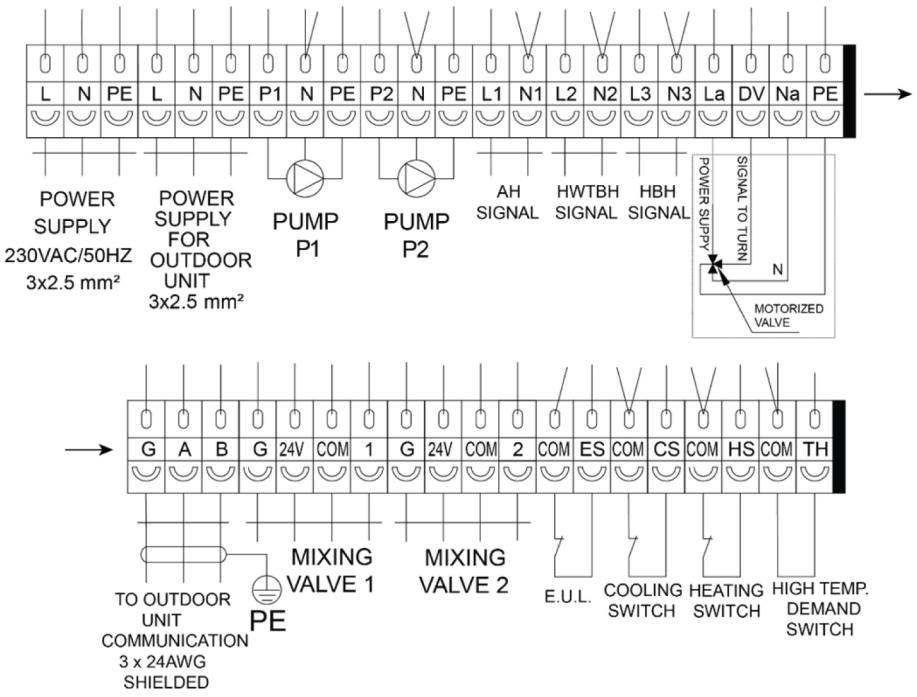
8.1.5 AWST-R32-S-V8



	Connections	Description
Power supply	L1, L2, L3, N, PE	Power supply for the indoor unit
Power supply to outdoor unit, single phase	PE, N1, L1	Recommended to route the power supply to the outdoor unit separately with its own fuse.
Pump 1	P1, N, PE	Circulation pump for heating/cooling circuit Zone 1 PE = Earth; N = Neutral; P1 = 230 V AC
Pump 2	P2, N, PE	Circulation pump for heating/cooling circuit Zone 2 PE = Earth; N = Neutral; P2 = 230 V AC
HBH signal	LH, N	Back-up heating signal for heating only N = Neutral; LH = 230 V AC **NOTE** Only for low power switching – relay coil.
Mode signal	MS, N	Gives signal when unit is selected mode (heating or cooling according to the settings). MS = 230 V AC, N = Neutral
To outdoor unit communication	A, B, G + shield	Modbus communication to outdoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)

	Connections	Description
Mixing valve 1	G, 24 V, COM, 1	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 1 = 0....10 V DC;
Mixing valve 2	G, 24 V, COM, 2	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 2 = 0....10 V DC;
ES (electrical utility lock)	COM, ES	Digital contact for electrical utility lock
CS (cooling switch)	COM, CS	Digital contact for controlling cooling mode
HS (heating switch)	COM, HS	Digital contact for controlling heating mode
TH (high temperature switch)	COM, TH	Digital contact for high temperature switch

8.1.6 AWH-R32-S-V8

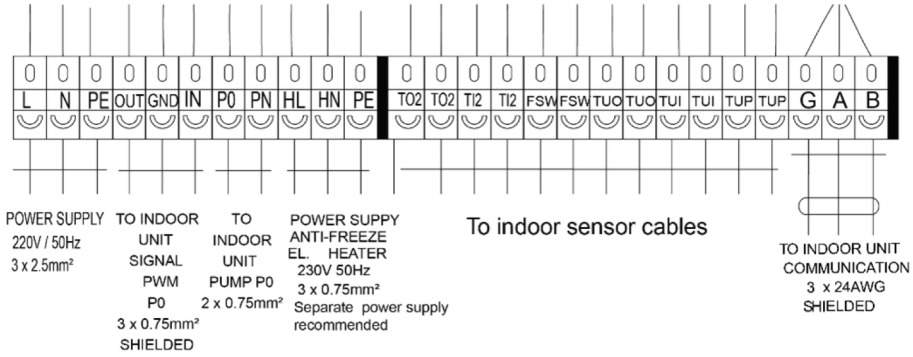


	Connections	Description
Power supply 230 V AC 50 Hz	L, N, PE	Power supply for the indoor unit
Power supply to outdoor unit	L, N, PE	Recommended to route the power supply to the outdoor unit separately with its own fuse.
To outdoor unit communication	A, B, G + shield	Modbus communication to outdoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)

	Connections	Description
Pump 1	P1, N, PE	Circulation pump for heating/cooling circuit Zone 1 PE = Earth; N = Neutral; P1 = 230 V AC
Pump 2	P2, N, PE	Circulation pump for heating/cooling circuit Zone 2 PE = Earth; N = Neutral; P2 = 230 V AC
AH signal	N1, L1	Back-up heating signal for heating and DHW N1 = Neutral; L1 = 230 V AC **NOTE** Only for low power switching – relay coil.
HWTBH signal	N2, L2	Back-up heating signal for DHW only N2 = Neutral; L2 = 230 V AC **NOTE** Only for low power switching – relay coil.
HBH signal	N3, L3	Back-up heating signal for heating only N3 = Neutral; L3 = 230 V AC **NOTE** Only for low power switching – relay coil.
Mixing valve 1	G, 24 V, COM, 1	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 1 = 0....10 V DC;
Mixing valve 2	G, 24 V, COM, 2	Proportional actuator control G = -0 V DC; 24 V = 24 V DC; COM = -0 V DC; 2 = 0....10 V DC;
ES (electrical utility lock)	COM, ES	Digital contact for electrical utility lock
CS (cooling switch)	COM, CS	Digital contact for controlling cooling mode
HS (heating switch)	COM, HS	Digital contact for controlling heating mode
TH (high temperature switch)	COM, TH	Digital contact for high temperature switch

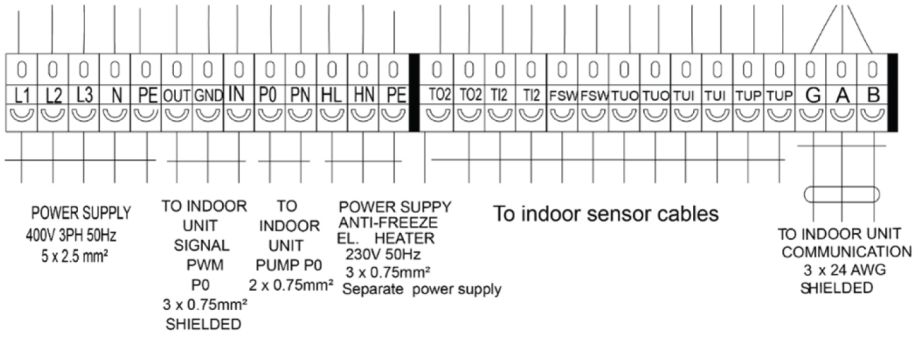
8.2 Cable connections for outdoor unit

8.2.1 AW-R32-M-V8; 6-12 kW



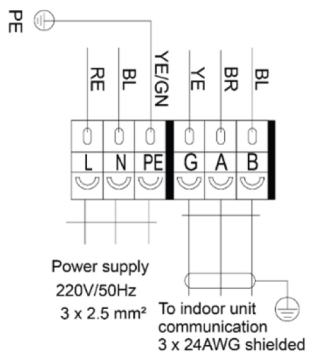
	Connections	Description
Power supply 220 V 50 Hz, 3×2.5 mm²	PE, L, N	Power supply for the outdoor unit PE = Earth; L = 230 V AC; N = Neutral
To indoor unit signal PWM P0	OUT, GND, IN	Connection for speed control of the P0 pump (not mandatory)
To indoor unit pump P0	P0, PN	Connection to indoor unit (cable included in the package)
Power supply anti-freeze el. heater	HL, HN, PE	HL = 230 V AC; HN = Neutral; PE = Earth Separate power supply and separate 6 A fuse.
/	TUO2, TUO2	NOT IN USE!
/	TUI2, TUI2	NOT IN USE!
Flow switch connection	FSW, FSW	Connection to indoor unit (cable included in the package)
Sensor connection	TUO, TUO	Connection to indoor unit (cable included in the package)
Sensor connection	TUI, TUI	Connection to indoor unit (cable included in the package)
Sensor connection	TUP, TUP	Connection to indoor unit (cable included in the package)
To indoor unit communication	A, B, G + shield	Modbus communication to indoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)

8.2.2 AW-R32-M-V8; 15-19 kW



	Connections	Description
Power supply 400 V AC 50 Hz	L1, L2, L3, N, PE	Power supply for the outdoor unit L1 = Phase 1; L2 = Phase 2; L3 = Phase 3; N = Neutral; PE = Earth
To indoor unit signal PWM P0	OUT, GND, IN	Connection for speed control of the P0 pump (not mandatory)
To indoor unit pump P0	P0, PN	Connection to indoor unit (cable included in the package)
Power supply anti-freeze el. heater	HL, HN, PE	HL = 230 V AC; HN = Neutral; PE = Earth Separate power supply and separate 6 A fuse.
/	TUO2, TUO2	NOT IN USE!
/	TUI2, TUI2	NOT IN USE!
Flow switch connection	FSW, FSW	Connection to indoor unit (cable included in the package)
Sensor connection	TUO, TUO	Connection to indoor unit (cable included in the package)
Sensor connection	TUI, TUI	Connection to indoor unit (cable included in the package)
Sensor connection	TUP, TUP	Connection to indoor unit (cable included in the package)
To indoor unit communication	A, B, G + shield	Modbus communication to indoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)

8.2.3 AW-R32-S-V8; 6-12 kW



	Connections	Description
Power supply 220 V AC 50 Hz, 3×2.5 mm²	PE, L, N	Power supply for the outdoor unit PE = Earth; L = 230 V AC; N = Neutral
To indoor unit communication 3×24 AWG shielded	A, B, G + shield	Modbus communication to outdoor unit (cable included in the package) **NOTE** Connect the shield of the cable only to one side (indoor or outdoor unit)

8.3 External modbus control connection

The V8 series units can all be controlled by an external device using a standard Modbus protocol connection.

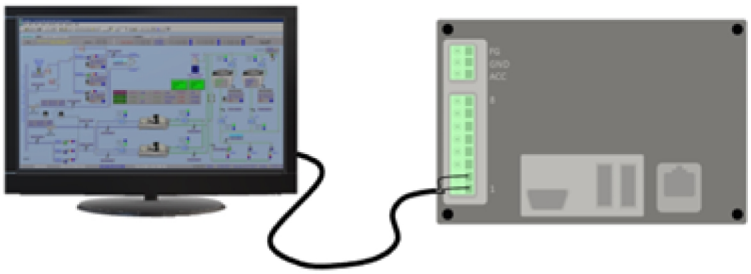
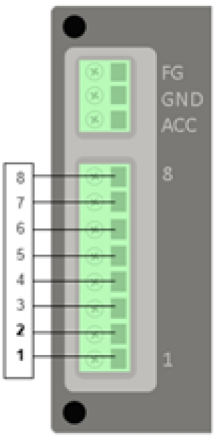


Figure 5: BMS system with ES heat pump operation panel



1 Modbus communication – T+
2 Modbus communication – R-
3 Wi-Fi module port 3
4 Wi-Fi module port 4
5 Wi-Fi module port 5
6 Blank
7 Heat pump internal communication – B
8 Heat pump internal communication – A

For detailed information about Modbus protocol settings and error codes, contact Energy Save or your local Energy Save dealer.

9 Backup thermostat settings

9.1 Analog back-up

NOTE

Only applicable for AWST models (AWST6-15-R32-M-V8 and AWST6-12-R32-S-V8)

Analog back-up is a function that will kick in as the last reserve, should a fatal failure occur in the unit. Fatal failure is a case where the indoor unit main control system fails (display or indoor PCB). If this happens, the system has no automatic control of the backup system.

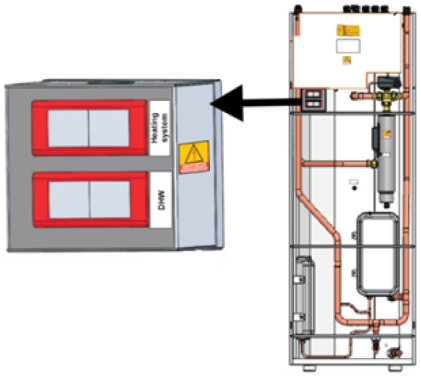
When the back-up function is activated, all circulation pumps will start running and the integrated electrical heater will be put into operation for ambient heating and DHW as set by the digital thermostats.

The digital thermostats are located in the upper left part in the cabinet.

The upper thermostat is used for ambient heating.

The lower thermostat is used for DHW.

The settings of the thermostats control the switching of the diverting valve between ambient heating and DHW.



CAUTION

During installation and start-up of the unit the installer must set the digital thermostats according to the type of heating used in the system. For example, in a floor heating system the setting should not be higher than 35 °C. For radiators it is usually approximately 55 °C. Check the design temperature of the particular heating system.

9.2 Digital thermostat buttons and indications

SET	Press to change the temperature setting. The temperature indication starts blinking.

	Press to increase the temperature. The setting is saved and automatically returns to the main screen.
	Press to decrease the temperature. The setting is saved and automatically returns to the main screen.
	Electrical heater is OFF
	Electrical heater is ON (a dot appears)

9.3 Thermostat failures

Failure on display	Possible causes	State of electrical flow heater
	– Temp. detected on the sensor ≥ 120 °C – Short circuit of the temp. sensor – Temp. sensor broken	STOP
	– Temp. detected on the sensor ≤ -45 °C – Open circuit of the temp. sensor (bad contact or disconnected) – Temp. sensor broken	STOP

9.4 Thermostat default settings

Code	Parameter description	Setting range	Default setting
E1	Low temperature limit	0 °C to E2	0 °C
E2	High temperature limit	E1 to 110 °C	75 °C
E3	Restart ▵T	1 to 50 °C	3 °C
E4	Turn off delay	0 to 10 min	0 min
E5	Temperature sensor calibration	-10 °C to +10 °C	0 °C

9.4.1 Changing the default thermostat settings

1 Press the  button 5 times, then press the  button 3 times. The screen will show "E1".

2 Press SET to select parameter (E1 to E5, according to section Digital thermostat parameters).

3 Press the ▲ or ▼ button to show and change the value of the selected parameter.

If no button is pressed, the screen will automatically return to normal mode after 6 seconds.

9.5 Disabling analog backup

1 Set the thermostats to 10 °C.

This means that if a fatal failure occurs, the thermostats will work only to prevent the water from freezing.

10 Backup anti-freeze protection

In addition to the automatic anti-freeze protection function that is set up in the control unit, the outdoor units have an additional back-up anti-freeze protection system that is independent of the main control system. The back-up anti-freeze protection is controlled by a mechanical thermostat located in the outdoor unit. If the temperature on the plate heat exchanger falls below the set value of the thermostat, this will activate an electrical heater placed on the heat exchanger and piping.

The backup anti-freeze heater requires a separate power supply with its own 6 A fuse. Connect the separate power supply to the outdoor unit terminals HL, HN, and PE.

The default setting of the thermostat is 7 °C.

NOTE

Provided that the unit is powered on, the built-in automatic anti-freeze functions are active and have priority over all other functions, as a security measure. It is therefore recommended to always keep the unit powered, even if it is not in use.

See also Section 14.15 "Other options settings", page 0.

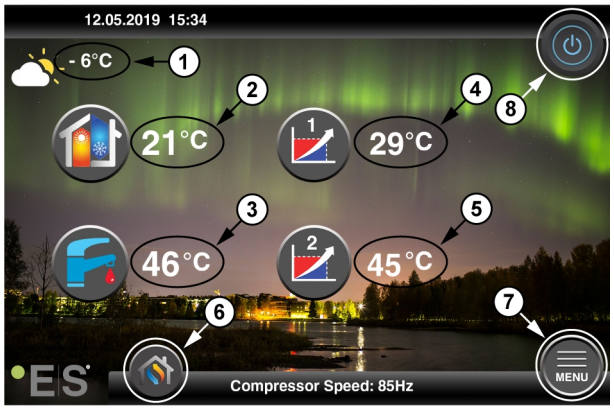
11 Control unit

The Energy Save heat pumps have an integrated LED touchscreen controller with a menu interface that has a big range of installation options developed to achieve optimal performance and reduce heating costs. The menu also offers sophisticated safety features for a carefree operation of the heat pump.

The control unit is powered by 24 V via the heat pump, and it has a small battery for the memory to keep the settings should there be a power loss.

11.1 Main screen

The main screen consists of the following elements:



NOTE

The naming of the functions in the menus may differ depending on the version of the software. But the order and function are the same in the menus.

1	**Outdoor temperature**	
2	**Room temperature**	Tap to: – parallelly move the heating curve of the zones 1 & 2 - if the room temperature is set **not** to affect the heating curve (factory setting) – change the set room temperature - if the room temperature is set to affect the heating curve
3	**Domestic hot water**	Tap to change the desired temperature of the hot water in the tank.
4	**Zone 1**	Current temperature in the heating system. Tap to change the temperature of the water for the current outdoor temperature (nearest point of the heating curve, outdoor temperature).
5	**Zone 2**	Current temperature in the heating system. (see point 4)

6	**Mode selection**	Tap to change the mode:
	Auto	Automatic alternation between heating, cooling, and domestic hot water. **NOTE** External signals will be active only in Auto mode. In the other modes the unit will disregard the external switch control!
	Heating	Only heating is activated
	Domestic hot water	Only domestic hot water is activated
	Cooling	Only cooling is activated
	Quick heat	Fast heating of domestic hot water to set temperature (switches back to Auto mode when done)
7	**Menu**	Access to submenus
8	**On/Off**	– Blue colour: Heat pump is on – Grey colour: Heat pump is switched off (standby)

Additional symbols

Additional symbols appear in the top bar of the main screen in cases when a special function is active.

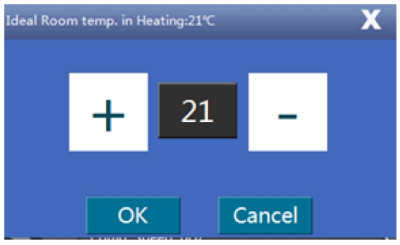
	Night mode
	Outdoor unit defrosting - normal operation
	Domestic hot water schedule
	Heating and cooling schedule

	Legionella function
	Vacation mode
	Floor curing function
	Electrical utility lock
	ECO heating function
	Warning (yellow): The heat pump operates normally but authorized service personnel must be informed!
	Alarm (red): To ensure the safety of the system and heat pump, the heat pump is switched off. If the **Emergency operation** function is activated (see the **Backup** menu), the heat pump continues to operate, but only with backup heating sources (e.g. electric heater). **Contact an authorized service personnel immediately!**

11.2 Menu navigation

These are the main navigation tools used to access parameters and information in the menu:

- Tap the specific icon to view or change its settings.
- Tap the menu button to access the submenus.
- Tap to select a submenu or change the setting of a parameter.
- Tap the up and down / buttons to go to the next or previous page.
- Tap the left and right / buttons to go to the next or previous menu screen.
- Tap the **+** (plus) or **-** (minus) buttons to increase or decrease a value.
- Tap **OK** to confirm a value or a function or tap **Cancel** to return without saving.



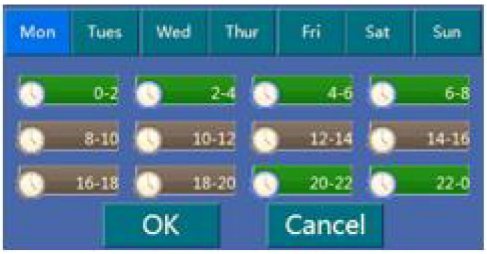
11.3 Setting the day and time for activation of a function

Some parameters require schedule settings in a separate screen.

1 Select the day of the week by tapping it in the upper bar.

2 Change the status between active and inactive by tapping the time fields.

- If the fields are green, the function is active.
- If the fields are grey, the function is not active.



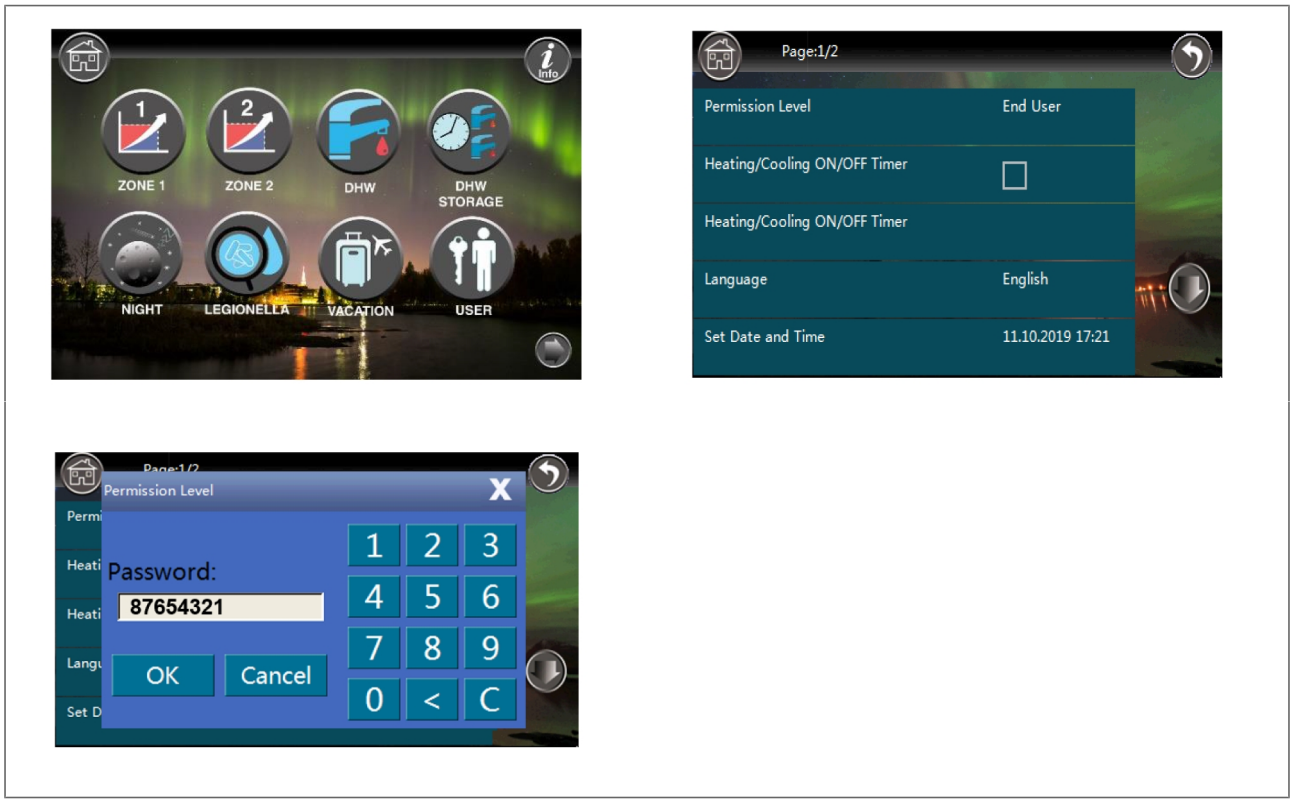
12 Login and access levels

NOTE

It is forbidden to pass on the installer password to the end user!

There are two access levels:

- End user level – no password required
- Installer level – password: **87654321**



Parameters indicated in grey for the end user are protected by the installer password.

NOTE

The unit returns to the end user level automatically after 5 minutes.

