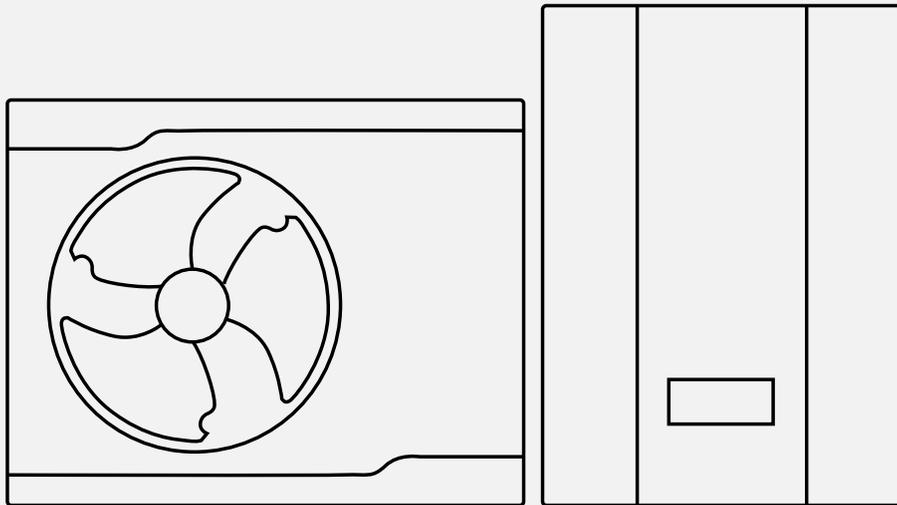


BAUF

BAUF INSTALLER HEAT PUMP
AIR TO WATER SPLIT SAUER R32



INDEX

1. Important information	04	12. Accessories	49
Symbols	04		
Safety	04		
2. Heat pump design	06	13. Contact Information	49
Outdoor and Indoor unit	06		
Electrical	07	Appendix 1.	
Sizes	08	Technical control before start	50
3. Transportation and installation location	09	Appendix 2.	
Transportation	09	Technical control after start	52
Installation location	09	Appendix 3.1	
Condensate drainage	13	Wiring diagram of indoor unit 6-18kW	54
4. System installation	14	Appendix 3.2	
Rated system flows	14	Wiring diagram of outdoor unit 6-18kW	55
Water volume	14	Appendix 3.3	
Hot water tank coil	14	Wiring diagram of indoor unit 10-24kW	56
Condensation and insulation	15	Appendix 3.4	
Pipes connections size`s	15	Wiring diagram of outdoor unit 10-24kW	57
Outdoor unit installation and fastening	15	Appendix 4	
Indoor unit installation and fastening	16	Sensor`s data	58
Pipe connections	16	Appendix 5	
5. Electrical installation	23	Principle hydraulic scheme	60
Recommended power cables	24	Parameter Settings	61
Wiring connection	24		
DIP switches settings	26		
Accessories connections	26		
6. Filling system	30		
7. Commissioning and configuration	30		
Technical control before start	30		
Releasing air during startup	31		
Start and navigate through	31		
8. WiFi adjusting and settings	37		
9. Running and factory parameters	38		
10. Maintenance and service	41		
Checking and cleaning fan	41		
Cleaning heat pump	41		
Draining the indoor unit	42		
Checking the safety valves	42		
Checking the expansion tank	42		
Refrigerant circuit	42		
11. Troubleshooting and diagnostics	43		
Description of all alarms and			
the first solutions	43		
Technical Data	45		
Basic solutions to problems	48		

1. IMPORTANT INFORMATION

■ Symbols



Symbol indicating important information



This appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.



Symbol indicating danger to person or device



The operation manual should be read carefully



Symbol indicating useful information and instructions



This information is available such as the operating manual or installation manual



A service personnel should be handling this equipment with reference to the installation manual

This manual describes installation and maintenance procedures to be performed by qualified specialist. We accept no liability for damage caused by failure to follow these instructions. Provide documentation to the customer and equipment owner.

■ Safety

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

This heat pump unit is a hermetically sealed equipment that contains fluorinated greenhouse gases (A2L).

Children should be supervised to ensure that they do not play with the appliance.

The instructions for appliances having a part of class III construction supplied from a detachable power supply unit shall state that the appliance is only to be used with the power supply unit provided with the appliance.

- This Machine is not allowed to be installed by the user. A professional installer must install it.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- Always wear appropriate PPE when handling the heat pump. This includes safety gloves, goggles, and protective clothing to avoid direct contact with refrigerant or sharp components.
- When installing the device, observe the safety instructions given in this installation manual and in accordance with the local law and directives.
- Keep children away from the equipment.
- The manufacturer is not responsible for improper use or other than intended use.

- Do not allow equipment to freeze.
- Do not start equipment if there is a risk that the water in the system has frozen.
- Incorrect installation of equipment or accessories may cause injury electric current, short circuit, leakage, fire or damage.
- Do not modify, replace or disconnect any safety or control equipment.
- Wear appropriate personal protective equipment (gloves, goggles, etc.) when installation or maintenance of equipment.
- If water escapes from the appliance, there is a risk of scalding. Never touch hot heating water.

R32 refrigerant

This unit contains a fluorinated greenhouse gas that is covered by the Kyoto agreement. The equipment contains R32, a fluorinated greenhouse gas with a GWP value (Global Warming Potential) of GWP 675. Do not release R32 into the atmosphere.

- Be aware that the R32 refrigerant does NOT contain an odour.
- Only certificated person is allowed to do installation, operation and maintenance.
- Marking of equipment using signs: Compliance with local regulations.
- Disposal of equipment using flammable refrigerants: Compliance with national regulations.
- Transport of equipment containing flammable refrigerants: Compliance with the transport regulations
- Before work is started on systems that contains combustible refrigerants, safety checks must be performed to ensure that the ignition risk is kept to a minimum.
- If hot work is carried out on the heat pump, a powder or carbon dioxide fire extinguisher must be to hand.
- All maintenance personnel and individuals working near the product must be informed about the specific tasks to be performed. Avoid performing work in confined spaces. The area around the worksite should be secured with barriers. Make sure the environment is safe by removing any flammable materials.
- Detection of flammable refrigerants.

Before and during the work, use an appropriate refrigerant detector to check for the presence of refrigerant in the area. This will alert the service technician to any potential flammable atmosphere. Ensure the refrigerant detector is designed for flammable refrigerants and does not produce sparks or cause ignition in any manner.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

- There is flammable refrigerant in the unit and it should be installed in a well-ventilated site. If the unit is installed inside, an additional refrigerant detection device and ventilation equipment must be added in accordance with the standard EN378. Be sure to adopt adequate measures to prevent the unit from being used as a shelter by small animals.

- When working on or near the unit, use tools and equipment that are certified for use with flammable refrigerants. Ensure that no sparks or heat are generated during maintenance activities.

- Pipes connected to the unit must be free of any potential ignition sources. Those working on refrigerant system connections, including handling pipes that contain or previously contained flammable refrigerants, must avoid using ignition sources that could create fire or explosion hazards. All possible ignition sources, including smoking, should be kept at a safe distance from the service area where flammable refrigerant leaks may occur. Before starting any work, the surrounding area must be inspected to ensure there are no ignition risks, and "No Smoking" signs should be clearly displayed.

When replacing electrical components, ensure the replacement parts are suitable for the intended purpose and meet the correct technical specifications. Always adhere to the manufacturer's guidelines for maintenance and servicing. If any uncertainty arises, contact the manufacturer's technical support team. The following checks must be performed for installations using flammable refrigerants:

- The actual refrigerant charge is appropriate for the size of the space where the refrigerant-containing parts are installed.

- Ventilation systems and outlets operate correctly and are unobstructed.

- For systems with an indirect refrigerant circuit, verify that the secondary circuit contains refrigerant.

- Ensure all equipment markings are clear and visible; any unclear labels or signs must be replaced.

- Refrigerant pipes and components are arranged to avoid exposure to substances that could corrode the refrigerant-containing parts, unless those components are made of corrosion-resistant materials or are properly protected from corrosion.

Electrical

- Work on electrical equipment may only be carried out by a qualified electrician.

- Prior to the initial commissioning, certified heating contractors must inspect all safety-critical aspects. The system should then be commissioned either by the system installer or by a qualified individual authorized by the installer.

- A note that all work must be carried out in accordance with local regulations and directives.

- The equipment should be installed using an isolator switch. The cable size needs to be determined according to the fuse rating utilized.

- Do not put your fingers into electrical things and use ESD gloves.

- Before starting work on the product, follow these steps:

- Disconnect the product from the power source by turning off all power supplies on all poles.

- Ensure it cannot be re-energized.

- Wait for the capacitor to discharge.

- Verify that there is no voltage.

- Check the connections, main voltage and phase voltage before the product is started, to prevent damage to the heat pump electronics.

- Do not twist, loosen or pull external heat pump cables.

- Always measure the voltage at the contacts, V whose chain you plan to interfere with.

Storage

- The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example:open flames,an operating gas appliance) and have a room size as specified below.

- The storage area must comply with local regulations for the storage of flammable gases.

- Keep the unit in an environment with a stable temperature, ideally between 5°C and 30°C (41°F and 86°F), to prevent excessive pressure buildup inside the system.

- Avoid stacking or placing heavy objects on top of the unit to prevent damage to the pipes and components.

- Implement an explosion prevention strategy for storage.

2. HEAT PUMP DESIGN

This section focuses on the various components inside the heat pump, detailing their functions, locations, and the standard notations used to identify them.

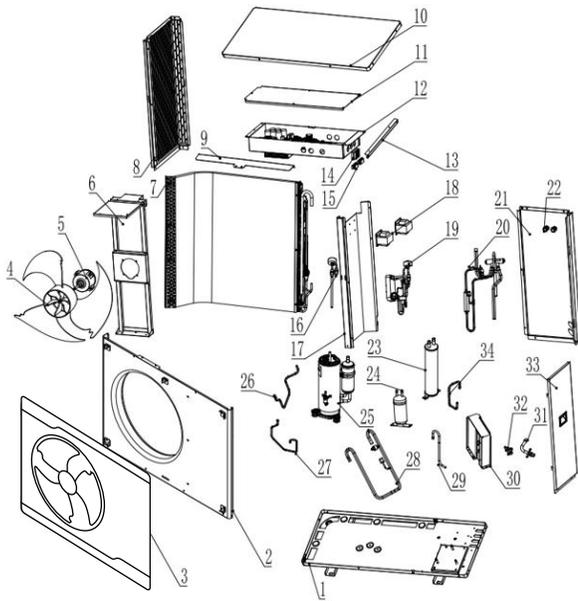


Possible additional manufacturer changes

OUTDOOR and INDOOR UNIT

Outdoor

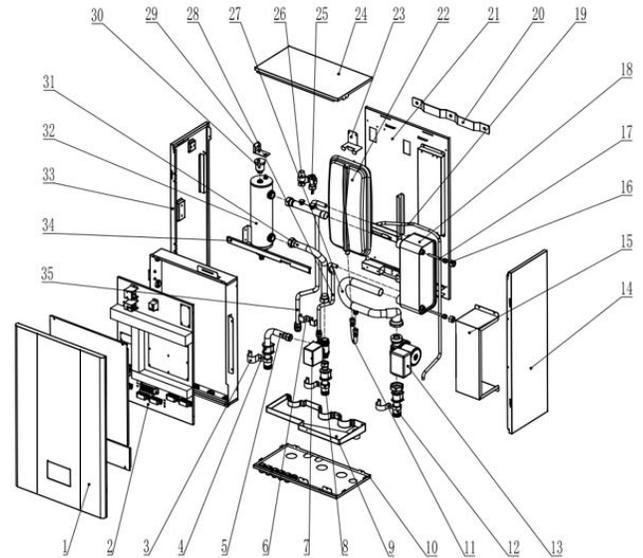
Heat Pump Split R32 Sauer 6/10/14



1. Chassis Drain Pan
2. Front panel
3. Trim panel
4. Fan blade
5. Motor
6. Motor support
7. Evaporator
8. Left pane
9. Evaporator fixed plate
10. Top cover
11. Electrical box cover
12. Electrical components
13. Electrical box fixed plate
14. Terminal
15. Crimping buckle
16. Expansion valve
17. Middle partition panel
18. Electric reactor
19. Economiser components
20. 4-way valve components
21. Right side rear panel
22. Water proof joint
23. Separator
24. Reservoir
25. Compressor
26. Expansion valve components
27. Jet pipe
28. Return pipe assembly
29. High-pressure valve connection
30. Valve fixing plate
31. Service valve-7/8"
32. Service valve-5/8"
33. Right panel

Indoor unit

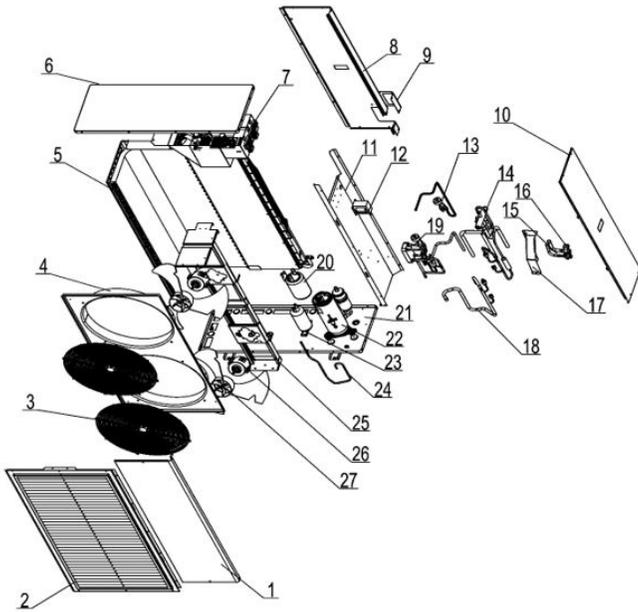
Heat Pump Split R32 Sauer 6/10/14



1. Front panel
2. Electrical components
3. Pipeline fixing clip
4. Pipeline fixing block
5. Buffer tank inlet pipe assembly
6. Fixed plate for refrigerant pipe
7. 3-Way valve
8. Domestic water tank inlet pipe assembly
9. Water drain pan
10. Bottom
11. Expansion tank connection pipe
12. Water circulation pump inlet pipe
13. Water circulation pump
14. Right panel
15. Plate heat exchanger fixing plate
16. G1/2 "union nut
17. Temperature sensing protective sleeve
18. Plate heat exchanger
19. Drain-pipe
20. Hanging plate fixing plate
21. Back metal board
22. Expansion tank
23. Expansion tank fixing plate
24. Top cover
25. Water flow switch
26. Safety valve
27. Plate heat exchanger water inlet pipe assembly
28. Plate heat exchanger refrigerant outlet pipe
29. Electric heating fixing plate
30. Automatic exhaust valve
31. Electric heating outlet pipe assembly
32. Additional electric heating
33. Left panel
34. Electrical box support plate
35. Plate heat exchanger refrigerant inlet pipe

Outdoor unit

Heat Pump Split R32 Sauer 18/24

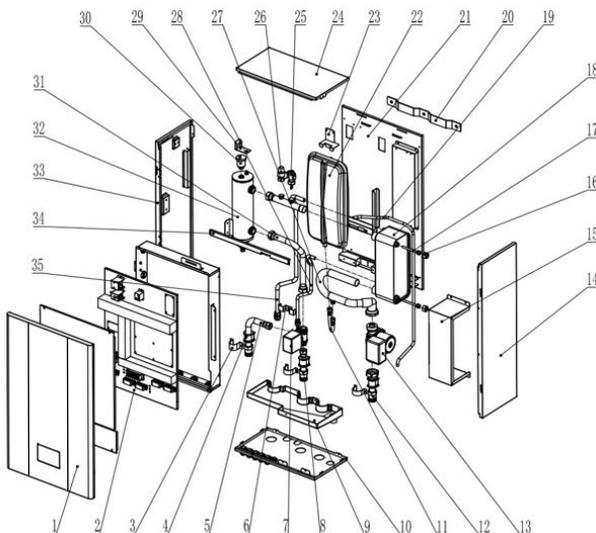


1. Right front panel
2. Left front panel
3. Wind net
4. Air deflector
5. Evaporator
6. Top cover
7. Electrical components
8. Right rear panel
9. Evaporator fixed plate
10. Right panel
11. Middle partition panel
12. Reactor
13. Main valve
14. 4-way valve components
15. Service valve1
16. Service valve2
17. Valve fixing plate
18. Suction pipe component
19. Economic components
20. Gas-liquid separator
21. Chassis Drain Pan
22. Compressor
23. Reservoir
24. Jet tube
25. Motor support
26. Motor
27. Fan

1. Front panel
2. Electrical components
3. Pipeline fixing clip
4. Pipeline fixing block
5. Buffer tank inlet pipe assembly
6. Fixed plate for refrigerant pipe
7. 3-Way valve
8. Domestic water tank inlet pipe assembly
9. Water drain pan
10. Bottom
11. Expansion tank connection pipe
12. Water circulation pump inlet pipe
13. Water circulation pump
14. Right panel
15. Plate heat exchanger fixing plate
16. G1/2 "union nut
17. Temperature sensing protective sleeve
18. Plate heat exchanger
19. Drain-pipe
20. Hanging plate fixing plate
21. Back metal board
22. Expansion tank
23. Expansion tank fixing plate
24. Top cover
25. Water flow switch
26. Safety valve
27. Plate heat exchanger water inlet pipe assembly
28. Plate heat exchanger refrigerant outlet pipe
29. Electric heating fixing plate
30. Automatic exhaust valve
31. Electric heating outlet pipe assembly
32. Additional electric heating
33. Left panel
34. Electrical box support plate
35. Plate heat exchanger refrigerant inlet pipe

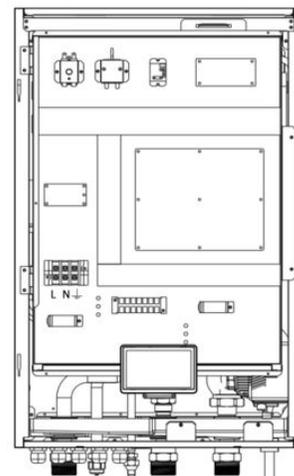
Indoor unit

Heat Pump Split R32 Sauer 18/24

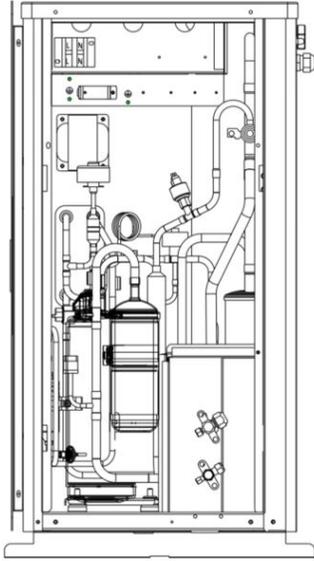


■ Electrical

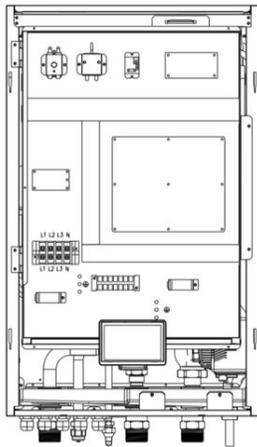
Heat pump Sauer split 1 phase Power connection indoor unit



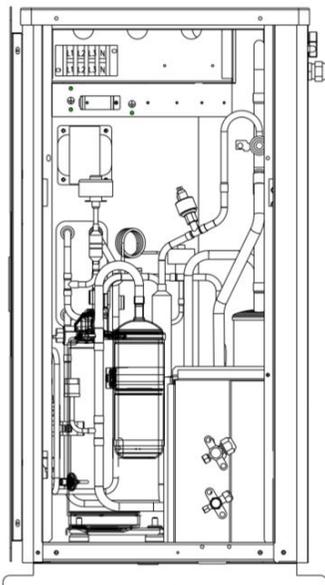
Power connection outdoor unit



**Heat pump Sauer split 3 phase
Power connection indoor unit**

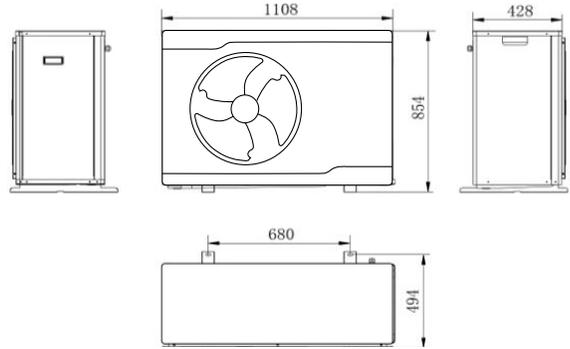


Power connection outdoor unit

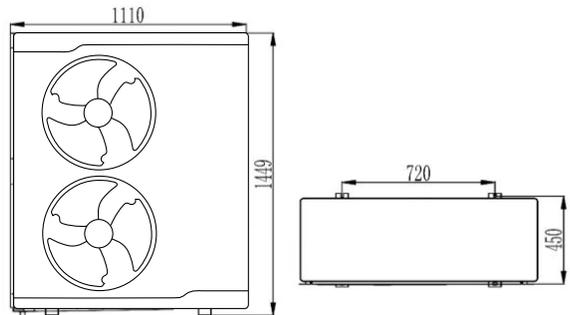


■ Sizes

**Outdoor unit
Heat Pump Split R32 Sauer 6/10/14**

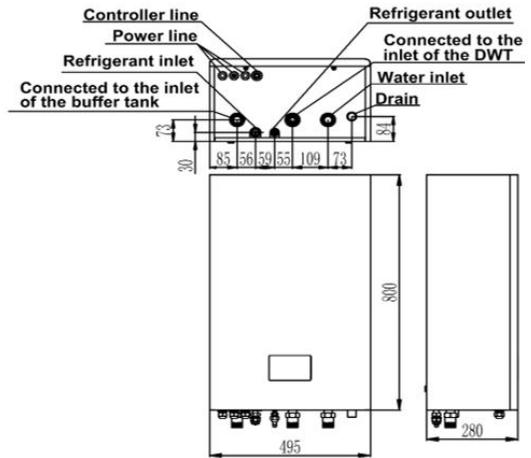


Heat Pump Sauer R32 Elbe 18/24

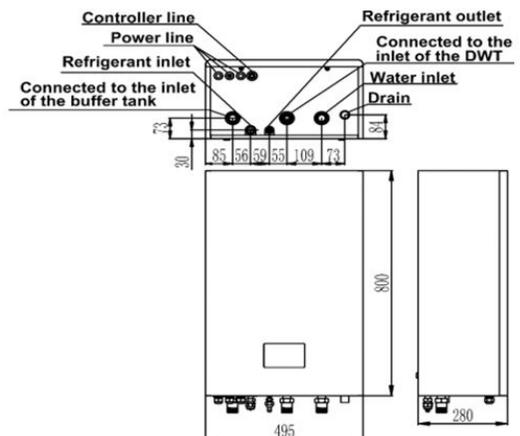


Indoor unit

Heat Pump Split R32 Sauer 6/10/14



Heat Pump Sauer R32 Elbe 18/24



3. TRANSPORTATION AND INSTALLATION LOCATION

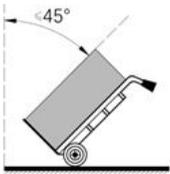
■ Transportation



Transport of equipment containing flammable refrigerants. Compliance with the transport regulations.



When transporting the unit, attention should be paid to maintaining verticality, and the inclination should not exceed 45°C, do not store the unit horizontally to prevent damage to compressor and other components;

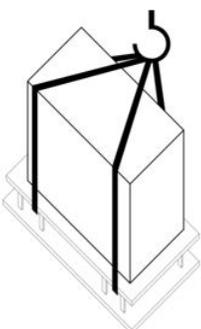


- Make sure that the units are not damaged during transportation.
- Handle the outdoor unit with care upon placement after transportation.
- Minimize vibration during transportation.
- Do not utilize equipment that has been damaged during transit.
- Protect the evaporator on the rear side of the outdoor unit from mechanical stress during transportation, for example, by using cardboard packaging or bubble wrap.

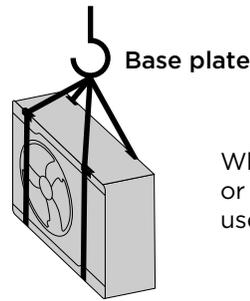


Please note that the equipment is heavy. Use sufficient force to avoid harm to health and equipment.

- Prohibit storing any items on the crew;
- When hoisting the unit, two slings with a length of more than 6m should be used, if the suspension rope is too short, it may cause deformation of the unit. The sling should have sufficient strength to withstand the weight of the unit; When hoisting, the machine should be kept balanced and raised safely and steadily;
- It is strictly prohibited to remove the outer packaging during hoisting to avoid scratching or damaging the machine.



Please lift with packaging or protection in place



When there is no packaging or packaging is damaged, use base plate to protect it

■ Installation location

When selecting a location, design, installation, operation, maintenance, and repair of the instrument, comply with national and local codes and regulations regarding the type of instrument.

The refrigerant circuit in the outdoor unit contains easily flammable refrigerant in safety group A3 according to ISO 817 and ANSI/ASHRAE Standard 34. Therefore a safety zone is defined in the immediate vicinity of the outdoor unit, in which special requirements apply.

