Installation manual

Monoblock Heat Pump

type HPX

CE

Version V03

Content

1 Introduction

This manual is intended for the installer of electrical and mechanical appliances. This document contains instructions to use and maintain the Heat Pump. It is imperative to read the instructions in this document with care, to install the appliances functionally and safely. It is paramount that this document is read thoroughly before installing the heat pump. Keep this document saved for quick reference if needed.

1.1 Symbols used in this manual

DANGER! Indicates a dangerous situation that may lead to death or severe injury.

WARNING! Indicates a possibly dangerous situation that may lead to death, severe injury, or product damage.

CAUTION! Indicates a possibly dangerous situation that may lead to injury or product damage.

PAY ATTENTION! Provides important information which is not directly related to safety issues.

1.2 Warranty

PAY ATTENTION! Using, installing, or maintaining this heat pump in a different manner than this manual indicates, may lead to product damages which cause the warranty to become void.
CAUTION! When the safety instructions described in this manual are disregarded, damage to the heat pump or the installation may incur and the warranty will become void.

1.3 Reporting malfunctions:

If the product is defective and cannot be used, please contact your installer and provide the following information:

- Information on the rating plate of the product (model, Heating capacity, product number, date of production).
- Nature of the malfunction (specify the situations before and after the occurrence of the error).

1.4 Disclaimer:

All illustrations and information in the manual are exclusively for reference, product innovations and improvements shall be continuously implemented without further notice.

2 Safety instructions

2.1 Installation by qualified personnel:

WARNING! This appliance has to be installed, operated, and maintained by qualified personnel who have followed the specific training required. It is of the utmost importance that all safety precautions mentioned on the labels, the user manual, and other documentation are followed with due diligence when operating this appliance.

WARNING! This appliance is not intended for usage by individuals with limited physical, sensory, or mental capacities (this includes children). Neither should the appliance be used when the required knowledge and experience are lacking, unless the proper instructions and supervision are provided to do so by an authorized safety professional. Children should be supervised to prevent them from playing with the appliance.

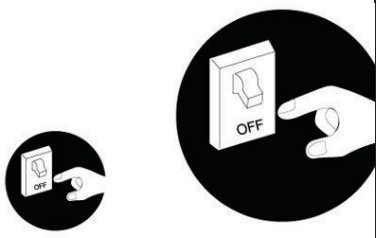
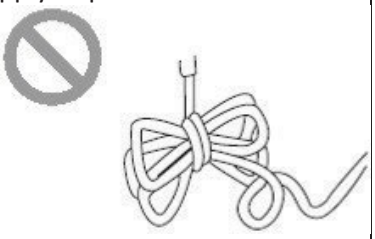
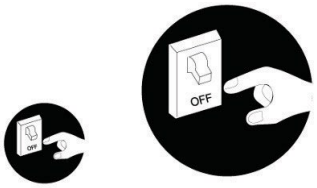
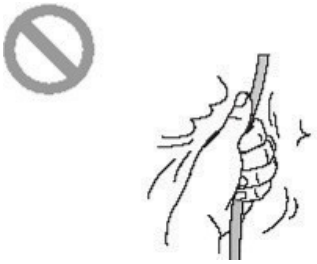
2.2 Service and inspection

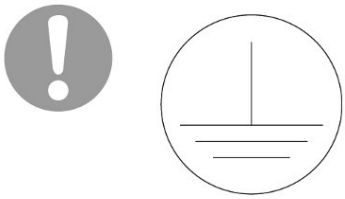
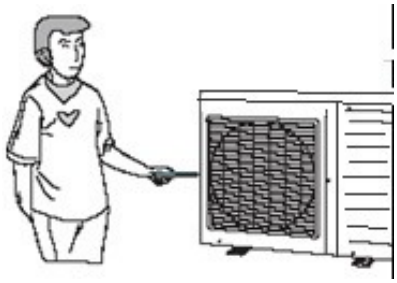
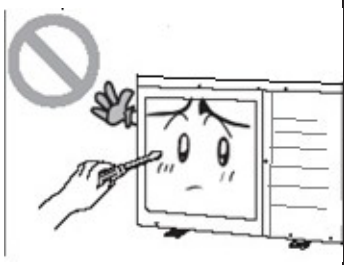
WARNING! This product is subjected to strict inspections and operational tests prior to leaving the factory. It is very important to refrain from disassembling the product by yourself, to prevent possible damage being incurred by incorrect disassembly and inspection. Instead, consult our designated dealer or local service centre for professional support.