13 Initial settings

13.1 Setting of room temperature

13.1.1 Setting room temperature with room temperature sensor (TR)

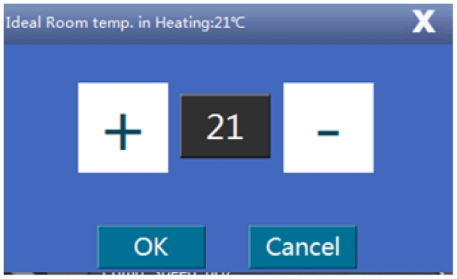
The room temperature control can only be used if the room temperature sensor is located in a proper room (for example a living room), and the function **Room temp. effect on heating curve** is activated (see Section 14.2 "Zone 1", page 49). If the function is not activated, the heat pump operates according to the heating curve only.

NOTE

The room temperature setting affects both zones.

1 On the main screen, tap the indication for room temperature, next to the house icon.

2 Tap **+** or **-** to raise or lower the temperature.



3 Tap **OK** to confirm.

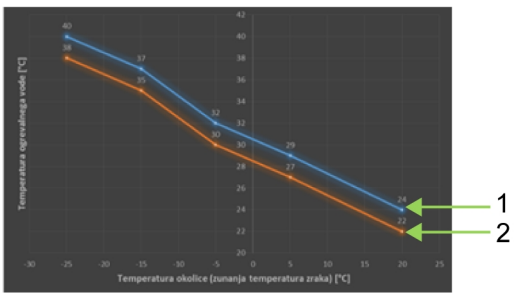
13.1.2 Setting room temperature without sensor

When commissioning, the heating curve must be adjusted based on the type of heating system of the house and the desired indoor temperature.

On the main screen, the heating curve can be fine-tuned by moving it in parallel (raised or lowered). The heating curve can be raised or lowered by maximum 3 °C (-3 °C to +3 °C).

Normally, raising the heating curve by 2–3 °C means an increase in room temperature of about 1 °C.

Example: The below graph shows a reduction (parallel move) of the heating curve by 2 °C.



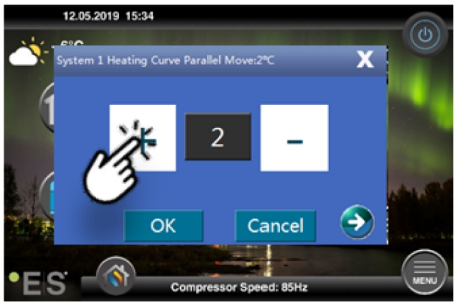
1 Heating curve – not fine-tuned

2 Lowering the heating curve by 2 °C

Parallel move of the heating curve – Zone 1

1 On the main screen, tap the indication for room temperature next to the house icon.

2 Tap **+** or **–** to raise or lower the heating curve by the selected temperature.



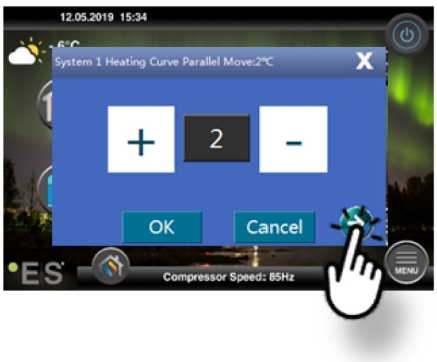
3 Tap **OK** to confirm.

Parallel move of the heating curve – Zone 2

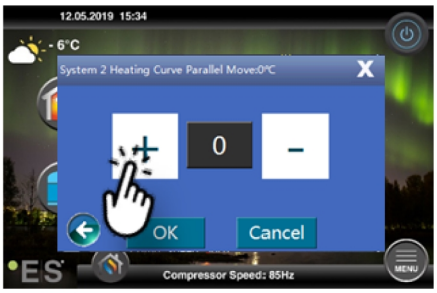
If the house has two heating systems with separate heating curves, these can be fine-tuned individually.

1 Go to the heating curve setting for Zone 1.

2 Tap  to go to the heating curve setting for Zone 2.



3 Tap **+** or **–** to raise or lower the heating curve by selected temperature.



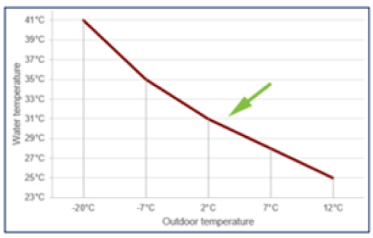
4 Tap **OK** to confirm both settings.

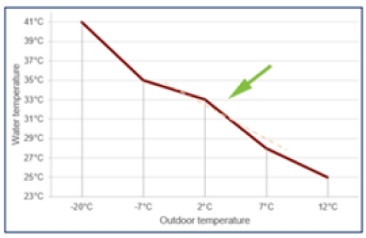
13.1.3 Adapting (breaking) the heating curve

If the heating curve needs to be adjusted at a certain outdoor temperature, a section of the curve can be broken to fit the water heating for that temperature.

On the heating curve the outdoor temperature value closest to the actual outdoor temperature is used as the point for which the water temperature is changed. Hence, if the actual outdoor temperature is -6 °C, the curve will be adjusted at -7 °C (the value of parameter Outdoor temp. 2 – HC that is used in the x-axis of the curve in this case).

Example: Changing the temperature setting for +2 °C outdoor temperature produces a heating curve as shown below.





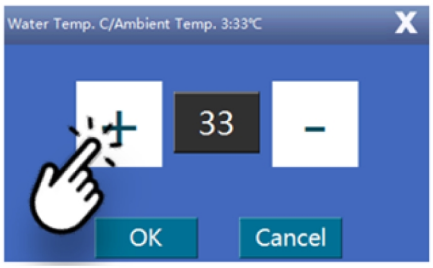
To adjust a section of the heating curve:

1 On the main screen, tap the indication for the Zone 1 temperature.

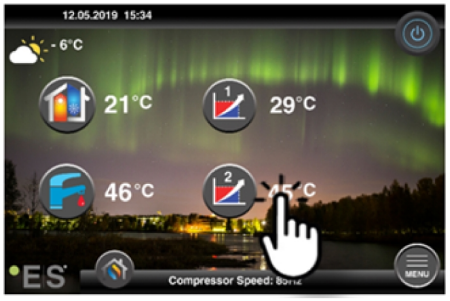
2 Tap **+** or **–** to raise or lower the water temperature.

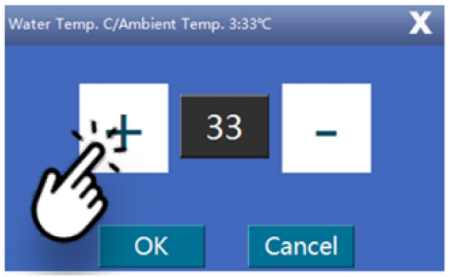
3 Tap **OK** to confirm.

Zone 1 (For example first floor/underfloor heating):



Zone 2 (For example second floor/radiators):



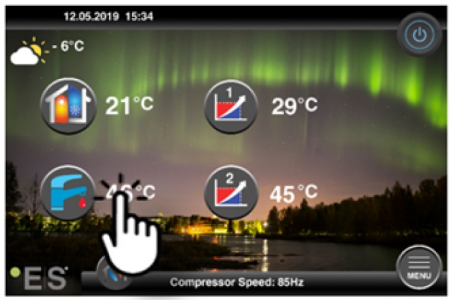


NOTE

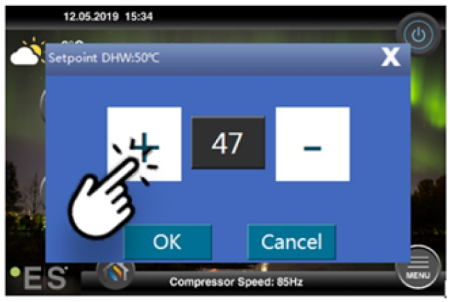
If the zone icon is grey this means that the zone is not activated.

13.2 Setting of domestic hot water temperature

1 On the main screen, tap the temperature indication next to the icon for domestic hot water.



2 Tap **+** or **–** to raise or lower the temperature.



The temperature that is suitable to set depends on the user's needs and habits.

The recommended setting is between 47 °C and 50 °C.

3 Tap **OK** to confirm.

14 Specific settings

Key features	
Heating, cooling	Heating and cooling the building.
DHW mode	Heating sanitary water.
Two mixing heating/cooling circuits	Controlling two mixing heating and cooling circuits.
Night mode	Lowering the heat production during the night. Quite operation during the night.
Controlling additional heating sources	Can control additional heating sources as back up or as bivalent mode.
Dual temperature settings for DHW	The sanitary hot water can be set with to set points at different times for each day of the week.
Vacation mode	Setting vacation time for the heat pump to reduce the heat production.
Floor curing	Drying and distressing the screed floor.
Anti Legionella function	Preventing legionella in sanitary hot water.

14.1 Accessing submenus

1 Select **MENU** icon in the lower right corner.

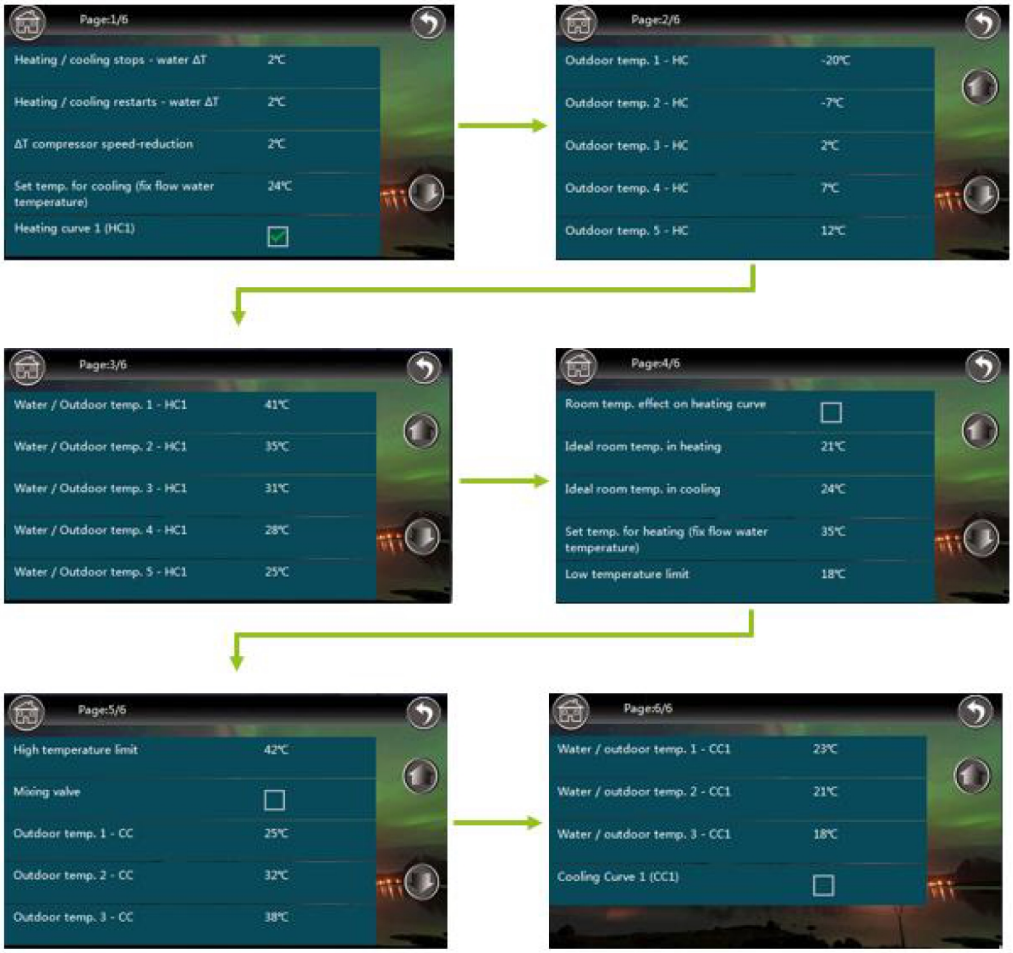
This opens the first submenu which mostly contains settings concerning the end user.

2 To access the second submenu which mostly contains settings concerning the installer (commissioning), select **MENU** icon in the lower right corner again.

Settings that affect the installer during deployment are protected with a password. The end user can see all the changes but can only change those that are not related to commissioning.

14.2 Zone 1

The menus for Zone 1 as well as for Zone 2 offer several detailed settings that can further adapt and improve the operation of the inverter technology in order to bring the highest savings.



Heating / cooling stops - water ΔT	Allowed overheating temperature of the heating system. Recommended setting: 2 °C. The heat pump is allowed to slightly overheat the system to maintain a low working speed and to avoid frequent stopping and starting of the compressor.
Heating / cooling restarts - water ΔT	Allowed temperature deviation in the heating/cooling circuits before the compressor restarts. Recommended setting: 2 °C.
ΔT compressor speed reduction	Allowed temperature deviation within which the compressor working speed is allowed to be reduced. Recommended setting: 2 °C. Example: If the set heating temperature is 30 °C and this parameter is set to 2 °C, the compressor will work at maximum speed until 28 °C is reached. At 28.1 °C and above the compressor speed will start to decrease towards the lowest operation speed of the compressor.
Set temp. for cooling (fix flow water temperature)	(Zone 1 and Zone 2 parameter) Desired cooling water temperature of cooling circuit 1 or cooling circuit 2.

Heating curve 1 (HC1) / Heating curve 2 (HC2)	(Zone 1 and Zone 2 parameter) Select the checkbox to enable the function. Enabled: The heat pump produces hot water for the heating system according to the heating curve setting. Disabled: The heat pump produces hot water for the heating system according to the fixed temperature setting (**Set temp. for heating** without heating curve). HC1 = Heating curve Zone 1 HC2 = Heating curve Zone 2 See Section 14.2.1 "Heating curve settings", page 52.
Outdoor temp. X – HC **Water / Outdoor temp. X - HCX**	(Zone 1 and Zone 2 parameters) See Section 14.2.1 "Heating curve settings", page 52.
Room temp. effect on heating curve	Applicable only if a TR room temperature sensor is used in the living area. Makes minor corrections to the heating curve, depending on the set value of parameter **Ideal room temp. in heating** Select the checkbox to enable the function. **NOTE** This feature is not intended to be used for temperature control by room temperature, only for correction of the heating curve. If this function is activated and the temperature where the TR room temperature sensor is located still exceeds the set ideal value, the heating curve settings should be reset.
Ideal room temp. in heating	Applicable only if the feature **Room Temp. Effect on Heating Curve** is enabled.
Ideal room temp. in cooling	Applicable only if the feature **Room Temp. Effect on Heating Curve** is enabled.
Set temp. for heating (fix flow water temperature)	(Zone 1 and Zone 2 parameter) Fixed temperature for the heating water system when the heating curve is disabled. **NOTE** Weather related control of the heating circuit is disabled, which can lead to higher heating costs!
Low temperature limit	(Zone 1 and Zone 2 parameter) Lowest allowed water temperature that the end user can set (without accessing the service level). Applicable for both heating mode and cooling mode.

High temperature limit	(Zone 1 and Zone 2 parameter) Highest allowed water temperature that the end user can set (without accessing the service level). Applicable for heating mode only. Default setting: 42 °C. **NOTE** If higher temperatures are required in the system the limitation must be increased (e.g. for radiators, fan coils, etc.).
Mixing valve	(Zone 1 and Zone 2 parameter) Select the checkbox to enable the function. Enables use of a mixing valve for the first/second heating/cooling circuit (Zone 1/Zone 2). **NOTE** A temperature sensor (TV1/TV2) must be added after the mixing valve.
Cooling curve (CC1) / Cooling curve (CC2)	(Zone 1 and Zone 2 parameter) Select the checkbox to enable the function. Enabled: The heat pump produces cold water for cooling according to the set cooling curve. Disabled: The heat pump produces cold water for cooling according to fixed temperature setting (**Set temp. for cooling**) CC1 = Cooling curve zone 1 CC2 = Cooling curve zone 2 See Section 14.2.2 "Cooling curve settings", page 54.

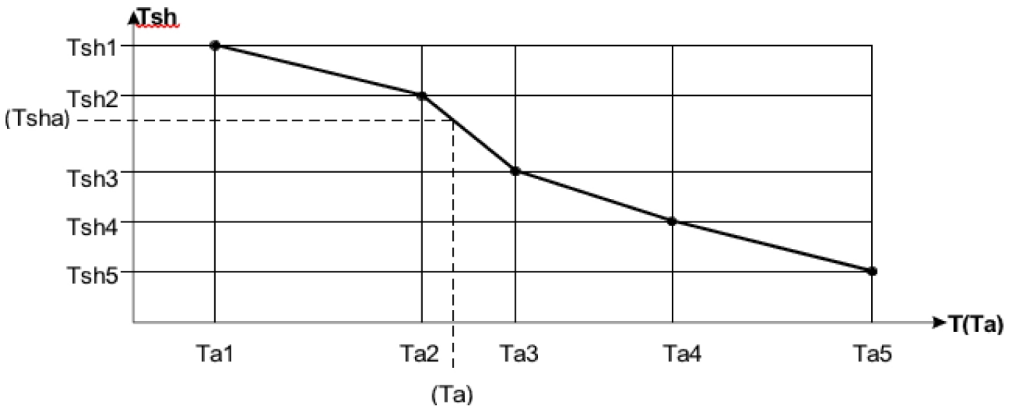
14.2.1 Heating curve settings

HC = heating curve, **HC1** = heating curve for Zone 1, **HC2** = heating curve for Zone 2

Outdoor temp. 1 - HC	
Outdoor temp. 2 - HC	
Outdoor temp. 3 - HC	Heating curve - outdoor temperatures
Outdoor temp. 4 - HC	
Outdoor temp. 5 - HC	

Water / Outdoor temp. 1 - HC1 /HC2	
Water / Outdoor temp. 2 - HC1 /HC2	
Water / Outdoor temp. 3 - HC1 /HC2	Heating curve - water temperatures Zone 1 / Zone 2
Water / Outdoor temp. 4 - HC1 /HC2	
Water / Outdoor temp. 5 - HC1 /HC2	

Tsh – Space heating temp.; T(Ta) – Outdoor temp.



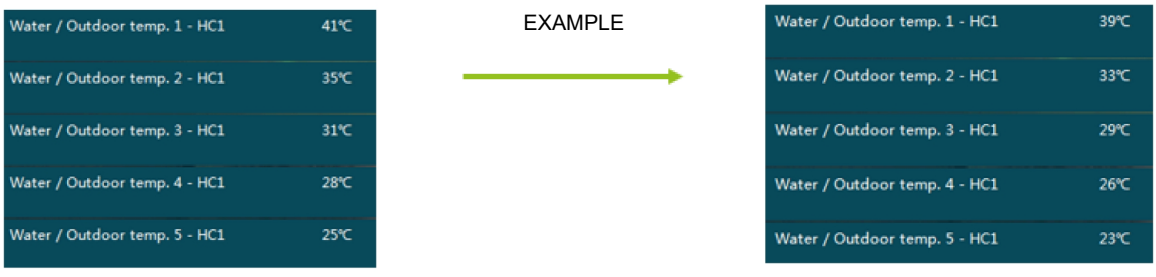
Heating curve 1 (HC1) is set on page 3 of the Zone 1 menu.

Heating curve 2 (HC2) is set on page 2 of the Zone 2 menu.

NOTE

It is recommended to reset only the space heating water temperatures (figure above on the right). Resetting outdoor temperatures for the heating curve affects both heating circuits.

Example: Setting the heating curves for heating circuit 1 and 2



The customer wants the room temperature to be 21 °C, but the heat pump heats the rooms to 22 °C. In this case the heating curve must be lowered. On page 3, all temperatures need to be lowered by 2–3 °C, which means that the room temperature will be reduced by 1 °C. If the room temperature is lower than the desired temperature, the temperature values must be increased.

14.2.2 Cooling curve settings

CC = cooling curve, **CC1** = cooling curve for Zone 1, **CC2** = cooling curve for Zone 2

Outdoor temp. 1 - CC	
Outdoor temp. 2 - CC	Cooling curve - outdoor temperatures
Outdoor temp. 3 - CC	
Water / Outdoor temp. 1 - CC1 / CC2	
Water / Outdoor temp. 2 - CC1 / CC2	Cooling curve - water temperatures Zone 1 / Zone 2
Water / Outdoor temp. 3 - CC1 / CC2	

NOTE

Outdoor temperature settings are done in the Zone 1 menu.

14.3 Zone 2

The Zone 2 menu contains parameters that are also present in the Zone 1 menu. For descriptions of the settings, see Section 14.2 "Zone 1", page 49.

NOTE

If the Zone 2 heating circuit is active and the room thermostat is not used, a wire must be placed between TH and COM. If a wire is not placed between TH and COM, the heat pump will heat the buffer tank according to the lower temperature demand.

To apply settings for Zone 2, select the checkbox for Zone 2.

14.4 DHW

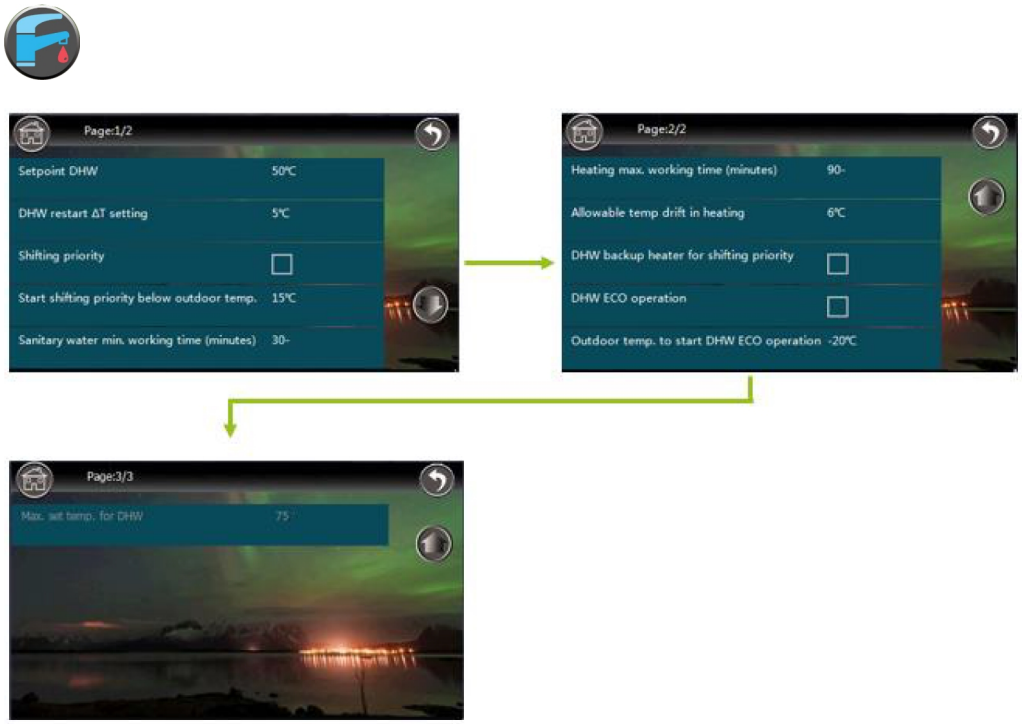


Table 52:

Setpoint DHW	Desired temperature for domestic hot water.
DHW restart ΔT setting	Allowed temperature deviation before the heating of the domestic hot water restarts. Recommended setting: 5 °C. Example: The Setpoint DHW parameter is set to 47 °C and the DHW restart ΔT setting parameter is set to 5 °C. 47 °C - 5 °C = 42 °C. This means that the heat pump will restart heating of the domestic hot water when the temperature drops below 42 °C.
Shifting priority	Select the checkbox to enable the function. Enabled: The heat pump switches to heating mode based on the temperatures in the heating system, disregarding the **Setpoint DHW** temperature setting. Disabled (default): The heat pump switches to heating mode only when the **Setpoint DHW** temperature is reached. See Section 14.4.1 "Shifting priority", page 56.
Start shifting priority below outdoor temp.	Outdoor temperature below which activation of the **Shifting priority** function takes place. Applicable only if **Shifting priority** is enabled.