The product is appropriate for the following types of installations: ground installation, wall installation, and flat-roof installation.

Install unit outdoors firmly on a level base capable of supporting the weight of the equipment, preferably concrete foundation. If concrete supports are used, they should be located on asphalt or pebbles.

- All wall outlets must be made gas-tight. This also includes wall outlets that lie below ground level.
- Avoid proximity to combustible materials or flammable gases.
- Steer clear of heat sources.
- Avoid placing the heat pump directly on grass or any other soft surface.
- It is advisable to install the heat pump on a ceiling made of steel-reinforced concrete.
- Structural calculations and the mounting system of the outdoor unit should consider increased roof height and wind loads.
- During defrosting, cold vapor is released from the outdoor unit's air discharge vents. This vapor discharge should be considered during installation, including the selection of the installation location and the orientation of the heat pump.



If the heat pump is positioned in a place where any potential refrigerant leakage could gather, such as below ground level (in a depression or low-lying area), the installation must meet the same standards for gas detection and ventilation as required for engineering rooms. Measures concerning ignition sources should also be implemented if deemed necessary.

- Do not install the outdoor unit near wells, pumps, power supplies to the house, sockets, lamps.

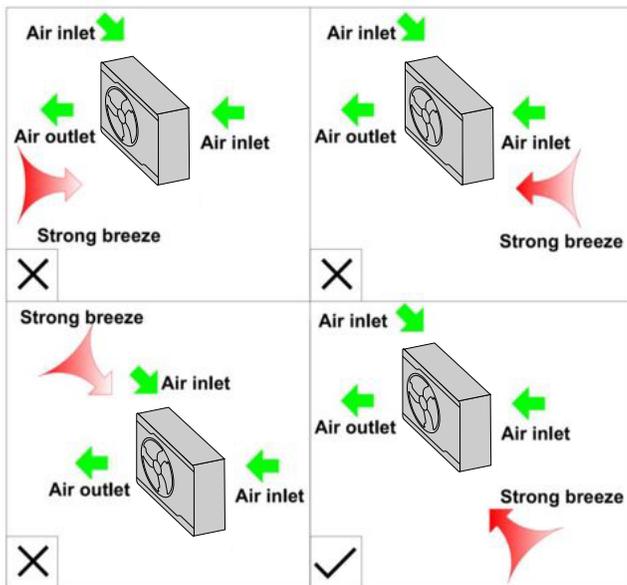
- Do not install equipment near doors or windows.

- Heat pump should not be placed adjacent to walls sensitive to noise, such as those adjoining a bedroom and ensure that the placement does not cause disturbance to neighbors.

- Avoid installing the product in buildings constructed with a wooden framework or featuring a lightweight roof.

- Install on site with good air circulation.

- The evaporator should not be exposed to strong winds.

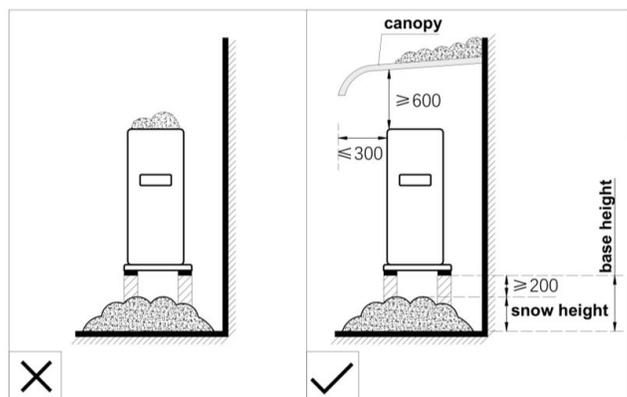


Location in coastal regions is distance less than 1000 m. Coastal areas are prone to corrosion due to salt and sand particles in the air. Place the heat pump in a position shielded from direct onshore wind to minimize exposure.

- Maximum geographical height of the installation location: 1500 m above sea level.

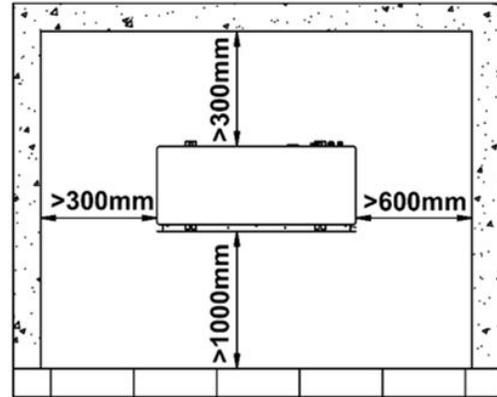
- Installing in underground car parks is not permissible.

- If there is a possibility of snow sliding from the roof, it is necessary to install a protective roof or cover to safeguard the heat pump, pipes, and wiring.



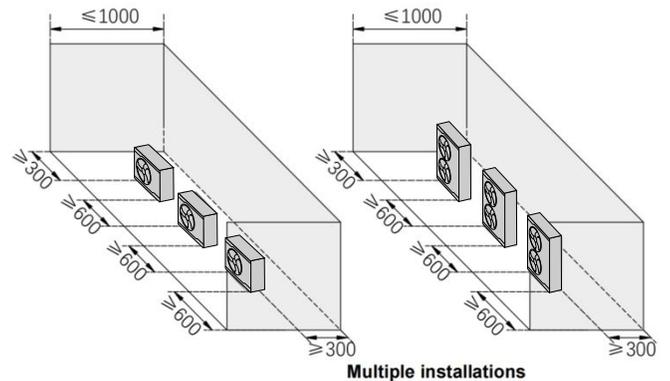
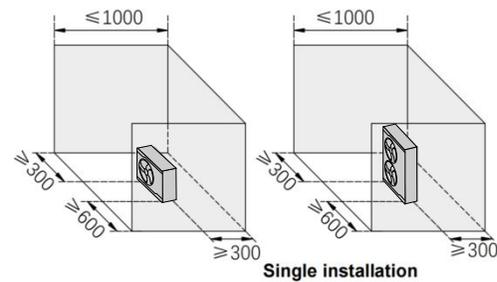
Minimum clearances

Outdoor unit

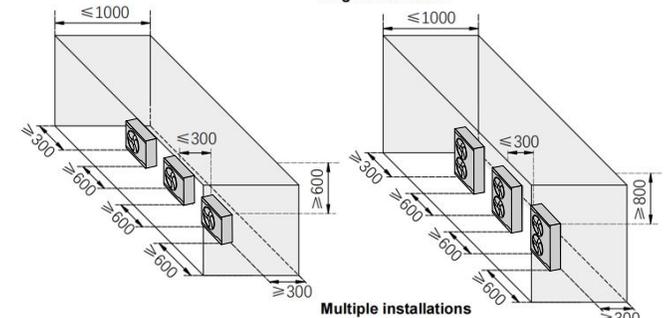
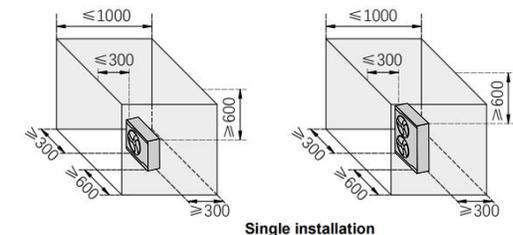


Obstacles on the inlet side and no obstacles on the outlet side.

If there are no obstacles above, the space requirements are as follows (Unit: mm)



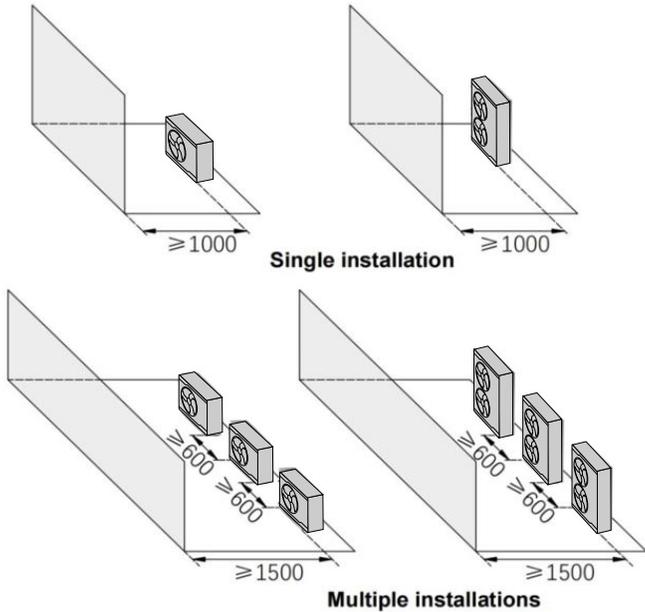
If there are obstacles above, the space requirements are as follows (Unit: mm):



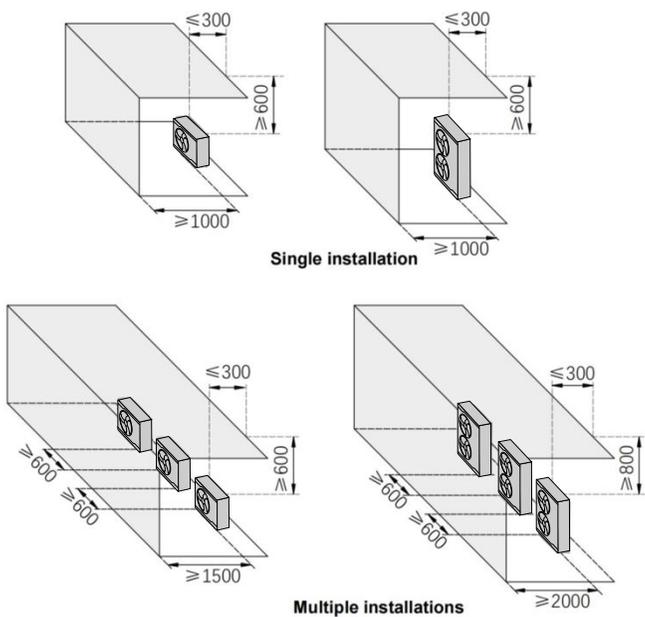
Note: When the length of the left or right walls of the machine exceed 1000mm, soft air ducts should be added to guide the air.

Obstacles on the outlet side and no obstacles on the inlet side

If there are no obstacles above, the space requirements are as follows (Unit:mm)

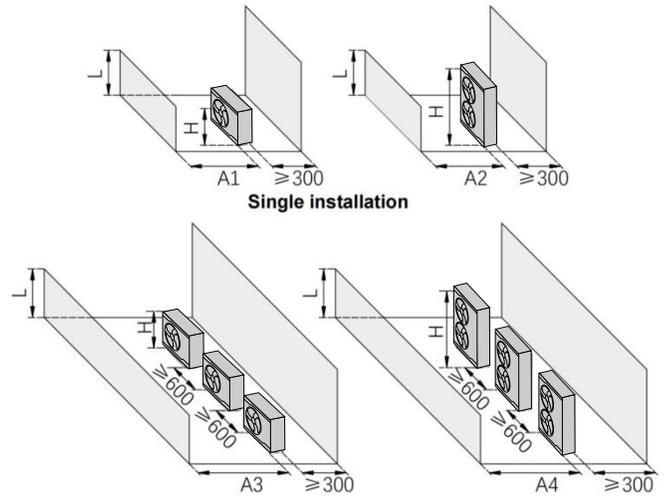


If there are obstacles above, the space requirements are as follows (Unit:mm)



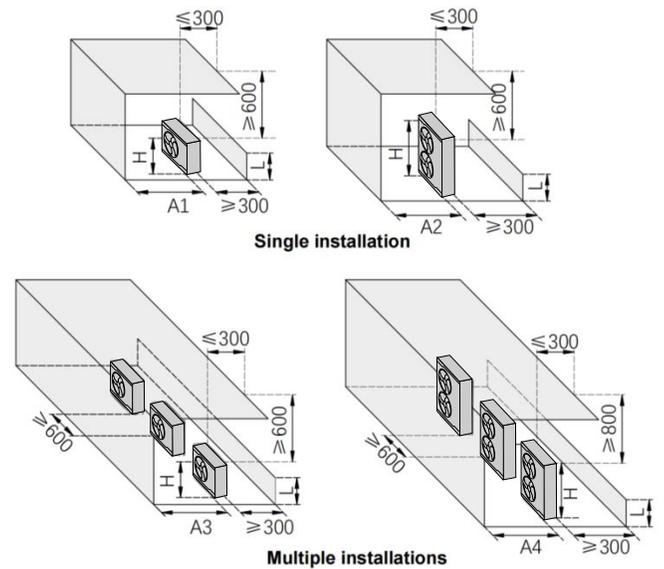
Obstacles on both the inlet and outlet sides.

If there are no obstacles above, the space requirements are as follows (Unit:mm)



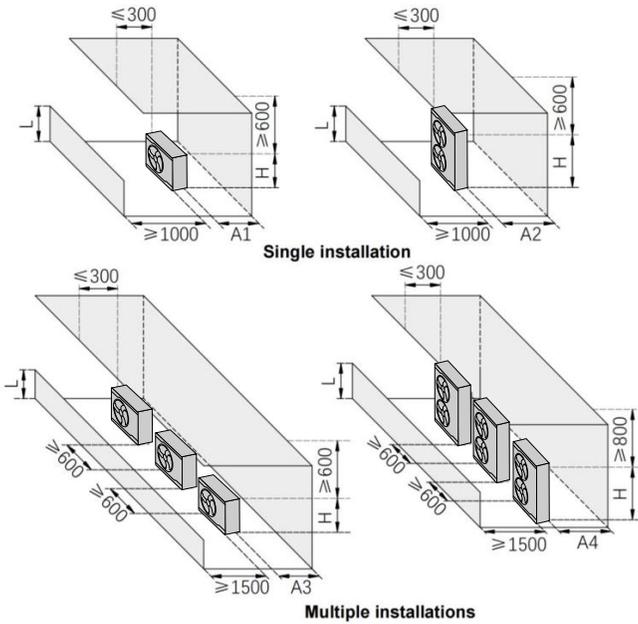
L	A1	A2	A3	A4
$0 < L \leq 1/2H$	≥ 600	≥ 600	≥ 1200	≥ 1500
$1/2H < L \leq H$	≥ 1000	≥ 1000	≥ 1500	≥ 2000

If there are obstacles above, the space requirements are as follows (Unit:mm):



L	A1	A2	A3	A4
$0 < L \leq 1/2H$	≥ 1000	≥ 1000	≥ 1500	≥ 1700
$1/2H < L \leq H$	≥ 1200	≥ 1200	≥ 1700	≥ 2000
$L > H$	Raise the foundation height of the unit to $L \leq H$ or install air ducts to exhaust the air outside the space			

If the height of the obstacle on the outlet side is lower than the height of the outdoor unit, and there is also an obstacle above it, the space requirements are as follows (Unit:mm):

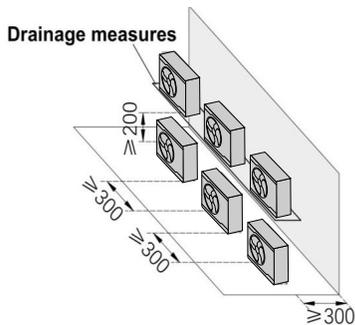


L	A1	A2	A3	A4
$0 < L \leq 1/2H$	≥ 300	≥ 300	≥ 300	≥ 300
$1/2H < L \leq H$	≥ 350	≥ 350	≥ 350	≥ 350
$L > H$	Raise the foundation height of the unit to $L \leq H$ or install air ducts to exhaust the air outside the space			

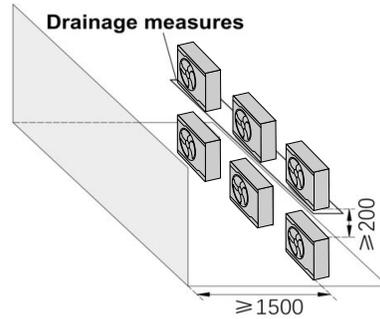
Outdoor unit stacking installation

Only 2-layer stacked installation is allowed. When using this installation method, the upper outdoor unit needs to be equipped with centralized drainage. Stacking installation is prohibited in severely cold areas.

If there are obstacles on only the inlet side, the space requirements are as follows (Unit:mm):

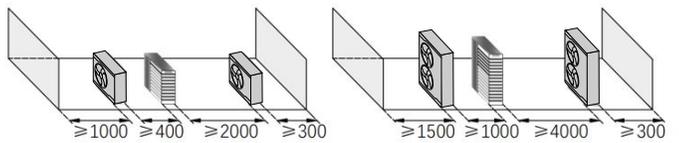


If there are obstacles on only the outlet side, the space requirements are as follows (Unit:mm)

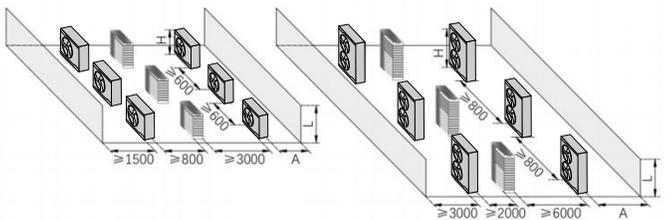


Installation of outdoor units in multiple rows on the roof.

When there is only one outdoor unit in each row, the space requirements are as follows (Unit:mm):

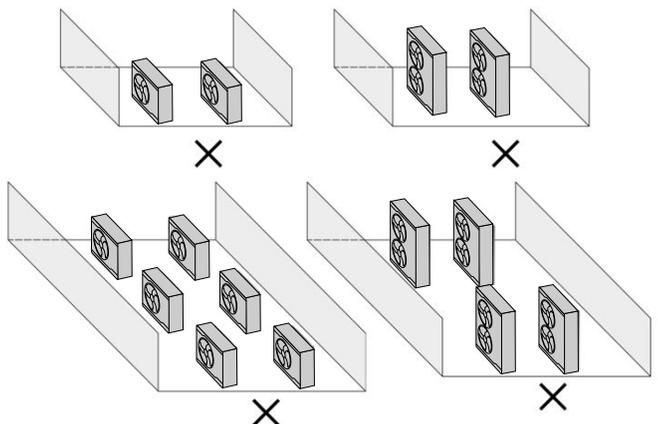


When there are multiple outdoor units in each row, the space requirements are as follows (Unit:mm):



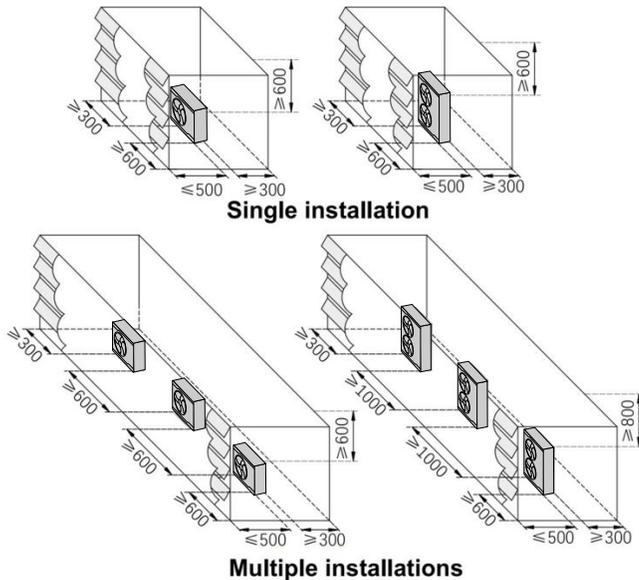
L	A2
$L \leq H$	≥ 300
$L > H$	Raise the foundation height of the unit to $L \leq H$ or install air ducts to exhaust the air outside the space

When installing outdoor units in multiple rows, it is strictly prohibited to install the air outlet side facing the air inlet side (Unit:mm):



Installation requirements for outdoor units in spaces with louvers

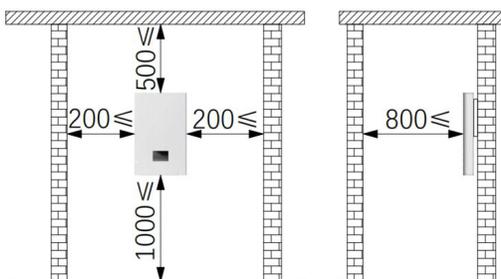
When installing outdoor units in spaces with louvers, the distance between the air outlet and the louvers must be ≤ 0.5 meters; When the distance between the air outlet and the blinds cannot meet the requirements, air ducts must be installed (Unit:mm):



The opening rate of the window shutter should be greater than 90%, and the angle of the window shutter should not exceed 15°



Indoor unit



Condensate drainage



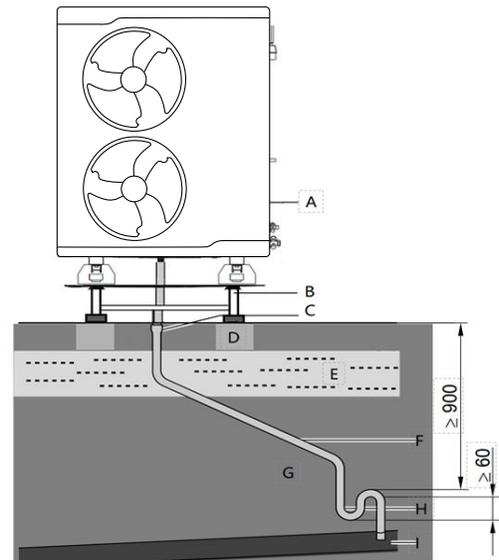
Service personnel must operate this equipment in accordance with the installation manual.

The collected condensation water in the trough should be directed away through a pipe (in the kit) to a suitable drain (at least DN 40). It's advisable to use the shortest outdoor route possible for this purpose.

- Make a non-freezing zone under outdoor unit with crushed condensate to a depth that meets local building codes.

- The condensate drain pan is equipped with a heating system, but it is additionally necessary to install a heating cable for the condensate pipe, where the air temperature drops below 0 degrees.

- You can drain the condensate either into a separate well or into a separate well or into the sewage system.



CONDENSATE DRAIN TO SEWAGE SYSTEM

- A. Heat pump outdoor unit
- B. Floorstanding stamina
- C. Condensate drain connector
- D. Foundation for stamina
- E. Crushed stone pillow
- F. Ribbon heater in the drain pipe (at least DN40)
- G. Ground
- H. Water seal
- I. Drain sewage

- Ensure that the pipe slopes downward from the heat pump. The condensation water pipe should include a water seal to prevent air circulation within the pipe.

- The condensate must flow freely.



The downpipe should not be connected to any pre-existing underground drain pipe that is connected to the wastewater system.

4. SYSTEM INSTALLATION



Observe safety measures when working with equipment with R32 freon.



Improper installation can result in equipment damage and personal injury, such as if the outdoor unit tips over or falls. Ensure the outdoor unit is installed strictly according to the guidelines provided in these instructions.



This appliance uses flammable refrigerant. If refrigerant leaks and is exposed to an external ignition source, there is a risk of fire.



Service personnel must operate this equipment in accordance with the installation manual.

- Don't forget to install all qualiters, check valves, shut-off valves, and an additional expansion tank if necessary.
- Install air valves on the highest points.
- Install the Y - filters suitable with your system mesh 40 in order to protect the device from foreign particles.
- The water quality flowing into the hot and cold water system must meet the following requirements. If it cannot meet the requirements, softening treatment is required:

Type	Unit	Standard	Type	Unit	Standard
PH (25°C)	/	7.5-8.0	Dissolved oxygen	mg/L	0
Turbidity	NTU	≤3	Organic phosphorus	mg/L	0
Conductivity (25°C)	μS/cm	≤200	Sulfate	mg/L	≤50
Chloride ions	mg/L	≤50	Acid consumption	mg/L	≤50
Iron ions	mg/L	≤0.3	Sulfide ions	mg/L	0
Calcium hardness	mg/L	≤80	Ammonium ions	mg/L	0
Total alkalinity	mg/L	≤200	Silica	mg/L	≤30

- Be careful when choosing pipe diameters.
- Install the shut-off ball valves closer to the indoor unit, as well as in other places for easy maintenance of the system in the future. You can install for dismantling outdoor and indoor unit.
- Calculate and install the expansion tank.
- Add an additional circulation pump if required.
- If you use metal pipes for connections to the outdoor unit, it must be grounded.
- Incorporate the outdoor unit into the lightning protection system.

- Thoroughly flush the heating system before connecting the product to remove any residue from the pipelines.

■ Rated system flows

In heating systems that primarily use thermostatic or electric valves, it's essential to maintain a constant and sufficient flow through the heat pump. During the design of the heating system, the minimum circulation volume of water for heating must be ensured for normal operation and defrosting.

Heat pump	Rated flow (m ³ /h)
6kW	1.1
10kW	1.75
14kW	2.52
18kW	3.2
24kW	4.12

■ Water volume

If you have in the your system non controlled by heat pump thermostats or another control and shut-off valves, than use bypasses for providing the necessary flow.

Heat pump can control pressure and flow across coil in heater tank if you have a small square. But for heating mode and circuit, please, provide a necessary volume.



The normal working water capacity can ensure normal defrosting in winter (to ensure that the water capacity per kW exceeds 10 l).

■ Hot water tank coil

The system have a safety and smart controlling for a little coil in water tanks, but there are limits. This information is recommended only.