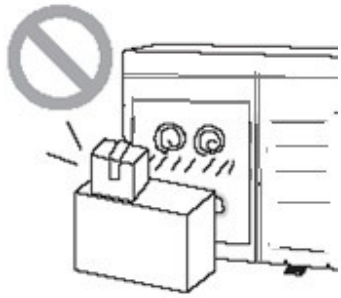
PAY ATTENTION! After receiving the unit, be sure to check its appearance and the supplied accessories. Compare these to your order.
The design and installation tasks of this unit must be executed by authorized personnel, in agreement with the applicable laws and regulations and these instructions.
The unit cannot be enabled directly after the installation unless it has been confirmed that no issues have arisen during the checking of the appliance.
Make sure that the unit is cleaned and maintained regularly, to ensure longevity and reliability of the appliance.

WARNING! If the power cord is damaged, it must be replaced by the manufacturer, an authorized service agent, or a qualified person to avoid risks.

WARNING! The appliance has to be installed in accordance with the national wiring requirements.
This product is a kind of comfort-air conditioning and cannot be installed at places where corrosive, explosive, and combustible elements or smog are present. This could lead to operational disturbances, shortened lifespans, danger, or severe injury. Special air conditions are required at these locations.

⚠ WAARSCHUWING		
If an abnormal situation occurs, such as a burning smell, immediately switch off the power supply and contact your installer.  If the defect persists, product damage and electrical shocks or fire may occur.	Do not use the appliance with wet hands.  This may lead to electrical shocks.	Check prior to the installation whether the power supply is in line with the rating plate and whether the connection cable or the wall outlet is suitable for the power of the device. 
It is important to use a dedicated circuit for the power supply to prevent fire.  Do not use a multi-functional plug or extension cord for the connection	When the unit is not in use for a long period of time, unplug it and drain the water system.  In this way, it is prevented that accumulated dust in the winter leads to overheating, fire hazards, or freezing of the water tank or heat exchanger.	Only use undamaged and specified electrical connection wires.  Usage of damaged or non-specified wires may lead to overheating or fire hazards.

Shut off the power supply before cleaning the device.  Otherwise, electrical shocks and damages may occur.	The power supply has to be a dedicated circuit with RCD (Residual Current Device) and needs to have sufficient capacity.	The user cannot modify the connections of the power cord, without being given permission in advance. Electrical wiring has to be executed by professionals. Ensure proper grounding and do not alter the grounding modes of the appliance.
Grounding: The unit needs to be grounded reliably! The Ground wire needs to connect with the grounding of the installation.  Ask qualified personnel for installation. Furthermore, the grounding wire should not be connected to gas pipes, water pipes, drainage pipes, or other incorrect locations that are not recognized by professionals.	Never put any odd objects in the outdoor unit to prevent damage. Also, refrain from putting your hands in the air outlet of the outdoor unit. 	Do not try to repair or replace the appliance by yourself.  Incorrect reparation may lead to electrical shocks or fire hazards. Please contact your installer for reparations.

Do not step on, or place anything on the appliance.  Otherwise falling danger of objects or people may occur.	Never block the air intake and outlet of the device.  This could reduce efficiency or lead to malfunctions.	Keep compressed air cylinders, gas bottles, and such at at least 1 meter distance of the appliance.  This may cause fire hazards or explosions.
Make sure that the installation stand is sufficiently sturdy.  If it is damaged this may lead to the unit becoming damaged and people getting injured.	The unit has to be installed at a location with enough ventilation for performance efficiencies.	Never turn the unit on if there is no water in the system.

WARNING! Do not use any means to accelerate the defrosting process or for cleaning, other than those that are recommended by the manufacturer. If repairs are required, please contact your nearest authorized service center. Repairs executed by unqualified personnel can be dangerous. The appliance needs to be stored in a place without continuously operating ignition sources (such as open flames, a functioning gas appliance, or an electrical heater). Do not puncture or burn.

WARNING! The appliance needs to be installed outside and stored in a room with a square footage larger than X m² (consult table “a” in the section “safe usage of combustible refrigerants” for the value X)

WARNING! The appliance is filled with the flammable gas R32. It is paramount that the instructions of the manufacturer are followed at all times when performing reparations. Take into account that refrigerants have no smell. Read the manual of the specialist.