Sanitary water min. working time (minutes)	The minimum time in minutes that the heat pump will heat the domestic hot water for before it switches to heating mode. Applicable only if **Shifting priority** is enabled. **NOTE** This parameter has precedence although all other conditions for **Shifting priority** are met.
Heating max. working time (minutes)	The maximum time in minutes that the heat pump can remain in heating mode, before switching back to domestic hot water heating. Applicable only if **Shifting priority** is enabled.
Allowable temp. drift in heating	Maximum allowed temperature drift of hot water for heating during domestic hot water heating. When this value is exceeded, the unit will switch to heating mode. Applicable only if **Shifting priority** is enabled.
DHW backup heater for shifting priority	Select the checkbox to enable the function. Applicable only if **Shifting priority** is enabled. Enabled: The backup heater will help heating up the domestic hot water faster. Disabled: The backup heater will work according to the normal back up function settings.
DHW ECO operation	Select the checkbox to enable the function. Enabled: The compressor speed is limited to a maximum of 50% of the full compressor working speed. Below this value the compressor speed is determined by the outdoor temperature. Disabled: Normal operation of DHW working mode, i.e. no limitations of the compressor speed; it is always determined by the outdoor temperature.
Outdoor temp. to start DHW ECO operation	Outdoor temperature above which activation of the **DHW ECO Operation** function takes place.
Max. set temp. for DHW	Highest possible temperature that the end user can set, without accessing the service level. Applicable for the DHW mode only. Example: If **Max. set temp. for DHW** is set to 50 °C, the end user will not be able to set the desired DHW temperature higher than 50 °C.

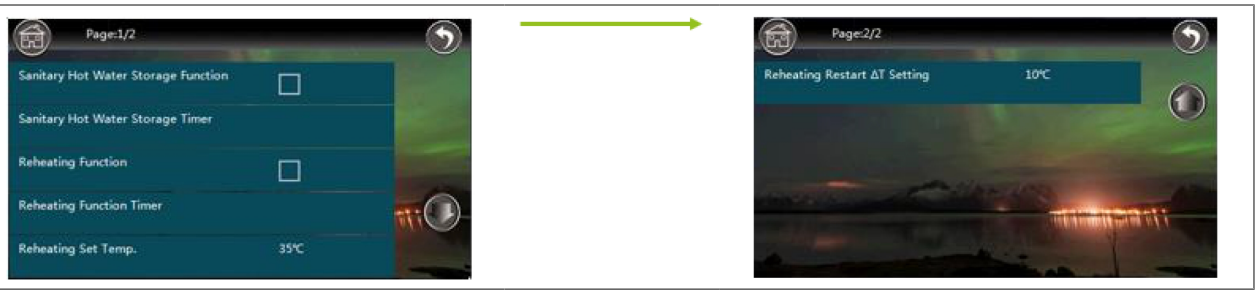
14.4.1 Shifting priority

The heat pump has absolute priority for the preparation of domestic hot water. With the **Shifting priority** feature, the priority adjusts to the heat losses when the outdoor temperature reaches a certain point. This feature is used in new buildings that still lack insulation and that will be without insulation for at least one heating season.

Example: The set temperature for DHW is 47 °C and the heat pump is currently working in DHW mode. The actual DHW temperature is 44 °C, meaning it still must be heated for another 3 °C before the heat pump can switch to heating mode (heating the house). In that moment, the unit detects that the temperature of the heating water for the heating system is dropping to a certain value, meaning there is a high risk that also the room temperatures drop below the desired value in the house. To prevent this from happening, the heat pump switches to heating mode to provide heat to the house. When the temperature has reached a safe level, or the maximum set time for heating is exceeded, the heat pump switches back to DHW mode to heat up the DHW to the desired value, before switching back to heating mode.

14.5 DHW storage

When active, this function is indicated with the symbol in the top bar of the screen.

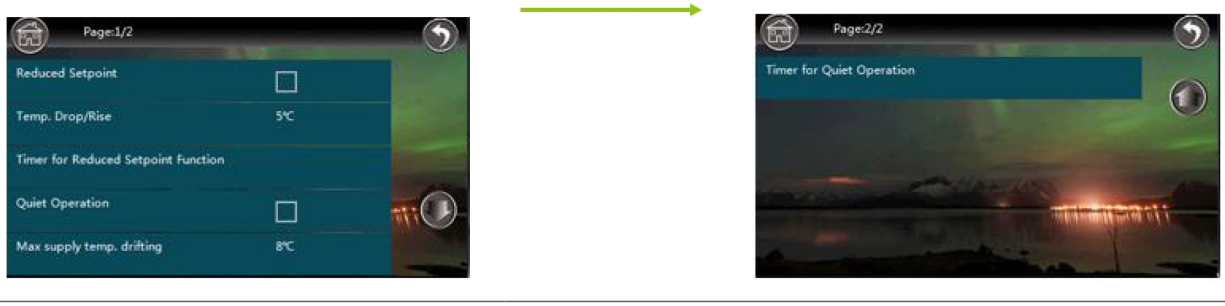


Sanitary hot water storage function	Select the checkbox to enable the function. Enabled: Hot water will be prepared only in the selected day and time periods set in parameter **Sanitary hot water storage schedule**. Disabled: Normal operation of DHW mode.
Sanitary hot water storage schedule	**Day and time** settings for the **Sanitary hot water storage function**. See section Section 11.3 "Setting the day and time for activation of a function", page 42. If the fields are green, domestic water heating is on. If the fields are grey, it means the heat pump is not heating domestic water.
Reheating function	Select the checkbox to enable the function. Function that makes it possible to have two different temperatures of the domestic hot water depending on the time of day. The second temperature mode is set in the parameter **Reheating set temp**.
Reheating function schedule	**Day and time** settings for the **Reheating function**. See section Section 11.3 "Setting the day and time for activation of a function", page 42. If the fields are green, domestic water heating is on. If the fields are grey, it means the heat pump is not heating domestic water.

Reheating set temp.	Desired temperature setting for the second mode of domestic hot water heating. This temperature will be the default temperature for the domestic hot water heating in the **Reheating function**. The temperature can be lower or higher than the primary setting of the desired domestic hot water temp. **NOTE** If the time and day settings overlap, the heat pump will take into account the higher level of desired domestic water temperature.
Reheating restart ΔT setting	Allowed temperature deviation before the heating of the domestic hot water restarts for the second mode of the **Reheating function**. Recommended setting: 5 °C. Example:**The Reheating set temp.** parameter is set to 45 °C and the **Reheating restart ΔT setting** parameter is set to 5 °C. 45 °C - 5 °C = 40 °C. This means that the heat pump will restart heating of the domestic hot water when the temperature drops below 40 °C.

14.6 Night

When active, this function is indicated with the symbol in the top bar of the screen.

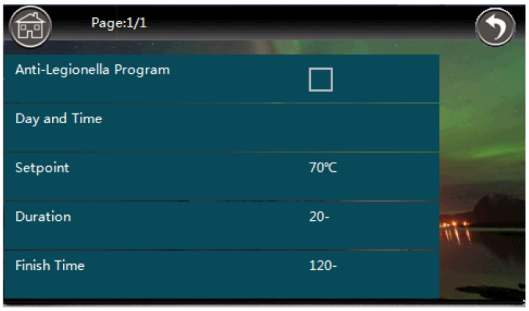


Reduced setpoint	Select the checkbox to enable the function. Reduction of the room temperature at night. The water temperature is lowered by the set value for both heating circuits in the set time.
Temp. Drop/Rise	Space heating water temperature drop or rise for both heating circuits. Settings: 2 °C to 10 °C.

Schedule for Reduced Setpoint Function	Schedule for activation of **Reduced setpoint**. If the fields are green, **Reduced setpoint** is active. If the fields are grey, **Reduced setpoint** is not active. See section Section 11.3 "Setting the day and time for activation of a function",page 42.
Quiet Operation	Select the checkbox to enable the function. Noise reduction during nighttime. The heat pump operates with the lowest possible rpm of compressor and fans.
Max supply temp. drifting	Maximum allowed space heating water temperature drift for both circuits when **Quiet operation** is active. Settings: 2° C to 10 °C.
Schedule for Quiet operation	Schedule for activation of **Quiet Operation**. If the fields are green, **Quiet operation** is on. If the fields are grey, **Quiet operation** is off. See section Section 11.3 "Setting the day and time for activation of a function",page 42. **NOTE** If the schedules for **Reduced setpoint** and **Quiet Operation** overlap, the heat pump will operate in the quiet mode with an additional temperature drop, as set in the **Temp. Drop/Rise**.

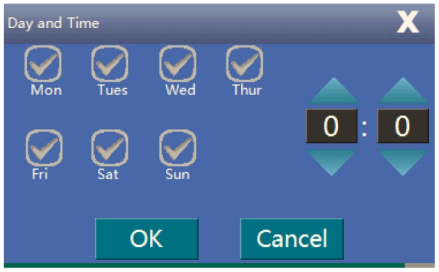
14.7 Legionella

When active, this function is indicated with the  symbol in the top bar of the screen.



Anti-Legionella Program	Select the checkbox to enable the function. The **anti-legionella program** is performed according to the set day, time, and temperature.

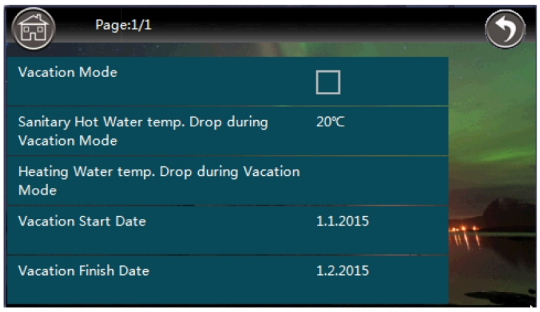
Day and time	Schedule for activation of the **anti-legionella program**. Set the day and time for the function to be switched on. Recommended setting: Monday at 2:00 AM



Setpoint	Desired temperature (setpoint) of the **anti-legionella program**.
Duration	Time during which the heat pump should maintain the desired temperature in the **anti-legionella program**.
Finish Time	Time during which the anti-legionella should run. If the heat pump cannot heat the domestic water in the set time, the program is terminated, and an error message appears on the display.

14.8 Vacation

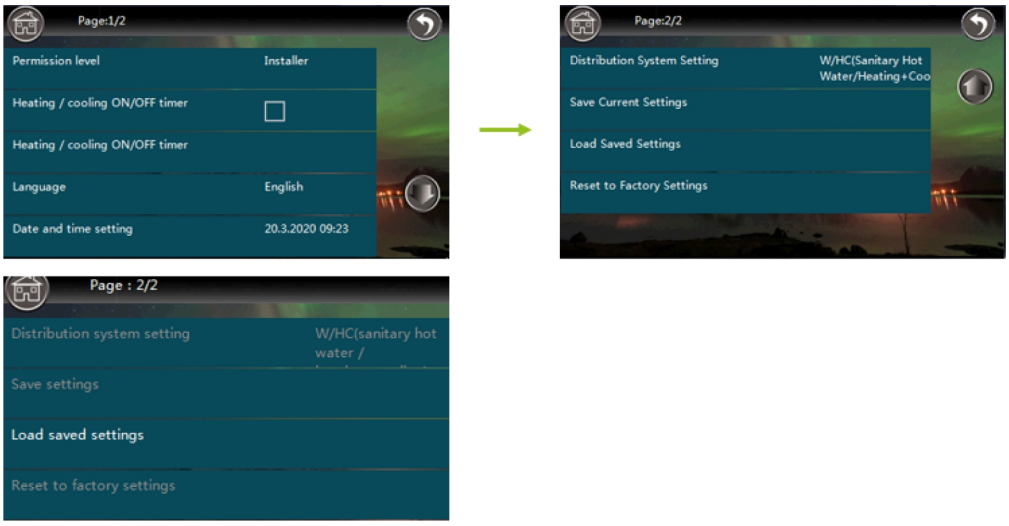
Vacation mode can be used for the time when you are absent and there is no need for heating or hot water. The date of departure (start date) and date of arrival (finish date) is set, and the desired heating and water temperature drop for the duration of your vacation.



Vacation mode	Select the checkbox to enable the function. **Vacation mode** is activated according to the settings of the times and temperatures.
Sanitary hot water temp. drop during vacation mode	Domestic hot water temperature drop during the vacation mode. Min. setting: 1 °C.
Heating water temp. drop during vacation mode	Heating water temperature (heating) drop during the vacation mode. Min. setting: 1 °C.
Vacation start date	Start date of the vacation.
Vacation finish date	Finish date of the vacation.

14.9 User

The User menu is intended for both installers and users, but some parameter settings require installer level access. For those parameters the user can see the settings but is not allowed to change anything.



Permission level	Enter the service password to access the service / installer level. Installer code: 87654321
Heating / cooling ON/OFF schedule	Select the checkbox to enable the function. Enabled: Heating or cooling is done according to the set day and time (depending on the outdoor temperature). The rest of the time the heat pump will be in Antifreeze protection mode. Disabled: Normal operation **NOTE** This function has no influence on the DHW mode.
Language	Selection of language in the interface.
Date and time setting	Schedule for activation of heating / cooling. If the fields are green, heating / cooling is ON. If the fields are grey, heating / cooling is OFF. See section Section 11.3 "Setting the day and time for activation of a function",page 42.
Distribution system setting	Installer code protected setting, not available for end user. Selection of distribution system. W / HC (Sanitary Hot Water / heating + cooling) or WH / C (hot water + heating / cooling) See Section 14.9.1 "Distribution system settings", page 62.

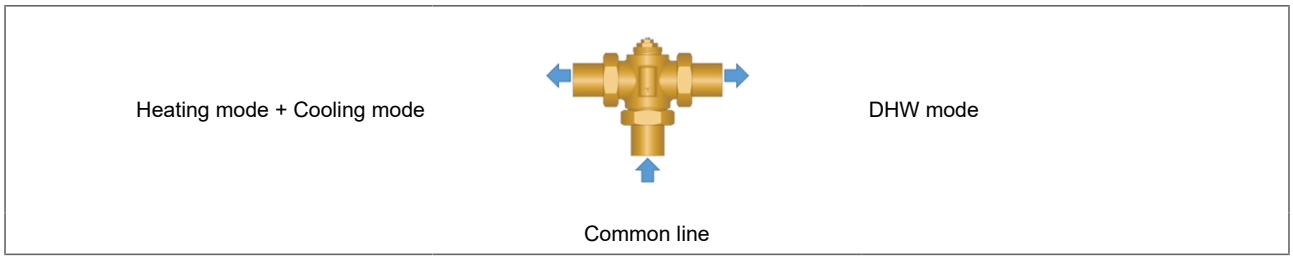
Save current settings	Installer code protected setting, not available for end user. Saves all the settings at the end of a start-up. The end user can recall the saved settings by selecting **Load saved settings**, which resets the system to the settings done during the start-up.
Load saved settings	Reset of the system to the installation settings stored during the last intervention by an authorized service person.
Switch to factory settings	Installer code protected setting, not available for end user. Reset of the system to the factory (default) settings.

14.9.1 Distribution system settings

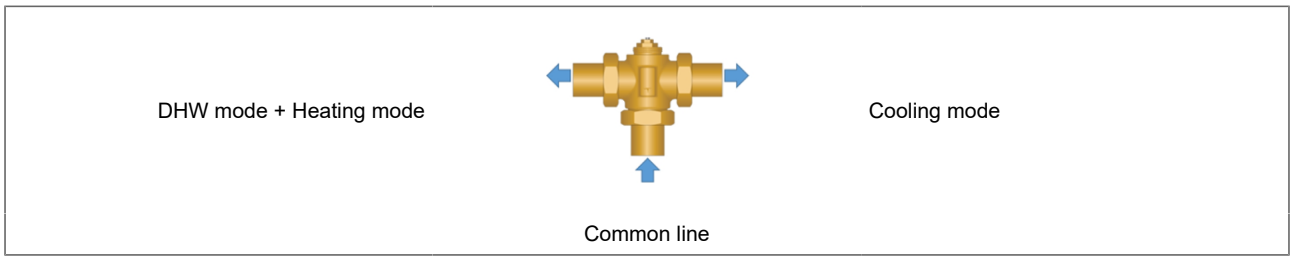
The **Distribution system setting** parameter is used to determine the working logic of the diverting valve, that is which way the water will flow in heating mode, cooling mode, and DHW mode.

There are two possible settings:

W / HC (sanitary hot water / heating + cooling)



WH / C (hot water + heating / cooling)



NOTE

TC will take the temperature reading of TW when set to W / HC (Sanitary Hot Water / Heating + Cooling)!

14.10 Working mode

Sanitary hot water	Select the checkbox to enable the function. Production of sanitary hot water (DHW) if demanded from the system.
Heating	Select the checkbox to enable the function Production of hot water for the heating system and control of the heating circuits if needed.
Cooling	Select the checkbox to enable the function. Production of cold water for the cooling system and control of the cooling circuits if needed.
Basic operation mode	Not available. **CAUTION** DO NOT ENABLE THIS FUNCTION! It may cause damage to the system and the unit if enabled!
Max duration for min compressor speed	Time limit for the minimum compressor speed (F1-F3). Settings: 5 to 180 minutes The min compressor speed kicks in when the actual heating water temperature exceeds the set temperature. This time limit may stop the compressor before the stop is triggered by the ΔT setting in Heating/cooling stops – water ΔT (setting for Zone).

Heating / cooling switch	Selection of switch function. – OFF: Manual switching only. – Outdoor temp.: Automatic switching between heating mode and cooling mode according to the average outdoor temperature. – External signal control: Automatic switching based exclusively on a signal received to contacts HS - COM (heating signal) and CS – COM (cooling signal). No consideration of the outdoor temperature.  **CAUTION** A potential free signal must be used. No voltage must be present!  **NOTE** If a heating signal is used during high outdoor temperatures (when heating is not needed), the heat pump will still run in heating mode. – External Signal Control + Outdoor Temp: Automatic switching based on a signal received to contacts HS - COM (heating signal) and CS – COM (cooling signal) along with the outdoor temperature.  **NOTE** This function does not influence the function of the DHW mode.
Outdoor temp. to start heating	Desired outdoor temperature for heating mode to start. Default setting: 18 °C. See Section 14.10.1 "Example (heating):", page 64.
Outdoor temp. to start cooling	Desired outdoor temperature for cooling mode to start. Default setting: 25 °C. See Section 14.10.1 "Example (cooling):", page 65.

14.10.1 Outdoor temp. to start heating or cooling

Example (heating):

The set temperature to start heating is 18 °C.

The heat pump will heat the facility depending on the set values (heating curve or constant space heating water temperature, depending on the settings), if the outdoor temperature drops below 18 °C.

When the outdoor temperature rises above 18 °C, the heat pump will automatically stop heating the facility.

It will resume heating when the outdoor temperature drops below 18 °C.

NOTE

To prevent too frequent switches between operation and non-operation, the control unit monitors the current temperature and temperature within a certain period and decides based on this whether heating should be activated or blocked.

Example (cooling):

The set temperature to start cooling is 25 °C.

Heat pump will cool the facility depending on the set values if the outdoor temperature rises above 25 °C.

When the outdoor temperature drops below 25 °C, the heat pump will automatically stop cooling.

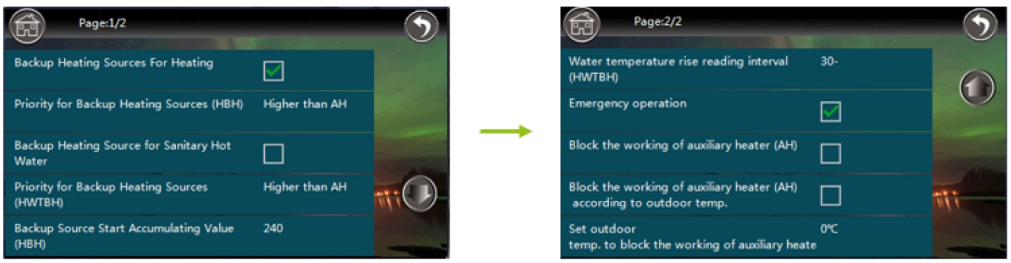
It will resume cooling when the outdoor temperature rises above 25 °C.

NOTE

To prevent too frequent switches between operation and non-operation, the control unit monitors the current temperature and temperature within a certain period and decides based on this whether heating should be activated or blocked.

14.11 Back-up

In the Back-up menu settings are done for the backup heating sources. By factory default, these heating sources are two-stage, which can be with a different heating source (electrical heaters, pellet burning furnace, oil burning furnace, etc.). In this case, the heat pump regulates the switching on/off of the furnace.



AH (Auxiliary Heater)	Back-up heating for both ambient heating and sanitary hot water (DHW).
HBH (Heating Backup Heater)	HBH (Heating Backup Heater) Back-up heating for ambient heating only.
HWTBH (Hot water backup heater)	Back-up heating for sanitary hot water (DHW) only.

NOTE

In some models, AH and HBH are integrated in the unit (electrical heaters), see the technical specification.

For installations with separate tanks for heating and hot water, keep in mind that AH is used for both and can therefore not be used in one of the tanks, but has to be placed before the diverting valve.

Backup heating sources for heating	Select the checkbox to enable the function. Enabled: The heat pump connects two additional backup heating sources in two stages (AH + HBH). Disabled: The heat pump uses only AH as a backup heating source.
Priority for backup heating sources (HBH)	Selection of relays to be connected in the first and second stage. **Lower than AH:** First stage AH (RK1) and second stage HBH (RK2) **Higher than AH:** First stage HBH (RK2) and second stage AH (RK1).
Backup heating source for sanitary hot water	Select the checkbox to enable the function. Enabled: The heat pump uses two additional backup heating sources in two stages (AH + HWTBH). Disabled: The heat pump uses only AH as a backup heating source.
Priority for backup heating sources (HWTBH)	Selection of relays to be connected in the first and second stage. **Lower than AH:** First step AH (RK1) and second step HWTBH (RK3). **Higher than AH:** First step HWTBH (RK3) and second step AH (RK1).
Heating source start accumulating value (HBH)	Setting for when the backup ambient heating should start, based on the thermodynamic properties in the system. Default setting: 200 Setting range: 0 to 600 See Section 14.11.1 "Heating source start accumulating value (HBH)", page 67.
Water temperature rise reading interval (HWTBH)	Time before the backup sanitary hot water heating should start. If the temperature in the DHW tank does not increase by at least 1 °C within the set number of minutes, the HWTBH back-up heater will be activated. Default setting: 30 minutes.
Emergency operation	Select the checkbox to enable the function. Enabled: If a fault prevents the compressor from starting, the heat pump will switch to **emergency operation** using backup heating sources. Disabled: If a fault prevents the compressor from starting, the heat pump will just stop working until the fault is cancelled, which leads to uncontrolled cooling of the house and the DHW. **NOTE** When **emergency operation** is active, all set values will drop automatically by 7 °C.
Block the working of auxiliary heater (AH)	Select the checkbox to enable the function. Enabled: Blocking of the AH heating function. Disabled: Normal operation of the AH backup heating source (according to settings).

Block the working of auxiliary heater (AH) according to outdoor temp	Select the checkbox to enable the function. Enabled: Blocking of the AH heating function according to the outdoor temperature set in parameter **Set outdoor temp. to block the working of auxiliary heater**. Disabled: Normal operation of the AH backup heating source (according to settings).
Set outdoor temp. to block the working of auxiliary heater	Outdoor temperature limit above which the AH heating function should be blocked.

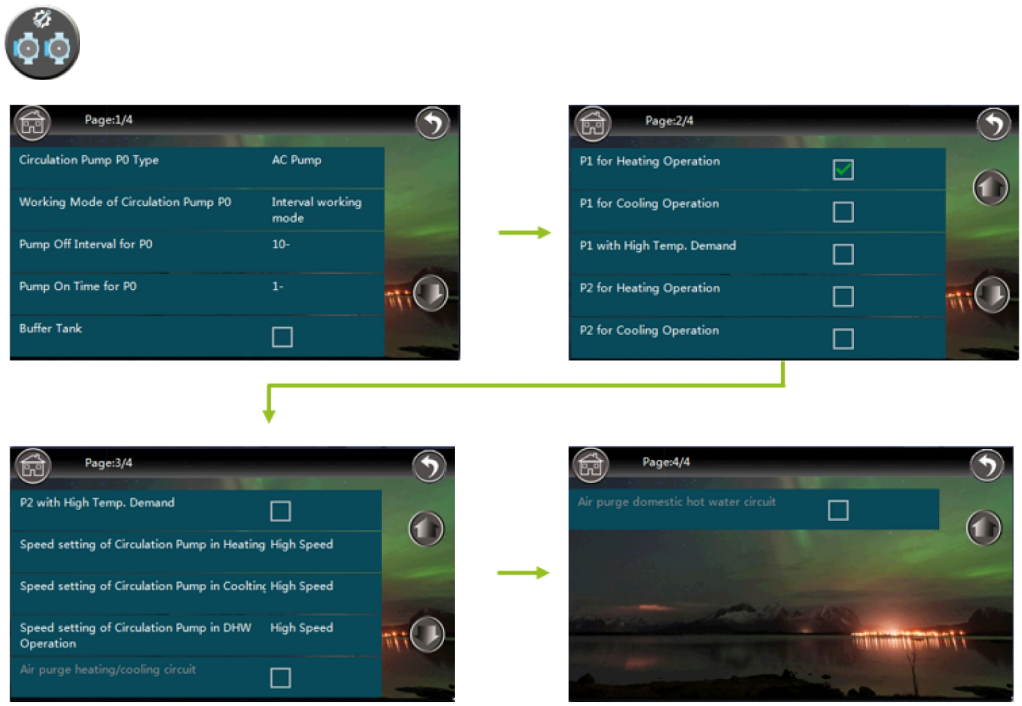
14.11.1 Heating source start accumulating value (HBH)

This parameter is based on a specially designed logic, which considers the $\Delta T_{(Tset - Tactual)}$ of the heating water as well as the temperature increase by time to determine whether backup heating is needed. If the set value is low, the backup heating will start sooner than if the value is high.