Heat pump	Re-comm.	6 kW	8-10 kW	12-16 kW
Tank volume, l	Min.	100-250	150-130	200-500
Heat exchange area for stainless steel, m ²	Min.	1.4	1.4	1.4
Heat exchange area for enamel, m ²	Min.	2.0	2.0	2.0

■ Condensation and insulation

Insulation and wrapping of refrigerant pipes

Before completing the airtightness test of the refrigerant pipeline, it is not allowed to insulate or wrap any welding points and internal machine horn connections.

Both liquid side piping and gas side piping must be insulated. Poor insulation can cause dripping or burns.

• Selection of insulation materials:

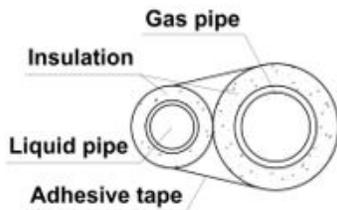
1. Insulation materials should use closed cell foam insulation materials, with a combustion grade of B1 and a flame resistance exceeding 120 °C.

2. When the outer diameter of the pipeline is ≤ 12.7 mm, the thickness of the insulation layer is ≥ 15 mm.

When the outer diameter of the pipeline is ≥ 15.9 mm, the thickness of the insulation layer is ≥ 20 mm.

3. If the refrigerant pipeline is installed in a humid and hot environment, the thickness of insulation material should be appropriately increased to ensure good insulation effect.

To avoid condensation and water leakage on the connecting pipe, the gas and liquid pipes of the connecting pipe must be separately wrapped with insulation material and tape to ensure isolation from the air.



Insulation of water pipe

- Insulate the pipes inside the building according to the norms and directives.

- The equipment has condensate pan heating belt. Use additional heating for condensate drain hose if this is not enough in your region.

1. The transmission and distribution pipelines should adopt insulation measures and comply with the following regulations:

1) The material and thickness of the insulation layer should be executed according to the construction drawings;

2) When using non closed cell materials, a protective layer should be placed on the outer surface;

3) Measures should be taken to prevent "hot bridges" or "cold bridges" at the locations where pipelines pass through walls or floors;

4) If not specified in the drawings, the minimum insulation layer thickness for pipe and equipment can be selected according to the table.

Heat-insulating material		Flexible foam rubber		
	Diameter	\leq DN20	\leq DN25-DN40	\leq DN50
Indoor	The minimum insulation layer thickness for pipe (mm)	25	28	32
	The minimum insulation layer thickness for equipment (mm)	45		

2. Insulation materials and their products should provide product quality inspection reports and factory certificates, and their specifications, performance, and other technical indicators should comply with relevant technical standards and design documents.

■ Pipe`s connections sizes

Pipe installation must be carried out in accordance with current norms and directives.

Refrigerant Pipe connection	Refrigerant Pipe connection	
	Liquid side	Gas side
6 kW	6.35 mm (1/4")	12.7 mm (1/2")
10-14 kW	9.52 mm (3/8")	15.9 mm (5/8")
18-24 kW	12.7 mm (1/2")	19.1 mm (3/4")

Water pipe`s

It is recommended to use PPR, which should be heat-resistant and have a pressure bearing capacity that meets local technical requirements (when there are no relevant requirements, the pressure bearing capacity should not be less than 2.0MPa), The size of the inlet and outlet interfaces of this unit is G1, male.

Refer to the table below for comparison between pipes and diameters:

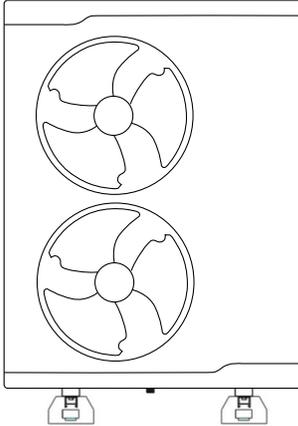
Water pipe connection	Water pipe connection
6-10 kW	G1(DN25)
14 kW	G1-1/4(DN32)
18-24 kW	G1-1/2(DN40)

■ Outdoor unit installation and fastening

Prepare the rubber insulators that is included to the kit. Prepare the concrete bricks or a metal bracket(not included in to the kit). Install the rubber insulators and tight the outdoor unit.



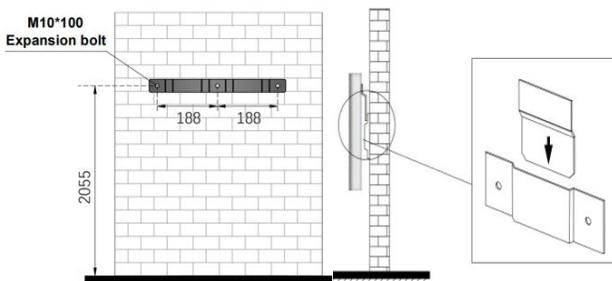
Adjust the position of the outdoor unit.



Indoor unit installation and fastening

Use the bracket fixing screw to secure the indoor unit to the wall. The wall must meet the structural requirements. Use suitable fixing materials, depending on the wall type.

Select a wall that can withstand the weight of the unit during operation, and follow the distance shown in the following diagram, using 3 pieces $\Phi 10$ expansion bolts will firmly fix the fixed hanging plate to the wall, and the height of the hanging plate from the ground can be adjusted according to the actual situation; insert the back hanging plate of the unit into the fixed hanging plate and adjust the unit to be perpendicular to the ground.



Pipe's connections



Incorrect installation can lead to equipment damage and personal injury. Only install the outdoor unit in accordance with the specifications in these instructions and local directives!



All connections are signed with sticks. Please keep an eye on the connection.



If you use non cooper metallic pipes, be sure that you isolated two kind materials from each other.



Do not use Zinc-coated parts to avoid corrosion.

Refrigerant pipes connections



This appliance uses flammable refrigerant. If refrigerant leaks and is exposed to an external ignition source, there is a risk of fire.



Refrigerant should be filled in the refrigeration circuit. When conducting leak detection and airtightness tests, it is prohibited to inject oxygen, acetylene, or flammable or toxic gases, as these gases may cause explosions. It is recommended to use nitrogen as the test gas.

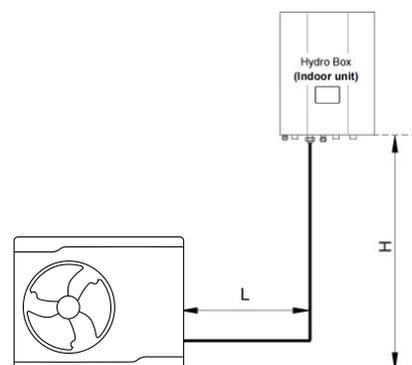
1. Selection of refrigerant pipe material

1. The refrigerant pipe needs to be made of copper and purchased by the user.

2. The thickness of copper pipes must comply with the relevant regulations of the local country/region. When there are no regulations, the thickness of copper pipes can be selected according to the following table (Unit:mm)

Diameter	Thickness	Material quality
$\Phi 6.35$	0.8	0
$\Phi 9.52$	0.8	0
$\Phi 12.7$	1.0	0
$\Phi 15.9$	1.0	0
$\Phi 19.1$	1.0	1/2H
$\Phi 22.2$	1.0	1/2H
$\Phi 25.4$	1.0	1/2H

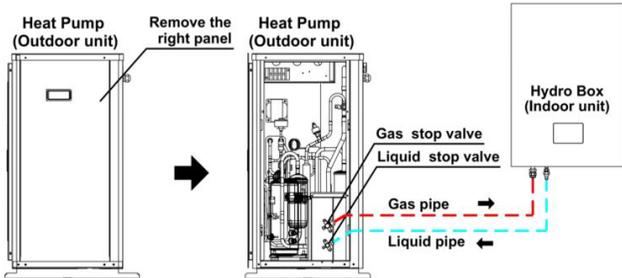
2. Requirements for the length of refrigerant pipe



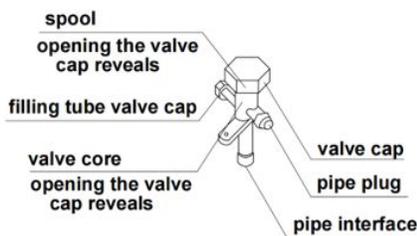
The height difference between the outdoor unit and the indoor unit is $H \leq 5\text{m}$.
 The length of the pipeline between the outdoor unit and the indoor unit is $H+L \leq 15\text{m}$.
 The number of turns must not exceed 10.

3. Installation of refrigerant pipeline

Schematic diagram of refrigerant pipeline valve connection
 The outdoor unit and indoor unit are connected using refrigerant pipes.



Schematic diagram of the structure of the gas (liquid) stop valve.



Refrigerant connection's sizes

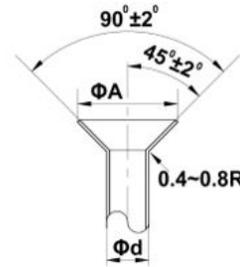
Refrigerant Pipe connection	Refrigerant Pipe connection	
	Liquid side	Gas side
6 kW	6.35 mm (1/4")	12.7 mm (1/2")
10-14 kW	9.52 mm (3/8")	15.9 mm (5/8")
18-24 kW	12.7 mm (1/2")	19.1 mm (3/4")

- Prefabricate the pipeline laying path according to the on-site situation. The shorter the pipeline, the better. The smaller the height difference between indoor and outdoor units, the better. The fewer the bending angles of the pipeline, the better. The bending radius should be as large as possible. When laying according to the predetermined route, the pipeline shall not be flattened or the insulation layer shall not be damaged. The bending radius at the bend must be greater than 3.5 times the diameter of the pipeline. The connecting pipe shall not be frequently stretched or bent, and a pipe shall not be bent at the same place more than 3 times.

- Clean new pipes should be used, and water and debris should not enter the pipes during construction; If water and debris enter, be sure to flush the pipeline with nitrogen gas. When pipes pass through walls, or place on the ground, or on rainy days, the pipe head should be sealed with a pipe cap or tape.

- Before tightening the expansion nut, apply refrigeration oil (compatible with the refrigerant of the model must be used) to the outer surface of the pipe expansion and the cone surface of the nut, and tighten it by hand for 3-4 turns first. When connecting or removing pipes, both wrenches must be used simultaneously.

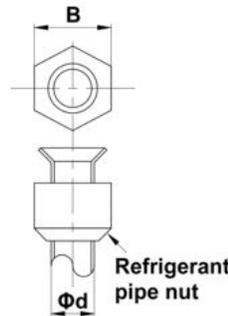
(1) Copper tube expansion size (Unit:mm)



Φd	ΦA
6.35	9.1
9.52	13.2
12.7	16.6
15.9	19.7

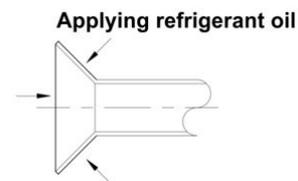
Note: When the material is 1/2H, it cannot be flared, and a flared variable diameter pipe needs to be used.

(2) Dimensions of copper pipe special joint (Unit: mm)

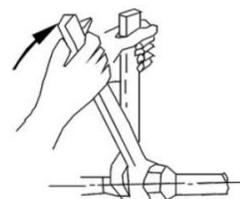


Φd	B
6.35	17
9.52	22
12.7	26
15.9	29
19.1	36

(3) Apply refrigerant oil position



(4) The torque required for tightening the pipeline with a wrench



Diameter	Moment(N*m)
Φ6.35	14-18
Φ9.52	34-40
Φ12.7	49-61
Φ15.9	62-75
Φ19.1	98-120

Connect the indoor unit and connect all refrigerant and hydraulic lines (room heating/cooling, DHW heating). Connect the drain hose from safety valve in accordance with local norms and conditions. Follow the stick on the bottom of equipment.



Excessive torque can damage the horn flares, while insufficient torque can cause air leakage. Please refer to the torque values in the table.

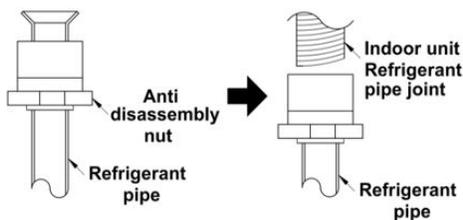
- When the refrigerant pipe needs to be cut, a professional pipe cutter must be used, and equipment such as saw blades or polishing machines must not be used. Ensure that the incision is smooth and flat, forming a 90 ° angle with the pipe wall.

- During operating , the pipe may vibrate, expand or shrink. If not fixed, the load will be concentrated in a certain part, which may cause deformation or rupture of the pipeline. Suspended pipelines should be well supported, and the distance between supports should not exceed 1m. The pipeline should be protected with buckle plates, and should be protected from sun, rain, weathering, and accidental damage.

- After the connected pipeline is made, please clean the pipeline with high-pressure nitrogen gas.

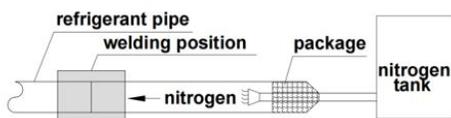
- Connect the indoor unit first, and then connect the outdoor unit.

- In order to prevent the connection between the indoor unit pipe joint and the connecting nut from loosening, which may lead to refrigerant leakage and cause safety accidents. It is recommended to use anti disassembly nut for indoor unit. First, thread the refrigerant pipe into the anti disassembly nut, and then tighten the anti disassembly nut to the indoor unit refrigerant pipe joint.

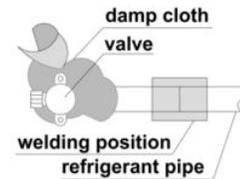


- The outdoor unit must ensure that the gas (liquid) stop valve is completely closed (in the factory state). Every time the connection is made, the nut should be loosened from the shut-off valve and the expansion pipe should be quickly connected. To prevent dust and other debris from entering the pipeline after the nut is removed and left for too long.

- When using brazed pipe joints, nitrogen should be introduced into the pipe, and the pressure regulator must be set at 0.02MPa (about 0.2kgf/cm²) before welding can be carried out under the condition of nitrogen flow. Otherwise, a large amount of oxygen film will form inside the pipe, causing adverse effects on the valves and compressors in the system, leading to abnormal operation or failure of the system.



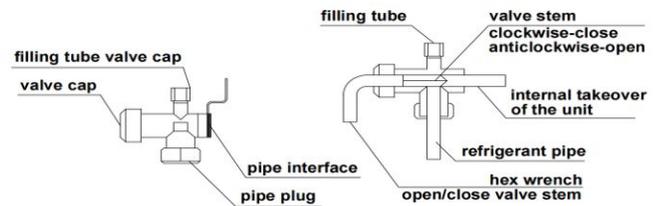
- When welding the outdoor unit connecting pipe, please wrap the valve body with a damp cloth to avoid high-temperature damage to the stop valve.



Air tightness test

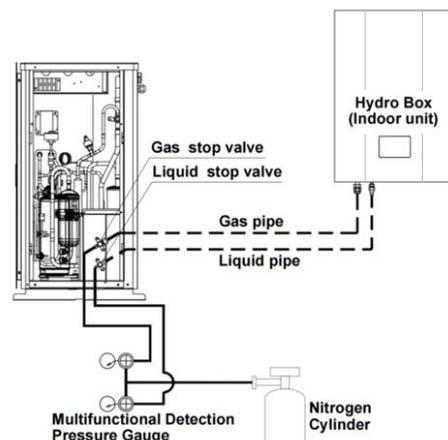
After the refrigerant pipe connects the outdoor unit and the indoor unit, conduct an air tightness test on the pipeline system.

Open right panel, before conducting the test, please open the valve cap and confirm that the valve is tightly closed (clockwise direction).



Precautions for air tightness test:

- The air tightness test must use nitrogen as the medium, and the use of other gases is prohibited;
- The air tightness test must be conducted using specialized tools, and the pressure gauge range should be not less than 5.0 MPa;
- When recording data, it is necessary to simultaneously record the reading of the pressure gauge, ambient temperature and test time.
- Pressure correction: Temperature change of 1 results in pressure change of 0.01 MPa;
- If long-term pressure retention is required, the pressure should be reduced to 0.5MPa or below;
- Long term high pressure may cause leakage at the welding site and pose safety hazards;
- Before completing the airtightness test of the refrigerant pipeline, it is not allowed to insulate or wrap any welding points and the connection of the internal machine horn mouth; (8) When pressurizing, both the gas and liquid pipes should be pressurized simultaneously, and it is strictly prohibited to pressurize from a single pipetest time;



Operating steps for air tightness test

The system test pressure is 4.3MPa, and the air tightness test must use dry nitrogen as the medium. Slowly pressurize in three steps:

1. Slowly pressurize to 0.5MPa, hold for 10 minutes, and conduct a leak check. Leaks may be found;
2. Slowly increase the pressure to 1.5MPa, hold for 10 minutes, and conduct an air tightness check. Leaks may be found;
3. Slowly apply pressure to 4.3Mpa, hold for 10 minutes, and conduct a strength test to check for any slight penetration or sand holes;
4. After pressurizing to the test pressure, hold it for 24 hours and observe whether the pressure has decreased. If the pressure does not decrease, it is considered qualified.



In order to prevent internal piping nitride, Nitrogen filling operations must be taken when the piping is welding, otherwise oxidation chip will plug the refrigerant cycling.

Vacuum pumping

Connect regulating valves at both ends of the liquid and gas stop valves as shown in the figure . Vacuum for 1-2 hours until the vacuum degree reaches below -0.1MPa (gauge pressure). Close the regulating valve, stop vacuuming and maintain for more than 1 hour. Confirm that the pressure of the regulating valve has not increased.

Note:

1. In direct contact with the refrigerant, professional tools and instruments for the refrigerant should be used;
2. Vacuum pumping must be carried out simultaneously from both the liquid and gas stop valves;
3. If the vacuum degree cannot reach -0.1MPa, there may be leakage. The airtightness should be checked again. After eliminating the leakage point, the above vacuum pumping operation should be repeated;
4. If the vacuum degree cannot be maintained after two vacuuming attempts, it can be determined that there is moisture in the pipeline under the condition of ensuring no leakage. At this point, vacuum breaking should be used to drain the water. The specific method is to fill the pipeline with 0.05MPa nitrogen gas, vacuum for 2 hours, and maintain vacuum for 1 hour. If the vacuum level cannot be reached, repeat this operation until all the water is drained.

Refrigerant filling

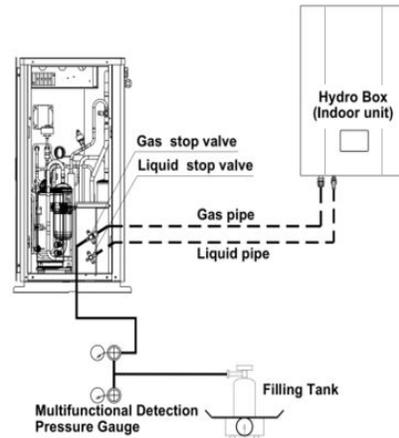
1. Connect the regulating valve and filling tank to the gas stop valve using a filling tube.

2. Open the regulating valve and fill the refrigerant (ensuring it is filled in liquid state), and fill the specified amount of refrigerant.

3. Use a weight gauge to confirm the refrigerant charge. Excessive or insufficient refrigerant can cause serious damage to the unit.

4. After filling is completed, fully open the stop valve.

5. If the refrigerant cannot be fully charged, it can be charged from the gas stop valve or maintenance joint after the unit is turned on.



Pressure measurement

When measuring pressure, measurements can be made from the stop valve detection joint. Due to different operating modes, the high-pressure and low-pressure sides may change. The pressure gauge should be connected according to the following table.

Name	Cooling mode	Heating mode
Gas stop valve detection joint	Low pressure	High pressure
Liquid stop valve detection joint	High pressure	Low pressure

Calculating additional refrigerant charge

The outdoor unit is already filled with refrigerant when leaving the factory. If the pipe length is 5m or less, there is no need to add additional refrigerant; otherwise, the amount of refrigerant to be added should be executed according to the table (Unit:Kg)

Model	Liquid pipe diameter	Additional refrigerant with equivalent pipe length
6 kW	Φ6.35	0.020Kg/m X (L-5) L: the length of the liquid pipe between indoor and outdoor units(m)
10-14 kW	Φ9.52	0.050Kg/m X (L-5) L: the length of the liquid pipe between indoor and outdoor units(m)
18-24 kW	Φ12.7	0.085Kg/m X (L-5) L: the length of the liquid pipe between indoor and outdoor units(m)

Refrigerant recovery

If the unit needs to be relocated, dismantled, or modified, the refrigerant should be recycled outdoor unit.

The steps for recovering refrigerant are as follows:

1. Connect the multifunctional measuring machine to the gas stop valve and the liquid stop valve.
2. Turn on the power supply of the unit.
3. Set the unit to cooling mode, close the liquid stop valve, and the unit begins to recover refrigerant.
4. When the pressure gauge (gas stop valve) on the low-pressure side shows 0.2MPa, immediately close the gas stop valve.
5. Stop the outdoor unit operation.
6. Turn off the power supply of the unit.



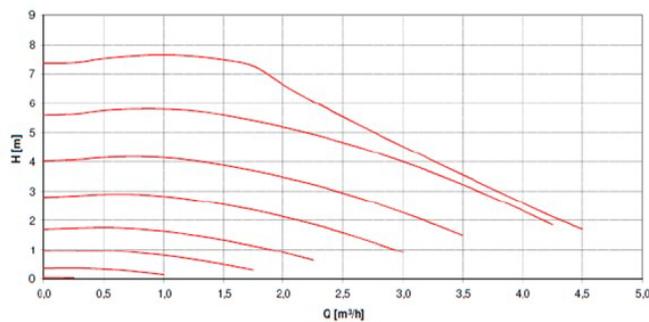
Use a pressure gauge to measure low pressure and maintain its pressure not less than 0.2MPa. If the pressure is too low, it will damage the compressor.

Hydraulic pipe`s connections

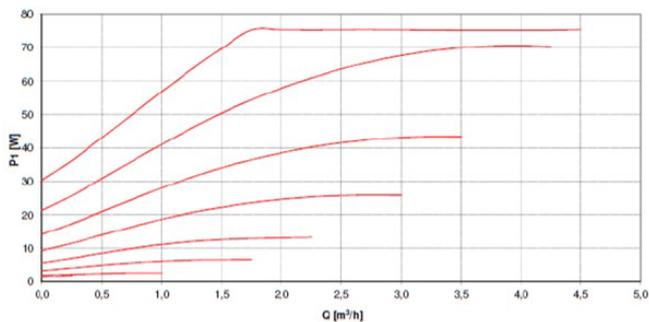
• Hydro box, buffer tank, and hot water tank should be installed as close as possible. If the distance is too far, the pressure loss of the pipeline will increase, and it is necessary to calculate whether the head of the water pump meets the normal operation of the system.

Pump`s H-P diagrams

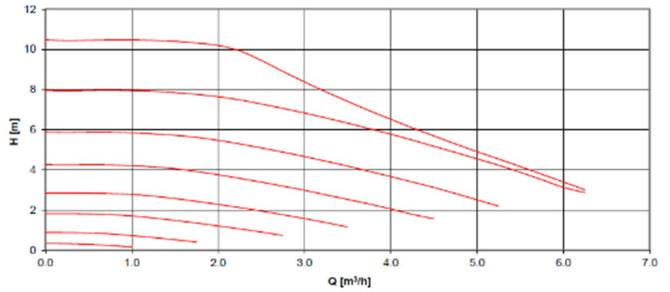
Sauer 6-10 kW H-Q



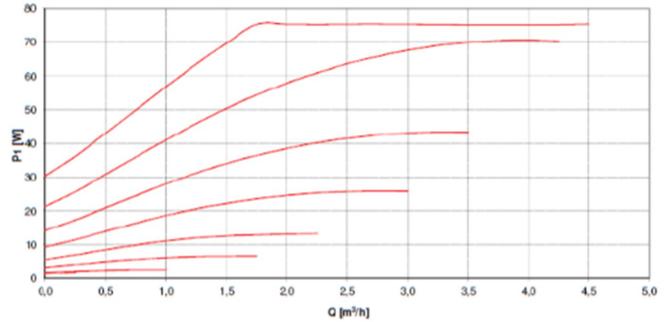
P-Q



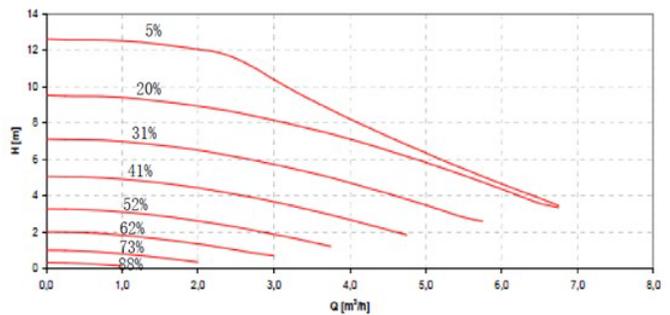
Sauer 14 kW H-Q



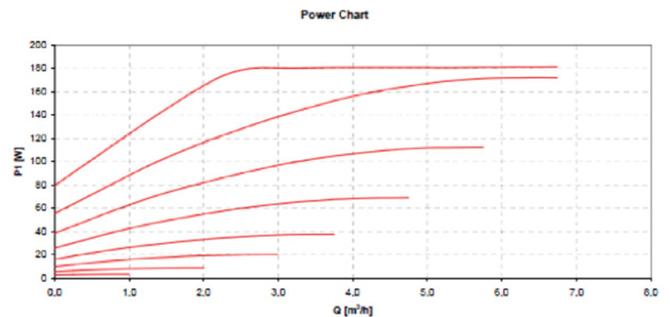
P-Q

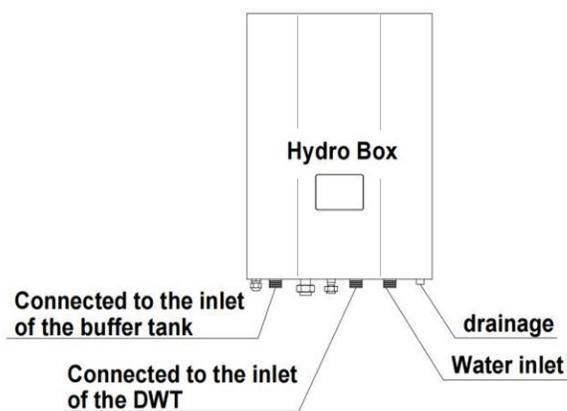


Sauer 18-24 kW H-Q



P-Q





• The system transmission and distribution pipelines and component connections should comply with the following regulations:

1. The bending radius of plastic pipes should not be less than 8 times the outer diameter of the pipeline, and the bending radius of composite pipes should not be less than 5 times the outer diameter of the pipeline;

2. The slope of pipeline laying should be 3‰. Equipment or valve with exhaust function should be installed at the highest point.