If a stationary appliance is not provided with a power cable and a plug, or other means to decouple the mains with a full interruption of the contacts under the circumstances of overvoltage category III, means of decoupling have to be included in the fixed connection in accordance with the wiring regulations.

This appliance can be used by children from the ages of 8 and above and individuals with reduced physical, sensory, or mental capacities, or individuals with a lack of experience and knowledge, provided that they are supervised or have received instructions about safely using the appliance and understanding the dangers. Children are not allowed to play with the appliance. Cleaning and user maintenance cannot be executed by children without supervision.

The appliance has to be stored in a well-ventilated area, with a size corresponding to the indicated operating space.

The appliance has to be stored in a place without continuously functioning open flames (for example a functioning gas appliance) and sources of ignition (for example a functioning electric heater)

The appliance needs to be stored properly to prevent mechanical damage

PAY ATTENTION

 The appliance is filled with the flammable gas R32.

 Read the user manual before using the appliance.

There is a special refrigerant in the appliance to guarantee the functionality of the heat pump. This refrigerant is the fluoride R32, which is specially treated. The refrigerant is combustible and odorless. It could lead to explosions under certain circumstances. However, the flammability of this refrigerant is very low and will only be ignited by fire. In comparison to other refrigerants, the R32 is environmentally friendly and it has no damaging effects on the ozone layer. Besides that, this appliance has a lesser impact on the greenhouse effect than comparable devices. The R32 has excellent thermodynamical properties also, resulting in high energy efficiency and requiring less refrigerant. Before installation, it is important to check if the power used corresponds to the specifications indicated on the nameplate to ensure the safety of the power supply. The unit must be connected to the electricity network using a full disconnecting device under the overload category III. Before use, it is advisable to check if the wiring and pipes are connected to prevent water leakage, electric shocks, and fire hazards. Do not operate the unit with wet hands and do not allow children to operate the appliance. The “On/Off” button referred to in the manual is the button on the control panel. “Power Off” means that the power supply to the unit is interrupted. Do not expose the unit directly to corrosive environments with water or humidity. Do not use the unit without water in the water reservoir. The air outlet/inlet of the unit should not be blocked by other units. When the unit is not in use, drain the water in the unit and pipes to prevent freezing and cracking of the water reservoir, pipes, and water pump. To protect the buttons of the control panel, refrain from using sharp objects to press the buttons. Never use gasoline, thinner or chemical cloths to prevent fading and failure for components. Instead use a neutral clean agent, and clean the display and connection components carefully to prevent fading. The power cable has to be separated from the communication cables. Every individual who is involved in working on or opening the refrigeration circuit needs to have a valid certificate from an authorized assessment authority.

Maximum and minimum water operating temperatures		
Item	*Minimum water operating temperatures*	*Maximum water operating temperatures*
Cooling	5°C	25°C
Heating	20°C	65°C
Water heating	40°C	80°C
Maximum and minimum water operating pressures		
Item	*Minimum water operating pressure*	*Maximum water operating pressure*
Cooling	0.5 bar	2.5 bar
Heating		
Water heating		
Maximum and minimum entering water pressures		
Item	Minimum water entering pressure	Maximum water entering pressure
Cooling	0.5 bar	2.5 bar
Heating		
Water heating		
Range of external static pressures where the appliance is tested. (Only with heat pumps and appliances with extra heating); If the power cable is damaged, it needs to be replaced by the manufacturer, an authorized service agent, or qualified personnel to prevent dangers. If there are any questions, please contact your distributor.		

PAY ATTENTION! Installation guidelines:
If there is work conducted involving the usage of heat when working with refrigeration equipment or other components, suitable fire extinguishing equipment needs to be within reach. Place a dry powder- or CO_2 fire extinguisher when filling.

Repairs and maintenance of electrical components include initial safety checks and inspection procedures of the components. If there is a defect that could jeopardize safety, no electrical power should be connected to the circuit until the defect is resolved. If the defect cannot be fixed immediately. An adequate temporary solution should be used, this should be reported to the owner of the device, so all parties involved are aware.
Initial safety checks encompass: discharging the capacitors in a safe manner to prevent the risk of sparks; ensure that there are no voltage-carrying electrical components and wiring out in the open. When filling, recovering, or rinsing the system; make sure that there is continuity in the grounding.