NOTE

At cold startup the backup heaters will switch on quickly because of the big difference between the set and the actual temperature ($\Delta T_{(Tset - Tactual)}$).

14.12 Water pump settings



The heat pump can control three circulation pumps.

P0: Integrated main circulation pump. Common for heating, cooling, and hot water.

P1: Heating / cooling circuit 1 – Zone 1 (after buffer tank)

P2: Heating / cooling circuit 2 – Zone 2 (after buffer tank)

Circulation pump P0 type	Control setting of the P0 circulation pump. **DC Variable speed pump:** PWM control – speed controlled **AC Pump:** ON/OFF control
Working Mode of Circulation Pump P0	Function of the **circulation pump P0**. **Interval working mode:** When the heat pump is not running (all the temperatures are achieved), P0 is running according to the parameters **Pump Off Interval for P0** and **Pump On time for P0**. **ON constantly:** P0 is constantly running when the unit is in heating mode. **OFF with compressor:** P0 is only running when the compressor is running.
Pump Off Interval for P0	Time during which the **circulation pump P0** should be switched OFF when in **Interval working mode**. Default setting: 10 minutes.
Pump On time for P0	Time during which the **circulation pump P0** should be switched ON when in **Interval working mode**. Default setting: 1 minute.
Buffer tank	Select the checkbox if a buffer tank is installed in the hydraulic system.
P1 for heating operation	Select the checkbox to enable the function. Enabled: P1 is used for heating circuit 1 – Zone 1 Disabled: P1 is not used for heating circuit 1 – Zone 1. During heating mode P1 will be OFF.
P1 for cooling operation	Select the checkbox to enable the function. Enabled: P1 is used for cooling circuit 1 – Zone 1 Disabled: P1 is not used for cooling circuit 1 – Zone 1. During cooling mode P1 will be OFF.
P1 with high temp. demand	Select the checkbox to enable the function. Enabled: P1 will work only with external signal to TH and COM. Disabled: Function not in use. Example: Enable if a room thermostat is used for the ZONE 1 heating system. The circulation pump P1 only functions when a signal from a room thermostat is present. The room thermostat is connected to COM and TH connectors with a **non-voltage contact**.
P2 for heating operation	Select the checkbox to enable the function. Enabled: P2 is used for heating circuit 2 – Zone 2 Disabled: P2 is not used for heating circuit 2 – Zone 2. During heating mode P2 will be OFF.

P2 for cooling operation	Select the checkbox to enable the function. Enabled: P2 is used for cooling circuit 2 – Zone 2 Disabled: P2 is not used for cooling circuit 2 – Zone 2. During cooling mode P2 will be OFF.
P2 with high temp. demand	Select the checkbox to enable the function Enabled: P2 will work only with external signal to TH and COM. Disabled: Function not in use. Example: Enable if a room thermostat is used for the Zone 2 heating system. The circulation pump P2 only functions when a signal from a room thermostat is present. The room thermostat is connected to COM and TH connectors with a **non-voltage contact**. **NOTE** Only one contact (COM and TH) is used for both pumps' high temp. demand settings. For this reason, use only one at a time.
Speed setting of circulation pump in heating	**High speed:** The **circulation pump P0** will run in high speed during heating operation. **Middle speed:The circulation pump P0** will run in middle speed during heating operation. **Low speed:The circulation pump P0** will run in low speed during heating operation. **NOTE** Applicable only if the type of P0 is set to DC variable speed pump (PWM control).
Speed setting of circulation pump in cooling	**High speed:** The **circulation pump P0** will run in high speed during cooling operation. **Middle speed:** The **circulation pump P0** will run in middle speed during cooling operation. **Low speed:** The **circulation pump P0** will run in low speed during cooling operation. **NOTE** Applicable only if the type of P0 is set to DC variable speed pump (PWM control).

Speed setting of circulation pump in DHW operation	**High speed:** The **circulation pump P0** will run in high speed during DHW operation. **Middle speed:** The **circulation pump P0** will run in middle speed during DHW operation. **Low speed:** The **circulation pump P0** will run in low speed during DHW operation. **NOTE** Applicable only if the type of P0 is set to DC variable speed pump (PWM control).
Air purge heating / cooling circuit	Function not available
Air purge domestic hot water circuit	Function not available

14.13 Floor curing

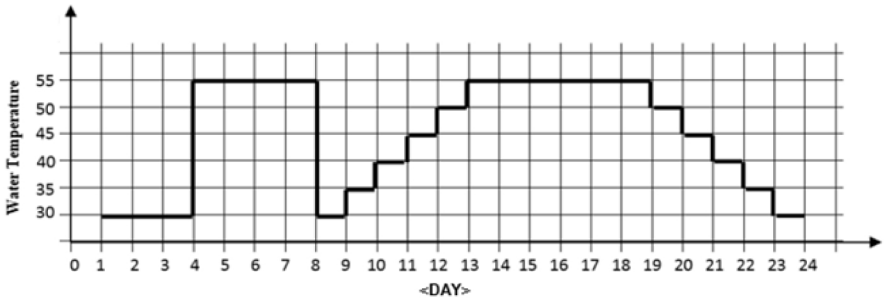
Floor curing is a function used for thermal treatment of screeds. There are two floor curing options.

Floor curing 1

Floor curing 1 is a fully automatic function which starts as soon as the function is activated. During the floor curing the DHW mode will be automatically disabled. The duration of the floor curing depends on the outdoor temperatures and moisture in the screed, but it will last for a minimum of 30 days.

There are two main cycles of the function, which is divided in 24 steps, see the graph below.

When the floor curing procedure is finished the heat pump returns to normal operation.

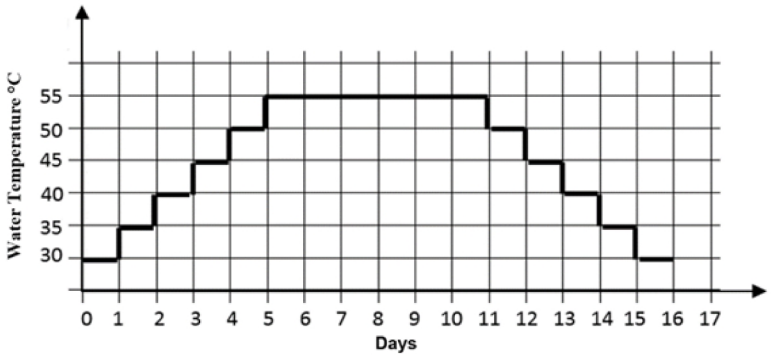


Floor curing 2

Floor curing 2 is a shorter floor curing function that basically consists of the second half of the Floor curing 1 function, but that also has some settings that can be used to adjust the curing procedure.

There will be a heating up of the water by 5 °C each day until the set temperature in the parameter ´Max. set temp. for floor curing 2´´ has been reached. This temperature is kept for the time set in the parameter **Max temp. running duration for floor curing 2 (h)**. When this time has elapsed, the water temperature will be lowered by 5 °C each day until the temperature at the starting point is reached.

When the floor curing procedure is finished the heat pump returns to normal operation.



14.13.1 Accessing floor curing settings

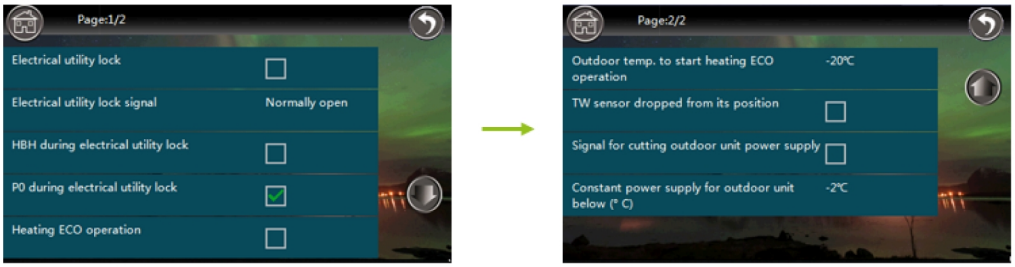
1. Tap the Floor curing icon on the Submenu 2 screen.
2. Tap **Floor curing** (default OFF).
3. Select one of the two options **Floor curing 1** or **Floor curing 2**, and tap **OK**.
4. If **Floor curing 2** was selected, continue with the specific time and temperature settings, see Floor curing settings.

When active, this function is indicated with the floor curing symbol in the top bar of the screen: .

Floor curing	Selection of floor curing function (default OFF)
Floor curing current stage	Shows the current stage of the floor curing function according to the diagrams in Floor curing function.
Floor curing current stage running duration	Shows the running time of the current floor curing stage counted from the point when the stage started, including the time for temperature increase/decrease (hours).
Floor curing current stage set temperature	Shows the set temperature of the correct working stage.
Floor curing current stage valid running duration	Shows the running time of the current floor curing stage counted from the point when the desired water temperature was obtained (hours).
Floor curing total running duration	Shows the total running time of the floor curing function.
Highest water temp. in floor curing operation	Shows the maximum water temperature reached during the floor curing operation.
Temp. to start floor curing 2	Setting of the temperature at which the Floor curing 2 operation should start. Example: If set to 30 °C the heat pump will first heat up the water to 30 °C, and then start the Floor curing 2 function accordingly.
Max. set temp. for floor curing 2	Setting of the maximum temperature for the Floor curing 2 function
Max temp. running duration for floor curing 2 (h)	Setting of the number of hours the heat pump will keep the max temperature for, before starting to decrease the temperature (5 °C each day).

14.14 Electric lock

When active, this function is indicated with the symbol in the top bar of the screen



Electrical Utility Lock, or EUL, is used in some countries where the industry has a particularly high demand on electrical power one or multiple times a day. The electricity distribution companies send a signal to the households that stops all high-power electrical consumption systems for a period of time. The heat pump belongs to this group, which means that it needs to stop during this time. If there is an alternative heating source that does not belong to the EUL group, it can be switched on automatically during this period.

A potential free contact is used and connected to the terminals ES and COM.

NOTE

For systems with enabled EUL a buffer is recommended, so that the heat stored in the buffer can be used for heating the house.

14.14.1 Heating ECO operation function

When active, this function is indicated with the symbol in the top bar of the screen.

The Heating ECO function (bivalent function) is used for switching to an additional heating source during the coldest days.

According to the temperature setting **Outdoor temp. to start heating ECO operation** an additional heating source (HBH) is switched ON for heating the building. The compressor is switched OFF during this time.

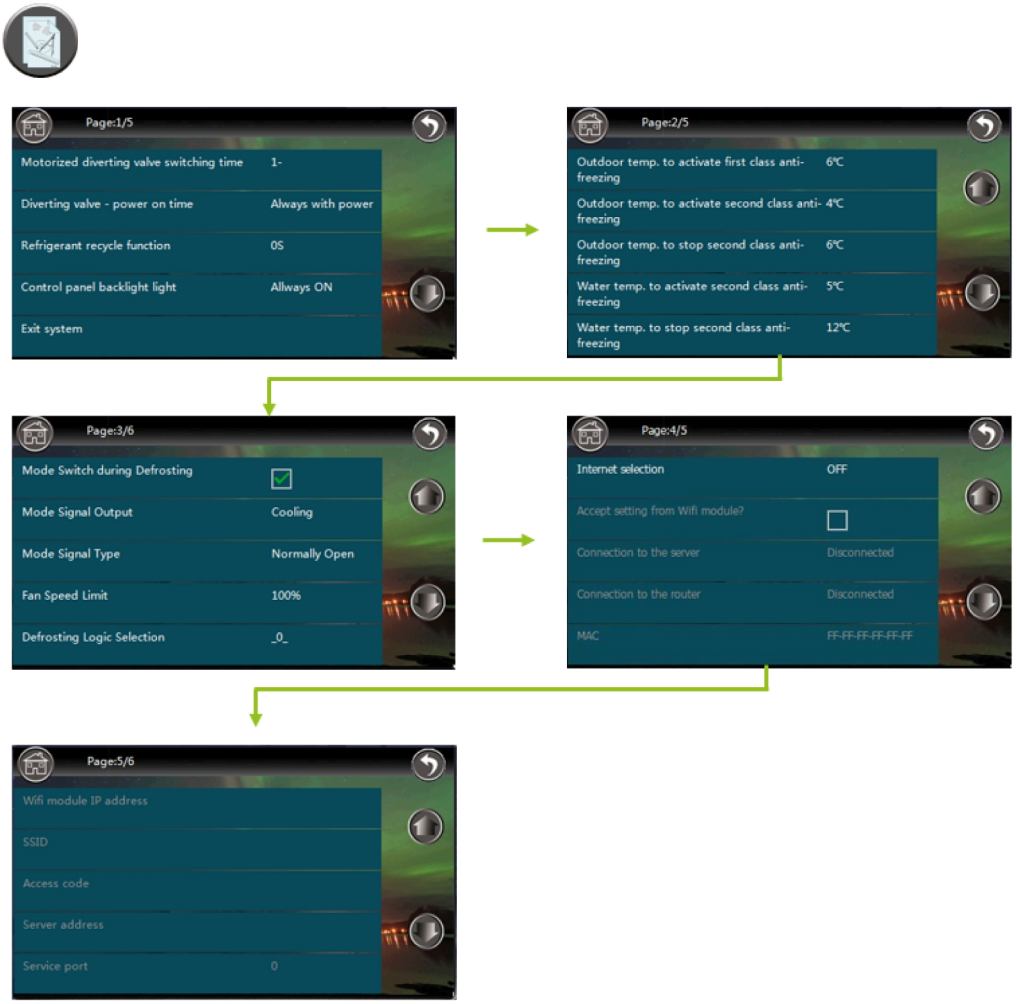
Example: The Heating ECO operation is enabled and the temperature to start the Heat ECO operation is set to -20 °C. A gas boiler is connected to the system as an additional heating source, controlled by HBH (RK2):

When the outdoor temperature falls below -20 °C the compressor will stop, and the heat pump will activate HBH (RK2) to switch on the gas boiler for heating the house. When the outdoor temperature rises again over -20 °C, the heat pump will stop the gas boiler and switch on the heat pump for heating.

NOTE

This function does not affect the heating of the sanitary water.

14.15 Other options



Motorized diverting valve switching time	Switching time of the diverting valve (minutes).
Diverting valve - power on time	Time setting that determines how long the diverting valve will have power in a particular mode. Setting range: 0 to 16 minutes (0 minutes = Always with power)
Refrigerant recycle function	Function used for pumping the refrigerant back to the outdoor unit. Tap to select and then confirm start of the pumping. A countdown starts for the function (600 seconds). When the time has elapsed, the function stops automatically. **CAUTION** When the refrigerant recycle function is active, all safety features are disabled. To stop this function, tap it again.

Control panel backlight light	Selection of the standby time for the backlight of the control panel display After the set minutes of inactivity, the display turns black. **Always on** **3 min** **5 min** **10 min** To turn on the display backlight again, tap the screen. **NOTE** It is not recommended to set this parameter to **Always on** as this will shorten the life of the display.
Exit system	Exit to the WinCE interface which is used for special service purposes. The WinCE interface can also be accessed from the main screen when the service **permission level** is active.
Outdoor temp. to activate first class anti-freezing	First class anti-freezing protection setting. If the outdoor temperature falls below the set value, the circulating pumps will start to operate, transferring heat to the outdoor unit. **NOTE** The anti-freeze protection is prioritized as long as the unit is powered on, which is recommended.
Outdoor temp. to activate second class anti-freezing	Second class anti-freezing protection setting. If outdoor temperature falls below the set value, the compressor and all additional backup heating sources will start to operate.
Outdoor temp. to Stop second class anti-freezing	Second class anti-freezing protection setting. If the outdoor temperature exceeds the set value, first and second-class anti-freeze protection will stop to operate.
Water temp. to activate second class anti-freezing	Second class anti-freezing protection setting. If the water temperature falls below the set value, the compressor and all additional backup heating sources will start to operate.
Water temp. to stop second class anti-freezing	Second class anti-freezing protection setting. If the water temperature exceeds the set value, first and second-class anti-freeze protection will stop to operate.
Mode switch during defrosting	Select the checkbox to enable the function. Enabled: The unit will switch working mode to the system that has a water temperature higher than 23 °C to make a safe defrosting. After defrosting is done, the unit will switch back to the required working mode. Switching mode during defrosting will only happen if there is not enough energy (temperature) in the current working mode. Disabled: The unit will start to defrost in the current working mode. If the water temperature is below 23 °C, the unit will stop with error if there is not enough energy for safe defrosting.

Mode signal output

Function that determines during which mode (heating or cooling) the Mode Signal (MS) contact will be active.

Cooling: When the unit goes to cooling mode, MS gives a signal according to the setting in **Mode Signal Type**.

Heating: When the unit goes to heating mode, MS gives a signal according to the setting in **Mode Signal Type**.

Mode signal type

Selection of signal handling for the Mode signal output.

Normally open: When the Mode signal output is activated, 230 V will be present on the MS contact. When the Mode signal output is deactivated, no voltage will be present on the MS contact.

Normally closed: When the Mode signal output is activated, no voltage will be present on the MS contact. When the Mode signal output is deactivated, 230 V will be present on the MS contact.

Fan speed limit

Maximum allowed fan speed in the outdoor unit, expressed in % of the maximum speed capacity of the fan.

90%

95%

100% (default)

NOTE

We do not recommend changing this value because it can lower COP and heating capacity, and it may cause improper defrosting.

Defrosting logic selection

Selection of defrosting logic:

0: Smart (default)

1: Fixed interval (45 minutes)

2: Test

NOTE

This function should only be used on the advice of ES technical support. Changed defrosting logic can damage the unit and affect the warranty!

Internet selection

Tap to select one of the alternatives:

OFF: Unit not connected to the internet for remote access.

Cable internet: Unit connected to the internet via LAN cable connected on the back of the controller.

Wi-Fi module: Unit connected to the internet via Wi-Fi module. Only applicable for some models.

Allow remote settings

Enabled: Remote control of the unit

Disabled: No remote control of the unit, only read data option

Connection to the server

Connected: The heat pump is connected to the ES Web server.

Disconnected: The heat pump is not connected to the ES Web server.

Connection to the router

Connected: The heat pump is connected to internet.

Disconnected: The heat pump is not connected to internet.

MAC	The MAC address is the identity of the unit. If the address is 00-00-00-00-00-00, check the LAN cable connection or the connection from the unit to the Wi-Fi module. **NOTE** The MAC address is different if connected via LAN cable or Wi-Fi module.
Module IP address	The IP address of the house router internet connection.
SSID	Name of the house router internet connection server to which is connected.
Password	SSID password (only if connected via the Wi-Fi module. Password is shown only with the **service permission** level enabled.
Server address	Server address must be www.myheatpump.com. **NOTE** If a Wi-Fi module is used, this setting must be done manually on the Wi-Fi module during installation.
Service port	Service port must be 18899. **NOTE** If a Wi-Fi module is used, this setting must be done manually on the Wi-Fi module during installation.

14.16 Real time data

Software version No.	Shows the software number of the controller – Touch display.
Database version	Shows the database version.
Heat exchanger water outlet temp. indoor – Tuo	Outlet water temperature on the plate heat exchanger.
Heat exchanger water return temp. indoor – Tui	Inlet water temperature on the plate heat exchanger.
Indoor coil temp. – Tup	Liquid line temperature.
Sanitary hot water temp. – TW	DHW temperature.
Cooling/heating water temp. TC	Heating / cooling water temperature.
Water flow rate	Running speed of the P0 circulation pump. Not actual flow rate!
Compressor working speed	Running speed of the compressor.
EEV opening	Electronic expansion valve opening (in steps)
Average outdoor temp. in 1 hour	Average outdoor temp. in 1 hour
Average outdoor temp. in 4 hours	Average outdoor temp. in 4 hours
Average outdoor temp. in 24 hours	Average outdoor temp. in 24 hours
High pressure – Pd	High pressure detected by the high-pressure sensor.
Low pressure – Ps	Low pressure detected by the low-pressure sensor.

Discharge temp. – Td	Hot gas temperature of the compressor.
Suction temp. – Ts	Suction temperature of the compressor.
Outdoor coil temp. Tp	Evaporator temperature.
Heat pump accumulated operation time	Heat pump accumulated operation time.
Preserved	Preserved
Fan speed 1	Fan 1 running speed.
Fan speed 2	Fan 2 running speed.
Outdoor unit working current	Outdoor unit current (in Amp)
Voltage	Voltage measured on the outdoor unit.
Eeprom version No.	Eeprom version number.

14.17 Info page

14.17.1 Accessing the info page

1

Tap 

.

2

Tap 

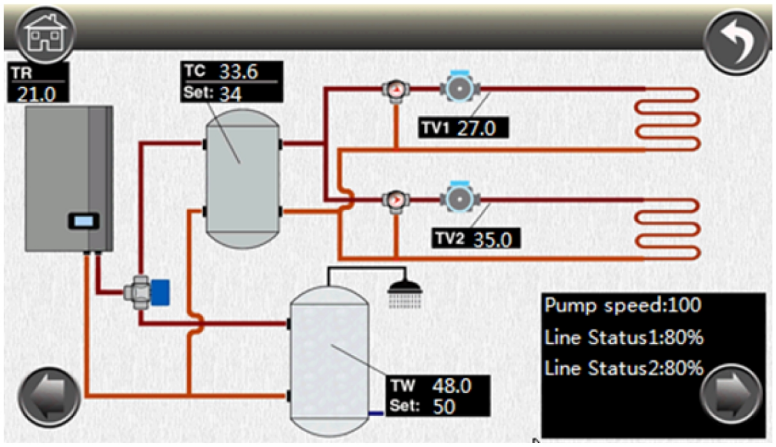
.

3

Use the right and left arrows ( and ) to go between hydraulic scheme, refrigerant scheme, and list of error codes screens.

14.17.2 Hydraulic scheme settings

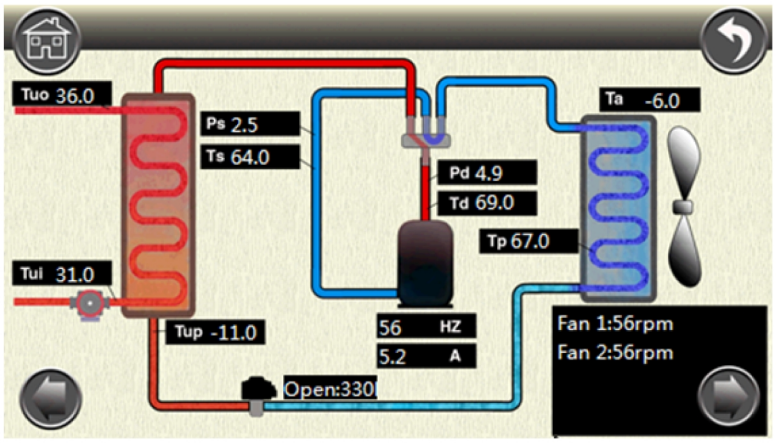
When entering the info page, the hydraulic scheme is displayed with temperature readings from all the sensors.