• The connection between pipelines, equipment, and valves should comply with the following regulations:

1. The connectors should use specialized connectors that are suitable for the pipes;

2. When using plastic pipe hot melt connection, the working temperature of the hot melt connection should meet the technical requirements of the pipe material;

3. The outer surface of the hot melt connection socket and the inner surface of the socket should be scraped with a small diameter of 0.2mm. The oxygen blocking layer of the oxygen blocking pipe must be scraped during hot melt connection;

4. The allowable error in concentricity after hot melt connection should be 2%, and the misalignment at the interface should be less than 10% of the wall thickness;

5. The hot melt device should use a digital temperature dial, and the temperature should be executed according to the regulations of the pipe manufacturer;

6. Insulation measures should be taken between plastic pipes and composite pipes and metal supports and hangers, and direct contact should not be allowed. Non metal pads or sleeves should be added between pipes and supports, and the spacing between supports and hangers should meet the design requirements. When there are no design requirements, the maximum spacing between plastic pipes and composite pipe supports should comply with the provisions of table:

Diameter (mm)	20	25	32	40	50
Horizontal maximum spacing (mm)	300	350	400	500	600
Vertical maximum spacing (mm)	900	1000	1100	1300	1600

7. The connection between system pipelines, valves, and metal connectors should be of the clamp type, sliding type, or sleeve type.

• The water pressure test of the pipeline should comply with the following regulations:

1. Components should undergo strength and tightness tests;

2. After the installation of the water pipeline, a water pressure test should be conducted. The test water temperature should be between 5°C and 40°C, and the accuracy of the pressure gauge should be greater than 0.01MPa. The test pressure should be 1.5 times the working pressure and not less than 0.3MPa. After stabilizing for 10 minutes, the pressure should not decrease. After the pressure test is completed, the pressure should be reduced to the working pressure, and the pressure should not decrease within 60 minutes. If there is no leakage during the appearance inspection, it is considered qualified;

3. Reliable anti freezing measures should be taken during the winter water pressure test. After the pressure test is completed, the water should be drained in a timely manner. If necessary, compressed air should be used to blow out the stored water at the low point of the water system.

• Please, flush and blow the pipes before connecting. The flushing test should comply with the following regulations:

1. When cleaning the water system, it is necessary to separate from the unit and cycle the water system separately to ensure that there are no impurities in the water system before connecting the water system to the unit;

2. Flushing tests should be conducted on different loops of the water system one by one. After flushing, it should be ensured that the water and flushing fluid in the pipelines and equipment are completely drained. After cleaning, the filter should be promptly removed and cleaned.

• During the installation process of all winter engineering projects, it is strictly prohibited to inject water into the system before the unit has no normal anti freezing protection ability to prevent freezing and damage to water pipelines and end equipment. The residual water in the pipelines and equipment during the hydrostatic test must be blown clean with compressed air. Water and antifreeze should be injected after system flushing and pressure testing, and the concentration of antifreeze should meet the antifreeze requirements. Antifreeze can be configured according to concentration or density. During the preparation process, corresponding protective measures should be taken according to the requirements of the antifreeze product manual. Or the system should be equipped with anti leakage protection devices, which should have active power outage protection and alarm functions. When there is water leakage in the system, the anti leakage protection device should automatically cut off the water supply and send out alarm and drainage signals.

- The system drain valve should be installed at the lowest point of the system return pipeline. In cold regions, it is advisable to consider automatic drainage function. When the main engine is powered off, it can automatically empty the water in the system to prevent the system pipeline from freezing and cracking.

- Recommend that the system shall be installed with automatic water refill valve, and the highest point shall be installed with automatic exhaust valve. Automatic exhaust valve installed in the system pipe at the highest point and the installation of the water pipe must be expanded.

- To conveniently maintain the unit, the outlet pipe of the unit needs to be installed with a pressure gauge.

- Connect the drainage hose to the indoor unit drainage outlet, and connect the end of the drainage hose to the floor drain or a drainable place.

- If you choose three and a two way valves for system. Check the local rules. We recommend to use less than 60 second maximum changeover time.

- According to DIN 1988-2, a drinking water filter must be installed in systems with metal pipework.

- The DHW cylinder must have a safety valve.

- If you use appliances that heat domestic hot water (DHW) to temperatures above 60 °C, you must install an automatic thermostatic mixing valve in the DHW line. This is necessary to prevent scalding and it is especially important when connecting solar thermal systems.

Antifreeze

In the event of a power failure, the unit's freeze protection will fail. Due to the possibility of power failures when unattended, suppliers recommend the use of antifreeze in the water system. Depending on the expected minimum outdoor temperature, ensure that the water system is injected with the glycol concentration shown in the table below. The performance of the unit will be affected when glycol is added to the system. Correction factors for system unit capacity, flow rate, and pressure drop are listed in the table.

Glycol Concentration (%)	Correction Factor				Freezing Point (°C)
	Cooling Capacity	Power Input	Water Resistance	Water Flow	
0	1.000	1.000	1.000	1.000	0
10	0.984	0.998	1.118	1.019	-4
20	0.973	0.995	1.268	1.051	-9
30	0.965	0.992	1.482	1.092	-16

Propylene Concentration (%)	Correction Factor				Freezing Point (°C)
	Cooling Capacity	Power Input	Water Resistance	Water Flow	
0	1.000	1.000	1.000	1.000	0
10	0.976	0.996	1.071	1.000	-3
20	0.961	0.992	1.189	1.016	-7
30	0.948	0.988	1.380	1.034	-13

Uninhibited glycol becomes acidic under the influence of oxygen. Copper purity and higher temperatures accelerate this process. Acidic uninhibited glycol will eat away at metal surfaces, forming galvanic corrosion cells that can cause serious damage to the system.

This is extremely important:

1. Water treatment is properly performed by a water specialist who should be qualified.

2. Glycols containing corrosion inhibitors are selected to counteract the acids formed by the oxidation of the glycol.

3. IF domestic hot water tank is installed, only propylene glycol is permitted. In other installations, the use of ethylene glycol is permitted, unless prohibited by local regulations.

4. Automotive glycols are not used because they have a limited corrosion inhibitor life and contain silicates that can contaminate or clog the system.

5. Galvanized piping is not used in glycol systems because it can cause precipitation of certain elements in glycol corrosion inhibitors.

6. Ensure that the glycol is compatible with the materials used in the system.

Pressure testing, anti-corrosion, and flushing

Pressure testing

System water pressure test: After the system installation is completed, a water pressure test should be conducted before the pipeline insulation.

1. Before the test, the pipeline should be fixed, the joints should be exposed, and water distribution equipment should not be connected;
2. The pressure gauge is installed at the lowest point of the test pipe section, with a pressure accuracy of 0.01MPa;
3. Slowly fill the pipeline with water from the lowest point of the pipe section, fully eliminate the air inside the pipeline, and conduct a water tightness test;
4. It is recommended to use a manual pump for pressure increase. The pressure increase time should not be less than 10 minutes;
5. The pressure test should meet the following requirements:
 - a. Hot water and heating systems should be subjected to a water pressure test at the top of the system working pressure plus 0.1MPa, and the test pressure at the top of the system should not be less than 0.6MPa;
 - b. High temperature hot water heating system, the test pressure should be the working pressure at the top of the system plus 0.4MPa;
 - c. The heating system using plastic pipes and composite pipes should undergo a water pressure test at the working pressure of the system vertex plus 0.2 MPa, and the test pressure at the system vertex should not be less than 0.4 MPa.
6. Inspection method:
 - a. The heating system using steel pipes and composite pipes should have a pressure drop of no more than 0.02MPa within 10 minutes under the test pressure. After the pressure drops to the working pressure, it should be checked and there should be no seepage or leakage;
 - b. The heating system using plastic pipes should have a pressure drop of no more than 0.05MPa within 1 hour under the test pressure, then reduce the pressure to 1.15 times the working pressure, stabilize for 2 hours, and the pressure drop should not exceed 0.03MPa. At the same time, there should be no seepage or leakage at all connections;
 - c. Allow additional pressures twice in 30mins to increase to the test pressure.

Anti-corrosion

After the system pressure test is qualified, remove the rust on the surface of the pipeline, and apply two coats of lead anti rust paint to the pipeline, its welding points, and all supports and hangers.

Flushing

After the pressure test is qualified, the system should

be flushed and the filter and dirt remover should be cleaned until the discharged water is free of impurities such as sediment and iron filings, and the water color is not turbid, which is considered qualified.

5. ELECTRICAL INSTALLATION



Risk of high voltage!



Only a qualified electrician can do this installation part and another electrical work!



Disconnect the current using the circuit breaker before carrying out any servicing!



Check the connections, main voltage and phase before start up!



Service personnel must operate this equipment in accordance with the installation manual.



Read the instruction manual carefully.

- The wiring must be performed by certified person technicians in accordance with national wiring regulation and this circuit diagram. An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device (RCD) with the rating not exceeding 30mA shall be incorporated in the fixed wiring according to the national rule
- Plan the route of the electrical wires from the building and through the wall duct to the product. If the total length of the line is more than 10 meters, plan for separate routes for the power supply cable and the sensor/bus line.
- Use the technical data sticks to determine whether the product requires a 1-/230V or a 3-/400V electrical connection.
- Electrical installation and wiring must be carried out in accordance with national code and regulations.
- If the building is equipped with an RCD, heat pump must be equipped with a separate one. And the RCD must have a nominal tripping current of no more than 30 mA.
- Install separate circuit breakers and RCD on the indoor and outdoor units
- Heat pump need be installed with separate isolator switch.
- Choose a screened cable for communication lines.

- The arrangement of power and signal lines should be neatly and reasonably arranged, not interfering with each other. The minimum distance should be maintained, and the distance between each other should exceed 25 millimeters. At the same time, do not come into contact with the connecting pipe and valve body. When the power line and control line are parallel, please place the wires separately in their respective conduits and leave a suitable distance between the wires.

- In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.

- In places open to the public, it is mandatory to install an emergency stop button close to the heat pump.

Recommended power cables



Incorrect phase sequence can cause damage to the appliance. Make the compressor power supply only in the phase sequence specified (see terminals).

Outdoor unit

Model	Sauer-6 1 phase	Sauer-10 1 phase	Sauer-14 1 phase	Sauer-18 1 phase
Power Supply	220-240 V/ 1/ 50 Hz			
Max Input Current (A)	12	17	27.5	35
Fuse (A)	16	25	40	50
Electric Leakage Protector (mA)	30	30	30	30
Power Cable (mm ²)	3*4	3*4	3*4	3*4

Model	Sauer-10 3 phase	Sauer-14 3 phase	Sauer-18 3 phase	Sauer-24 3 phase
Power Supply	380-415 V/3/ 50 Hz			
Max Input Current (A)	6.5	10.5	13	17
Fuse (A)	16	16	20	25
Electric Leakage Protector (mA)	30	30	30	30
Power Cable (mm ²)	5*4	5*4	5*4	5*6

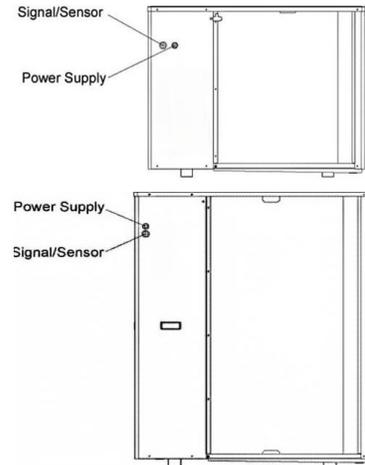
Indoor unit

Model	Sauer-6 1 phase Sauer-10 1 phase Sauer-14 1 phase Sauer-18 1 phase	Sauer-10 3 phase Sauer-14 3 phase Sauer-18 3 phase Sauer-24 3 phase
Power Supply	220-240 V/ 1/ 50 Hz	380-415 V/3/ 50 Hz
Max Input Current (A)	15.6	16.2
Fuse (A)	25	25
Electric Leakage Protector (mA)	30	30
Power Cable (mm ²)	3*4	5*4

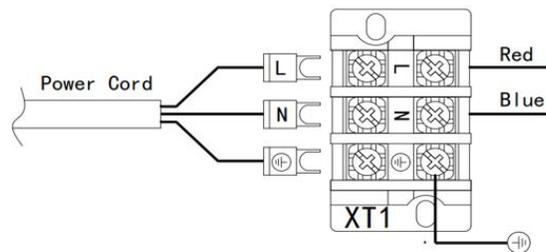
Wiring connections

The voltage of 1 or 3 phases comes from the junction box to the indoor unit. Next, the wire connects the indoor unit and the outdoor one for power supply. The separate wire is used for communication AB-.

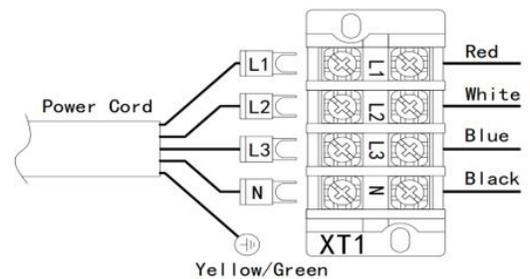
Power and signal connections



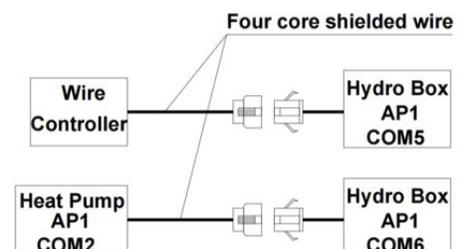
1 phase 230V connection



3 phase 400V connection



Signal wiring diagram

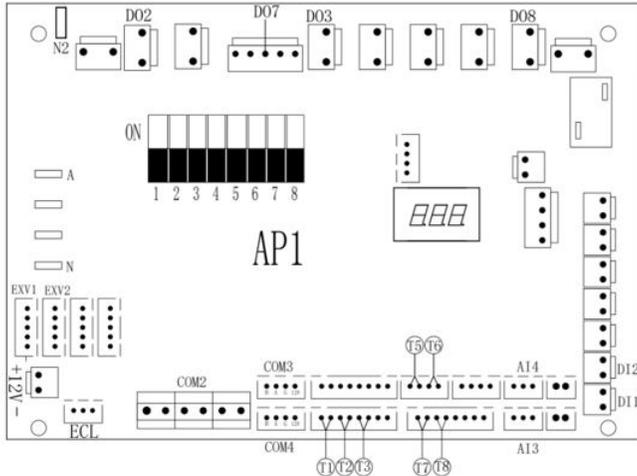


Route the power L N cables and communication cables AB- through the fasteners and connect and tighten to the outdoor unit.

- Protect the RS485 bus communication cable from damage.

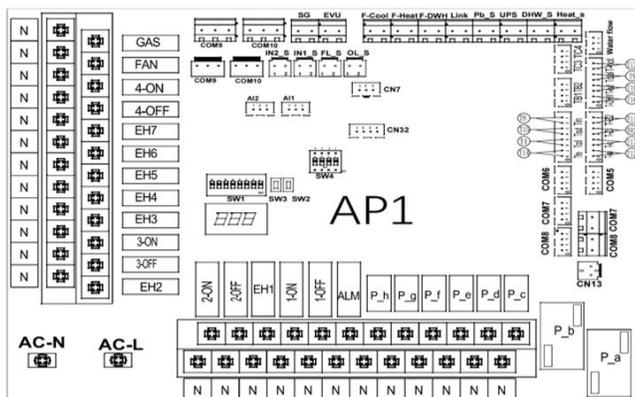
Board`s terminals description

Outdoor unit



Port	Description
N2	Crankshaft heater null wire
D02	4-way valve
D03	Mixing Valve on
D07	Crankshaft heater live wire
D08	Condensate tray heater
A	Live wire
N	Null wire
EXV1	Main EEV
EXV2	Bypass EEV
+12V-	DC 12V
ECL	Expansion Module
COM2	Indoor unit signal
COM3	Connect to AP2
COM4	Connect to AP5
Reserve1	Coil Temp
Reserve2	Gas Exhaust Temp
Reserve3	Gas Exhaust Temp
Reserve5	Economizer Inlet Temp
Reserve6	Economizer Outlet Temp
Reserve7	Ambient Temp 1
Reserve8	Ambient Temp 2
A13	Low Pressure Sensor
A14	High Pressure Sensor
DI1	High pressure switch
DI2	Low pressure switch

Indoor unit



Port	Description
P_a	Circulating Water Pump
P_b	Indoor pump
P_c	Hot water auxiliary pump
P_d	Zero cooling water pump
P_e	Heat source hot water pump
P_f	Reserve
P_g	Reserve
P_h	Mixing pump
ALM	Failure output
1-OFF	DHW Valve off
1-ON	DHW Valve on
EH1	DHW Electric Heater
2-OFF	AC Valve off
2-ON	AC Valve on
EH2	Electric heater for heating
3-OFF	Mixing Valve 2 OFF
3-ON	Mixing Valve 2 ON
EH3	Electric heating of expansion tank
EH4	Electric heating of changing electricity
EH5	Total electrical heating of pipes
EH6	Pipe electric heating 1
EH7	Pipe electric heating 2
4-OFF	Mixing Valve 1 ON
4-ON	Mixing Valve 1 OFF
FAN	Refrigerant leakage exhaust fan
GAS	Gas signal output
CN13	DC12V
COM8	Cascades
COM7	PC monitor
COM6	485 communication
COM5	Power Module/Wire Controller
T12	Hot water side heat source.Temp
T17	Reserve
TH2	Zone 1.Temp
T11	Zone 2.Temp
T14	Refrigeration anti-freeze Temp 1
T4	Inner Coil Temp 1
T15	Outlet Water Temp
T8	Inlet Water Temp
T16	Water Tank.Temp
T10	Heating water tank.Temp
T9	Total outlet water.Temp
T13	Zero cooling.Temp
TC3	Reserve
TC4	Reserve
Water flow	Water flowmeter
Heat_s	Heat source heating link switch
DHW_S	Heat source hot water link switch
UPS	UPS
Pb_S	Indoor pump linkage switch
Link	Link Switch
F-DWH	Forced hot water switch
F-Heat	Forced heating switch
F-Cool	Forced cooling switch
EVU	Smart grid
SG	Smart grid
COM10	Indoor pump P_b(DC)
COM9	Circulating Water Pump p_a(DC)
OL_S	Pipe electric heating overload switch
FL_S	Water flow switch
A11	Reserve
A12	Reserve
SW1	Setting master and slave
SW2	
SW3	
SW4	Setting Unit Functions
CN32	PROM
CN7	ECL

DIP Switch Type	Status	Functions
SW1	ON     OFF     1 2 3 4	Setting the Master and Slave Addresses
	ON     OFF     5 6 7 8	Setting Unit Functions

■ DIP switch settings

For activation of buffer sensor need to change a SE6 DIP switch.

N°	Function	State	Status
SE5	O(None)	ON	—
	O(None)	OFF	—
SE6	Enable Buffer Tank Temp. Sensor	ON	ON  OFF 
	Disable Buffer Tank Temp. Sensor	OFF (default)	ON  OFF 
SE7	Enable Total Water Outlet Temp. Sensor	ON	ON  OFF 
	Disable Total Water Outlet Temp. Sensor	OFF (default)	ON  OFF 
SE8	Three-phase models	ON	ON  OFF 
	Single-phase models	OFF	ON  OFF 

■ Accessories connections

Here you can connect additional accessories if necessary. The terminals are located in the indoor unit PCB.

Circulation pumps

- Water pump can be PWM controlled when connected to the COM10 port on the motherboard AP1 of indoor unit.

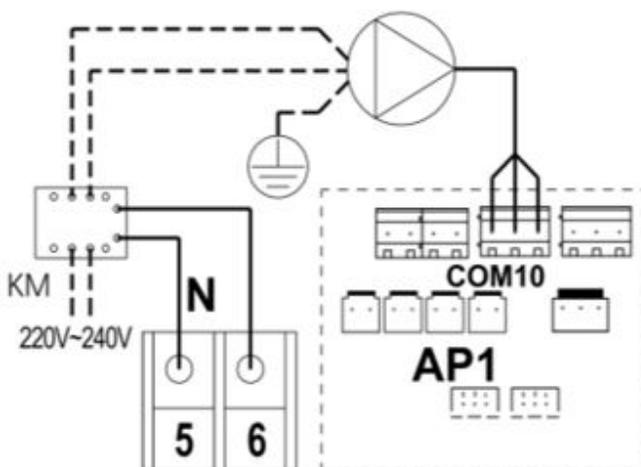
- Water pump requires additional relays if load more than 100W, please refer to wiring diagram.

P_b1 Heating/Cooling Water circulation pump (if needed)

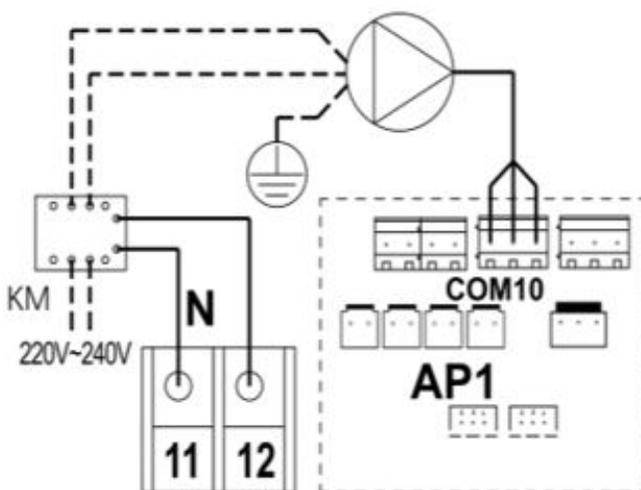
Working in heating or cooling modes only.

Electrical connection

For 1 phase 230V models



For 3 phase 400V models



Adjusting circulation pump P_b

Set needed mode in parameter 150:

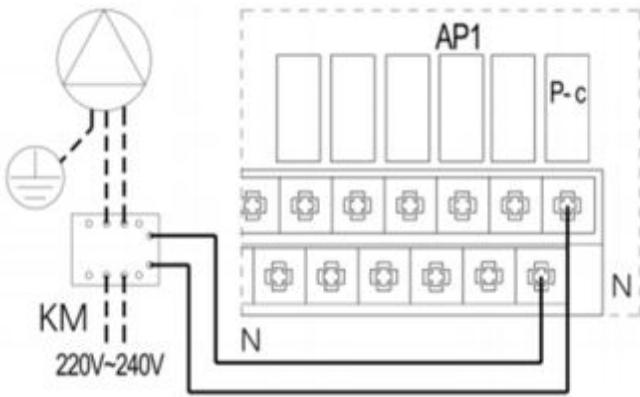
- The water pump starts when the unit is turned on or when it reaches temperature and stops.
- The water pump is controlled via room thermostat.
- The water pump is controlled via the wire controller.

P_c Auxiliary circulation water pump (if needed)

You can choose to turn on this pump in any of the modes in parameter.

When running the corresponding mode, when the main unit circulation pump starts, the unit auxiliary pump starts at the same time

Electrical connection:



Adjusting circulation pump P_c

Set needed mode in parameter 161:

- 0. Auxiliary pumps for DHW.
- 1. Auxiliary pumps for cooling/heating circuits.
- 2. Auxiliary pumps for underfloor heating.
- 3. Auxiliary pumps for cooling/heating and underfloor heating circuits.
- 4. Auxiliary pumps for unit circulation

AHS(Auxiliary heating source) heating (if needed)

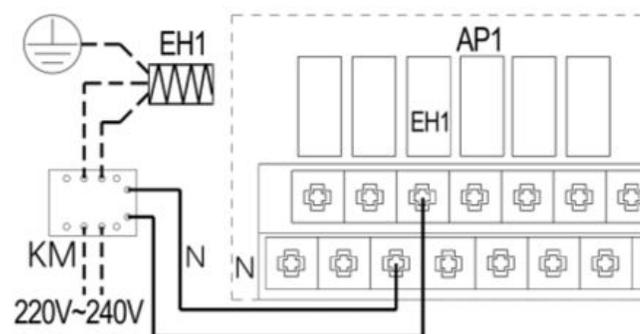
You can use the control signal for additional heating or when the heat pump and heating element power is insufficient. Or as a reserve. It is possible to connect an electric boiler or a gas or wood pellet boilers, but be sure of all safety aspects and compliance with local regulations.