During repairs to the sealed components, the device should not be electrically connected. If it is necessary to supply the appliance with electricity during repairs, a special permanently functioning kind of leakage detection needs to be applied to the most critical point on the appliance to alert for potentially hazardous situations. Special attention should be given to the following: Exercise caution when working on electrical components, so the housing does not alter in a way that compromises the degree of protection/waterproofing. This includes damage to cables, an excessive amount of connections, connections that are not made according to the original specifications, damage to seals, improper mounting of cable glands, etc.
Make sure that the device is securely mounted.
Make sure that the seals or sealing materials are not degraded to the extent that they are unsuitable to protect against the penetration of flammable vapors. Replaced components have to be in accordance with the specifications of the manufacturer. The use of silicone sealant can hinder the effectiveness of certain types of leakage detection equipment.
Intrinsically safe components do not need to be shut off prior to working on them.

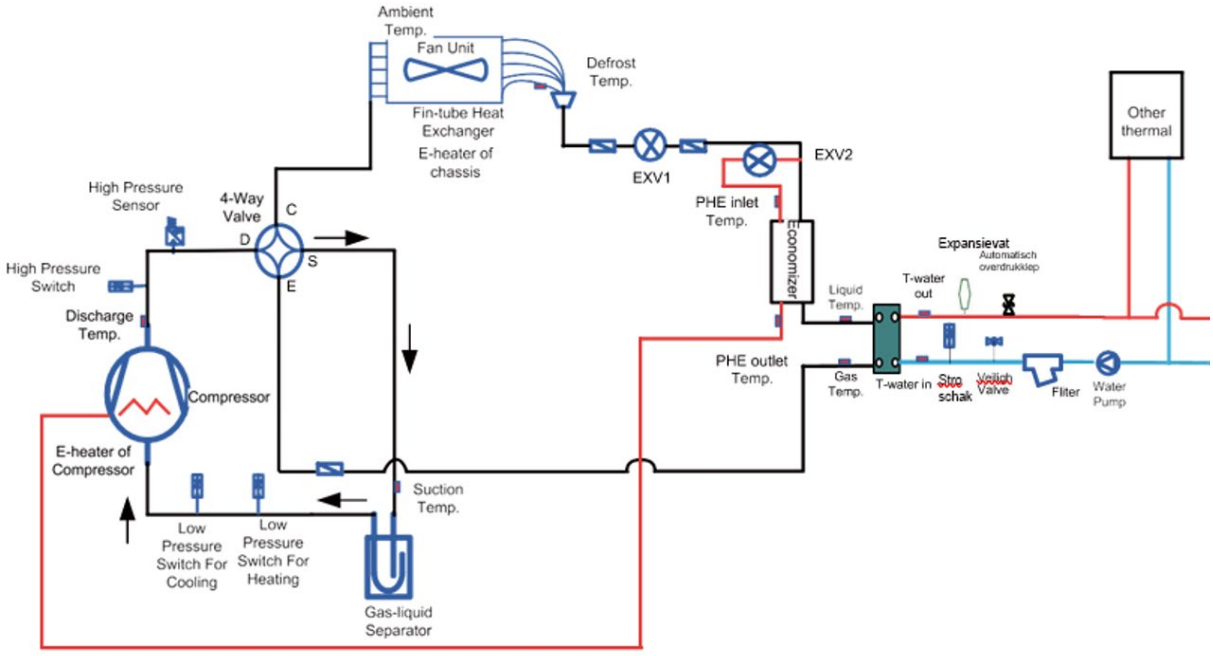
Make sure that the voltage and electricity limits of the appliance are not exceeded when adding inductive or capacitive loading to the circuit.
Only intrinsically safe components can be used when inflammable objects are in the presence of inflammable vapors. Moreover, the test device needs to be classified properly.
Only use specified replacement components that are produced by the manufacturer. The usage of unoriginal parts may lead to the leakage of refrigerants in the atmosphere and may lead to fire hazards.

Ensure that the wiring is not exposed to erosion, corrosion, excessive pressure, vibrations, sharp angles, or other negative environmental influences. When checking the safety effects caused by aging or consistent vibrations of sources such as compressors and fans need to be taken into account.