TC	Heating / Cooling (direct circuit or Buffer Tank)
TW	DHW Temperature
TV1	Mixing Circuit 1
TV2	Mixing Circuit 2
TR	Room Temperature
Line status 1	Communication – Touch Screen controller to the Indoor PCB 90–100% = normal communication
Line status 2	Communication – Touch Screen controller to the Outdoor PCB 90–100% = normal communication
Pump speed	100 = Pump P0 Activated 0 = Pump P0 Deactivated

14.17.3 Refrigerant scheme settings

To view the refrigerant scheme, tap the right arrow  .



Ta	Outdoor Temperature Sensor
Tui	Condenser Inlet Temperature Sensor

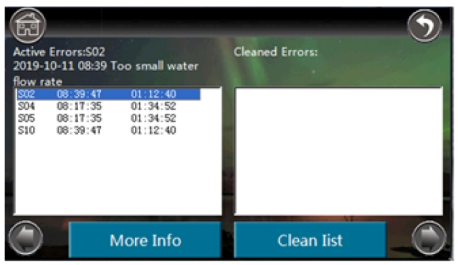
Tuo	Condenser Outlet Temperature Sensor
Tup	Liquid Refrigerant Temperature Sensor
Ts	Suction Temperature (Compressor) Sensor
Td	Discharge Temperature (Compressor) Sensor – Hot Gas Temperature
Tp	Evaporation Temperature Sensor
Ps	Low pressure – Suction pressure
Pd	High pressure – Discharge pressure
Fan 1, 2	Fan speed for Fan 1 and Fan 2

14.18 Error codes

If some faults happen and some errors appear, it is not always because of the heat pump itself. Most errors occur due to the hydraulics system and especially in the first heating season (water pressure falls, air in the system, dirt in the piping, etc.).

On the main screen an error is indicated in the upper bar with a symbol for warning or alarm , and a description of the error is displayed in red at the bottom of the screen.

The error codes can also be found in the error code menu.



14.19 Accessing the error code menu

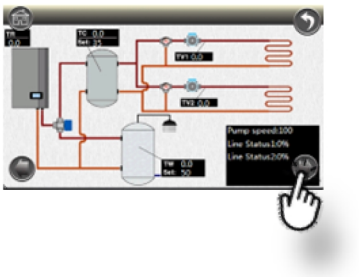
1 On the main screen, tap .

2

Tap  to go to the **Info Page**.

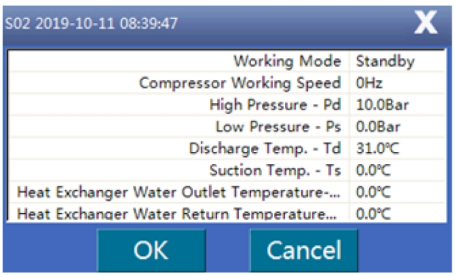
3

Tap the right arrow icon  in the lower right corner until a list of active and historic errors opens.



4 To view detailed information about the error, tap to select the error code, then tap **More info**.

Additional info is displayed regarding the status of the heat pump at the time when the error happened.

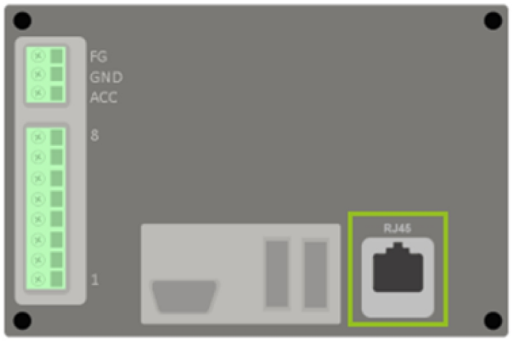


See also Section 19 "Appendix A: Error codes", page 88.

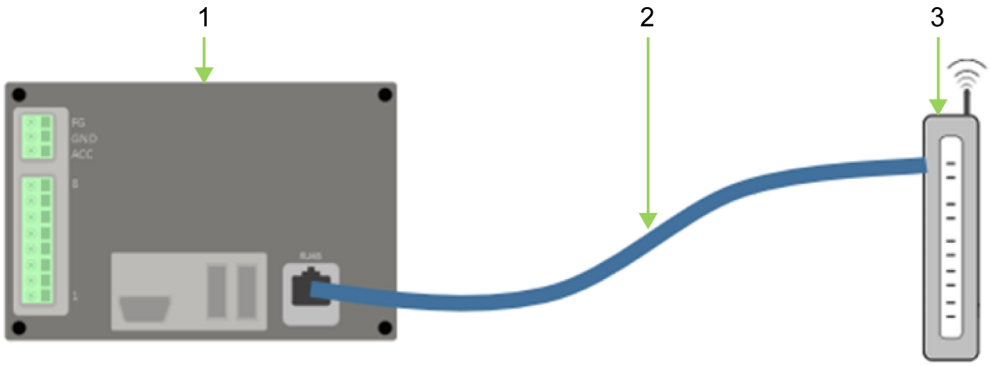
15 Internet connection

All units come equipped with an internet connection. This will provide a 24/7 monitoring and control of the heat pump.

The unit is connected to the internet via a LAN cable (RJ45) on the back of the controller.



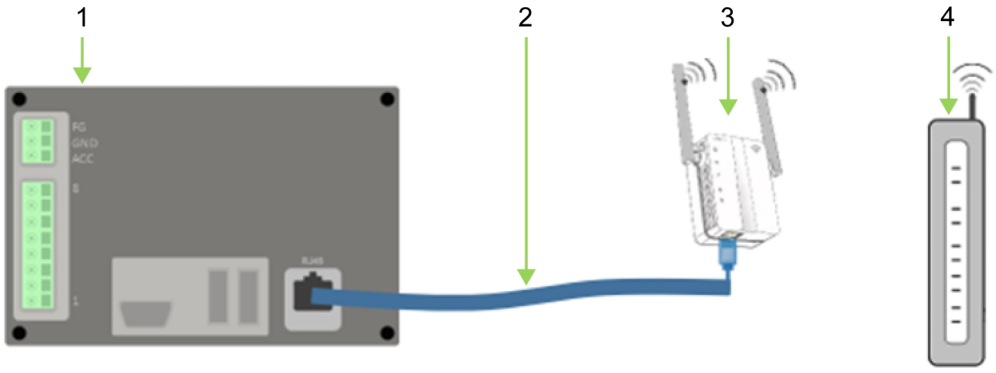
15.1 Connection directly to house router



1 Heat pump controller
2 LAN cable
3 Router

15.2 Connection with a wireless network

The heat pump can also be connected via an additional Wi-Fi repeater which is freely available on the market. For the connection to be possible the Wi-Fi repeater requires an RJ45 port.



1 Heat pump controller
2 LAN cable
3 Wi-Fi repeater (not supplied by Energy Save)
4 Router

15.3 Verifying connection to router

On the heat pump controller:

1 Go to **Other option** and scroll to page 4 using the down arrow to the right.

2 Check the status for the connection at **Connection to the router**:

- Connected – The heat pump is connected to the router.
- Disconnected – There is no connection to the router.

3 To make a new connection attempt:

3.1 Turn the power supply off for the heat pump.

3.2 Wait for two minutes.

3.3 Turn the power supply back on.

3.4 Check if the connection is established.

15.4 Adding the heat pump to the Energy Save server

1 Log in to http://www.myheatpump.com with your installer access data.

NOTE

If you do not have the access data (username and password), contact your Energy Save heat pump dealer.

16 Commissioning and testing

Before leaving the installation site, perform the following actions.

1 Ensure that all system components are fully functional and that all required features are working as intended.

2 Check that pressures and temperatures are within stated limits and perform a leakage test to identify any possible weak points in the hydraulic system.

3 Clean the site from excess material and debris caused by the installation work.

4 Inform the end user about functions and settings available to the user, and about general care and handling of the equipment.

17 Service and maintenance

17.1 Requirements on service area and personnel

Service personnel and all other people at the service site must be aware and familiar about the character of the maintenance to be carried out. Only trained and approved technicians are authorized to perform commissioning of the heat pump. This ensures that the technicians have the necessary knowledge, skills, and experience to complete the job correctly and in accordance with safety regulations and specifications of Energy Save.

Make sure the service area is not enclosed and provide good ventilation (opening doors and windows). The service area must be properly isolated. Ensure the safety of the working conditions in the service area by controlling any combustible materials.

17.2 Inspections

The following inspections should be done in accordance with the precautions indicated.

Monitoring status of refrigerant	Before or during the service operation, a monitoring device is required to keep track of the refrigerant status for service staff to be warned about any existing combustible gas.
Availability of fire extinguishers	When hot-working treatments are needed for the heat pump system or its related components, ensure that a fire extinguisher is placed nearby. The proper fire extinguisher should be of dry powder or carbon dioxide type.
Prohibition of fire	Conduct safety inspections at the service area to ensure that there is no flames and potential ignition sources (including smoke) and keep strict control in isolating combustible materials.
Inspection of equipment	If electrical components are to be replaced, they should be installed in accordance with the intended use and correct operating regulations.
Inspection of electrical elements	The service on electrical components should include a general security check and inspection of electrical elements. If a defect that could threaten personal safety is found, immediately power off the appliance until the defect is properly solved. If the defect cannot be completely eliminated while it is necessary to continue the operation, appropriate temporary solutions should be well adopted. Please report the situation to the owner of the equipment and warn all relevant personnel.
Test run of heat pump	Turn on the heat pump and verify that it is working properly. Make sure that the temperatures increase as expected. Check for any unusual noises. Test the heat pump in all operation modes.
Auditory inspection	Check that there are no strange noises in the system, if there are, find the source of the noise and address the issue.
Inspection of sensors	Test the temperature sensors readings. Use a reference thermometer to check the values shown on the screen and the thermometer. If the readings are differing much, check if the heat pump temperature sensors are correctly positioned and have good contact.

Inspection of pump	Check the water pump. Listen for the pump! With the system on, there should be a consistent hum or whirring sound. Feeling the pipes near the pump for vibration can also confirm operation. Visually check for leaks around the pump connections.
Leak inspection	Perform a leak test of the system.
Inspection of cables	Check the status of cables, including factory terminations, and verify if any defects have occurred due to abrasion, corrosion, overpressure, vibration, cutting by sharp edges, or other reasons. This inspection should also consider the effects of cable aging and the continuous vibration of compressor and fans. Also verify that all cable connectors are securely fastened.
Inspection of flammable refrigerants	An inspection of refrigerant leakage should be carried out in the service area, without the presence of fire or any other potential ignition sources. The inspection should not be done using detectors that work with ignition, such as a halogen probe. If a leak is suspected, the service area must be cleared from flammable material and all flames must be extinguished. If soldering is required at the leakage point, it is a must to recover all refrigerant or isolate it away from the leakage point (by a service valve). Before or in the process of soldering, oxygen-free nitrogen (OFN) should be used in order to purify the system.
Service procedures on the refrigeration system	The refrigeration circuit should be operated according to the proper procedures. The flammability of the refrigerant should also be considered. Follow the procedures below. – Remove refrigerant. – Purify the pipeline with inert gas. – Vacuum the refrigerant system. – Purify the pipeline with inert gas again. – Cut pipeline or weld it as required.
Refrigerant charging	As a supplement to regular procedures of refrigerant charging, the following is required: – Ensure that there is no mutual contamination between different refrigerants during refrigerant charging. The pipeline to fill system with refrigerant should be as short as possible in order to eliminate any residual amount of refrigerant. – Ensure that the refrigeration system has been well grounded before charging. – Label the system when the charging is finished (or not yet completed). – Overfilling is prohibited. **CAUTION** Make sure that the charging of refrigerant is done with the correct amount based on the information stated on the unit label.

Emergency treatment	An emergency plan should be prepared for the service site, and daily preventive measures should be carried out. For example, fire is forbidden at the service site, and it is prohibited to wear clothing or shoes which can generate static or sparks. Suggested disposal in case of serious leakage of flammable refrigerant: – Switch on the ventilation equipment and disconnect the power supply of other devices. – Immediately evacuate people from the site. – Notify and evacuate people nearby and stay away by at least 20 metres from the site. Inform the authorities and set up a warning zone, forbidding people and vehicles from approaching. – The on-site treatment should be carried out by professional firefighters with anti-static clothing. – Cut off the leakage source. – Use nitrogen to purge and eliminate flammable refrigerant and residual gas at the leakage point and its surroundings, especially in low-lying areas. Detect and verify the elimination work using an appropriate detector, until the concentration of flammable refrigerant is zero. Only after that, the alarm can be cleared.
Storage requirements for R32 refrigerant	– The refrigerant storage tank should be placed separately in an environment with ambient temperature of -10 °C to +50 °C and good ventilation. Warning labels should be placed in the area or on the tanks. – Service tools that are in contact with the refrigerant should be stored and used separately. – Service tools designed for different refrigerants should not be mixed in usage or storage.
Dismounting of equipment	Before dismounting, check and ensure safety at the service area and keep good ventilation (open doors and windows). Ignition sources are prohibited at the place where the equipment is to be dismounted, and combustible materials should be isolated. For split type equipment, recover the refrigerant in the equipment before dismounting. Try to move the refrigerant pipes along with the indoor unit. If the refrigerant pipes are too long, cut them from a position outside the house for easier removal. When the pipes are going to be used again, connect them with additional extension pipes by soldering. During transportation, loading and unloading, be careful not to damage the equipment, making sure that it is properly secured and protected from shock. It is forbidden to store the unit in a confined space or a space with ignition sources.

17.3 Maintenance intervals

We recommend performing maintenance as specified below. However, applicable legislation might require shorter maintenance intervals.

Legend	
IN	Indoor unit / distribution system
OUT	Outdoor unit
IN + OUT	Indoor and outdoor unit
IN / OUT	Indoor or outdoor unit, depending on the heat pump type
SYSTEM	External installation (not included in the heat pump)
*	Or / and according to the local regulations

Some of the following specified procedures might apply to some models only.

NOTE

Make sure to follow all local regulations and specifications when performing maintenance work on the heat pump and connected equipment and systems.

17.4 Maintenance checklist hydraulic system

Hydraulic system	Applies to:	Annual	Every 2 years	Every 4 years
Check for any visible damages on the hydraulic / piping system.	IN + OUT	x		
Check for any signs of hydraulic fluid leaks.	IN / OUT	x		
Check the hydraulic system pressure (should be 1,2–1,5 bar).	IN	x		
Clean the dirt and magnetic filter of the hydraulic system.	IN	x		
* Check water quality in the system PH value.	IN + OUT		x	
Check pressure of all expansion vessels.	IN		x	
Check safety valves.	IN / OUT		x	
Clean the plate heat exchanger.	IN / OUT			x
Check the automatic purging valves.	IN / OUT		x	

17.5 Maintenance checklist electrical system

Hydraulic system	Applies to:	Annual	Every 2 years	Every 4 years
Visually inspect that all cables and connections are without visible damage.	IN + OUT		x	
Check that all electrical connections are tight.	IN + OUT		x	
Check power supply correct voltage.	IN + OUT		x	
Check the correct working of the RCD protection according to the RCD manufacturer.	SYSTEM		x	

17.6 Maintenance checklist refrigerant system

Hydraulic system	Applies to:	Annual	Every 2 years	Every 4 years
Visually inspect all connections for any damage.	OUT		x	
* Perform a leak detection check.	OUT		x	
Clean the heat exchanger (Evaporator) with clean water. Don't use high pressure water.	OUT		x	

17.7 Other maintenance checks

Hydraulic system	Applies to:	Annual	Every 2 years	Every 4 years
Check for strange / unregular sounds while system is working.	IN + OUT	x		
Check positioning of temperature sensors.	IN		x	
Check the anode rod and exchange if needed. (Systems with R32 refrigerant only) **NOTE** Only applies for units with enameled DHW tank. If system with Stainless steel 316 or Duplex tank, no actions required.	IN		x	

18 Document history

Version	Release date	Version information
current	November 21, 2024	First release

19 Appendix A: Error codes

19.1 Heat pump error list

Code	Name	Heat pump status	Possible reasons and solutions
P01	Main line current protection	Compressor stops	Input current is too high or too low or the system works in over-load condition. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happens 3 times in a certain period of time, unit stops until repowered. Check unit input current. Check if the fan motor and circulation pump is working OK; Check if condenser is blocked; Check if the water temperature is too high and if the water temperature difference between inlet and outlet is too big (should not be bigger than 8 °C)
P02	Compressor phase current protection	Compressor stops	Compressor input current is too high or too low or the system works in over-load condition. Check compressor input current. Check if the fan motor and circulation pump are working OK; Check if the condenser is blocked; Check if the water temperature is too high and if the water temperature difference between inlet and outlet is too big (should not be bigger than 8 °C)
P03	IPM module protection	Compressor stops	Compressor drive failure. Check whether cable is broken or loosen. Check whether compressor driver PCB or compressor is broken.
P04	Compressor oil return protection	Compressor speed up	If unit has been continuously working in low speed for certain period of time, unit starts this protection to suck compressor oil back into compressor. This is a normal protection and doesn't need any treatment.

Code	Name	Heat pump status	Possible reasons and solutions
P05	Compressor shut down due to high/low pressure switch open caused by abnormal high/low pressure	Compressor stops	If system pressure is too high or too low, it activates this protection. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happens 3 times in a certain period of time, unit stops until repowered. Check if the fan motor and circulation pump are working OK; Check if the condenser is blocked; Check if the water temperature is too high and if the water temperature difference between inlet and outlet is too big (should not be bigger than 8 °C).
P06	Compressor speed down due to abnormal high pressure detected by condensing pressure sensor	Compressor speed down	This protection happens when system pressure is higher than the set compressor speed-down pressure point. If the pressure is still higher than the protection point after slowing down the compressor speed, compressor stops. Check if the water temperature set value is too high; Check if the system water flow rate is too small; Check if EEV works normally; Check if air circulates fluently in cooling mode; Check if temperature difference between water inlet and outlet is too big (should not be bigger than 8 °C).
P07	Compressor preheating	Standard function, doesn't need any treatment.	This is a normal protection and doesn't need any treatment. When compressor did not work for long time and outdoor temperature is low, compressor crankcase heater work for certain period of time before compressor start to warm up the compressor.
P08	Compressor discharge temp. too high protection	Compressor stops	Check if the water temperature set value is too high, especially when outdoor temperature is low; Check if the water flow rate too small; Check if the system is lacking enough refrigerant.
P09	Outdoor evaporator coil temp. sensor protection	Compressor stops	Check if air circulates fluently in outdoor unit.
P10	AC over high/low voltage protection	Compressor stops	Unit input voltage too high or too low. Check the voltage of unit power supply.
P11	Compressor shut down due to too high/low outdoor temperature	Compressor stops	Outdoor temperature is too high or too low for unit to work.
P12	Compressor speed limited due to too high/low ambient temperature	Compressor speed down	Normal operation - no error

Code	Name	Heat pump status	Possible reasons and solutions
P14	Compressor speed limited due to low condensing pressure	Compressor speed down	Not enough refrigerant in the system, low inlet water temperature, Air flow on the evaporator restricted, EEV not working properly, broken cable to the EEV.
F01	Outdoor ambient temp. sensor failure - Ta	Compressor stops	Check if outdoor temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F02	Outdoor evaporator coil temp. sensor failure - Tp	Compressor stops	Check if outdoor coil temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F03	Compressor discharge temp. sensor failure - Td	Compressor stops	Check if compressor discharge temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F04	Outdoor Suction temp. sensor failure - Ts	Compressor stops	Check if outdoor suction temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F05	Evaporating pressure sensor failure - Ps	Compressor stops	Check the refrigerant charge. This failure can indicate a refrigerant leakage. Please note that if the pressures seem normal in standby mode, there can still be a high percentage of the refrigerant missing. Check if evaporating pressure sensor is open, short-circuited or broken. Replace it if necessary.
F06	Condensing pressure sensor failure - Pd	Compressor stops	Check if condensing pressure sensor is open, short-circuited or broken. Replace it if necessary.
F07	High/low pressure switch failure	Compressor stops	If pressure switch is in open position when unit is in standby state or 2 minutes after compressor stops, unit gives this failure. Check if high or low-pressure switch is broken or not well connected.
F09	DC fan failure (A)	Compressor speed down	Speed of DC fan (or one of the DC fans for dual fan system) can't reach the required value or no feedback signal. Please check whether the PCB or fan motor is broken.
F10	DC fan failure (B)	Compressor stops	Speed of both DC fans (for dual fan system) can't reach the required value or no feedback signal. Please check if the PCB or fan motor is broken.

Code	Name	Heat pump status	Possible reasons and solutions
F11	System evaporating pressure too low	Compressor stops	If system too low-pressure protection detected by evaporating pressure sensor happened 3 times in a certain period, it gives this failure code and unit can't be restarted until repowered. Check if the system has enough refrigerant or if there is a leakage inside (more likely it is not enough refrigerant that caused this abnormal evaporating pressure); Check if the fan motor and circulation pump are working OK; Check if condenser is blocked; Check if EEV works normally; Check if the water temperature is too low and if the water temperature difference between inlet and outlet is too big in cooling (should not be bigger than 8 °C).
F12	System condensing pressure too high	Compressor stops	If system too high-pressure protection detected by condensing pressure sensor happened 3 times in a certain period of time, it gives this failure code and unit can't be restarted until repowered. Check if the water flow rate is not enough (more likely it is not enough water flow rate that caused system build up too high pressure); Check if the fan motor and circulation pump is working OK; Check if the condenser is blocked; Check if EEV works normally; Check if the water temperature is too high and if the water temperature difference is too big between inlet and outlet (should not be bigger than 8 °C).
E01	Communication between operation panel and indoor PCB or outdoor PCB failure	Compressor stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check if the last three switches on outdoor power PCB are set to 001; Check the last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.
E02	Outdoor power PCB and driver PCB communication failure	Compressor stops	Check the communication cable between outdoor power PCB and driver PCB. Check if the outdoor power PCB and driver PCB is broken.

Code	Name	Heat pump status	Possible reasons and solutions
E03	Compressor phase current failure	Compressor stops	Check if the power cable to the compressor is broken or short-circuited.
E04	Compressor phase current overload (over current)	Compressor stops	Check if the power cable to compressor is broken or short-circuited.
E05	Compressor driver failure	Compressor stops	Check if the compressor drive PCB is broken, or the cable to compressor is connected wrong.
E06	Module VDC over high/low voltage failure	Compressor stops	Input voltage too high or too low.
E07	AC current failure	Compressor stops	Check the current to outdoor unit and compare it with the unit current shown on the operation panel. If the difference is not big, check if the system has enough refrigerant (more likely it is not enough refrigerant that caused this abnormal low current). If the difference is big, outdoor power PCB is broken. Please replace it with a new one;
E08	EEPROM failure	Compressor stops	Cut the unit power and short-circuit JP404 port on outdoor power PCB, repower the unit, cut power again and cancel the short-circuit on JP404 port. If still not OK, replace the outdoor power PCB.
E10	Communication error	Unit stops	Check if the communication wires are loosened or not connected.
E11	Clock error	Unit stops	Change with new controller
E12	Ext. memory error	Unit stops	Change with new controller
E13	High pressure protection	Unit stops	Too much refrigerant. Reclaim and vacuum and inject the correct amount. There is air inside the refrigerant system. Vacuum again and inject refrigerant again. Too low water flow. Check the water system and circulating pumps, increase water flow. Condenser is dirty and is blocked inside. Wash it. EEV does not work. Check its wiring and if its coil is OK or not.
E14	Low pressure protection	Unit stops	Filter in the refrigerant system is blocked, change a new one to clean the inside refrigerant system. EEV does not work. Check its wiring and if its coil is OK or not. EEV inside is blocking. Change the EEV and clean the refrigerant system. Refrigerant leakage. Check and find the leakage point and fix it. Vacuum and inject new refrigerant.

Code	Name	Heat pump status	Possible reasons and solutions
E15	Power plus offline	Unit stops	Communication between CPP controller and driver is OFF. Check if the wiring is loosened or not.
E16	Power plus generic AL	Unit stops	Check if the 3-phase power for outdoor unit is OK or not. If it is OK, the Power plus driver is defective, replace the Power plus driver.
E17	EVO sensor error	Unit stops	Sensor wires are off or defective. Check if the wires are loose or if the sensor body resistance is OK or not. If the resistance is not OK, replace the sensor.
E18	Low superheat EVO	Unit stops	Too much refrigerant. Reclaim and vacuum and inject the correct amount. Refrigerant system leakage, not enough refrigerant. Check and fix the leakage, vacuum, and inject again. Bad ventilation condition for outdoor unit fans. Check if there is an obstacle at the fan system. Not enough evaporating area after the evaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly.
E19	Low evap. temp. EVO	Unit stops	Not enough evaporating area after the evaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly. Refrigerant system leakage, not enough refrigerant. Check and fix the leakage, vacuum, and inject again. Filter of the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system.