There are three relays, one is designed to control additional heating to the buffer, the other for additional heating to the DHW tank and signal for gas boiler which you can set for hot water or heating.

- EH1** - for el.heater DHW tank
- EH2** - for el.heater buffer tank
- GAS** - for gas boiler signal

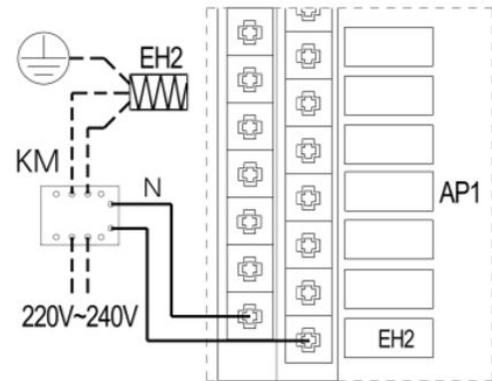
Electrical connection EH1

Electric heater requires additional relays, please refer to wiring diagram:

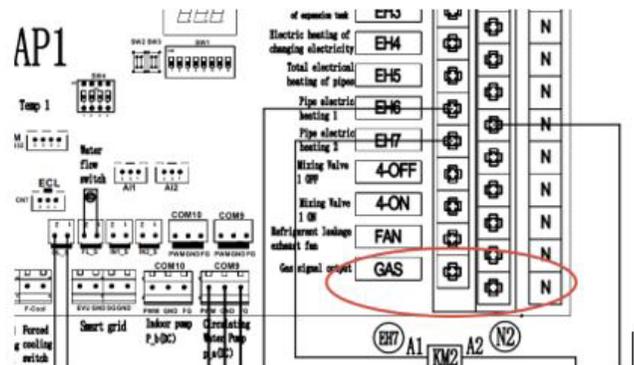


Electrical connection EH2

Electric heater requires additional relays, please refer to wiring diagram:



Electrical connection GAS



AHS heating adjusting

Parameters P139/P140 are used for electric heater or auxiliary heat source turn on, then the parameters need to be configured as follows

P139

- 0. Electric heater of buffer tank switch on for heating mode according to parameters P26, P22.
- 1. Electrical heater of buffer tank switch off
- 2. When P139 are selected as 2, the output of heating supply electric heating (EH2) is changed to the output of gas control signal.

- It is forbidden to start the heat pump to turn on the gas boiler when the heating mode is below minus 26 degrees, and the heat pump and the boiler work together between minus 15 degrees and minus 26 degrees.

- P139 It is forbidden to use gas in hot water mode.

P140

- 0. Electric heater of DHW tank switch on for heating mode according to parameters P96, P22.
- 1. Electrical heater of DHW tank switch off.

2. When P140 are selected as 2, the output of hot water electric heating (EH1) is changed to the output of gas control signal.

- It is forbidden to start the heat pump to turn on the gas boiler when the hot water mode is below minus 26 degrees, and the heat pump and the boiler work together between minus 15 degrees and minus 26 degrees.

- P139 It is forbidden to use gas in heating mode.

Parametr	Setting Value	Description
P139	0	Enable buffer tank electric heater
	1	Disable butfer tank electric heater
	2	Enable auxiliary heat source for heating
P140	0	Enable DHW tank electric heater
	1	Disable DHW tank electric heater
	2	Enable auxllary heat source for DHW

Set parameters:

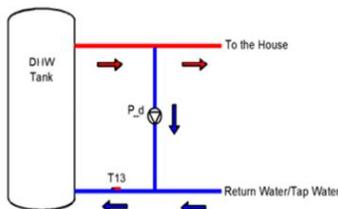
P22 - target ambient temperature,
P26 - delta of water inlet temperature of water inlet temperature
P96 - delta of water inlet temperature of DHW

Electric Heater Type	Turn On	Turn Off
EH2	Ambient Temperatures $\leq P22$ and Water Inlet Temperature $< \text{Setting Temperature} - P26$	Ambient Temperature $\geq P22 + 3$ or Reach Setting Temperature
EH1	Ambient Temperatures $\leq P22$ And DHW Tank Temperature $< \text{Setting Temperature} - P96$	DHW Tank Temperature $\geq \text{Setting Temperature}$

Note:
P22 = -7°C (Default); P26 = 5°C (Default); P96 = 5°C (Default)

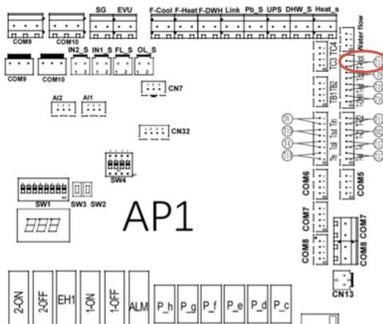
For gas mode, you can also connect a separate circulation pump or valve.

DHW recirculation (if needed)



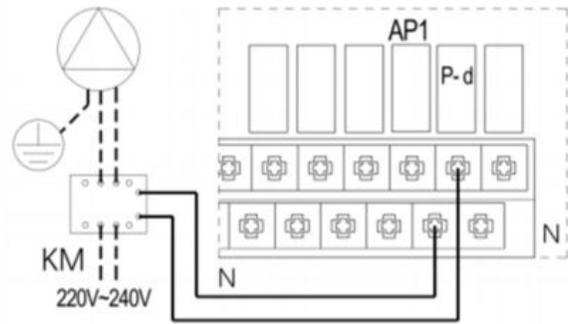
T13 DHW Return sensor connection

Sensor built-in (Red/5K) disabled by default



P_d DHW Return water pump electrical connection

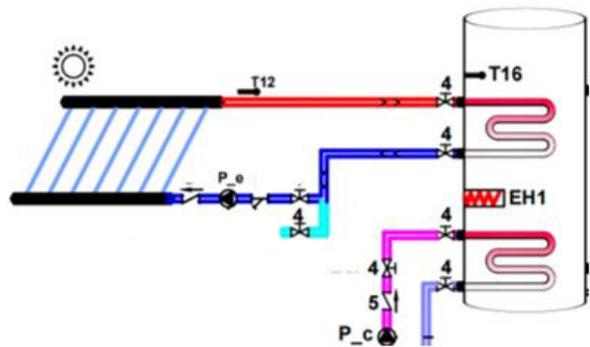
- Water pump requires additional relays, please refer to wiring diagram.



DHW recirculation heating adjusting

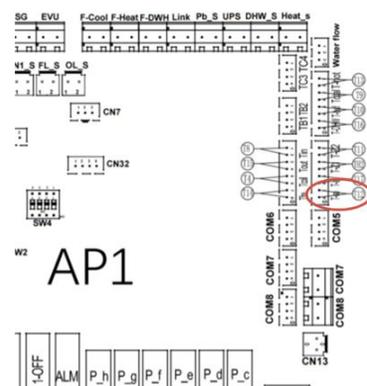
Parametr	Setting Value	Description	Note
L22	0 (Default)	Disable DHW return water function	
	1	Enable the water return function and keep the water pump on.	
	2	Enable the water return function and control the water return function according to the cycle. At this time, the water pump runs L26 after every L25.	L25: Default 30Min(3-90Min) L26: Default 5Min(1-30Min)
	3	Enable the water return function and control the water return function according to the temperature difference. At this time, if the return water temperature L23 \leq L24, then enable the water return function, and stop after reaching the temperature.	L23: Default 40°C(20-65°C) L24: Default 5°C(1-15°C)

Solar heating (To purchase a kit, please contact the supplier).



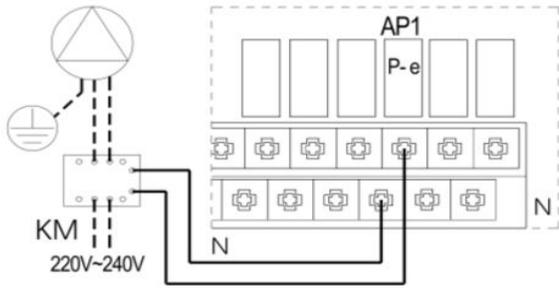
T12 solar sensor connection

Sensor built-in (Orange/5K) disabled by default



P_e Solar water circulation pump electrical connection

- Water pump requires additional relays, please refer to wiring diagram



Solar heating adjusting

When the system is connected to solar water heater, the unit starts the solar water heater by controlling this water pump. The water pump is controlled by parameters P151 and P152, which are set in the following table:

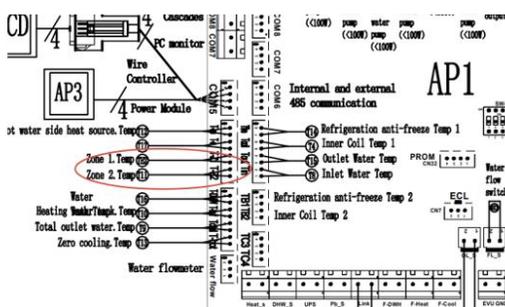
Parametr	Default Value/Range/Unit	Description	Note
P151	10(0-40) / °C	DHW tank heat source return temperature	When the solar water heater water pump is used in the hot water tank
P152	10(0-40) / °C	Buffer tank heat source return temperature	When the solar water heater water pump is used in the buffer tank

- Turn on:** Hot water/buffer side heat source temperature > hot water/buffer tank temperature + P151/P152.
- Turn off:** Hot water/buffer side tank temperature < hot water set temperature.

Dual Temperature Zone (To purchase a kit, please contact the supplier).

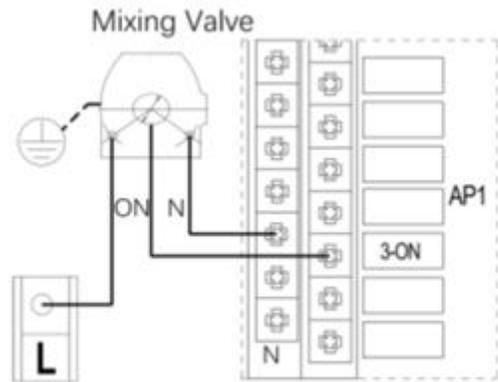
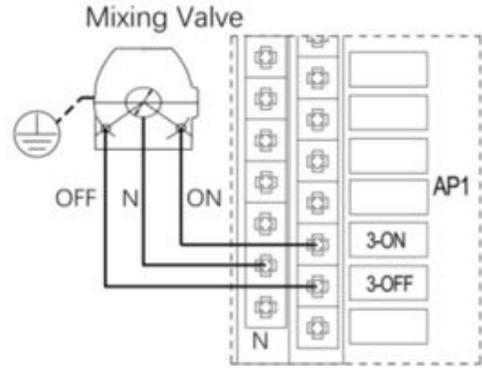
When the house at the same time using the radiator and floor heating, need to set different water temperature, this time you need to turn on the unit's dual-temperature zone function, the unit through the control of the mixing valve and mixing pump to achieve the floor heating temperature regulation.

TH2 1st (Purple/5K) zone sensor connection and T11 2nd (Yellow/5K) zone sensors connections

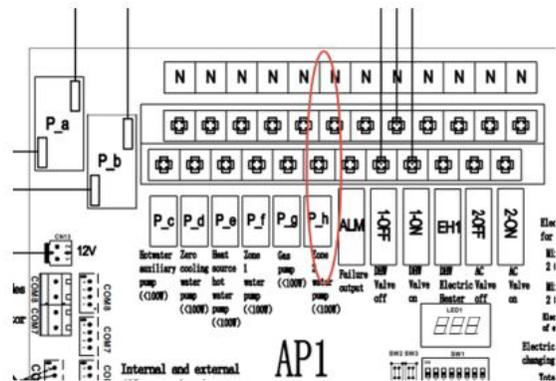


Mixing valve connection SV3

Type 1



Circulation pump for 2nd zone P_h connection



Adjusting of dual zone control

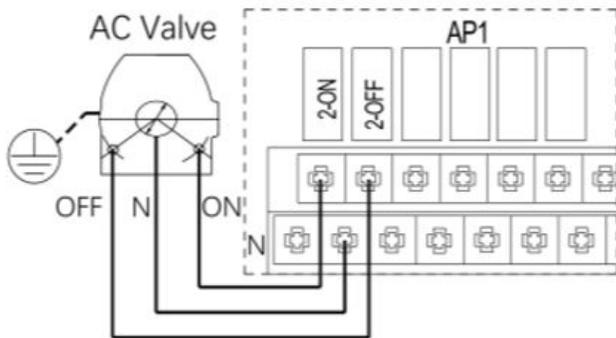
Currently, the parameter settings refer to the following table:

Parametr	Setting Value	Description	Note
P257	0	Enable dual temperature zones when the unit is turning on	Correspond to the temperature sensor: T11: Enable temperature zone 2 temperature. T10: Enable buffer tank temperature
	1	Enable dual temperature zones on demand	
	2 (Default)	Disable dual temperature zones	
P258		Mixing valve adjustment cycle	Factory parameter adjustment is recommended to consult the manufacturer
P259		Mixing valve closure duration	
P265		Mixing valve single adjustment percentage	

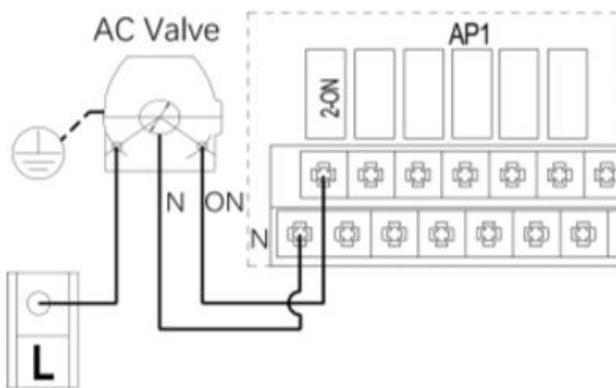
A two-way or three-way valve for cooling SV2

This three-way valve is used to switch fan coil- floor heating, when switching the end of the work, the three-way valve is used to switch the water circuit. Open, when cooling mode is on. Closed when cooling mode is off.

Type 1



Type 2



SG Ready

If the unit is connected to the smart grid, this function can be enabled via parameter P255.

Parametr	Setting Value	Running Mode	Description
P255=0	1	Running DHW Mode	1. Set the hot water temperature to the sterilization temperature. 2. Turn on electric heater
	1	Running DHW Mode	1. Set the hot water temperature to the sterilization temperature. 2. Turn on electric heater
	0	Running current mode	
	0	Turn off hot water mode and enter ECO mode	1. Turn off the hot water mode, turn off the electric heater 2. Turn off after running P256 Min (default 3Min)
P255=0 (Default)		Disable	

6. FILLING SYSTEM



Fill system according to local requirements and regulations!



Service personnel must operate this equipment in accordance with the installation manual.



Read the instruction manual carefully.



Before filling the installation, measure the hardness of the filling and supplementary water. Water quality should be complied with EN 98/83 EC Directives

Fill the product and the primary heating circuit with a water or a solution of separate propylene glycol and water mixture, which provides frost protection. The mixture should be fed through the return line. Gradually increase the filling pressure until you reach the required operating pressure.



Do not use any unsuitable antifreeze and corrosion inhibitors, biocides or sealants!

Venting system with air vent valves in the indoor unit and outdoor and also on the top installed air valves in your system.

Operating pressure: 0.15 to 0.2 MPa (1.5 to 2.0bar)

Initially, air is released from the hot water. It may be necessary to vent it more. If you hear bubbling sounds coming from the heat pump, charge pump or radiators, the entire system needs more venting. When the system has stabilized and there is the correct pressure and all air has been eliminated, you can set up the automatic heating control system as required.

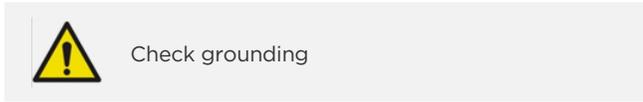
Check the system pressure during the purging process.

7. COMMISSIONING AND CONFIGURATION

■ Technical control before start

- Ensure all hydraulic lines are strong connected to the heat pump and inspected for leaks.
- Check on refrigerant leaks.
- Check all safety valves in heat pump and system.
- Installed hydraulic connections between the indoor and outdoor units.

- If you use metal pipes for connections to the outdoor unit, they must be grounded.
- The heating system remains unfilled with water under right working pressure.
- Connect all electrical elements of the system.
- Link equipment to power supply.



- Check DIP switch configuration
- Check the presence and testing of the RCD and switch isolator.

IEC 60364-4-41
 VDE regulations
 TAR low voltage VDE-AR-N-4100

- Fill Appendix 1. Technical control before start

■ Releasing air during startup

Since air will escape when the primary is heated and circulation pump work, the first time you need to open the air vents and check (indoor unit, outdoor unit, radiators and other places with air vents). Later, if the system loses pressure and does not have automatic replenishment, then you need to increase the pressure to working pressure.

Working pressure: Min. 0.2 bar (0.02 MPa) above the pre-charge pressure of the expansion vessel
 Factory set pre-charge pressure of expansion vessel: 0.75 bar (0.075 MPa) to 0.1 bar (0.1 MPa)

■ Start and navigate through start actions and menus

Compressor heater

After connecting the power and turning on the heat pump, the compressor heating will turn on. After a long period of inactivity, time must pass for heating, especially in cold weather.

Controller

The main menu contains several graphic symbols that show the current values and allow you to go to an extended menu when pressed.

Icon	Meaning
	Day-month-year
	Current time
	Current ambient temperature
	Defrost mode

Icon	Meaning
	Cascade mode
	Power mode
	Silent mode
	Night mode
	Timer mode
	Water pump
	Return valve
	Electric heating
	Compressor
	Fan motor
	WIFI
	Error Notification



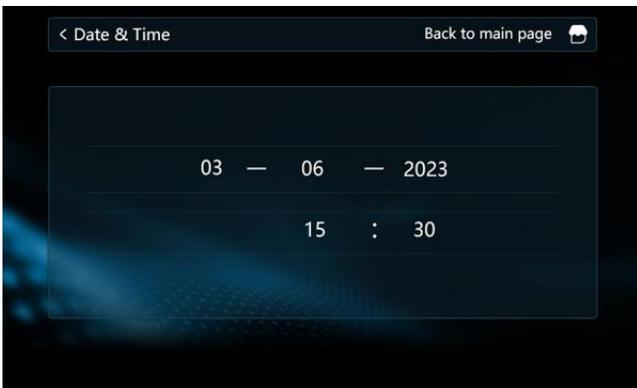
Icon	Meaning	Function
	Power ON/OFF	Perform power on/off
	Operating mode	Switch operating mode
	Functional Services	Switch operating mode
	Parameter query	Query operating status parameters.
	System setting	Manage system applications, flexibly set device operating parameters, and improve experience

Setting the Clock and Date

In main interface, touch to enter setting page.



In setting page, touch **Date & Time** to enter time setting page. Touch Day-Month-Year-Time and slide the wheel value and press "/" to save the setting.



In setting page, touch **Display and sound** to enter the brightness and sound setting interface.

Drag the slider to set different brightness, click "OFF/ON" to "turn off/on" the sound, press "<" ">" to switch between different languages.



DHW activate

In Factory parameter(setting page) set P48=1 Enable Tank Temperature Sensor

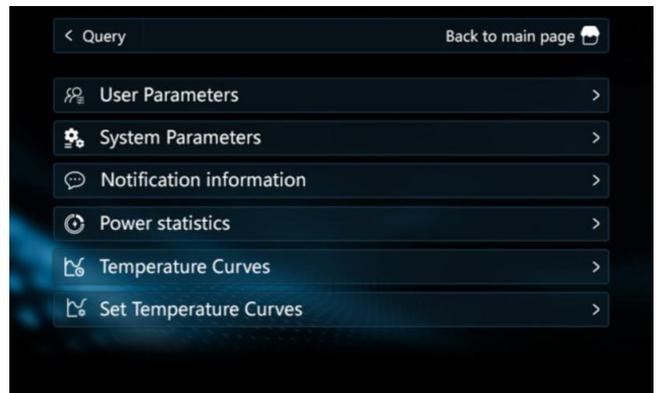
Mode settings

When the screen is on touch **Mode** to enter the unit mode selection. Then touch corresponding mode to switch mode. Press the upper left or upper right corner to return to the home page.



Parameter query setting

In the main interface when the screen is on, press **Parameter Query** to enter parameters query page.



User parameters

In query selection page, touch **User Parameters** to enter scene setting page to enter the user parameter list and press "<" ">" to switch pages. Click the parameter value on the right to enter the parameter value modification page. Touch the value on the right of "set value" to input modified value in the pop-up keyboard and touch "Enter" and "OK" in a row to save the parameters.



User functions

In function selection page, touch  **User functions** Click the corresponding button to activate/deactivate the corresponding function.



Silent mode Can be touched anytime to activate or deactivate silent mode. In quiet mode the compressor /fan motor operates at low frequency and the capacity of the unit is reduced.

Power mode Can be touched anytime to activate or deactivate silent mode. In the boost mode, the compressor or fan motor operates at high frequency, and the capacity of the unit is increased.

Sterilization mode Unit will operate sterilization mode. Parameters 8-12 are used to set the sterilization mode

Manual Defrosting When the current mode is not in the cooling mode, touch “Forced frosting” to activate or deactivate forced defrosting; When the defrost is activated, the machine determines whether to enter defrost according to the current working conditions.

Manual Electric Heater Unit will turn on the AHS and electric heater for fast heating

Air emptying function This function can be turned on when the unit is power off, touch “Waterway emptying” to activate waterway emptying air. In this mode, the water pump will turn on automatically. When the unit is power on, this mode will exit automatically.

Night mode The percentage of compressor capacity and running time can be set, and the unit automatically enters the night mode within the set time; outside the set time, the night mode is switched off.

Temperature Difference Setting (ΔT)

In general, this parameter is not recommended to be changed, and this section describes the basic settings of the temperature difference. The following is expressed using ΔT .

When running hot water mode, the temperature differential setting is parameter P96. When running the heating mode, the temperature differential setting is parameter P26. At this time, when $P26 \neq 0$, the unit's temperature differential is set according to P26; when $P26 = 0$, the unit's temperature differential value is calculated by the special formula.

When operating in the underfloor heating mode, this is parameter P27. In cooling mode same with heating is P26.

The higher this parameter, the less often the heat pump will start, but it will cool down more.

* Temperature Difference: To prevent the unit from frequent off and on, this parameter is set to regulate the unit off and on.

Note:

P26=0°C (Default); P27=0°C (Default); P96=5°C (Default); P116=1 (Default)

Temperature Curves

In the parameter query page, touch  **Weather Compensation Curves Setting** to enter curve settings. To switch the curve settings in different modes; click the curve code to select a different curve control, and the specific parameters of the current curve will be displayed in the curve area; when the curve function is set, the set temperature will be updated every 15 minutes according to the current ambient temperature, and changing the set temperature through any scene is invalid.

Underfloor heating mode

High Temperature Curve for Ground Heating

Curves No	Corresponding Curve
GH1	Ground heating Curve 1
GH2	Ground heating Curve 2
GH3	Ground heating Curve 3
GH4	Ground heating Curve 4
GH5	Ground heating Curve 5
GH6	Ground heating Curve 6
GH7	Ground heating Curve 7
GH8	Ground heating Curve 8

Low Temperature Curve for Ground Heating

Curves No	Corresponding Curve
GL1	Ground heating Curve 1
GL2	Ground heating Curve 2
GL3	Ground heating Curve 3
GL4	Ground heating Curve 4
GL5	Ground heating Curve 5
GL6	Ground heating Curve 6
GL7	Ground heating Curve 7
GL8	Ground heating Curve 8





Hot water mode

Curve for Hot water

Curves No	Corresponding Curve
H1	Hot water Curve 1
H2	Hot water Curve 2
H3	Hot water Curve 3
H4	Hot water Curve 4



Cooling mode

High Temperature Curve for Cooling

Curves No	Corresponding Curve
CH1	Heating Curve 1
CH2	Heating Curve 2
CH3	Heating Curve 3
CH4	Heating Curve 4
CH5	Heating Curve 5
CH6	Heating Curve 6
CH7	Heating Curve 7
CH8	Heating Curve 8

Low Temperature Curve for Cooling

Curves No	Corresponding Curve
CL1	Heating Curve 1
CL2	Heating Curve 2
CL3	Heating Curve 3
CL4	Heating Curve 4
CL5	Heating Curve 5
CL6	Heating Curve 6
CL7	Heating Curve 7
CL8	Heating Curve 8



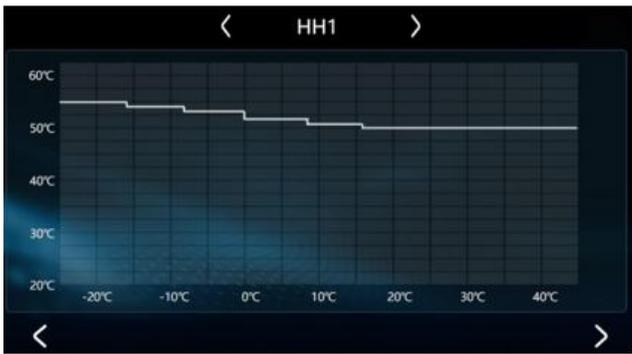
Heating mode

High Temperature Curve for Heating

Curves No	Corresponding Curve
HH1	Heating Curve 1
HH2	Heating Curve 2
HH3	Heating Curve 3
HH4	Heating Curve 4
HH5	Heating Curve 5
HH6	Heating Curve 6
HH7	Heating Curve 7
HH8	Heating Curve 8

Low Temperature Curve for Cooling

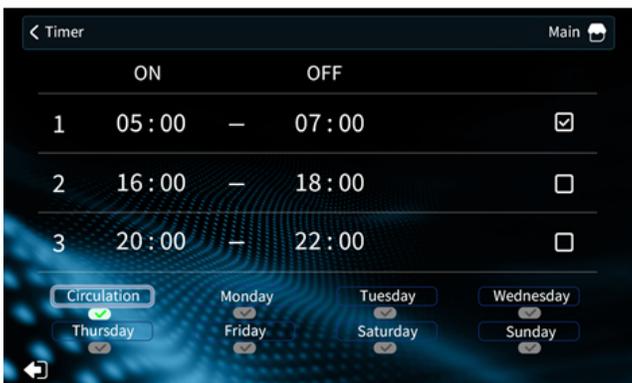
Curves No	Corresponding Curve
HL1	Heating Curve 1
HL2	Heating Curve 2
HL3	Heating Curve 3
HL4	Heating Curve 4
HL5	Heating Curve 5
HL6	Heating Curve 6
HL7	Heating Curve 7
HL8	Heating Curve 8



In the accessories section you can see an additional set for this function.