Under no circumstances can sources of ignition be used to look for leaking refrigerants. A naked flame (or other detector that uses an open flame) cannot be used.

Equipment has to be labeled with the mention that refrigerant is removed and the device is out of service. The label needs to be provided with a date and signature. Make sure that there are labels on the devices that mention that the appliance contains flammable refrigerants.

3 The functioning principle of the Heat Pump



The air-to-water heat pump consists of an outdoor unit, an internal fan heat exchanger, and an internal expansion vessel.

Functions:

(1) Cooling;
(2) Heating;
(3) Emergency operation;
(4) Forced operating mode;
(5) Venting the water system.

1 Cooling: in the cooling mode the refrigerant is condensed in the outdoor unit and evaporated in the heat exchanger. The heat exchange with water in the heat exchanger leads the temperature to decrease and releases heat, while the refrigerant absorbs and condenses the heat. The settings for the water temperature can be operated by the room thermostat. By operating the valve, cold water will be connected to the system of issuing, so the water temperature will decrease to the desired range.

2 Heating: The refrigerant evaporates in the heating mode and will be condensed in the heating exchanger of the outdoor unit. As a result of the heat exchange with water in the heat exchanger, the water will absorb heat and increase in temperature, while the refrigerant emits heat and condenses. The temperature is regulated by the room thermostat. The valve arranges a connection between the high-temperature water in the system and the indoor heat exchange with the fan, and exchanges heat with the air indoors, so the core temperature will rise to the required range.

3 Emergency operation: This mode is only available for heating and warm water heating. When the outside unit stops functioning for any reason, the added emergency mode will be activated. In heating mode, after entering emergency mode heating can only be realized through the optional e-heater of the outdoor unit. When the set outlet temperature or indoor temperature is reached, the e-heater of the outdoor heater stops working.

4 Forced operating mode: This mode is only used for regaining refrigerant and detecting malfunctions of the device.

5 Venting the water system: this function is meant to fill up water and remove air from the water system, so the appliance can function at a stable water pressure level.

4 Technical data

4.1 Table with data

		HPX06A	HPX12A	HPX16A
Heating capacity *	kW	6,0	12,0	15,7
Absorbed electrical power	kW	1,11	2,49	3,57
COP		5,41	4,82	4,40
SCOP **		5,041	4,584	4,556
Energy classroom heating ** (811/2013/EU)		A+++	A+++	A+++
Seasonal energy efficiency for room heating (ηs, h) **	%	198,7	180,3	179,2
Refrigerant		R32	R32	R32
Refrigerant contents	kg	0,95	2,2	2,2
Net weight	kg	106	162	162
Measurements (W x D x H)	mm	1150x372x733	1206x445x878	1206x445x878
Water connection (in)	inch	1	1	1
Voltage outdoor unit (50hz)	V	230	3x400	3x400
Electrical current outdoor unit (max)	A	11,0	11,5	12,5
Noise level, heating	db(A)	58	54	56
Noise level, cooling	db(A)	56	55	59
Noise level, defrosting	db(A)	58	68	68
Grade of protection		IPX4	IPX4	IPX4
Outdoor temperature range heating modes	°C	-25 / 35	-25 / 35	-25 / 35
Contents internal expansion vessel.	L	2	3	3
Maximum height 1" without extra expansion vessel	m	70	100	100
Water flow	m³/hr	1,1	2,1	2,8
Waterside designed pressure	Bar	1,5	1,5	1,5
Maximum discharge head	m	8	9	9
Modulating compressor		Yes	Yes	Yes
Modulating energy-efficient water pump		Yes	Yes	Yes
Venting + overflow included		Yes	Yes	Yes
Water circulation filter supplied		Yes	Yes	Yes

Comments:

(a) Heating capacities and power input are based on the following circumstances:
Temperature of the water 30°C/35°C. Outside temperature of the air 7°C DryBulb/6°C WetBulb.

(b) Cooling capacities and power input are based on the following circumstances:
Water temperature 23°/18°C. Outside temperature of the air 35°C DryBulb/24°C WetBulb.