Code	Name	Heat pump status	Possible reasons and solutions
E20	High evap. temp. EVO	Unit stops	Bad ventilation condition for outdoor unit fans. Check if there is an obstacle at the fan system. Not enough water flow leads to low heat exchange in condenser. Check the water system and discharge inside air, make sure pumps 1 and 2 are powerful enough to run the water system. Sensor is defective or bad connection. If it is connected correctly, check its wiring if the wiring is OK, replace the sensor. The suction temp. sensor is loosened. Plug it back to its position and make sure the heat preservation is good. Refrigerant leakage. Find and fix the leakage, vacuum, and inject refrigerant again. Sensors of main EEV and EVI EEV mix each other. Check both sensors according to wiring scheme.
E21	Low suction temp. EVO	Unit stops	Too much refrigerant. Reclaim and vacuum and inject the correct amount. Filter if the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system. Bad ventilation condition for outdoor unit fans. Check if there is an obstacle at the fan system. Not enough evaporating area after the evaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly.
E22	Comp. start failure	Unit stops	Hardware failure, compressor or driver has a problem. Change the compressor or change the driver.
E23	Envelop error	Unit stops	Compressor envelope out of range.
E24	Low press. differential error	Unit stops	Pressure difference to low during start.
E25	High discharge temp.	Unit stops	There is air inside the refrigerant system. Vacuum again and inject new refrigerant. Not enough water flow leads to low heat exchange in condenser. Check the water system and Discharge inside air, make sure pump 1 and 2 are powerful enough to run the water system. Plate heat exchanger condenser is dirty and blocking at water side. Wash it. Filter if the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system. Refrigerant leakage.

Code	Name	Heat pump status	Possible reasons and solutions
E26	Amb. temp. probe fault (B1)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E27	Outdoor unit alarm: Evap. coil temp. probe fault (B2)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E28	Outdoor unit alarm suction temp. probe fault	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E29	Outdoor unit alarm comp. discharge probe	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E30	B5 temp. prob fault	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E31	Outdoor unit alarm suction pressure sensor	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E32	Outdoor unit alarm: Discharge pressure sensor fault (B7)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E33	Outdoor unit alarm: Defrost time too long	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E34	Outdoor unit alarm: Gas Pressure differ. too high at Comp. Start	Unit stops	Only displayed on outdoor software interface. This alarm normally would happen after the unit stops and before re-start.
E35	Outdoor unit alarm: EVI Sunction temp. probe fault (B8)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.
E36	Outdoor unit alarm: EVI sunction pressure probe fault (B11)	Unit stops	Sensor wiring is loosened, or sensor is defective. Check the wiring, if wiring is OK, check the sensors resistance. If resistance is not OK, replace the sensor.

Code	Name	Heat pump status	Possible reasons and solutions
E37	High press. swtich defect	Unit stops	Too much refrigerant. Reclaim and vacuum and inject the correct amount. There is air inside the refrigerant system. Vacuum again and inject new refrigerant. Not enough water flow leads to low heat exchange in condenser. Check the water system and discharge inside air, make sure pumps 1 and 2 are powerful enough to run the water system. Plate heat exchanger condenser is dirty and blocking at waterside. Wash it. EEV does not work. Check its wiring or if its coil is OK or not. The check valves at the outdoor unit are not opened.
E38	Low press. switch defect	Unit stops	Too much refrigerant. Reclaim and vacuum and inject the correct amount. Filter if the refrigerant system is dirty and blocking, change a new one and clean the refrigerant system. Bad ventilation condition for outdoor unit fans. Check whether there is obstacle at the fan system. Not enough evaporating area after the evaporator is frosted. Check if the defrost coil sensor is positioned correctly and if it can measure the temperature correctly.
E39	EVI low superheat	Unit stops	
E40	EVI low evap. temp.	Unit stops	
E41	EVI high evap. temp.	Unit stops	
E42	Outdoor unit alarm: Amb. temp. out of HP working range	Unit stops	Too high/low outdoor temperature. Check whether the outdoor sensor is installed correctly or not.
E43	Outdoor unit alarm: Outlet water temp. too low	Unit stops	Avoid too low water outlet temperature in cooling mode, protect the plate heat exchanger. This alarm can be cleared only after power is cut off.
F13	Room temp. sensor failure	Unit stops	Check if room temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F14	Sanitary hot water temp. sensor failure	Unit stops	Check if sanitary hot water temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F15	Cooling/heating water temp. sensor failure	Unit keeps on working, use unit water inlet temperature as reference.	Check if cooling/heating water temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.

Code	Name	Heat pump status	Possible reasons and solutions
F16	Unit water outlet temp. sensor failure	Unit keeps on working, use unit water inlet temperature as reference.	Check if unit water outlet temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F17	Unit water inlet temp. sensor failure	Unit keeps on working, use unit water outlet temperature as reference.	Check if unit water inlet temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F18	Indoor coil temp. sensor failure	Unit keeps on working, except cooling mode.	Check if indoor temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F21	Mixing valve 1 temperature sensor failure	Unit keep on working, mixing valve 1 output fixed to 0.	Check if TV1 temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F22	Mixing valve 2 temperature sensor failure	Unit keep on working, mixing valve 2 output fixed to 0.	Check if TV2 temperature sensor is open, short-circuited or value drifts too much. Replace it if necessary.
F25	Communication between operation panel and indoor PCB or outdoor PCB failure	Unit stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check if the last three switches on outdoor power PCB are set to 001; Check if the last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.
F27	Indoor EEPROM failure	Unit keeps on working	Cut the unit power, connect CN213-5 and CN213-6 together, repower the unit and then cut the power and cancel the connection. If still not OK, replace the indoor PCB.
F28	Circulation pump PWM signal feedback failure	Unit keeps on working	Check the circulating pump cable connection; Check the power supply to the circulating pump; Check if the circulating pump is broken.
F29	Mixing valve 1 failure	Unit keeps on working, mixing valve 1 output fixed to 0.	Check MV1 cable connection; Check the PCB output voltage signal; Check if the MV1 is broken.
F30	Mixing valve 2 failure	Unit keeps on working, mixing valve 2 output fixed to 0.	Check MV2 cable connection; Check the PCB output voltage signal; Check if the MV2 is broken.

Code	Name	Heat pump status	Possible reasons and solutions
S01	Indoor anti-freezing protection in cooling	Compressor speed down or stop	Compressor speed down if coil temp. lower than 2 °C; Compressor stops if coil temp. lower than -1 °C; Compressor restarts if coil Temp. higher than 6 °C. Check if the set temperature for cooling is too low; Check if the system has too small water flow rate; Check the water system especially the filter. Check if the system has not enough refrigerant inside by measuring the evaporating pressure. Check if the outdoor temperature is lower than 15 °C.
S02	Too small water flow rate	Compressor stops	System water flow rate is less than minimum allowable flow rate. Check the water system, especially the filter. Check the working statue of water pump.
S03	Water flow switch failure	Unit stops	Water flow switch failed to work. Flow switch detects flow when P0 is on Stand-by. Check if some flow in the system that is not produced by the heat pump. Check if the flow switch is broken or not well connected. Check if the flow switch is broken or not well connected.
S04	Communication failure	Unit stops	Communication data lost too much. Check if the communication cable is longer than 30 m; Check if there is a source of disturbance nearby the unit. Unit recovers when communication recovers.
S05	Serial port connect error	Unit stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check if the last three switches on outdoor power PCB are set to 001; Check if last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.

Code	Name	Heat pump status	Possible reasons and solutions
S06	Water outlet temp. too low protection in cooling	Compressor stops	Compressor stops if water outlet is lower than 5 °C in cooling mode. Check if the temperature sensor Tc is OK and well connected; Check if the set water temperature too low Check if the system flow rate too small.
S07	Water outlet temp. too high protection in heating/hot water	Compressor stops	Compressor stops if water outlet is higher than 57 °C in heating or hot water mode. Check if the temperature sensors Tc and Tw is OK and well connected; Check if the set water temperature is too high; Check if the system flow rate is too small.
S08	Unit defrosting failure	Unit stops and can only be restarted by repowering the unit	System water temperature is too low for defrosting. Please either set the temperature higher, have the back-up heating source connected or close some heating circuit to let the system enough high-water temperature for a safe defrosting.
S09	Water outlet temp. too low protection in defrosting	Quit current defrosting operation	If water outlet temperature is lower than 15 °C during defrosting, water may freeze up in the plate heat exchanger and cause damage, so unit will quit current defrosting mode. It will try again in next defrosting cycle but if it continuously failed to make the defrosting for 3 times, it shows S08 failure code and can only be restarted by repower the unit. Please either set the temperature higher, have the back-up heating source connected or close some heating circuit so to let the system has enough high-water temperature for a safe defrosting.
S10	Too small water flow rate failure	Compressor stops	If "too small water flow rate protection" happens over 3 times in certain period, it gives this failure code and unit stops until repower. This failure means the system water flow rate is less than minimum allowable flow rate.
S11	Indoor anti-freezing failure in cooling	Compressor stops	If "indoor coil anti-freezing protection in cooling mode" happens over 3 times in certain period of time, it gives this failure code and unit stops until repower.
S12	Floor curing function failed to finish	Unit switch back to standard working mode with failure information shown on the screen	If floor curing function can't be finished in the maximum allowable time, it shows this information. Unit will go back to normal working mode, with failure information shown on the display. Failure information can only be erased until repower or start the floor curing function again.