Timer setting

In function selection page, touch  **Timer** to enter the page of timer control of power on and power off.

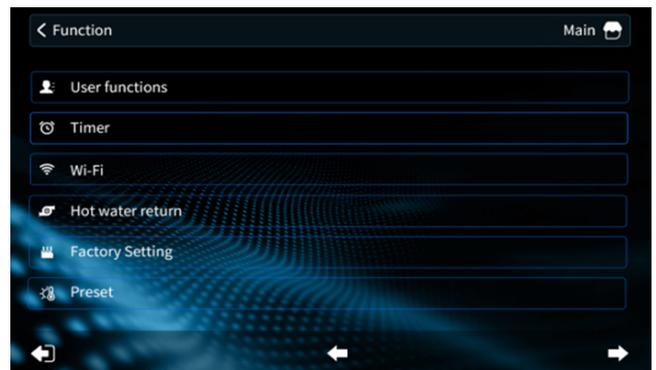


1. Touch "Repeat" to set timer for everyday, and the unit will be running in the set time-frame everyday.

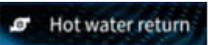
2. Select any button of from Monday to Sunday to enable weekly timer, for example every Monday, every Tuesday, or etc. If the time-frame of any day is not set, then timer will not start. Click the time period to enter the time setting of the time period, enter the time through the keyboard, click "Enter", and then click the button "ON/OFF" to start/close the time period, press "OK" to save after the setting is completed.

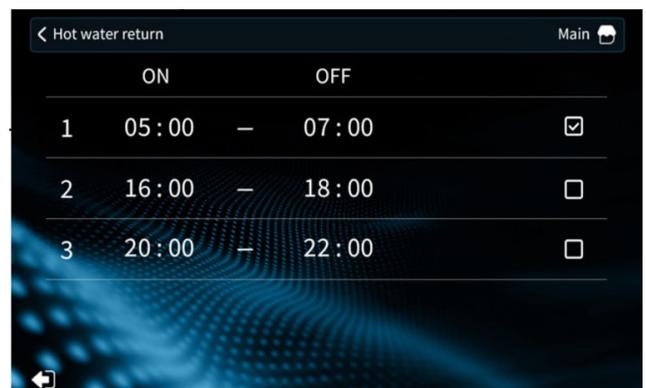
Function settings

When the screen is on  to enter the function selection page. Under this page, press "<" ">" to switch pages



Return water function

In function selection page, touch  **Hot water return** to enter timed return water query page



Touch the time area can edit the time, and using the pop-up keyboard to input time, and touch "ON/OFF" to enable the timer, and finally touch "OK" to save.

If the timed return water function is set, the return water pump can only be turned on within the set time period; if the timed return water function is not set, the return water pump can be turned on at any time.

Screed Drying

In the function interface, click  **Screed Drying** to enter the screed drying interface.



Scene settings

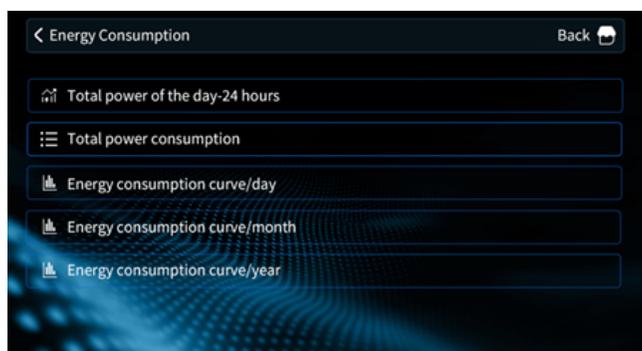
In function selection page, touch  Preset to enter scene setting page.



1. Touch “Repeat” to set everyday running. Unit will run according to the set time and set mode.
2. Select any button of from Monday to Sunday to enable weekly timer, for example every Monday, every Tuesday, every Wednesday, or etc. If the time-frame of any day is not set, then timer will not start.
3. 6 scenes can be set by each day. Touch “ON” to activate/deactivate the scene setting.
4. Touch the scene which needs modification, touch “Tryb” to switch operation mode. Touch time can edit the timeframe. By input the number in pop-up keyboard to edit the time frame and touch “ON” to activate/deactivate the setting, and then touch “OK” to save.
5. Scene operation: When the time enters the set time, the operation mode and set temperature will automatically switch to the value set by the scene, but the state of power on and off will not be changed.

Energy Consumption

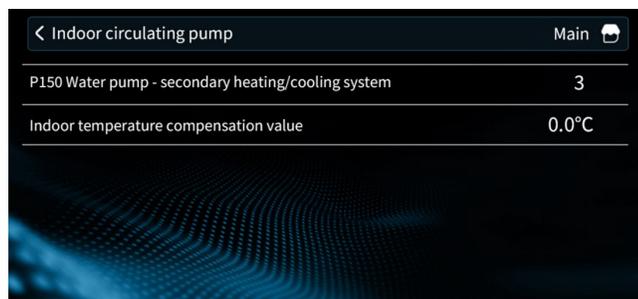
When the unit is equipped with a power module, in the parameter query page touch Energy consumption to enter electricity page inquiry. Total power consumption, current power, voltage, and current parameters can be checked.



Indoor circulation pump

In the function interface, click  Indoor circulating pump to enter the interface, change P150=3.

This function requires a temperature sensor that is built into the wired controller, the sensor black probe can be seen on the bottom back of the controller. In general, the wire controller can be used to detect room temperature when P150=3. At this point, the wired controller will act as a thermostat.



After setting, return to the main interface. The “Zone”  button will be added to the main interface.



Click  to enter the interface of indoor Temp. setting.



Dual Heating zones and Indoor Circulation Pump function can only be selected to enable one of them. P150 is used to enable/disable functions. (1-Runs on power-up/ 2-Controlled via linkage switch/ 3-Controlled by room temperature). Once installed, the wired controller with built-in temperature sensor will automatically detect the indoor ambient temperature and display it in the top status bar of the wired controller.



However, the accuracy of the temperature detection by the built-in sensor will be affected because the screen will heat up during the use of the wired controller, resulting in a temperature rise of 1°C-5°C. To better match the actual indoor ambient temperature, it is recommended to manually adjust the indoor temperature compensation value according to the actual indoor temperature. Display value = sensor detection value + compensation value.

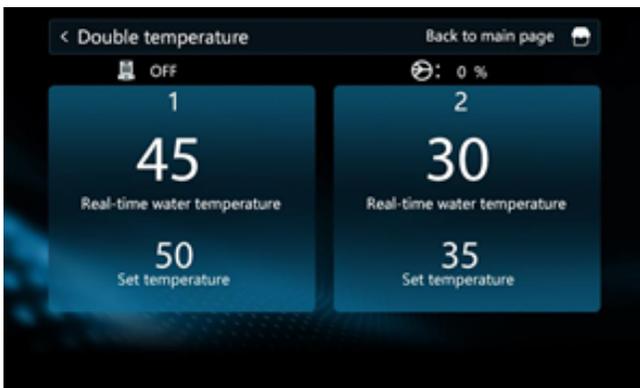
Please consult the installer for more settings

Double temperature zone

In function selection page, touch  Double temperature zone to enter scene setting page.

In factory function setting page, touch “>” to switch between pages. If  Double temperature zone is with dark color, it means the dual temperature zone function is not activated. It is default as disabled. Touch on the upper left corner or upper right corner to return to the home page, and touch  enter setting page, and touch  Factory function and touch “Enter” to enter parameters setting page.

Touch “<” “>” to check the parameter of P257, and touch the value on the right hand side to enter the page of modifying parameters. Touch the number on the right of “set value” to modify. Input “0” in the pop-up keyboard, and touch “Enter” and touch “OK” to save parameters.



In the accessories section you can see an additional set for this function.

Smart power grid

In function selection page, touch  Smart power grid is dark, it means that SG-Ready is not enabled, and it is disabled by factory default. Touch “<” “>” to check the parameter of P255, and touch the value on the right hand side to enter the page of modifying parameters



8. WI-FI ADJUSTING AND SETTINGS



Service personnel must operate this equipment in accordance with the installation manual.



Read the instruction manual carefully.



This information is available such as the operating manual or installation manual

The equipment already contains WiFi wireless signal transmission devices. Using a special application, you can control and monitor the device. Use the guide below to set it up.

In function selection page, touch  WiFi distribution



Touch “ON/OFF” in  Intelligent WIFI Distribution Network to activate/deactivate the intelligent network distribution. Touch “ON/OFF” in  AP Distribution Network to activate/deactivate the AP Distribution Network.

The heat pump supports remote control by mobile phone. You need to download the APP in the app store and register an account to perform network distribution operations. The heat pump supports smart distribution network and AP distribution network. Under normal circumstances, it is recommended to use smart distribution network connection.

1. Search “Smart Life” in the App Store or scan the following QR code with mobile phone to download.



2. Enter your account number and password to enter the APP main page.

3. If you log in for the first time, you need to register an account. After registration is completed, enter your account password to enter the APP main page.

Networking (Smart Mode)

Generally, it is recommended to use smart mode. The wire controller is required to be within WIFI coverage. The wire controller must first enter the network distribution mode.

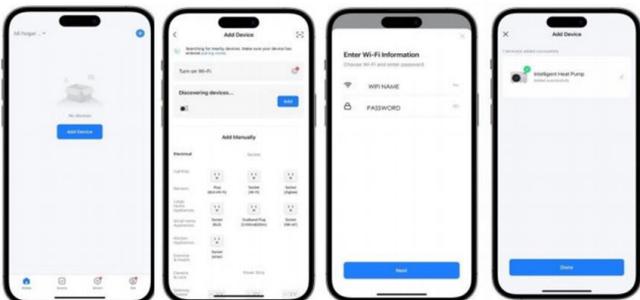
The following is the operation method:

1. Click  on the wired controller to enter the function setting page.
2. Click  to enter smart mode.
3. Click  to enter smart mode.

After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP and click 

5. In the Smart mode, the APP will automatically identify the device, click 

6. After entering the current WIFI account and password, wait for the APP to complete binding.



Networking (AP Mode)

The wire controller is required to be within WIFI coverage. The wire controller must first enter the network distribution mode.

1. Click  on the wired controller to enter the function setting page.
2. Click  to enter smart mode.
3. Click  to enter AP network mode.
4. At this time, the wire controller will transmit a WIFI hotspot named "smartlife-XXXX" or "SL-XXXX". After the wire controller enters the network distribution mode, open the "Smart Life" APP on the mobile phone to enter device binding. Before binding, the mobile phone needs to be connected to the WIFI network, confirm that the Bluetooth and WIFI of the mobile phone are turned on and authorize the APP.
5. Place your mobile phone close to the wired controller and on the same WIFI network, open the APP and click

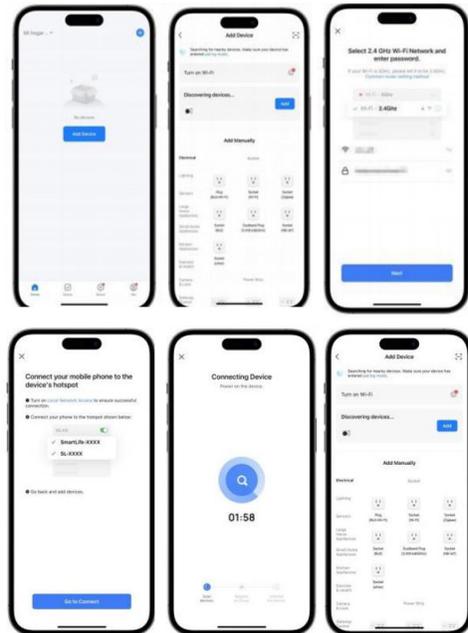


6. In the Smart mode, the APP will automatically identify the device, click 

7. Enter the account and password of the WIFI to be connected.

8. Click  to enter the WIFI settings page, find the WIFI hotspot named "smartlife-XXXX" or "SL-XXXX" and connect.

9. Wait for the APP to complete binding.

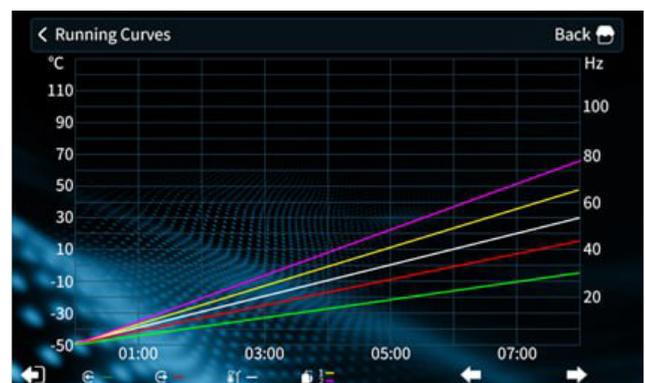


9. RUNNING AND FACTORY PARAMETERS

The Parameter query menu is used to change the advanced settings of the heat pump system. Here you can change modes, accessories, language and more. Be careful, you need to understand what you are doing in this menu. Or only to be used by an installer.

Running Curves

In the parameter query page, touch  to enter curve query. This page records 5 parameters including water inlet temperature, water outlet temperature, compressor frequency, ambient temperature, and fan motor frequency within 24 hours.

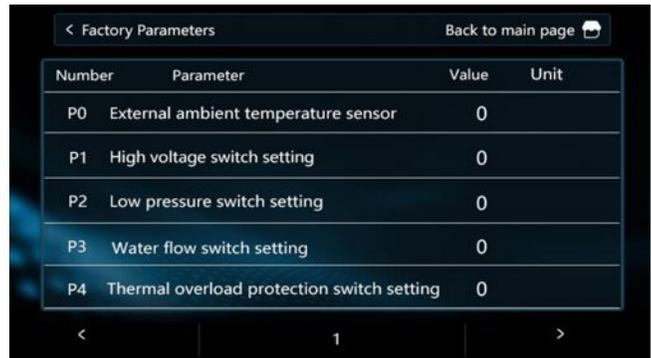


Running parameter

Curves No	Description	Setting Range
1	Compressor Running Frequency	0-150Hz
2	Fan Running Speed	0-999Hz
3	EEV Open Step	0 480P
4	EVI Valve Open Step	0 480P
5	AC Input Voltage	0 500V
6	AC Input Current	0 50.0A
7	Compressor Phase Current	0 50.0A
8	Compressor IPM Temp.	-40-140°C
9	High Pressure Saturation Temp.	-50-200°C
10	Low Pressure Saturation Temp.	-50-200°C
11	Ambient Temp. T1	-40-140°C
12	Outer Coil Temp. T2	-40-140°C
13	Inner Coil Temp. T3	-40-140°C
14	Suction Temp. T4	-40-140°C
15	Exhaust Temp. T5	0-150°C
16	Water Inlet Temp. T6	-40-140°C
17	Water Outlet Temp. T7	-40-140°C
18	Economizer Inlet Temp. T8	-40-140°C
19	Economizer Outlet Temp. T9	-40-140°C
20	Current Unit Tool Number	0 120
21	DHW Tank Temp.	-40-140C
22	Plate Heat Exchanger Exhaust Temp.	-40-140C
23	Driver Manufacturer	0 10
24	Water Pump Speed PWM	0 100%
25	Water Flow	3-100L/min
26	DHW Return Water Temp.	-40-140°C
27	Unit Input Voltage	0-500V
28	Unit Input Current	0.00A-99.99A
29	Unit Input Power	0.00-99.99KW
30	Unit Power Consumption	0-9999Kw.h
31	System 2 Compr. Running Frequency	
32	System 2 Fan Running Speed	
33	System 2 EEV Open Step	
34	System 2 EVI Valve Open Step	
35	System 2 AC Input Voltage	
36	System 2 AC Input Current	
37	System 2 Compr. Phase Current	
38	System 2 Compressor IPM Temp.	
39	System 2 High Pres. Saturation Temp.	
40	System 2 Low Pres. Saturation Temp.	
41	System 2 Outer Coil Temp.	
42	System 2 Inner Coil Temp.	
43	System 2 Suction Temp.	
44	System 2 Exhaust Temp.	
45	System 2 Economizer Inlet Temp.	
46	System 2 Economizer Outlet Temp.	
47	Reserve	
48	Reserve	
49	Reserve	
50	Reserve	
51	Solar Water Heater Temp.	
52	Zone 2 Temp.	
53	Butter Tank Temp.	
54	Total Water Outlet Temp.	
55	Unit B Phase Input Voltage	
56	Unit B Phase Input Current	
57	Unit C Phase Input Voltage	
58	Unit C Phase Input Current	
59	Smart Grid Status	
60	Zone 2 Mixing Valve Opening	

Factory parameter

In setting page, touch  **Factory Parameters** and enter password, touch "Enter" in the pop-up keyboard to enter the parameters setting page. At this point, you can press "<" ">" to check the value of each parameter. Click the parameter value on the right to enter the parameter value modification page. Click the parameter value on the right of "Set value", enter the setting value in the pop-up keyboard, press "Enter" to confirm, and then click "OK" to complete the setting. On the parameter modification page, you can press "<" ">" to switch parameters directly.



No	Description	Default Value	Setting Range	Note
L12	Sterilization	0	0 2	
L13	Days between Sterilizations	7	5 30	
L14	Sterilization Start-up Time	23:00	00:00-24:00	
L15	Sterilization Running Time	10	0-50Min	
L16	Sterilization Temp Setting	7°C	50-8°C	
L22	DHW return water Setting	0	0 3	0-Disable / 1-Continuous return / 2-Cycle return / 3-Temperature
L23	Return Water Temp Setting	4°C	20-65°C	
L24	Return Water Return Temp Differential	5C	1-15°C	
L25	Return Water Interval Period	30min	3-90min	
L26	Return Water Running Period	5min	1 30min	
P22	Ambient temperature value- Unit no starting	-15	-15-40°C	If Ambient Temp. <P22 then enter defrost
P24	Ambient temperature value- Allow electric heater to start	0	-10-10°C	
P25	Overprotection value- Inlet and outlet water temperature differential	0	-10- 10°C	
P26	Compensation value- Return water temperature	5	0- 10°C	
P27	Floor heating return differential value	5	0- 10°C	
P28	Water Pump Control- Unit shutdown when reaching temperature	0	0-1	0-Running / 1-Stop /2-Run. in cooling mode /3-Running in cooling/heating mode /4-Run. in underfloor heating mode

No	Description	Default Value	Setting Range	Note
P29	Anti-freeze-water pump running time	2	0-10min	0-Intelligent control 1-Timing control 2-Rapid control 3-Dew point control
P30	Defrost mode selection	0	0 2	
P31	Defrosting - cumulative runtime	45	0 120	
P32	Defrosting - coil temperature value	-5	-30 0	
P33	Defrosting - temperature differential 1	9	0 20	
P34	Defrosting - temperature differential 2	7	0 20	
P35	Maximum defrosting time	10	0 30	
P36	Exit defrosting - coil temperature	12	0 - 30	
P37	Shutdown mode - Reaching target temp.	0	0 2	0-Intelligent shutdown 1- Temp. shutdown 2- Cooling intelligent
P38	Opening degree constant - Heating main valve	300	-999- 999	
P48	Enable/Disable Hot Water Tank temperature sensor	0	0 - 1	0-Disable 1-Enable
P88	Silent mode - compressor maximum frequency	50	20-70Hz	
P89	Silent mode - fan motor maximum frequency	40	20-60Hz	
P95	Cascade - water pump operation mode	0	0-1	0-Together control 1- Independent control
P96	DHW differential value	5	0- 10°C	
P97	Water tank temperature automatic compensation	0	0-1	0-Enable 1-Disable
P98	Water tank temperature manual compensation	0	-10- 10°C	
P99	Water pump speed regulation temperature differential	5	2-10°C	
P100	PWM pump minimum speed	50	20-80%	Percentage of RPM
P101	Unit water pump control mode (Master)	1	0-1	0-ON/OFF/ 1-PMW
P115	Unit type selection	1	0-5	0-2-unit/ 1-3-unit
P116	Unit temperature control mode	0	0-1	0-Water Inlet Temp. 1-Water Outlet Temp.
P117	Ambient temp. - Allow access to anti-freeze	5	0- 10°C	
P118	Outlet water temp. - Allow access to anti-freeze	3	0-20°C	
P119	Refrigerant type	2	0-20	1-R410A/ 2-R32/3-R290
P139	Buffer tank electric heating	0	0/1	0-Enable 1-Disable
P140	DHW electric heating	0	0/1	0-Enable 1-Disable

No	Description	Default Value	Setting Range	Note
P150	Water pump - secondary heating/cooling system	0/1/2/3	2	
P151	Return differential - Hot water heat source	0-40	0	
P152	Return differential - Heating heat source	0-40	0	
P153	Upper temperature limit - Hot water heat source combined temperature	15-80	70	
P154	Upper temperature limit - Heating water heat source combined temperature	15-80	60	
P161	Auxiliary pump selection	0/1/2/3/4	0	0-DHW 1-Cooling 2-Underfloor heating 3-Heating& Cooling 4- Above all
P162	Anti-freezing interval - Hot water pipes	0 360	90	If set to 0, mean disable
P163	Water pump speed regulation - Minimum speed	0 70	30	L/min
P164	Level control	0/3	3	0-Enable 3-Disable
P165	Load return differential	1-15°C	3	
P166	Lightening back to the poor	1-15°C	2	
P167	Stop back to the poor	1-15°C	3	
P168	Hot water mode start ratio	1 100%	50	
P169	Non-hot water mode start ratio	1 100%	100	
P170	Loading cycle	3-60min	7	
P179	Target frequency - Power mode	0-40Hz	15	
P180	Target frequency upper limit- Power mode	0-40Hz	5	
P181	Defrost selection - Evaporate side	0 2	0	0-Current 1-Heating 2-DHW
P182	Pipe electric heating option	0 4		0-3kW+6kW 1- 3kW 2-6kW 3- Disabled 4-Forced enable
P255	Smart Grid Options - On/Off	0 1		
P256	Smart Grid Options - Peak grid running time	30 - 999		
P257	Dual temperature zone selection	0 2		
P258	Mixed water regulating valve cycle	5 20		
P259	Mixing valve full cycle time	0 180		
P260	Maximum water pump speed	50 - 99	99	%
P261	Water pump speed - at constant temperature	20 - 99	30	%

10. MAINTENANCE AND SERVICE

The thermal system requires minimal maintenance. At least once a year, check the hydraulic pipes for leaks and clean the heat pump, check safety valves and tanks. Also, during operation, check the system pressure using pressure gauges. Install a removable filter to clean it.

Check insulation and wiring on additional heater.



Perform maintenance according to local regulations.



This appliance uses flammable refrigerant. If refrigerant leaks and is exposed to an external ignition source, there is a risk of fire.



Service personnel must operate this equipment in accordance with the installation manual.



Read the instruction manual carefully.



Touching live components can result in severe injury from electric shock. Certain components may remain live even when the power supply is turned off.

- Avoid contact with electrical terminal areas.
- Before performing any work on the indoor or outdoor unit, disconnect the system from the power supply using a separate circuit switcher or mains isolator. Ensure that it is no longer receiving power.
- Wait at least 10 minutes for the voltage to fully dissipate before working on the appliance



All installation and maintenance activities should be carried out by qualified personnel!

■ Checking and cleaning fan



Always turn off equipment and power.



Protect electrical components.

1. Remove screws.
2. Pull grille.
3. Turn the fan.
4. Clean the area from garbage



Avoid fan clogging and check visually, especially after strong winds.

■ Cleaning heat pump



Performed by a specialist!



Avoid using sprays, scouring agents, detergents, solvents, or cleaning agents containing chlorine and ammonia, solvents and acid. Avoid flammable product, for example - naphtha.