4.2 Measurements

[redacted]

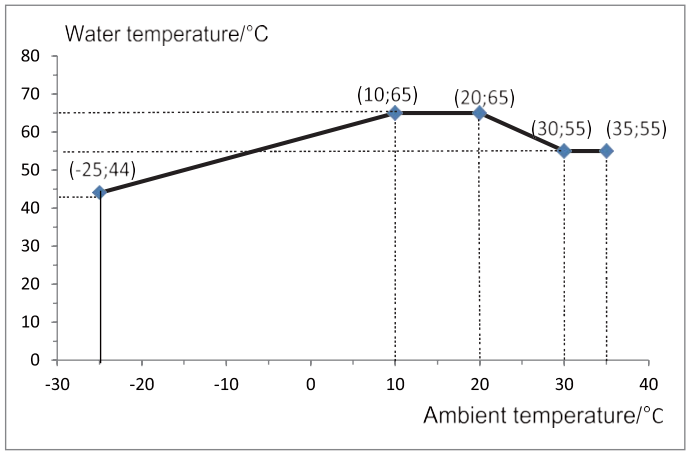
	A	B	C	D	E	F	Ø G
HPX06A	1150	735	365	415	1036	302	10
HPX12A	1206	878	445	490	1120	355	12
HPX16A	1206	878	445	490	1120	355	12

4.3 Temperature Limits

The device has limitations in regard to functioning well in different outdoor temperatures.

Mode	Outdoor Temperature (°C)	Water Temperature (°C)
Heating	-25 - 35	20 - 65
Cooling	-15 - 48	5 - 25

The influence of environmental temperatures and the maximum water temperature:



Note:
The environmental and water temperature both influence the functioning of the device

4.4 Maximum and minimum water pressure

Mode	Minimum water pressure	Maximum water pressure
Heating	0,5 bar	2,5 bar
Cooling	0,5 bar	2,5 bar

The internal expansion vessel has a pre pressure of 1,5 bar.

5 Installation of the Heat Pump

5.1 General instructions

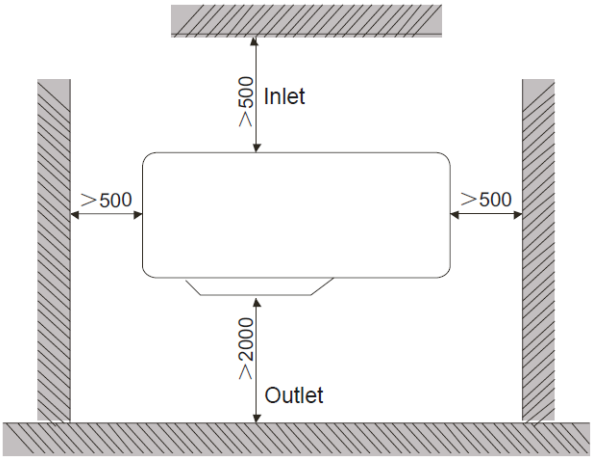
PAY ATTENTION !

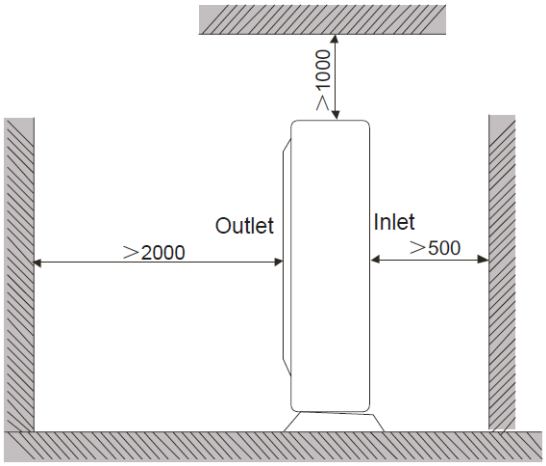
- The installation of the unit has to be in accordance with national and local safety precautions.
- The quality of the installation has a direct influence on the performance of the heat pump. The installation has to be conducted by professionals who are familiar with heat pump installations.
- Do not connect the unit to a power source until all installation activities are concluded.
- It is generally NOT required to modify the refrigerant circuit during the installation. There is no F-gasses certification requirement for installing the heat pump.
- Actions regarding the refrigerant circuit can only be conducted by certified individuals.