20 Appendix B: Wiring diagrams

20.1 Indoor unit wiring diagrams

20.1.1 Monobloc units

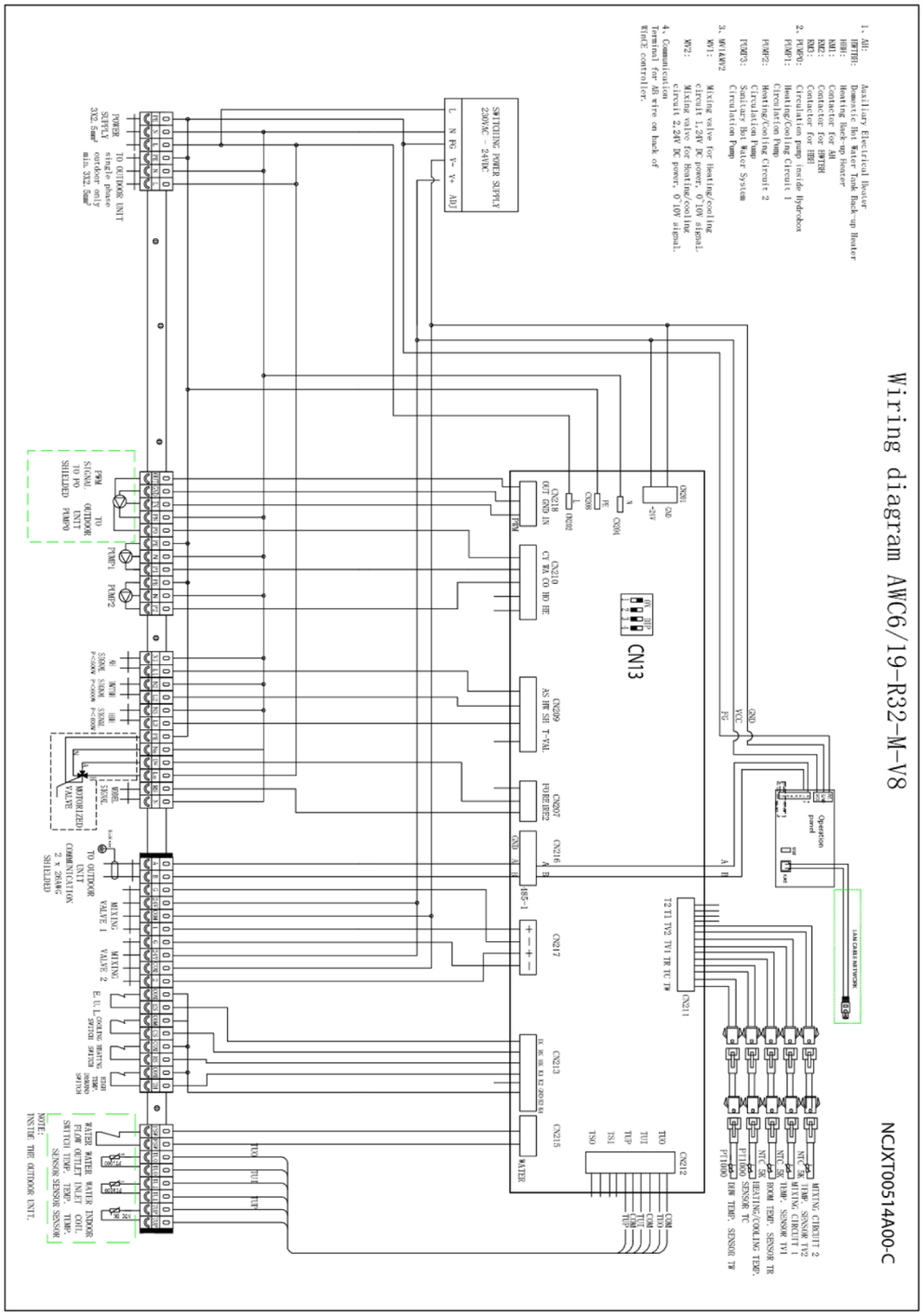


Figure 6: AWC-R32-M-V8; 6-19 kW

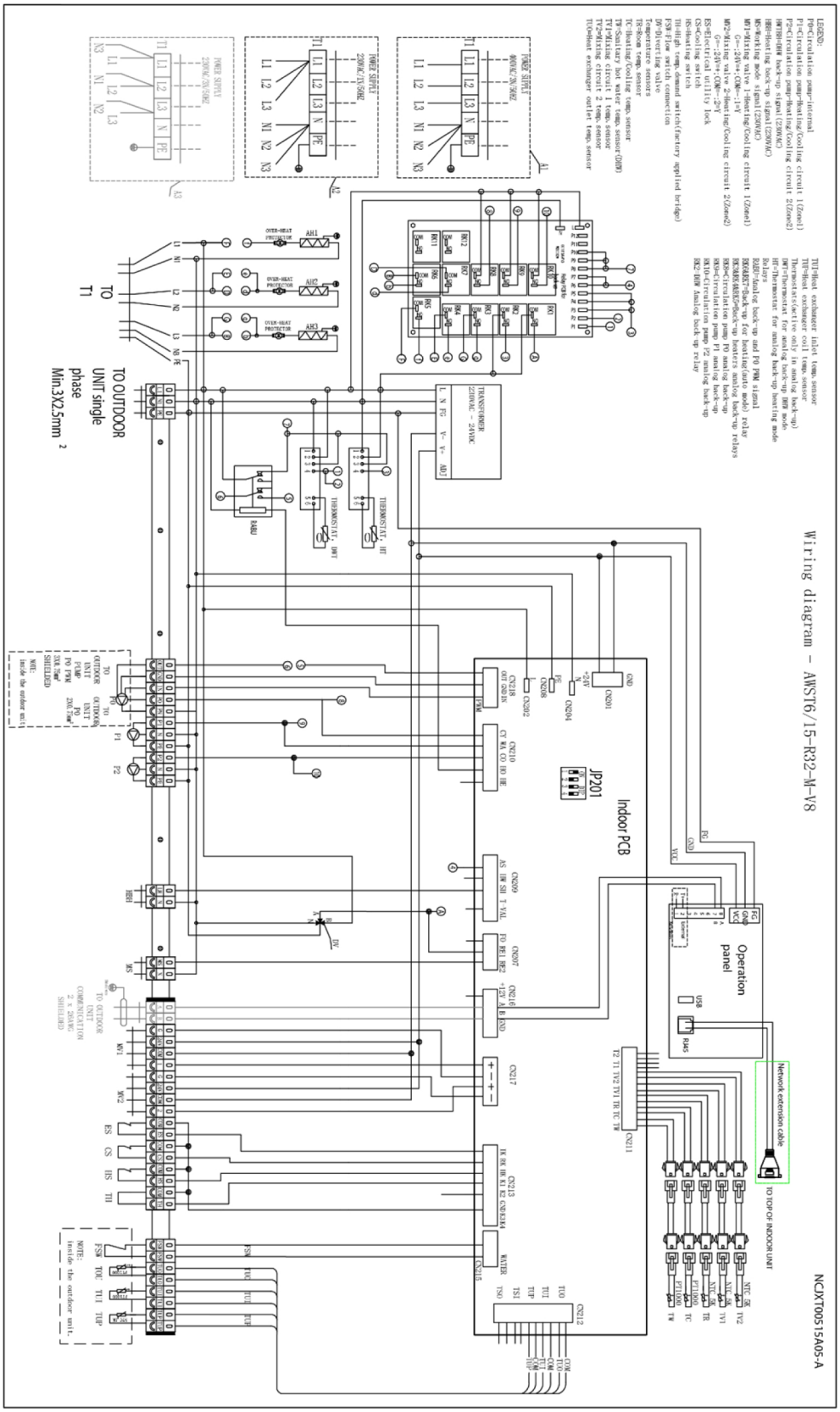


Figure 7: AWST-R32-M-V8; 6-15 kW

20.1.2 Split units

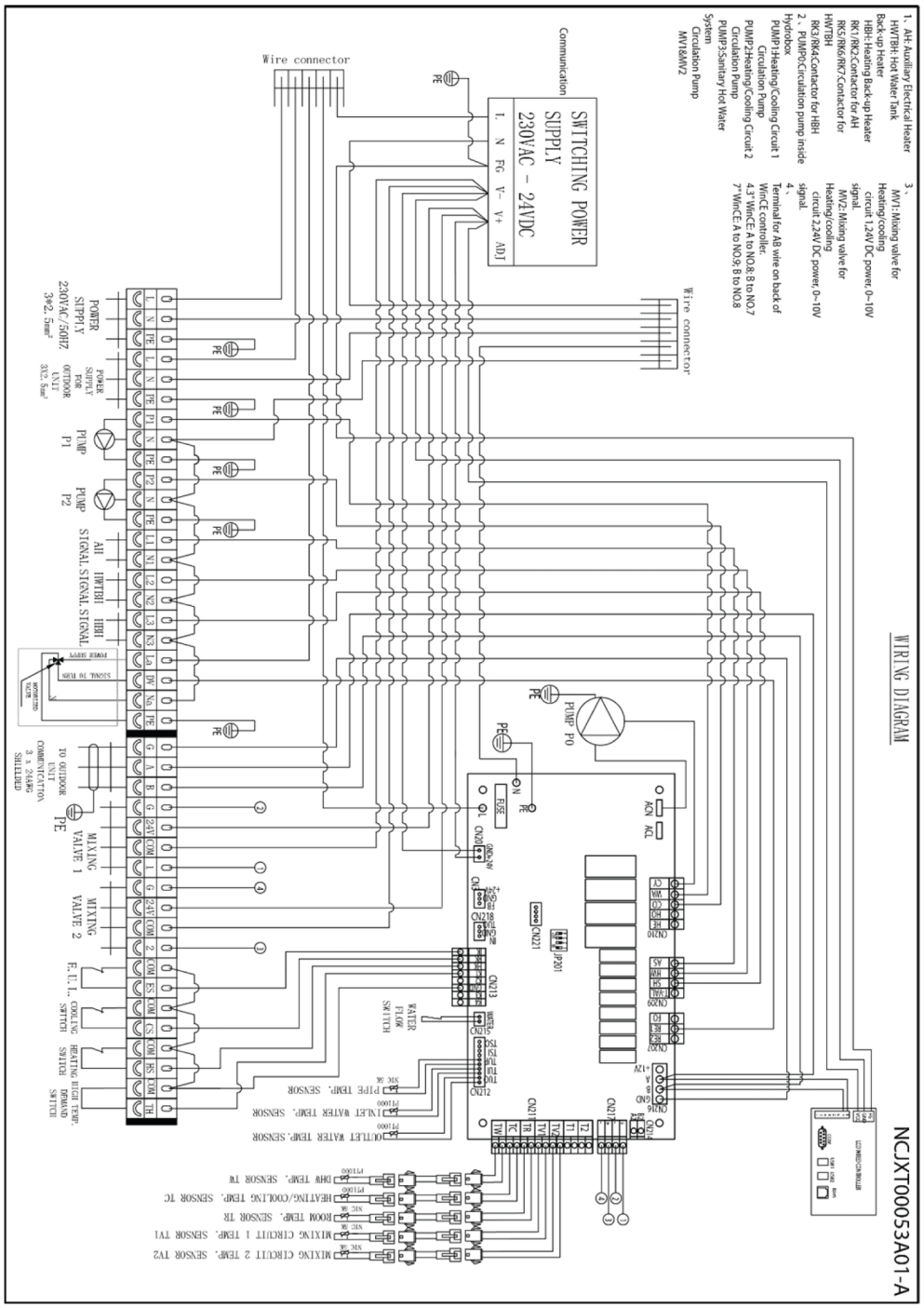


Figure 8: AWH-R32-S-V8; 6-12 kW

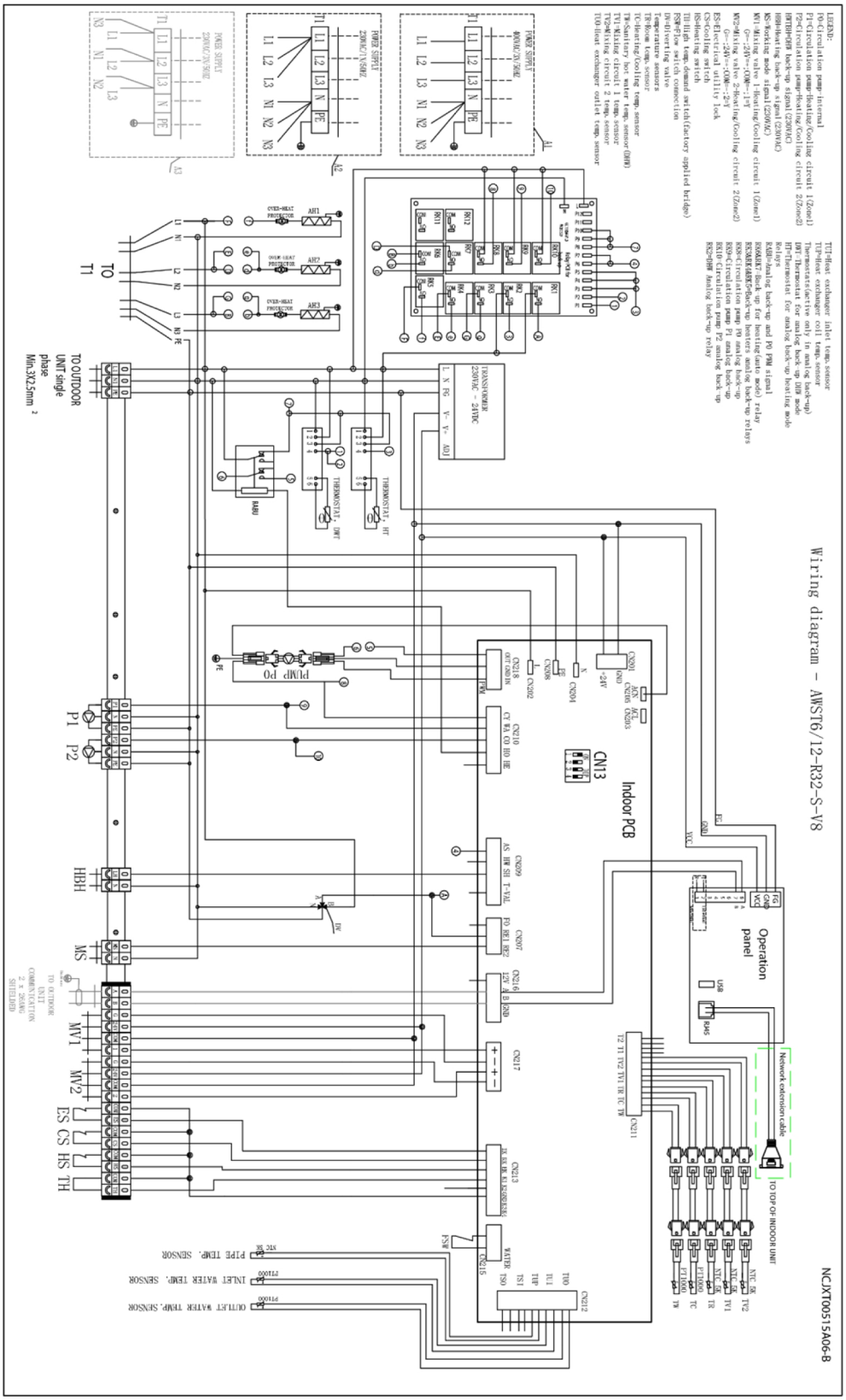


Figure 9: AWST-R32-S-V8; 6-12 kW

20.2 Outdoor unit wiring diagrams

20.2.1 Monobloc units

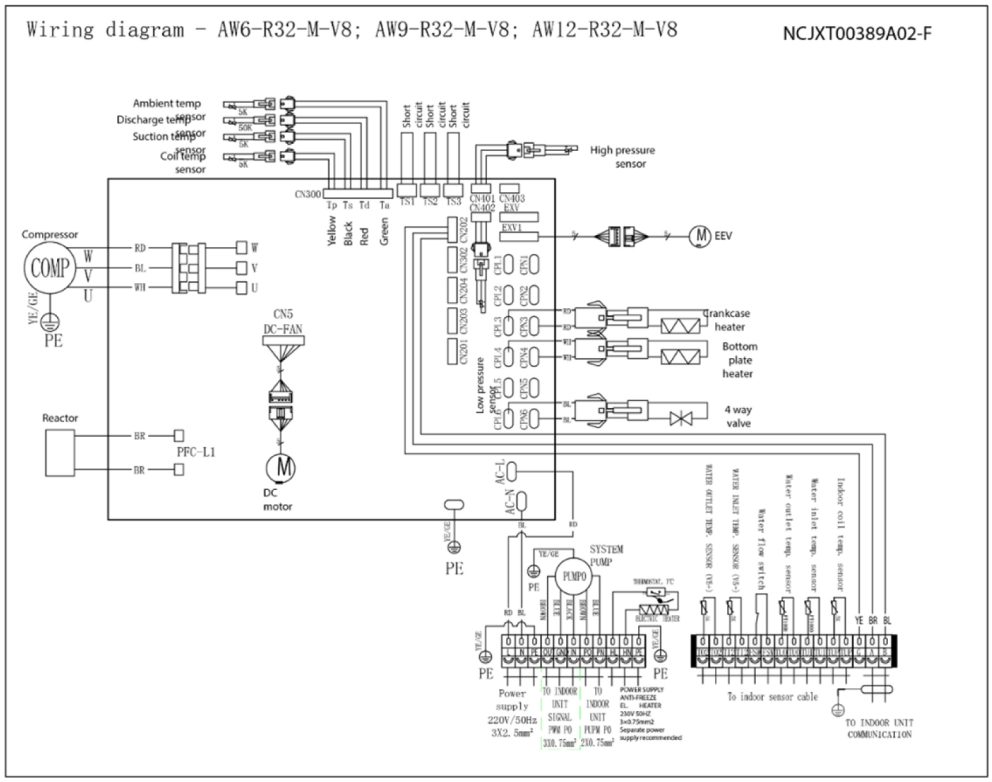


Figure 10: AW-R32-M-V8; 6-12 kW

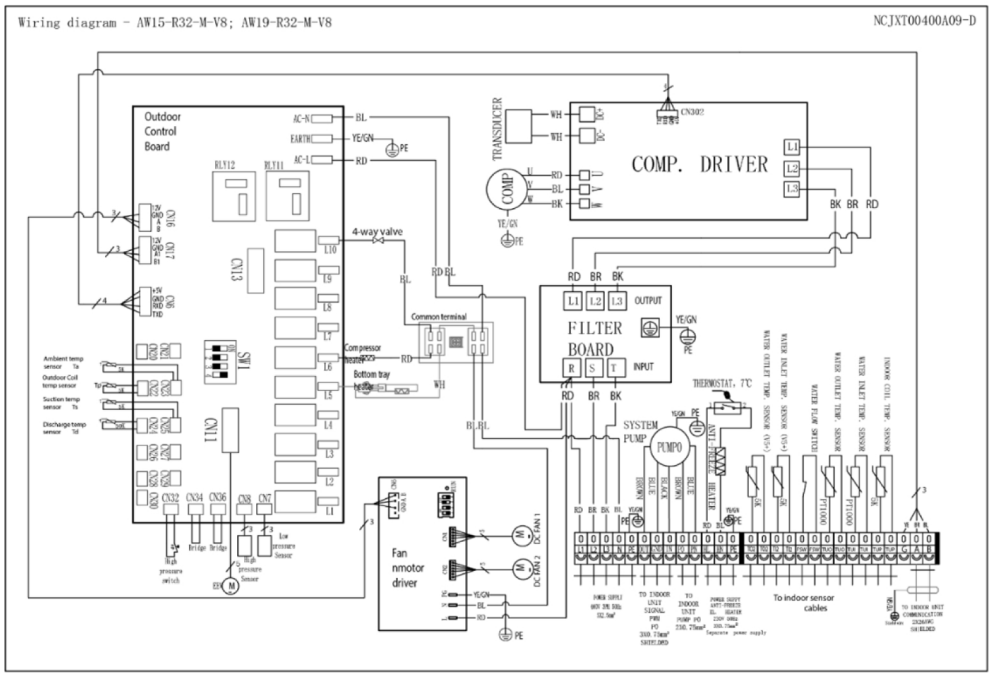


Figure 11: AW-R32-M-V8; 15-19 kW

20.2.2 Split units

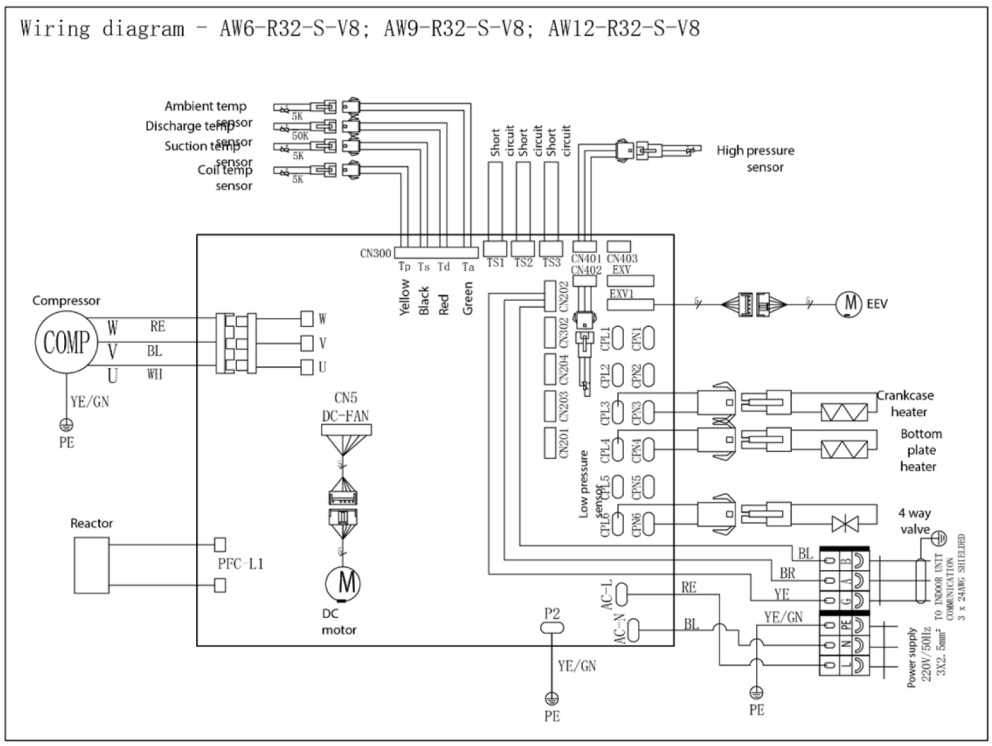


Figure 12: AW-R32-S-V8; 6-12 kW

20.3 Dip switch default settings AW-R32-M-V8; 15-19 kW

NOTE

0: OFF

1: ON

Compressor drive PCB

SW1: Compressor model selection

Compressor model no.	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8
AW15-R32-M-V8	0	0	0	0	0	0	0	0
AW19-R32-M-V8	0	0	0	0	0	1	0	0

SW2: Reserved

SW3: Reserved

Main PCB (Power PCB)

Table 88: SW1

	Default Setting	Function
SW1-1	1	Fixed setting for 15-19 kW model
SW1-2	1	
SW1-3	0	Reserved
SW1-4	0	Reserved
SW1-5	0	Reserved
SW1-6	0	Communication address selection for outdoor unit
SW1-7	0	000: Address 1
SW1-8	1	001: Address 2 (default)
		010: Address 3
		011: Address 4
		100: Address 5
		101: Address 6
		110: Address 7
		111: Address 8

Table 89: SW2

	Default Setting	Function
SW1-1	0	Reserved
SW1-2	0	Reserved
SW1-3	0	Reserved
SW1-4	0	Reserved
SW1-5	0	Reserved
SW1-6	0	Reserved
SW1-7	0	Reserved
SW1-8	0	If set to "1" it enables software update via USB.