Protect electrical components.



If the air heat exchangers are fouled, clean them gently in a vertical direction, using a brush.

Heat exchanger cleaning

1. Turn off the equipment and disconnect power. Wait at least 20 minutes.
2. Open the heat pump to provide access to the heat exchanger, remove the fan if necessary.
3. Clean with compressed air from inside to out (no very high pressure and use a big diffuser).
4. Wash with special instrument and light domestic based water cleaning agent (no very high pressure and use a big diffuser).



Do not change much inclination from the direction of the fin heat exchanger to avoid damaging it.

5. Inspect a fins and fix with special instrument if needed it.
6. Close heat pump.
7. Check a normal operation.

Condensate drain pan cleaning

1. Turn off the equipment and disconnect power. Wait at least 20 minutes.
2. Open the heat pump to provide access to the heat exchanger, remove the fan if necessary.
3. Remove garbage by hand.
4. Remove dust and debris using a tool.
5. Check a drain hole and clean it if needed.
6. Wash condensate drain pan carefully. Use clear water only.
7. Close heat pump.

■ Draining the indoor unit



Disconnect the heat pump from power and wait until it is completely discharged!



Be careful, the water may be hot. Wait until it cools down!



Protect electrical components!

Outdoor unit drainage:

1. Connect the hoses to the drain valves.
2. Open the drain valves.
3. Drain the indoor unit.

■ Checking the safety valves

The safety valve is the main safety device when operating pressure equipment. Check the valve by turning the cap each time before putting the system into operation and after repair work.



Danger. The water may be hot!



Protect electrical components!

Test the valve for pressure operation according to local codes.



We recommend checking with pressure safety valves once a year. But this is only informational and may not be a standardized norm in your case.

■ Checking the safety valves

The expansion tank is located in the indoor unit and has a volume of 6 liters.



Danger. The water may be hot!



Protect electrical components!

Test the valve for pressure operation according to local codes.



We recommend checking with pressure safety valves once a year. But this is only informational and may not be a standardized norm in your case.

Measuring pressure:

1. Close shut-off valves.
2. Measure pressure.

- If the pre-charge pressure of the expansion vessel is below the static system pressure: Add nitrogen through the valve of the diaphragm expansion vessel until the pre-charge pressure is 0.1 to 0.2 bar higher than the static system pressure.

- Do not allow the pre-charge pressure to fall below 0.7 bar.

- Factory-set pre-charge pressure: 0.75 to 0.95 bar.

■ Refrigerant circuit



The outdoor unit contains the flammable refrigerant R32, which can potentially combine with air to create a combustible environment, posing a fire and explosion hazard.

Frequency of Refrigerant Leakage Checks

- For unit that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO₂ equivalent or more, but of less than 50 tonnes of CO₂ equivalent, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.

- For unit that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO₂ equivalent or more, but of less than 500 tonnes of CO₂ equivalent at least every six months, or where a leakage detection system is installed, at least every 12 months.

- For unit that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO₂ equivalent or more, at least every three months, or where a leakage detection system is installed, at least every six months.

Only certificated person is allowed to do installation, operation and maintenance.

Before work

- Only a licensed specialist can perform this work with refrigerant.

- Ensure that all personnel in the vicinity are aware of the risks and safety measures associated with working with R32.

- A CO₂ or powder extinguisher should be readily available in the following situations:

1. When charging refrigerant.

2. When draining refrigerant.

3. When performing welding, brazing, or soldering work.

- Only use tools and units that are permitted for R32 refrigerant.

- Use a special R32 leak detector. Do not use liquid leak detectors that contain chlorine!

- Ventilating the work location or work on the open air outdoors. Ventilation equipment must be added in accordance with the standard EN378.

- Use respiratory protection if there is a risk of inhaling refrigerant vapors.
- Gather necessary personal protective equipment (PPE).
- Remove all possible ignition sources. For example: lighters, cigarettes, sparkfree tools.
- Label your heat pump for any work which were made on the refrigerant circuit.
- There should be no other hazardous electrical work carried out nearby where sparks may occur.

Extracting refrigerant

Extracting R32 refrigerant requires strict adherence to safety protocols due to its flammable nature.



There is a risk of material damage due to freezing, when extracting the refrigerant!

- Turn off the system and disconnect it from the power supply.
- Allow the system to cool down before proceeding.
- Make leak detection.
- Put the refrigerant cylinder on the scales and connect it to service valve, manifold and recovery machine.
- Open valves and extract refrigerant.
- Extract freon and dispose of it according to regulations.
- Purge the refrigerant circuit with oxygen-free nitrogen for a minimum of 5 minutes, repeating the process at least twice. Check pressure!
- Release the positive pressure.
- Carry out a static vacuum test.
- Repeat purging if needed.
- Close valves and check for leak.

Filling refrigerant

Filling R32 refrigerant requires strict adherence to safety protocols due to its flammable nature.

- Turn off the system and disconnect it from the power supply.
- Allow the system to cool down before proceeding.
- Make leak detection.
- Extract the refrigerant and check the pressure. Absolute pressure before filling: < 2.7 mbar



When filling the refrigerant circuit, make sure that neither air nor oxygen enters the system!



Using the incorrect or contaminated refrigerant can cause material damage!

If there is a risk of frost damage, drain the heating water from the product.

- Ensure that the product is still earthed.
- Fill refrigerant via service valve using scales.
- Make leak detection.
- Stick a label.

11. TROUBLESHOOTING AND DIAGNOSTICS

Notification information

This chapter is dedicated to providing you with a comprehensive guide to diagnosing and resolving common problems associated with air-water heat pumps. Identification of frequent problems, such as reduced heating efficiency, unusual noises, and system shutdowns, along with their potential causes.

The system automatically detects major faults and displays them on the main screen. You can also view the alarm history in a special menu.

The alarm is displayed in real time on the main screen and can be acknowledged.

Notification information menu

To view the faults and alarms history, go to the next menu **Notification information** in the parameter query page.



■ Description of all alarms and the first solutions

PCB

Error Code	Error Description	Troubleshooting
E01	Wrong Phase	Power Supply Connect Wrong Phase
E02	Missing Phase	Power Supply Missing Phase

Error Code	Error Description	Troubleshooting
E03	Water Flow Failure	<ol style="list-style-type: none"> 1. Check whether the circulating water pump is normal and whether the water system is blocked. 2. Check whether the water flow switch is normal and whether the installation direction is correct. 3. Check whether the wiring of the water flow switch is correct or not. 4. Check whether the water pump head meets the actual requirements 5. Check whether the water pump is reversed and installed in the wrong direction.
E04	Abnormal Communication between Motherboard and Remote Module (Reserved)	Check the communication connection between the motherboard and the remote module.
E05	High Pressure Switch Failure	<ol style="list-style-type: none"> 1. Check pressure switch for damage, wiring error 2. Check if there is too much refrigerant in the system. 3. Check whether the fan is working properly and whether the water flow of the unit is normal. 4. Check whether there is air or blockage in the fluorine system. 5. Check whether the water-side heat exchanger is seriously caked with whitewash.
E06	Low Pressure Switch Failure	<ol style="list-style-type: none"> 1. Check pressure switch for damage, wiring error 2. Check if there is not enough refrigerant in the system. 3. Check whether the fan is working properly. 4. Check whether there is air or blockage in the fluorine system.
E09	Wire Controller Communication Failure	Check the communication connection between the wire controller and the main board.
E10	Reserve	Reserve
E11	Out of Use Time	The free trial period has expired, enter the boot password.
E12	Exhaust Temp. Too High	<ol style="list-style-type: none"> 1. Fluorine system clogging. 2. Lack of refrigerant in the fluorine system or bad sensor.
E14	Water Tank Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E15	Water Inlet Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E16	Coil Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E18	Exhaust Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E20	Indoor Ambient Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged

Error Code	Error Description	Troubleshooting
E21	Outdoor Ambient Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E22	DHW Return Water Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E23	Water Outlet Temp. Too Low in Cooling Mod	<ol style="list-style-type: none"> 1. Check whether the water flow is too low or no water flow 2. Check if the water outlet sensor is damaged 3. Fluorine system clogging
E24	Antifreeze Temp. Sensor Failure (Fluorine Circuit)	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E25	Reserve	Reserve
E26	Antifreeze Temp. Sensor Failure (Water Circuit)	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E27	Water Outlet Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E29	Suction Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E30	Suction Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E31	Water Pressure Failure	<ol style="list-style-type: none"> 1. Water pressure switch wiring error 2. Water pressure switch failure
E32	Water Outlet Temp. Sensor T15 Failure	<ol style="list-style-type: none"> 1. Water flow is not enough 2. Sensor failure
E33	High Pressure Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E34	Low Pressure Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E37	Large Temp. Difference between Water Inlet and Outlet	<ol style="list-style-type: none"> 1. The water inlet or outlet sensor is damaged 2. Water inlet or outlet sensor not placed or in the wrong position 3. Water flow is not enough
E38	Fan Failure	Fan driver board or motor failure
E42	Cooling Coil Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E44	Ambient Temp. Too Low	Normal protection
E47	Economizer Inlet Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged

Error Code	Error Description	Troubleshooting
E48	Economizer Inlet Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
E49	Economizer Outlet Temp. Sensor Failure	Same as E47
E51	High Pressure Too High	Same as E05
E52	Low Pressure Too Low	Same as E06
E55	Expansion Board Communication Failure	<ol style="list-style-type: none"> 1. Poor contact or broken signal wire 2. Expansion board damage 3. Motherboard damage
E80	Power Supply Error	Single-phase power supply unit detects a three-phase electrical signal
E88	Inverter Drive Module Protection	Compressor or compressor driver board is damaged, specific faults see 4.2.2
E94	Built-in pump over/under voltage	<ol style="list-style-type: none"> 1. Input power supply voltage <165V 2. Input power supply voltage >265V 3. Electronic components on the pump drive board are damaged or damp 4. Water pump failure
E96	Compressor Drive Board Communication Failure	<ol style="list-style-type: none"> 1. Poor contact or broken signal wire 2. Electronic components on the motherboard are damaged or damp. 3. Compressor drive board on the electronic components are damaged or moisture 4. Compressor drive board power supply is not powered on
E98	Fan Board Communication Failure	<ol style="list-style-type: none"> 1. Poor contact or broken signal wire 2. Electronic components on the motherboard are damaged or damp. 3. Fan drive board on the electronic components are damaged or moisture 4. Fan drive board power supply is not powered on
EA1	Cascade Model Mismatch	Different series of units are not allowed to be cascaded
EA2	Solar Water Heater Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
EA3	Zone 2 Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
EA4	Buffer Tank Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged
EA5	Total Water Outlet Temp. Sensor Failure	<ol style="list-style-type: none"> 1. The sensor wire is loose or damaged 2. Sensor is damaged 3. The motherboard port is damaged

Compressor

Compressor Drive Error Description Table		
E88	P1	IPM Module Overheat and Shutdown
	P2	Compressor Driver Failure
	P3	Compressor Overcurrent
	P4	Input Voltage Missing Phase
	P5	IPM Supply Voltage Failure
	P6	Power Component Overheating and Shutdown
	P7	Pre-charge Circuit Voltage Failure
	P8	DC Bus Overvoltage
	P9	DC Bus Undervoltage
	P10	AC Input Undervoltage
	P11	AC Input Overvoltage
E89	P12	Input Voltage Sampling Failure
	P13	DSP and PFC Communication Failure
	P14	Board Radiator Temp. Sensor Failure
	P15	DSP and Communic. Board Communic. Failure
	P16	Communication Failure with Motherboard
	P17	Compressor Overcurrent Alarm
	P18	Compressor Weak Magnetic Protection Alarm
	P19	IPM Overheat Alarm
	P20	PFC Overheat Alarm
	P21	AC Input Overcurrent Alarm
	P22	EEPROM ErrorAlarm
	P23	N/A
	P24	EEPROM Refresh Complete
	P25	Temperature Sensing Failure Limit
	P26	AC Undervoltage Frequency Limit Protec. Alarm;
	P27	N/A
	P28	N/A
	P29	N/A
	P30	N/A
	P31	N/A
	P32	N/A
	P33	IPM Module Overheat and Shutdown
	P34	Compressor Missing Phase
	P35	Compressor Overload
	P36	Input Current Sampling Failure
	P37	IPM Supply Voltage Failure
	P38	Pre-charge Circuit Voltage Failure
	P39	EEPROM Failure
	P40	AC Input Overvoltage Failure
P41	Microelectronics Failure	
P42	Compressor Type Code Failure	
P43	Current Sampling Signal Overcurrent	

Wire controller blinks to cycle through E88 and above codes.

■ Technical data

Sauer 6/10/14/18 1 phase

Model	Unit	Sauer 6 - 1 phase- OU+IU	Sauer 10 - 1 phase- OU+IU	Sauer 14 - 1 phase- OU+IU	Sauer 18 - 1 phase- OU+IU
Power Supply	220-240-/50Hz				
Test Standard: EN14511 Ambient Temperature: 7°C/6°C(DB/WB), Water Inlet/Outlet: 30°C/35°C					
Heating Capacity Min./Max.	kW	2.5-8.3	4.2-12.2	5.3-16.5	6.2-20.5
Heating Power Input Min./Max.	kW	0.57-1.92	0.86-2.88	1.15-4.15	1.36-5.28
Heating Capacity Rated	kW	6.46	10.58	14.75	18.77
COP	/	4.93	4.62	4.60	4.51
Test Standard: EN14511 Ambient Temperature: 7°C/6°C(DB/WB), Water Inlet/Outlet: 47°C/55°C					
Heating Capacity Min./Max.	kW	2.3-7.6	3.8-11.2	4.9-15.1	6.3-19.9
Heating Power Input Min./Max.	kW	0.75-2.61	1.13-3.75	1.65-5.25	1.65-6.82
Heating Capacity Rated	kW	5.92	9.28	14.51	18.47
COP	/	3.17	3.12	3.03	2.97
Test Standard: EN14511 Ambient Temperature: 35°C/24°C(DB/WB), Water Inlet/Outlet: 12°C/7°C					
Cooling Capacity Min./Max.	kW	1.8-7.1	2.6-10.3	4.5-13.5	5.5-17.5
Cooling Power Input Min./Max.	kW	0.61-2.43	0.91-3.65	1.45-4.85	1.65-6.25
Cooling Capacity Rated	kW	5.53	8.54	12.50	15.88
EER	/	3.04	3.01	2.77	2.96
Ambient Temperature: 20°C/15°C(DB/WB), Water Temperature from 15°C to 55°C					
Hot Water Capacity Min./Max.	kW	3.0-9.9	4.8-14.0	6.1-18.9	7.5-24.2
Hot Water Power Input Min./Max.	kW	0.66-2.26	0.99-3.32	1.10-4.70	1.51-6.05
Hot Water Capacity Rated	kW	7.43	11.91	17.56	22.34
COP	/	4.67	4.52	4.39	4.30
Test Standard: EN14825					
Energy Efficiency Class(35°C)	/	A+++	A+++	A+++	A+++

Energy Efficiency Class(55°C)	/	A++	A++	A++	A++
Operating Temp.Range (Heating)	°C	-25-35			
Water Outlet Temp.Range (Heating)	°C	20-60			
Operating Temp.Range (Cooling)	°C	16-45			
Water Outlet Temp.Range (Cooling)	°C	5-25			
Operating Temp.Range (Hot Water)	°C	-25-45			
Water Outlet Temp.Range (Hot Water)	°C	20-55			

Outdoor Unit

Model	Unit	Sauer 6 - 1 phase- OU	Sauer 10 - 1 phase- OU	Sauer 14 - 1 phase- OU	Sauer 18 - 1 phase- OU
Refrigerant Type/Weight	kg	R32 /1.35	R32 /1.9	R32 /2.9	R32 /3.7
Compressor	/	Panasonic			
Maximum Allowable Pressure	MPa	4.4			
Power Input Max.	kW	2.71	3.83	6.2	7.5
Current Input Max.	A	12	17	27.5	35
Electrical Shock-proof	/	I			
IP Class	/	IPX4			
Sound Pressure Level	dB (A)	49	52	53	55
Sound Power Level	dB (A)	63	66	68	71
Unit Dimensions (W/H/D)	mm	1100×445×850			1110×445×1450
Shipping Dimensions (W/H/D)	mm	1160×565×1010			1170×530×1610
Net Weight	kg	90	92	109	132
Gross Weight	kg	100	102	119	146

Indoor Unit

Model	Unit	Sauer 6 - 1 phase-IU	Sauer 10 - 1 phase-IU	Sauer 14 - 1 phase-IU	Sauer 18 - 1 phase-IU
Water Pump	/	Grundfos			
Expansion Tank	L	6	6	6	6
Electric Heater	kW	3	3	3	3
Power Input Max.	kW	3.5	3.5	3.5	3.5
Current Input Max.	A	15.6	15.6	15.6	15.6
Water Piping Connect.	Inch	G1"			G 1-1/2"
Water Pressure Drop	kPa	25	27	30	32
Water Pressure Min/Max	MPa	0.1 / 0.3			
Water Flow Rated	m ³ /h	1.1	1.75	2.52	3.2
Sound Pressure level	dB (A)	35	35	35	35
Electrical Shockproof	/	I			
IP Class	/	IPX1			
Unit Dimensions (W/H/D)	mm	495×800×280			
Shipping Dimensions (W/H/D)	mm	560×920×355			
Net Weight	kg	44	47	50	57
Gross Weight	kg	49	52	55	58

Sauer 10/14/18/24 3 phase

Model	Unit	Sauer 10 - 3 phase-OU+IU	Sauer 14 - 3 phase-OU+IU	Sauer 18 - 3 phase-OU+IU	Sauer 24 - 3 phase-OU+IU
Power Supply		380-415/3N-/50Hz			
Test Standard: EN14511 Ambient Temperature: 7°C/6°C(DB/WB),Water Inlet/Outlet: 30°C/35°C					
Heating Capacity Min./Max.	kW	4.2-12.2	5.3-16.6	6.2-20.5	6.5-26.1
Heating Power Input Min./Max.	kW	0.86-2.88	1.15-4.15	1.36-5.28	1.78-6.45
Heating Capacity Rated	kW	10.58	14.75	18.77	23.98
COP	/	4.62	4.60	4.51	4.34

Test Standard: EN14511 Ambient Temperature: 7°C/6°C(DB/WB),Water Inlet/Outlet: 47°C/55°C					
Heating Capacity Min./Max.	kW	3.8-11.2	4.9-15.1	6.3-19.9	6.9-26.1
Heating Power Input Min./Max.	kW	1.13-3.75	1.65-5.25	1.65-6.82	1.95-8.55
Heating Capacity Rated	kW	9.28	14.51	18.47	23.77
COP	/	3.12	3.03	2.97	3.08
Test Standard: EN14511 Ambient Temperature: 35°C/24°C(DB/WB),Water Inlet/Outlet: 12°C/7°C					
Cooling Capacity Min./Max.	kW	2.6-10.3	4.5-13.5	5.5-17.5	5.2-21.3
Cooling Power Input Min./Max.	kW	0.91-3.65	1.45-4.85	1.65-6.25	1.95-8.20
Cooling Capacity Rated	kW	8.54	12.50	15.88	20.44
EER	/	3.01	2.77	2.96	2.86
Ambient Temperature: 20°C/15°C(DB/WB), Water Temperature from 15°C to 55°C					
Hot Water Capacity Min./Max.	kW	4.8-14.0	46.1-18.9	7.5-24.2	8.0-31.3
Hot Water Power Input Min./Max.	kW	0.99-3.32	1.10-4.70	1.51-6.05	1.87-7.50
Hot Water Capacity Rated	kW	11.91	17.56	22.34	28.65
COP	/	4.52	4.39	4.30	4.29
Test Standard: EN14825					
Energy Efficiency Class(35°C)	/	A+++	A+++	A+++	A+++
Energy Efficiency Class(55°C)	/	A++	A++	A++	A++
Operating Temp.Range (Heating)	°C	-25-35			
Water Outlet Temp.Range (Heating)	°C	20-60			
Operating Temp.Range (Cooling)	°C	16-45			
Water Outlet Temp.Range (Cooling)	°C	5-25			
Operating Temp.Range (Hot Water)	°C	-25-45			
Water Outlet Temp.Range (Hot Water)	°C	20-55			

Outdoor Unit

Model	Unit	Sauer 10 - 3 phase-OU	Sauer 14 - 3 phase-OU	Sauer 18 - 3 phase-OU	Sauer 24 - 3 phase-OU
Refrigerant Type/Weight	kg	R32 /1.9	R32 /2.9	R32 /3.7	R32 /3.7
Compressor	/	Panasonic			
Maximum Allowable Pressure	MPa	4.4			
Power Input Max.	kW	3.83	6.2	7.5	10
Current Input Max.	A	6.5	10.5	13	17
Electrical Shockproof	/	I			
IP Class	/	IPX4			
Sound Pressure Level	dB (A)	52	54	55	57
Sound Power Level	dB (A)	67	68	70	72
Unit Dimensions (W/H/D)	mm	1100×445×850		1110×445×1450	
Shipping Dimensions (W/H/D)	mm	1160×565×1010		1170×530×1610	
Net Weight	kg	92	109	132	140
Gross Weight	kg	102	119	146	155

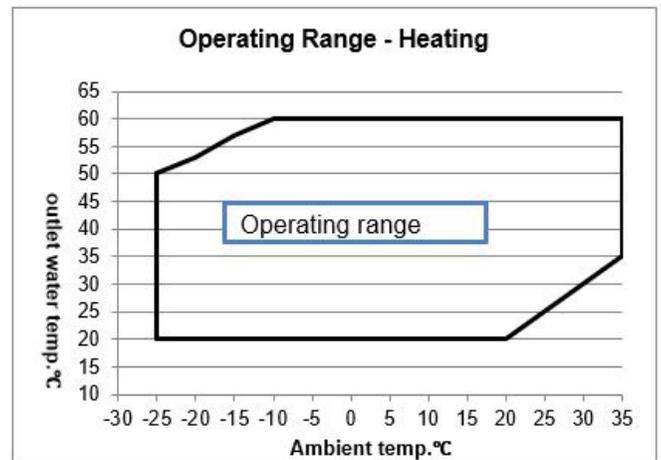
Indoor Unit

Model	Unit	Sauer 10 - 3 phase-IU	Sauer 14 - 3 phase-IU	Sauer 18 - 3 phase-IU	Sauer 24 - 3 phase-IU
Water Pump	/	Grundfos			
Expansion Tank	L	6	6	6	6
Electric Heater	kW	3/6/9	3/6/9	3/6/9	3/6/9
Power Input Max.	kW	9.5	9.5	9.5	9.5
Current Input Max.	A	16.2	16.2	16.2	16.2
Water Piping Connect.	Inch	G1"		G1-1/2"	
Water Pressure Drop	kPa	27	30	32	35

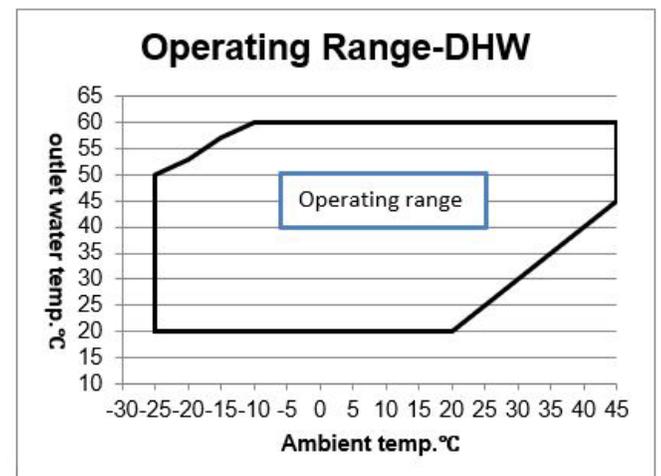
Water Pressure Min/Max	MPa	0.1 / 0.3			
Water Flow Rated	m ³ /h	1.75	2.52	3.2	4.12
Sound Pressure level	dB (A)	35	35	35	35
Electrical Shockproof	/	I			
IP Class	/	IPX1			
Unit Dimensions (W/H/D)	mm	495×800×280			
Shipping Dimensions (W/H/D)	mm	560×920×355			
Net Weight	kg	47	50	57	57
Gross Weight	kg	52	55	58	58

Operating range

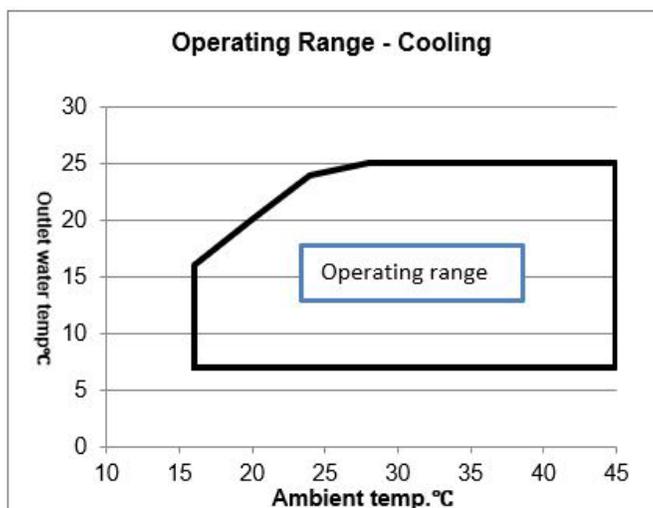
Heating



DHW



Cooling



Basic solutions to problems



Danger. The water may be hot!



Risk of high voltage!

The heat pump does not start:

1. Check the power.
2. Check fuses and circuit breakers.
3. Check high limit temperature switcher.
4. It is possible that the time for the compressor to trip has not passed.
5. It is possible that the ambient temperature is not suitable for operation according to the specified mode.
6. Look for alarms.

The low room temperature:

1. Incorrect settings of heat pump.
2. Incorrect settings of separate automatic thermostats if use.
3. Closed radiators or floor heating thermostats.
4. Check filters.
5. Bleed hydraulic.

Ice on the grille and fan:

1. Something is blocking the air passage across the heat exchanger.

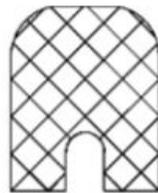
2. Switch on a defrosting mode manually.

3. Look for alarms.

4. Natural disaster.

5. Design problems.

Box contents



Rubber insulators x4



Expansion bolts x3



Installer and user manual x1

12. ACCESSORIES

For convenient and quick installation, you can order perfectly matching and selected additional accessories together with the heat pump.



AZC

To control the second heating circuit



IoT

Service control and GSM



SC

Solar collector connection kit

13. CONTACT INFORMATION

BAUF HOME GmbH

Frankfurter Straße 16, 74072 Heilbronn, Deutschland
Telefon: +49 7941 6433976
E-Mail: support@bauf-home.de

APPENDIX 1

Technical control before start

Please, fill and send to brand representative together the warranty card

Installation organization _____		Room area _____ m ²	
Installation engineers _____		Heat loss _____ W/m	
Date _____		DHW requirement _____ l/h	
Seller company _____		DHW tank _____ l	
		Heat accumulator _____ l	
Model			
Antifreeze			
Power 230V 400V		_____	
	Write		
RCD/SPD (nominal)			
Circuit breaker(nominal)			
Grounding			
Safety valves nominal			
System pressure			
Drainage			
Filling			
Venting			
Expansion tank pressure			

Customer (full name) _____

Installation(full name) _____ Signature _____

Address _____

Type	Inspection Content	Yes or No
Installation of unit	Is the appearance intact and free of scratches	
	Is the installation space meet the requirements	
	Is the indoor unit installed securely and reliably	
	Does the installation foundation height of the outdoor unit meet the requirements	
	Does the inlet and outlet of the wind side heat exchanger meet the requirements	
	Are rain, sun, snow, and strong wind protection measures implemented	
Installation of water pipe	Is the pipeline well sealed and leak free after water injection	
	Is the pipeline cleaned and free of impurities	
	Are drainage measures in place and ensure smooth drainage	
	Is the pipeline insulation complete	
	Is the air inside the pipe completely discharged	
	Is the pipeline valve in the correct open/ closed state	
	Is an air vent installed at the highest point and other high points of the pipeline	
	Is a drainage valve installed at the lowest point of the pipeline	
Installation of electrical	Does the power supply meet the requirements of the unit	
	Can the leakage protector effectively operate	
	Is the earth wire correctly connected	
	Is the piping and wiring specifications correct	
	Is the power wiring intact and undamaged	
Installation of refrigerant pipe	Whether the piping and wiring are connected correctly	
	Is the pipeline well sealed	
	Is the pipeline insulation complete	
	Is the refrigerant volume sufficient	

Customer (full name) _____

Installation(full name) _____ Signature _____

Address _____

APPENDIX 2

Technical control after start

Please, fill and send to brand representative together the warranty card

After passing the inspection according to the above list, turn on the power. Wait for the host to be powered on and preheated for more than 12 hours before starting up and running. Control the operation of the host with a wire controller and check the following items according to the manual: (If there is a fault, please troubleshoot it according to the fault and its cause explained in the manual)

Installation organization _____		Room area _____ m ²	
Installation engineers _____		Heat loss _____ W/m	
Date _____		DHW requirement _____ l/h	
Seller company _____		DHW tank _____ l	
		Heat accumulator _____ l	
Model			
Antifreeze			
Power 230V 400V		_____	
	Write		
Mode			
Voltage			
Water Outlet Temp. T7			
Water Inlet Temp. T6			
System pressure			
Set heating temperature			
Set water tank temperature			
TC electric heater outlet water temp			
Inlet temperature			
Expansion tank pressure			

Customer (full name) _____

Installation (full name) _____ Signature _____

Address _____

Type	Inspection Content	Yes or No
The operation of the unit	Is the wire controller working properly	
	Are the function keys of the wire controller working properly	
	Is the indicator light working properly	
	Is there any abnormal vibration or sound in the unit	
	Does it work properly in each mode	
The operation of the water system	Is the drainage normal	
	Is the outlet water temperature normal	
	Is there any water leakage in the pipeline	
	Is the air vent on the pipeline venting properly	
The operation of the electrical system	Does the power supply meet the requirements of the unit	
	Is the earth wire connected securely	
The operation of the refrigerant	Is there any refrigerant leakage in the pipeline	

Customer (full name)_____

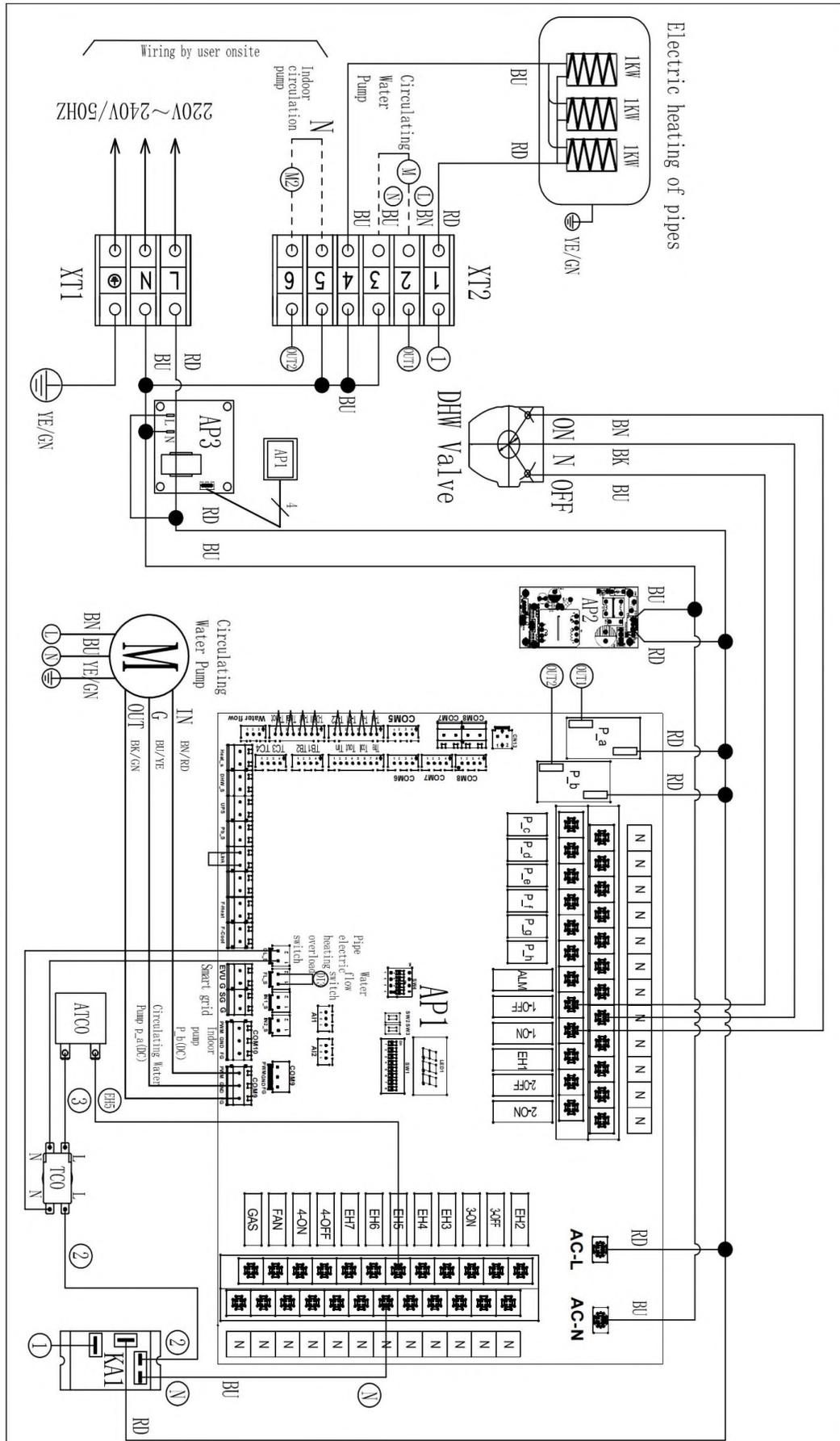
Installation(full name)_____ Signature _____

Address _____

APPENDIX 3.1

SAUER

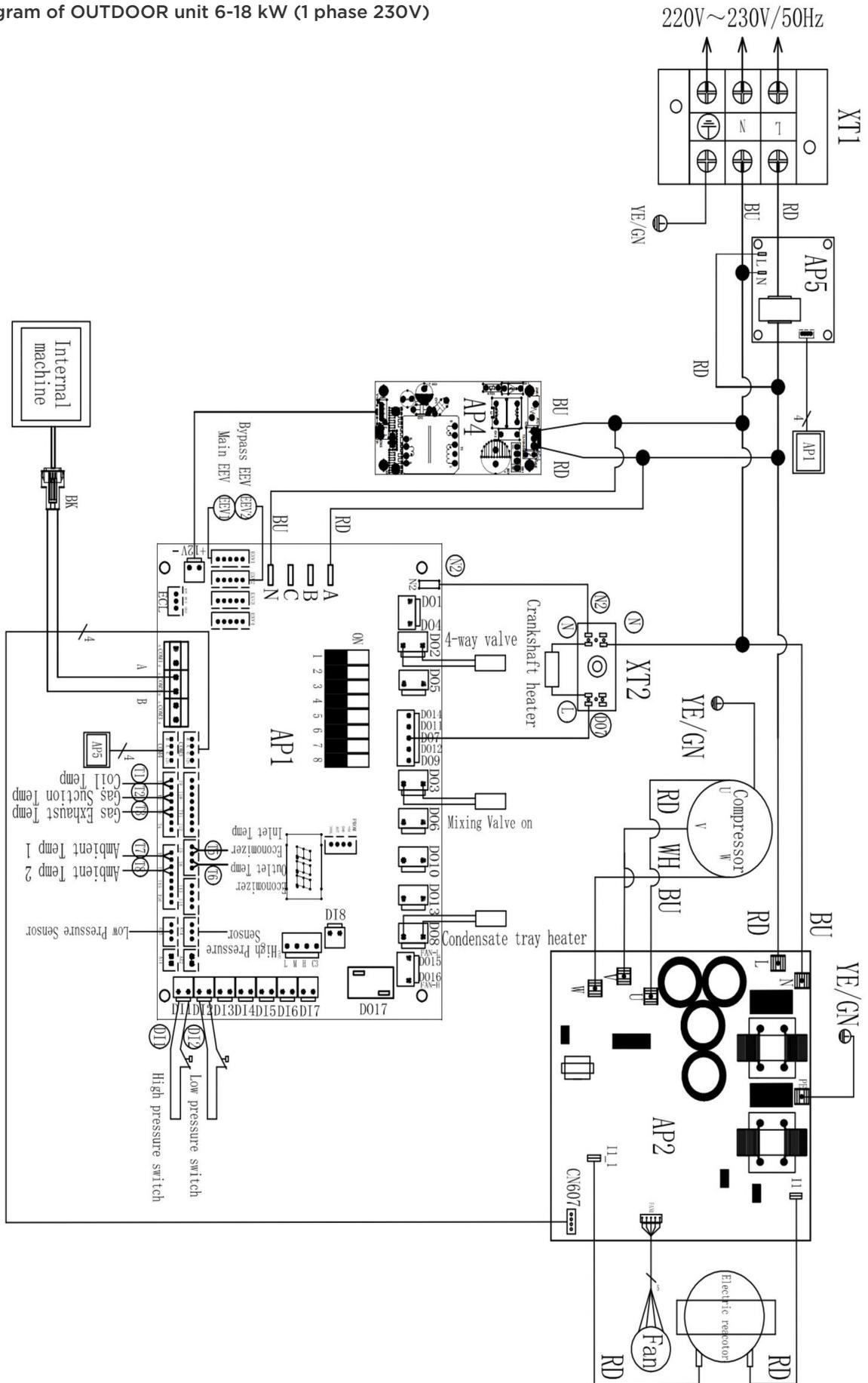
Wiring diagram of INDOOR unit 6-18 kW (1 phase 230V)



APPENDIX 3.2

SAUER

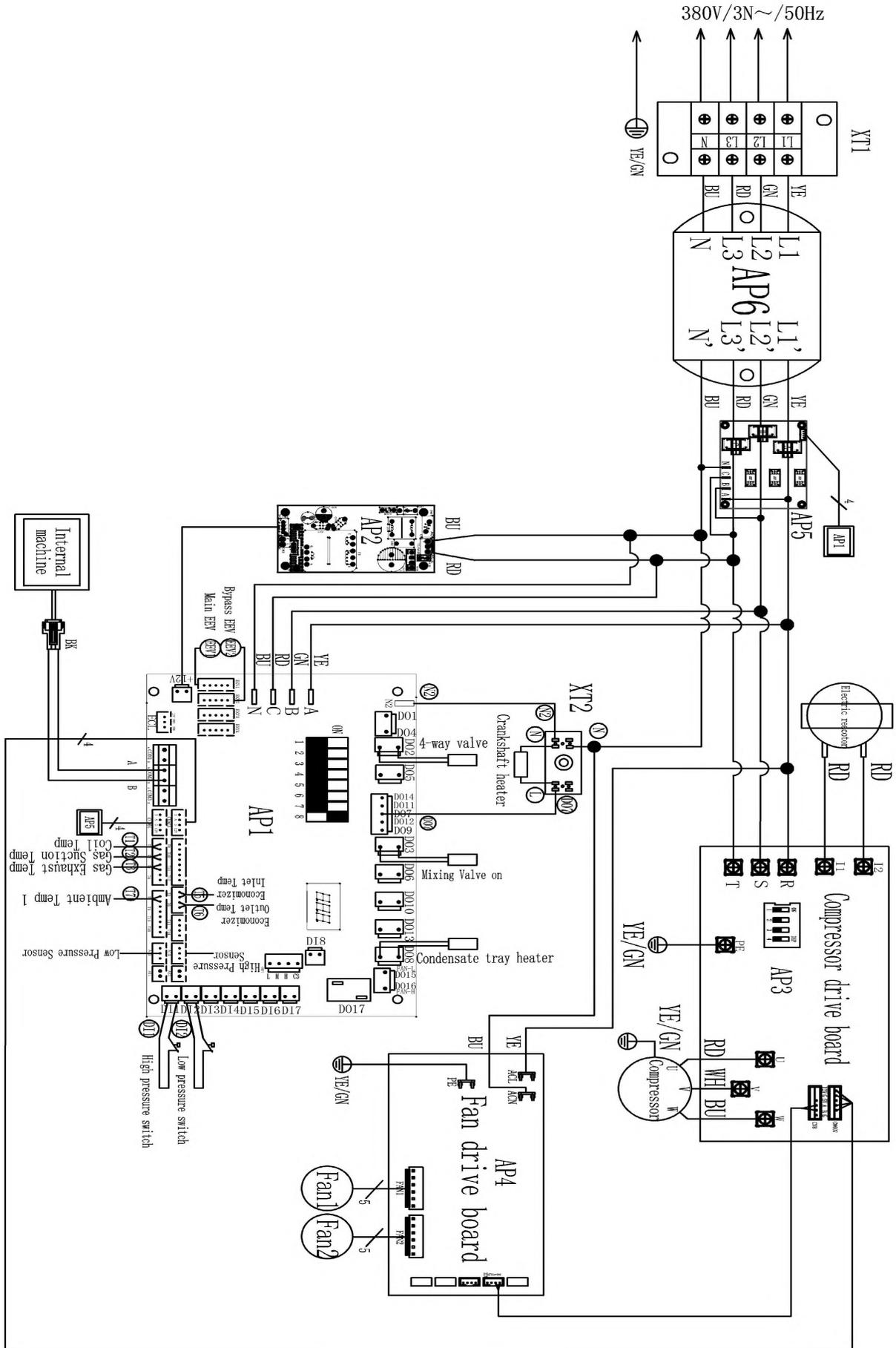
Wiring diagram of OUTDOOR unit 6-18 kW (1 phase 230V)



APPENDIX 3.4

SAUER

Wiring diagram of OUTDOOR unit 10-24 kW (3 phase 400V)



APPENDIX 4

Sensor`s data

T1, T2, T5, T6, T7, T8

5K (3470K) Sensor resistance table													
Temp. (°C)	Resistance value (K Ω)	Temp. (°C)	Resistance value (K Ω)	Temp. (°C)	Resistance value (K Ω)	Temp. (°C)	Resistance value (K Ω)	Temp. (°C)	Resistance value (K Ω)	Temp. (°C)	Resistance value (K Ω)	Temp. (°C)	Resistance value (K Ω)
-40	108.4	-13	26.2913	14	7.7643	41	2.7692	68	1.1413	95	0.5196	122	0.2677
-39	102.3	-12	25.033	15	7.4506	42	2.6735	69	1.1008	96	0.5088	123	0.2615
-38	96.62	-11	23.8424	16	7.1813	43	2.5816	70	1.0734	97	0.4919	124	0.2554
-37	91.26	-10	22.7155	17	6.8658	44	2.4936	71	1.0412	98	0.4786	125	0.2496
-36	86.23	-9	21.6486	18	6.5934	45	2.4097	72	1.01	99	0.465	126	0.2438
-35	81.51	-8	20.638	19	6.3333	46	2.3276	73	0.98	100	0.4533	127	0.2383
-34	77.08	-7	19.6806	20	6.085	47	2.2491	74	0.9508	101	0.4418	128	0.2329
-33	72.92	-6	18.7732	21	5.8479	48	2.1739	75	0.9228	102	0.4385	129	0.2276
-32	69.01	-5	17.9129	22	5.6213	49	2.1016	76	0.8957	103	0.4273	130	0.2225
-31	65.33	-4	17.097	23	5.4048	50	2.0321	77	0.8695	104	0.4165	131	0.2175
-30	63.7306	-3	16.323	24	5.1978	51	1.9656	78	0.8441	105	0.406	132	0.2127
-29	60.3223	-2	15.5886	25	5	52	1.9016	79	0.8196	106	0.3958	133	0.2079
-28	57.118	-1	14.8713	26	4.8108	53	1.8399	80	0.7959	107	0.3859	134	0.2034
-27	54.1043	0	14.2293	27	4.6298	54	1.7804	81	0.773	108	0.3763	135	0.1989
-26	51.2686	1	13.6017	28	4.4586	55	1.7232	82	0.7508	109	0.367		
-25	48.5994	2	13.0057	29	4.2909	56	1.668	83	0.7295	110	0.3579		
-24	46.086	3	12.439	30	4.1323	57	1.614	84	0.7086	111	0.3491		
-23	43.7182	4	11.9011	31	3.9804	58	1.5636	85	0.6885	112	0.3406		
-22	41.4868	5	11.3894	32	3.8349	59	1.5142	86	0.669	113	0.3323		
-21	39.3833	6	10.9028	33	3.6955	60	1.4856	87	0.6502	114	0.3243		
-20	37.3992	7	10.4399	34	3.562	61	1.4206	88	0.632	115	0.3165		
-19	35.5274	8	9.9995	35	3.434	62	1.3763	89	0.6144	116	0.3089		
-18	33.7607	9	9.5802	36	3.3119	63	1.3336	90	0.5973	117	0.3015		
-17	32.0927	10	9.181	37	3.1937	64	1.2923	91	0.5808	118	0.2944		
-16	30.5172	11	8.8008	38	3.0809	65	1.2526	92	0.5647	119	0.2874		
-15	29.0286	12	8.4395	39	2.9727	66	1.2142	93	0.5492	120	0.2807		
-14	27.6216	13	8.0934	40	2.8688	67	1.1771	94	0.5342	121	0.2741		

50K(3950K) Sensor resistance table

Temp. (°C)	Resistance value												
-40	1588	-12	306.29	16	75.001	44	22.648	72	8.0903	100	3.312	128	1.5165
-39	1489	-11	290.06	17	71.625	45	21.773	73	7.8193	101	3.215	129	1.4774
-38	1396	-10	274.78	18	68.416	46	20.935	74	7.5586	102	3.1214	130	1.4396
-37	1310	-9	260.4	19	65.368	47	20.134	75	7.3077	103	3.031	131	1.4028
-36	1230	-8	246.85	20	62.474	48	19.368	76	7.0667	104	2.9435	132	1.3672
-35	1156	-7	234.08	21	59.719	49	18.635	77	6.8345	105	2.8589	133	1.3327
-34	1086	-6	222.02	22	57.104	50	17.932	78	6.6109	106	2.7772	134	1.2991
-33	1021	-5	210.69	23	54.62	51	17.26	79	6.396	107	2.6982	135	1.2665
-32	959.9	-4	199.98	24	52.253	52	16.616	80	6.189	108	2.6218	136	1.2349
-31	903.1	-3	189.86	25	50	53	16.001	81	5.9894	109	2.5479	137	1.2042
-30	866.96	-2	180.34	26	47.857	54	15.41	82	5.7976	110	2.4764	138	1.1744
-29	815.7	-1	171.33	27	45.817	55	14.844	83	5.6126	111	2.4072	139	1.1455
-28	767.71	0	162.81	28	43.877	56	14.302	84	5.4346	112	2.3403	140	1.1174
-27	722.87	1	154.78	29	42.027	57	13.782	85	5.2629	113	2.2755	141	1.0901
-26	680.87	2	147.19	30	40.265	58	13.284	86	5.0974	114	2.2128	142	1.0636
-25	641.59	3	140	31	38.585	59	12.807	87	4.9379	115	2.1522	143	1.0379
-24	604.82	4	133.21	32	36.987	60	12.348	88	4.7842	116	2.0934	144	1.0128
-23	570.34	5	126.79	33	35.462	61	11.909	89	4.6359	117	2.0365	145	0.9886
-22	538.03	6	120.72	34	34.007	62	11.487	90	4.4931	118	1.9814	146	0.9649
-21	507.74	7	114.96	35	32.619	63	11.083	91	4.3552	119	1.928	147	0.942
-20	479.34	8	109.51	36	31.297	64	10.694	92	4.2222	120	1.8764	148	0.9197
-19	452.68	9	104.34	37	30.034	65	10.321	93	4.0939	121	1.8263	149	0.898
-18	427.67	10	99.456	38	28.827	66	9.9628	94	3.97	122	1.7778	150	0.8769
-17	404.17	11	94.826	39	27.677	67	9.6187	95	3.8506	123	1.7308		
-16	382.11	12	90.426	40	26.578	68	9.2882	96	3.7351	124	1.6852		
-15	361.35	13	86.262	41	25.528	69	8.9706	97	3.6238	125	1.6411		
-14	341.86	14	82.312	42	24.524	70	8.6655	98	3.5162	126	1.5983		
-13	323.53	15	78.561	43	23.566	71	8.3723	99	3.4123	127	1.5567		

Parameter Settings

P48=1 Enable Tank Temperature Sensor
 L12=0 Enable sterilization
 L22 is the return water parameter setting

1. If the unit is too far away from the domestic water tank coil is too long, it is necessary to increase the installation of this pump to auxiliary circulation.
2. If you need to turn on the return function, you need to instal this pump.
3. This sensor needs to be enabled when opening the dual-temperature zone control.
4. If you need to enable the return water function, you need to enable this sensor. NOTE The installation diagram is for reference only and installation is subject to actual conditions

1. Water Flow Switch (Built-in)	P_a Built-in water pump (Built-in)
2. Safety Valves (Built-in)	P_b Heating/Cooling water pump (Field Supply)
3. Expansion Tank (Built-in)	P_c¹ Auxiliary water pump (Field Supply)
4. Ball Valves (Field Supply)	P_d² Return water pump (Field Supply)
5. Check Valves (Field Supply)	SV1 3-Way Valve (Built-in)
6. Filter (Field Supply)	SV2 3-Way Valve (Field Supply)
7. Bypass Valves (Field Supply)	EH1 Electric heater (Field Supply)
8. DHW Tank (Field Supply)	EH2 Electric heater (Field Supply)
9. Buffer Tank (Field Supply)	T15 Water Inlet Temp. Sensor (Built-in)
10. Fan Coil (Field Supply)	T8 Water Outlet Temp. Sensor (Built-in)
11. Underfloor Heating (Field Supply)	T10³ Buffer Tank Temp. Sensor (Built-in)
12. Two Connecting Wires	T13⁴ Return Water Temperature Sensor (Built-in)
13. Three Connecting Wires	T16 DHW Tank Temp. Sensor (Built-in)



+49 7941 6433976
bauf-climate.de
support@bauf-home.de

**BAUF INSTALLER HEAT PUMP
AIR TO WATER SPLIT SAUER R32**