21 Appendix C: Dimension drawings

21.1 Indoor unit dimensions

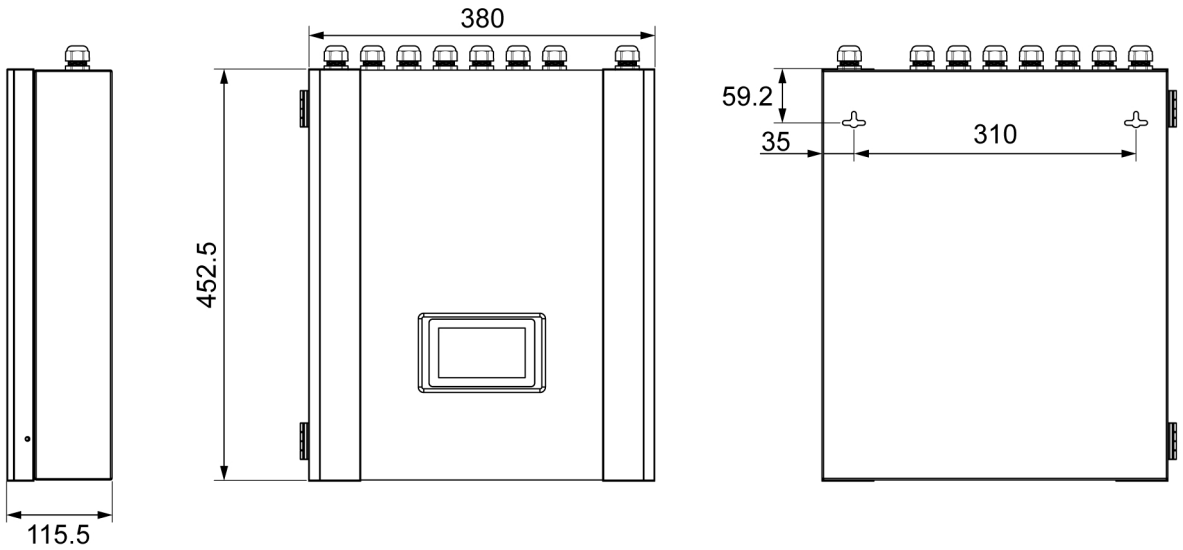


Figure 13: AWC-R32-M-V8; 6-19 kW

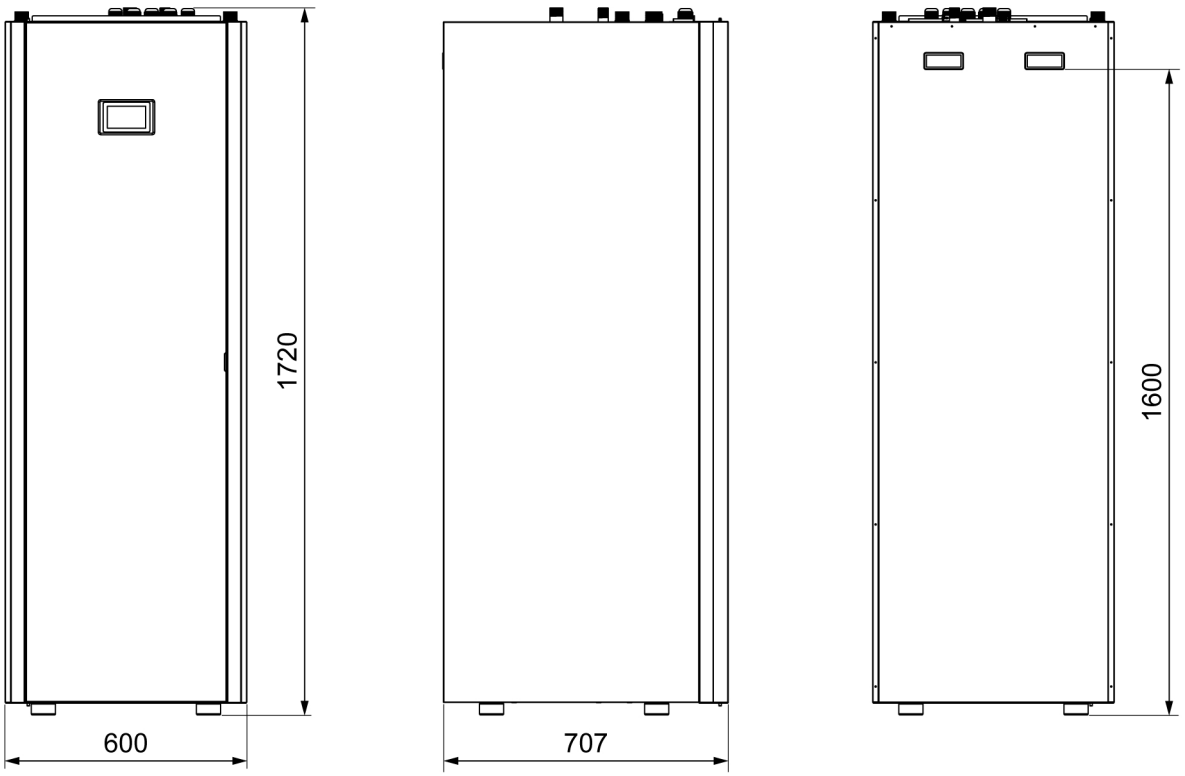


Figure 14: AWST-R32-M-V8; 6-15 kW and AWST-R32-S-V8; 6-12 kW

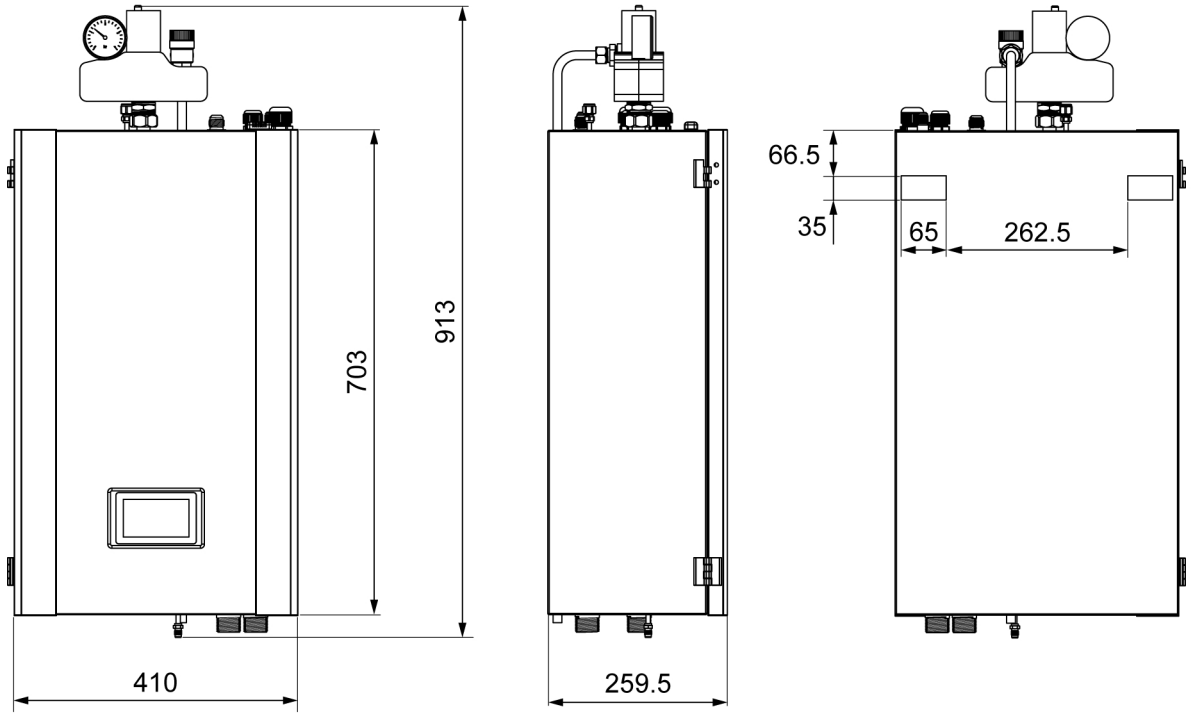


Figure 15: AWH-R32-S-V8; 6-12 kW

21.2 Outdoor unit dimensions

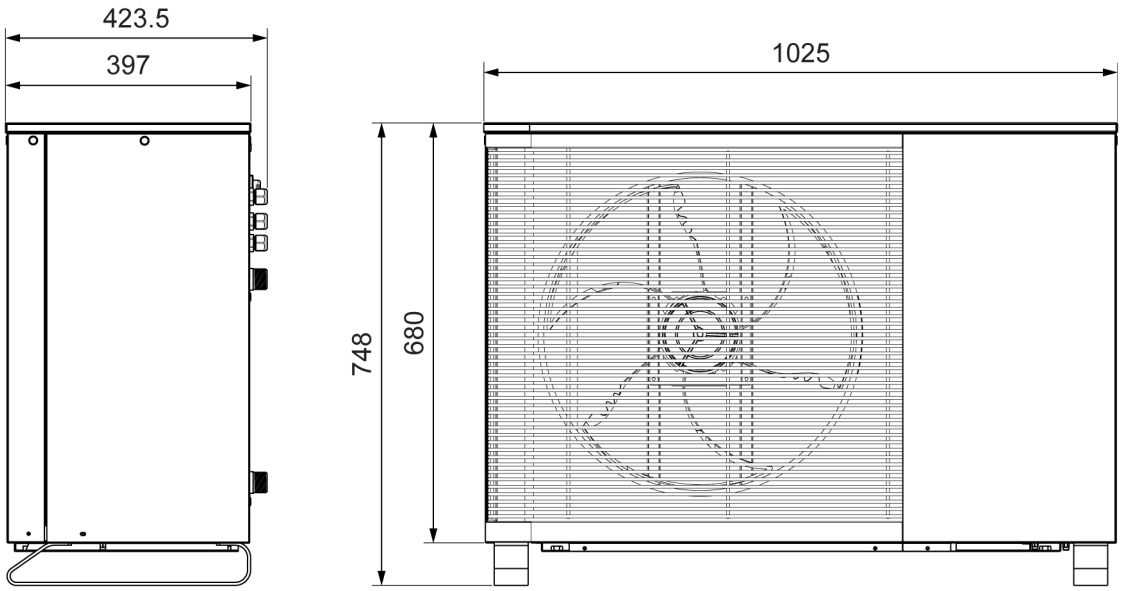


Figure 16: AW6-R32-M-V8

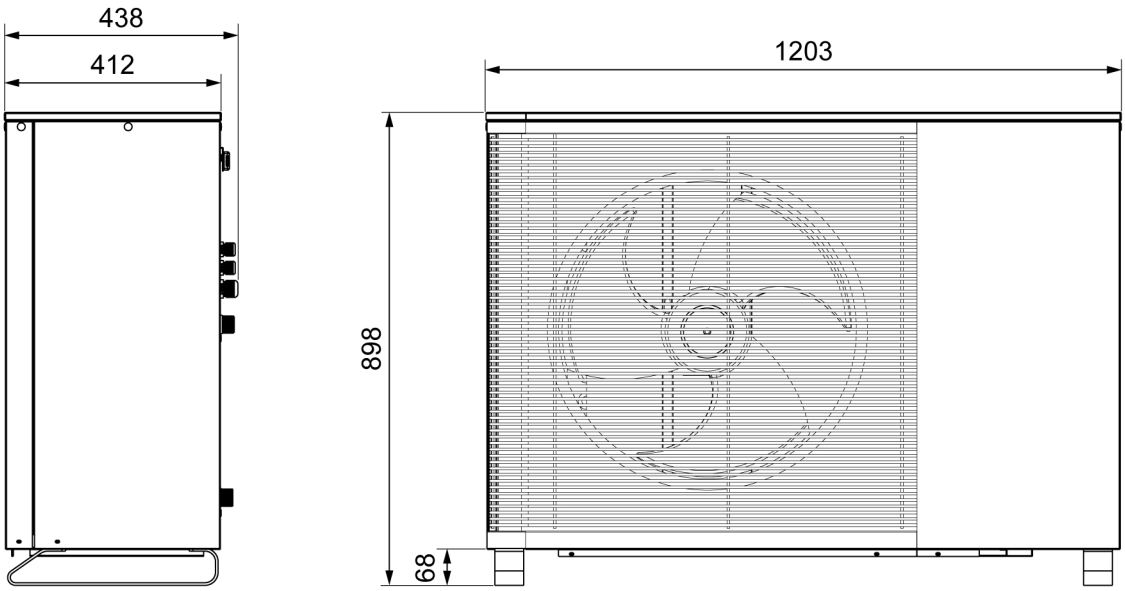


Figure 17: AW-R32-M-V8; 9-12 kW

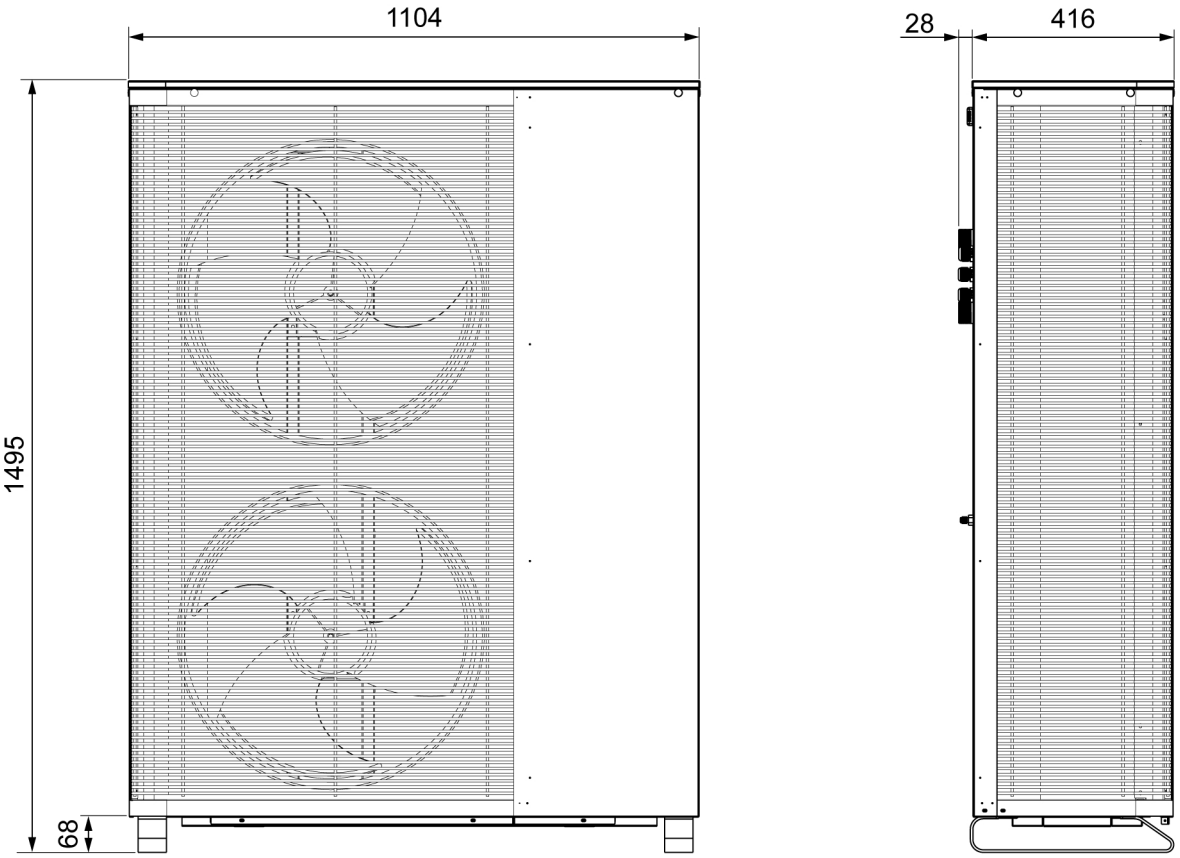


Figure 18: AW-R32-M-V8; 15-19 kW

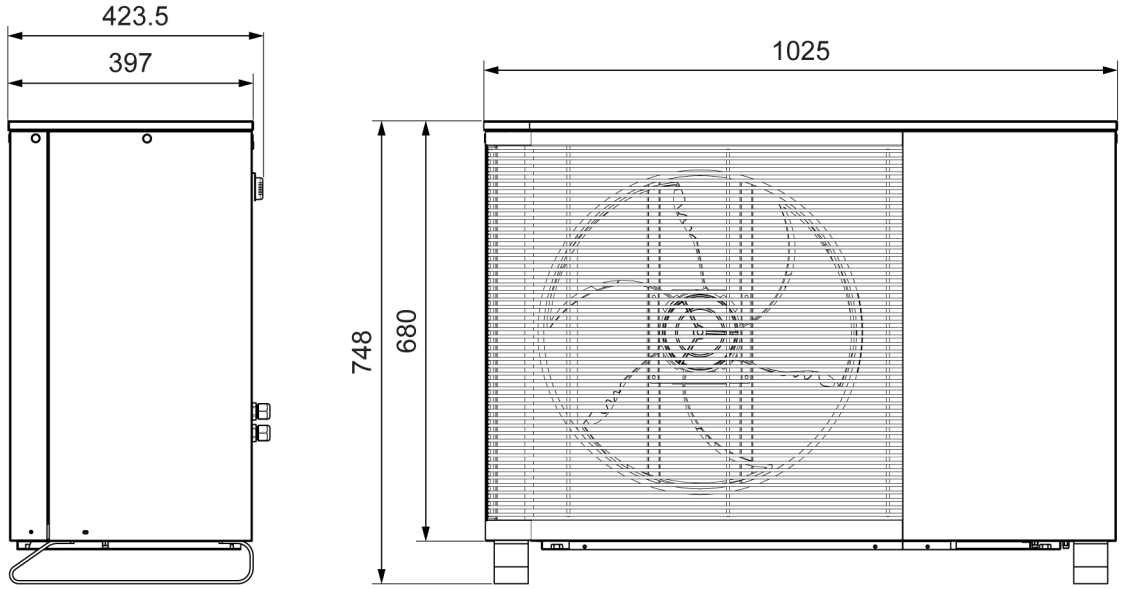


Figure 19: AW6-R32-S-V8

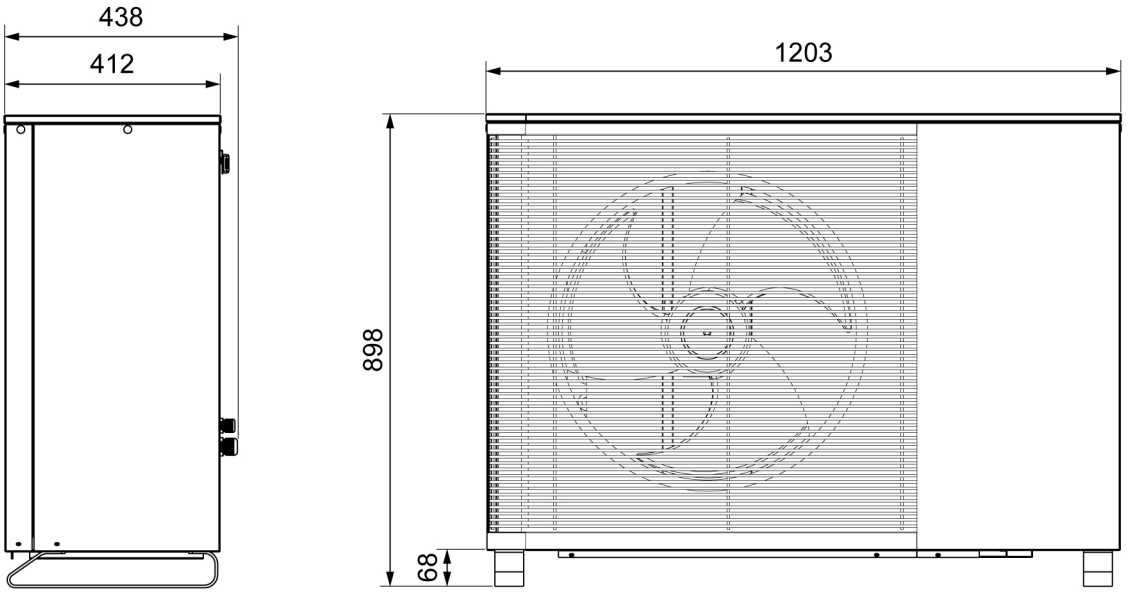


Figure 20: AW-R32-S-V8; 9-12 kW

22 Appendix D: Technical data

22.1 AWC-R32-M-V8; 6-12 kW

		Unit	AWC6-R32-M-V8	AWC9-R32-M-V8	AWC12-R32-M-V8
Min/max heating capacity [1]		kW	3.50 / 6.50	4.30 / 9.20	5.50 / 11.60
El. power input in heating min/max [1]		W	758 / 1410	927 / 2097	1107 / 2683
COP min/max [1]		W/W	4.50 / 4.70	4.38 / 4.71	4.30 / 4.90
Min/max heating capacity [2]		kW	3.15 / 6.00	3.90 / 8.60	4.90 / 11.20
El. power input in heating min/max [2]		W	943 / 1732	1162 / 2550	1401 / 3263
COP min/max [2]		W/W	3.34 / 3.56	3.37 / 3.58	3.30 / 3.50
SCOP – average climate, low temperature		W/W	4.74	4.73	4.71
Min/max cooling capacity [3]		kW	3.50 / 4.50	4.90 / 7.20	4.90 / 9.50
El. power input in cooling min/max [3]		W	1330 / 1680	1451 / 2366	1358 / 2444
El. power input in cooling min/max [3]		W	1330 / 1680	1451 / 2366	1358 / 2444
E.E.R. min/max [3]		W/W	2.50 / 2.74	2.80 / 3.10	2.60 / 3.50
Energy class			A+++	A+++	A+++
Defrost upon demand			Yes	Yes	Yes
Heating cable for defrosting/anti-freeze protection			Yes / Yes	Yes / Yes	Yes / Yes
Compressor pre-heat			Yes	Yes	Yes
Electronic expansion valve			Yes	Yes	Yes
ErP circulating pump / flow switch			Yes / Yes (outdoor)	Yes / Yes (outdoor)	Yes / Yes (outdoor)
Compressor			Mitsubishi		
Fan	Manufacturer		Yibisi	Shunwei	
	Quantity	pcs	1	1	1
	Airflow	m³/h	2500	3150	3150
	Rated power	W	34	45	45
Sound pressure level*	Outdoor 0 m/5 m	dB(A)	52 / 30	53 / 31	52 / 30
Plate heat exchanger	Manufacturer		SWEP		
	Water press. drop	kPa	26	26	26
	Piping connection	Inch	G1"	G1"	G1"
Residual current device and overvoltage protection			Required		

1) Heating condition: water inlet/outlet temperature: 30 °C/35 °C, ambient temperature: DB 7 °C/WB 6 °C.

2) Heating condition: water inlet/outlet temperature: 40 °C/45 °C, ambient temperature: DB 7 °C/WB 6 °C.

3) Cooling condition: water inlet/outlet temperature: 12 °C/7 °C, ambient temperature: DB 35 °C/WB 34 °C.

		Unit	AWC6-R32-M-V8	AWC9-R32-M-V8	AWC12-R32-M-V8
Power supply, grounded		V/Hz/A	230 / 50 / 10	230 / 50 / 16	230 / 50 / 16
Refrigerant type		kg	R32 / 0.90	R32 / 1.40	R32 / 1.80
Dimensions (W×D×H)	Outdoor unit	mm	1025×397×750	1207×412×900	1207×412×900
	Indoor unit	mm		380×115×450	
Net weight	Outdoor unit	kg	79.5	98.5	105
	Indoor unit	kg		9	
Article number indoor/outdoor			120315 / 120317	120315 / 120318	120315 / 120319

22.2 AWC-R32-M-V8; 15-19 kW

		Unit	AWC15-R32-M-V8	AWC19-R32-M-V8
Min/max heating capacity [1]		kW	6.00 / 15.30	9.20 / 18.50
El. power input in heating min/max [1]		W	1223 / 3209	1834 / 4142
COP min/max [1]		W/W	4.78 / 5.06	4.47 / 5.01
Min/max heating capacity [2]		kW	5.60 / 14.30	8.5 / 18.2
El. power input in heating min/max [2]		W	1551 / 3914	2248 / 4998
COP min/max [2]		W/W	3.60 / 3.82	3.60 / 3.82
SCOP – average climate, low temperature		W/W	4.98	4.85
Min/max cooling capacity [3]		kW	4.50 / 13.00	5.50 / 16.00
El. power input in cooling min/max [3]		W	2590 / 4390	2970 / 5510
E.E.R. min/max [3]		W/W	2.96 / 3.26	2.85 / 3.20
Energy class			A+++	A+++
Defrost upon demand			Yes	Yes
Heating cable for defrosting/anti-freeze protection			Yes / Yes	Yes / Yes
Compressor pre-heat			Yes	Yes
Electronic expansion valve			Yes	Yes
ErP circulating pump / flow switch			Yes / Yes (outdoor)	Yes / Yes (outdoor)
Compressor			Mitsubishi	
Fan	Manufacturer		Shunwei	
	Quantity	pcs	2	2
	Airflow	m³/h	6200	7000
	Rated power	W	90	120
Sound pressure level*	Outdoor 0 m/5 m	dB(A)	58 / 36	61 / 39
Plate heat exchanger	Manufacturer		SWEP	
	Water press. drop	kPa	26	26
	Piping connection	Inch	5/4"	5/4"

		Unit	AWC15-R32-M-V8	AWC19-R32-M-V8
Residual current device and overvoltage protection			Required	12
Power supply, grounded		V/Hz/A	400 V/3 N/50 Hz/3-p 16 A	400 V/3 N/50 Hz/3-p 16 A
Refrigerant type		kg	R32 / 2.55	R32 / 2.60
Dimensions (W×D×H)	Outdoor unit	mm	1106×416×1498	1106×416×1498
	Indoor unit	mm	380×115×450	
Net weight	Outdoor unit	kg	157	166
	Indoor unit	kg	9	
Article number indoor/outdoor			120315 / 120320	120315 / 120321

1) Heating condition: water inlet/outlet temperature: 30 °C/35 °C, Ambient temperature: DB 7 °C /WB 6 °C.

2) Heating condition: water inlet/outlet temperature: 40 °C/45 °C, Ambient temperature: DB 7 °C /WB 6 °C.

3) Cooling condition: water inlet/outlet temperature: 12 °C/7 °C, Ambient temperature: DB 35 °C /WB 34 °C.

22.3 AWST-R32-M-V8; 6-9 kW

	Unit	AWST6-R32-M-V8	AWST9-R32-M-V8
Article number (indoor/outdoor unit)		120316/120317	120316/120318
ErP energy efficiency class		A+++ / A++	A+++ / A++
SCOP 35 °C (floor heating) EN 14825		4.74	4.73
Tap water profile		L/A+	
HEATING MODE (A7/W35)			
Heating capacity*	kW	3.50–6.50	4.30–9.20
COP max - coefficient of performance*	W/W	4.70	4.71
Rated input power*	kW	0.75–1.41	0.92–2.10
Max. temperature of heating water	°C	58	
Operating range heating	°C	-30 to +45	
DHW TANK			
Type		SUS316 steel, DHW storage type	
Volume	l	250	
COOLING MODE			
Cooling capacity**	kW	6.22–7.45	6.70–9.50
EER max – energy efficiency ratio**		4.45	4.60
Min. temperature of cooling water	°C	7	
Operating range cooling	°C	0 to +65	
POWER SUPPLY – SPECIFICATIONS			
Outdoor unit	V/ph/fuse	230 V/1-ph/10 A/C	230 V/1-ph/16 A/C
Indoor unit + electric flow heater	V/ph/fuse	230 V/3-ph/25 A/C or 400 V/3-ph/16 A/C	
Anti-freeze protection outdoor	V/ph/fuse	230 V/1-ph/6 A/C	
REFRIGERANT SPECIFICATION			

	Unit	AWST6-R32-M-V8	AWST9-R32-M-V8
Type / mass of refrigerant	kg	R32 / 0.90	R32 / 1.40
Type of connection between indoor-outdoor unit		Hydraulic connection	
Dimensions of refrigerant pipes connectors	Inch	G1"	
SOUND POWER AND SOUND PRESSURE LEVEL			
Sound power level LwA - indoor unit	dB(A)	44	45
Sound power level LwA - outdoor unit***	dB(A)	52	53
NET DIMENSIONS			
Indoor unit (W×D×H)	mm	600×707×1720	
Outdoor unit (W×D×H)	mm	1025×397×750	1207×412×900
NET WEIGHT			
Indoor unit / outdoor unit	kg	108 / 79.5	108 / 98.5

* Measured according to standard EN 14511. Heating condition: water inlet/outlet temperature 30 °C/35 °C, ambient temperature DB/WB 7 °C/6 °C.

** Measured according to standard EN 14511. Cooling condition: water inlet/outlet temperature 18 °C and ambient temperature 35 °C.

*** Measured according to standard EN 12102.

22.4 AWST-R32-M-V8; 12-15 kW

	Unit	AWST12-R32-M-V8	AWST15-R32-M-V8
Article number (indoor/outdoor unit)		120316/120319	120316/120320
ErP energy efficiency class		A+++ / A++	A+++ / A++
SCOP 35 °C (floor heating) EN 14825		4.71	4.98
Tap water profile		L/A+	
HEATING MODE (A7/W35)			
Heating capacity*	kW	5.50–11.60	6.00–15.30
COP max - coefficient of performance*	W/W	4.90	5.06
Rated input power*	kW	1.10–2.68	1.22–3.20
Max. temperature of heating water	°C	58	
Operating range heating	°C	-30 to +45	
DHW TANK			
Type		SUS316 steel, DHW storage type	
Volume	l	250	
COOLING MODE			
Cooling capacity**	kW	7.00–9.80	7.20–18.50
EER max – energy efficiency ratio**		3.80	5.42
Min. temperature of cooling water	°C	7	
Operating range cooling	°C	0 to +65	
POWER SUPPLY – SPECIFICATIONS			
Outdoor unit	V/ph/fuse	230 V/1-ph/16 A/C	400 V/3-ph/16 A/C

	Unit	AWST12-R32-M-V8	AWST15-R32-M-V8
Indoor unit + electric flow heater	V/ph/fuse	230 V/3-ph/25 A/C or 400 V/3-ph/16 A/C	
Anti-freeze protection outdoor	V/ph/fuse	230 V/1-ph/6 A/C	
REFRIGERANT SPECIFICATION			
Type / mass of refrigerant	kg	R32 / 1.80	R32 / 2.55
Type of connection between indoor-outdoor unit		Hydraulic connection	
Dimensions of refrigerant pipes connectors	Inch	G1"	G1-1/4"
SOUND POWER AND SOUND PRESSURE LEVEL			
Sound power level LwA - indoor unit	dB(A)	45	45
Sound power level LwA - outdoor unit***	dB(A)	52	58
NET DIMENSIONS			
Indoor unit (W×D×H)	mm	600×707×1720	
Outdoor unit (W×D×H)	mm	1207×412×900	1106×416×1498
NET WEIGHT			
Indoor unit / outdoor unit	kg	108 / 105	108 / 157

* Measured according to standard EN 14511. Heating condition: water inlet/outlet temperature 30 °C/35 °C, ambient temperature DB/WB 7 °C/6 °C.

** Measured according to standard EN 14511. Cooling condition: water inlet/outlet temperature 18 °C and ambient temperature 35 °C.

*** Measured according to standard EN 12102.

22.5 AWH-R32-S-V8, 6-12 kW

	Unit	AWH6-R32-S-V8	AWH9-R32-S-V8	AWH12-R32-S-V8
Article number (indoor/outdoor unit)		120334/120324	120334/120325	120334/120326
ErP Energy efficiency class		A+++ / A++	A+++ / A++	A+++ / A++
SCOP 35 °C (floor heating) EN 14825		4.74	4.73	4.71
HEATING MODE (A7/W35)				
Heating capacity*	kW	3.50–6.50	4.30–9.20	5.50–11.60
COP max - Coefficient of Performance*	W/W	4.70	4.71	4.90
Rated input power*	kW	0.75–1.41	0.92–2.10	1.10–2.68
Max. temperature of heating water	°C		58	
Operating range heating	°C		-30 to +45	
COOLING MODE				
Cooling capacity**	kW	6.22–7.45	6.70–9.50	7.00–9.80
EER max – energy efficiency ratio**		4.45	4.60	3.80
Min. temperature of cooling water	°C		7	
Operating range cooling	°C		+8 to +65	
POWER SUPPLY – SPECIFICATIONS				
Outdoor unit	V/ph/fuse	230 V/1-ph/10 A/C	230 V/1-ph/16 A/C	
Indoor unit or (indoor + outdoor unit)	V/ph/fuse	230 V/1-ph/6 A/C or (230 V/1-ph/16 A/C)		

	Unit	AWH6-R32-S-V8	AWH9-R32-S-V8	AWH12-R32-S-V8
REFRIGERANT SPECIFICATION				
Type / mass of refrigerant	kg	R32 / 0.90	R32 / 1.40	R32 / 1.80
Type of connection between indoor-outdoor unit		Refrigerant flare connection		
Dimensions of refrigerant pipes connectors	Inch	¼ and ½	3/8 and 5/8	
SOUND POWER AND SOUND PRESSURE LEVEL				
Sound power level LwA - indoor unit	dB(A)	44	45	45
Sound power level LwA - outdoor unit***	dB(A)	52	53	52
NET DIMENSIONS				
Indoor unit (W×D×H)	mm	410×260×700		
Outdoor unit (W×D×H)	mm	1025×397×750	1207×412×900	1207×412×900
NET WEIGHT				
Indoor unit / outdoor unit	kg	31 / 83.5	31 / 90	31 / 93.5

* Measured according to standard EN 14511. Heating condition: water inlet/outlet temperature 30 °C/35 °C, ambient temperature DB/WB 7 °C/6 °C.

** Measured according to standard EN 14511. Cooling condition: water inlet/outlet temperature 18 °C and ambient temperature 35 °C.

*** Measured according to standard EN 12102.

22.6 AWST-R32-S-V8, 6-12 kW

	Unit	AWST6-R32-S-V8	AWST9-R32-S-V8	AWST12-R32-S-V8
Article number (indoor/outdoor unit)		120335/120324	120335/120325	120335/120326
ErP Energy efficiency class		A+++ / A++	A+++ / A++	A+++ / A++
SCOP 35 °C (floor heating) EN 14825		4.74	4.73	4.71
Tap water profile			L/A+	
HEATING MODE (A7/W35)				
Heating capacity*	kW	3.50–6.50	4.30–9.20	5.50–11.60
COP max - coefficient of performance*	W/W	4.70	4.71	4.90
Rated input power*	kW	0.75–1.41	0.92–2.10	1.10–2.68
Max. temperature of heating water	°C		58	
Operating range heating	°C		-30 to +45	
DHW TANK				
Type			SUS316 steel, DHW storage type	
Volume	l		250	
COOLING MODE				
Cooling capacity**	kW	6.22–7.45	6.70–9.50	7.00–9.80

	Unit	AWST6-R32-S-V8	AWST9-R32-S-V8	AWST12-R32-S-V8
EER max – energy efficiency ratio**		4.45	4.60	3.80
Min. temperature of cooling water	°C		7	
Operating range cooling	°C		+8 to +65	
POWER SUPPLY – SPECIFICATIONS				
Outdoor unit	V/ph/fuse	230 V/1-ph/10 A/C	230 V/1-ph/16 A/C	
Indoor unit + electric flow heater	V/ph/fuse	230 V/3-ph/25 A/C or 400 V/3-ph/16 A/C		
REFRIGERANT SPECIFICATION				
Type / mass of refrigerant	kg	R32 / 0.90	R32 / 1.40	R32 / 1.80
Type of connection between indoor-outdoor unit		Refrigerant flare connection		
Dimensions of refrigerant pipes connectors	Inch	¼ and ½	3/8 and 5/8	
SOUND POWER AND SOUND PRESSURE LEVEL				
Sound power level LwA - indoor unit	dB(A)	44	45	45
Sound power level LwA - outdoor unit***	dB(A)	52	53	52
NET DIMENSIONS				
Indoor unit (W×D×H)	mm		600×707×1720	
Outdoor unit (W×D×H)	mm	1025×397×750	1207×412×900	1207×412×900
NET WEIGHT				
Indoor unit / outdoor unit	kg	118 / 83.5	118 / 90	118 / 93.5

* Measured according to standard EN 14511. Heating condition: water inlet/outlet temperature 30 °C/35 °C, ambient temperature DB/WB 7 °C/6 °C.

** Measured according to standard EN 14511. Cooling condition: water inlet/outlet temperature 18 °C and ambient temperature 35 °C.

*** Measured according to standard EN 12102. /WB 34 °C.

23 Appendix E: Included in the package

23.1 AWC-R32-M-V8; 6-19 kW

No.	Description	Quantity
1	Manuals	1 pcs
2	Temperature sensors: TC - Heating / cooling temp. sensor TW - Domestic hot water temp. sensor TR - Room temperature temp. sensor TV1 - Mixing circuit 1 temp. sensor TV2 - Mixing circuit 2 temp. sensor	1 pcs / each
3	Sensor communication cable	5 pcs
4	Communication cable (indoor - outdoor unit)	1 pcs
5	Sensor communication cable (indoor - outdoor unit)	1 pcs
6	Screws	3 pcs

23.2 AWST-R32-M-V8; 6-15 kW

No.	Description	Quantity
1	Manuals	1 pcs
2	Temperature sensors: TC - Heating / cooling temp. sensor TR - Room temperature temp. sensor TV1 - Mixing circuit 1 temp. sensor TV2 - Mixing circuit 2 temp. sensor	1 pcs / each
3	Extension cables for temperature sensors	4 pcs
4	Communication cable (indoor - outdoor unit)	1 pcs
5	Connection cable (indoor - outdoor unit)	1 pcs
6	Connection cable for P0 circulation pump	1 pcs
7	Connection cable for P0 circulation pump PWM signal	1 pcs
8	Automatic air purging valve	1 pcs

23.3 AWST-R32-S-V8; 6-12 kW

No.	Description	Quantity
1	Manuals	1 pcs
2	Temperature sensors: TC - Heating / cooling temp. sensor TR - Room temperature temp. sensor TV1 - Mixing circuit 1 temp. sensor TV2 - Mixing circuit 2 temp. sensor	1 pcs / each
3	Extension cables for temperature sensors	4 pcs
4	Communication cable (indoor - outdoor unit)	1 pcs
5	Automatic air purging valve	1 pcs
6	5/8" nut	1 pcs
7	3/8" nut	1 pcs

23.4 AWH-R32-S-V8; 6-12 kW

No.	Description	Quantity
1	Manuals	1 pcs
2	Temperature sensors: TC - Heating / cooling temp. sensor TW - Domestic hot water temp. sensor TR - Room temperature temp. sensor TV1 - Mixing circuit 1 temp. sensor TV2 - Mixing circuit 2 temp. sensor	1 pcs / each
3	Sensor communication cable	4 pcs
4	Communication cable (indoor - outdoor unit)	1 pcs
5	Bracket for indoor unit	1 pcs
6	Expansion bolts	2 pcs
7	Screws	10 pcs
8	Multifunctional safety valve	1 pcs

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We reserve the right to make changes that do
not impair the functionality of the device.