5.2 Setting up the Heat Pump

- The heat pump needs to be installed on a sturdy and solid foundation. The free space between the lower part and bottom of the heat exchanger has to be at least 300mm.
- The airflow at the entry and outlet cannot be blocked.
- Install the heat pump at a well-ventilated location, so the machine can absorb and drain a sufficient amount of air.
- Do not place the device under a window or between two buildings to avoid nuisance of normal operating sounds.
- Do not install the device in a location where open flames, flammable or combustible elements are present. Also avoid locations that have a lot of dust, salty mist, and polluted air.

5.2.1 Distances to hindering airflow.





PAY ATTENTION! Considering the limited space as presented in the picture on the left, the distance has to be at least 500mm between the unit and the closest barrier, this does not apply to the outlet side. For the right picture, the distance between the inlet side and the closest barrier cannot be less than 500mm.

5.2.2 Precautions when installing the heat pump unit:

(1) Use M10 or M12 bolts to mount the heat pump.

(2) The appliance needs to be installed on a foundation that is at least 300mm above the bottom.
PAY ATTENTION ! Local rules may enforce a bigger distance than 300mm because of possible excessive snowfall.

(3) The appliance needs to be lifted with the designated lifting positions. Ensure that the unit is protected while it is lifted. It is important to refrain from damaging the metal components, to prevent rust formation.

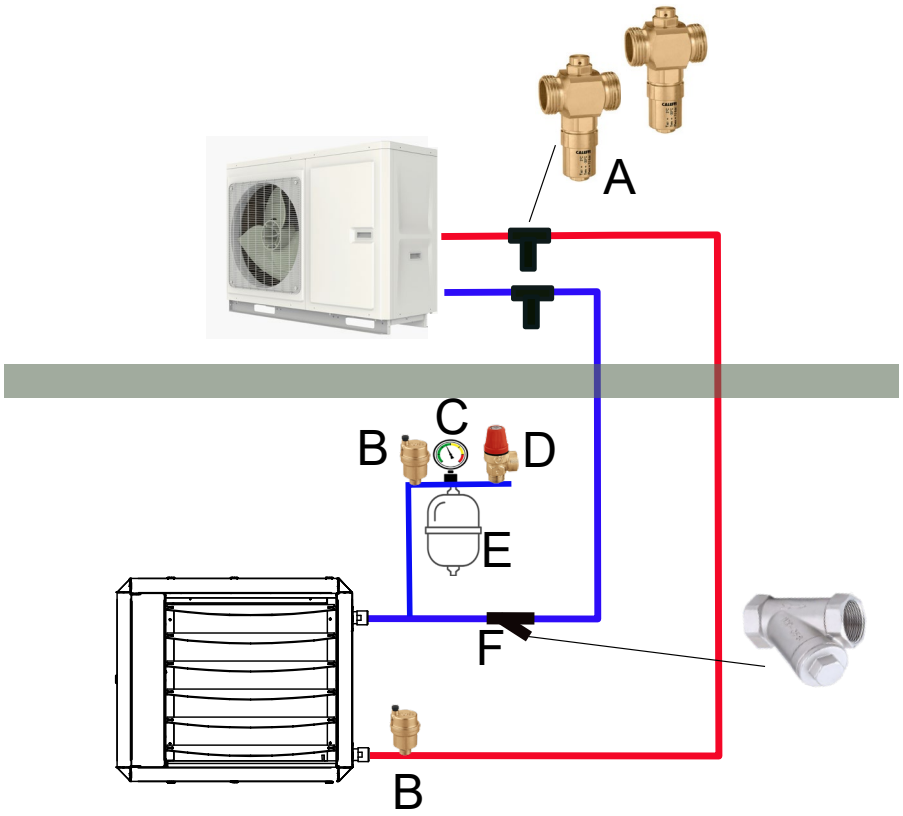
5.2.3 Usage of rubber grommets

Water return Water supply

(1) Use the long rubber grommets to connect the wiring.
(2) Separates the power cable from the control cable.
(3) Tie up the rubber rings after finishing the wiring connection.

5.3 Closing water side

5.3.1 Installation scheme



A) Anti-frost valve (2x with the heat pump, not supplied)
B) Automatical venting (2x with inlet AND outlet, not supplied)
C) Pressure meter (not supplied)
D) Expansion valve (not supplied)
E) Expansion vessel(not supplied)
F) Filter (not supplied)

5.3.2 Explanation of the components

A) Anti-Frost valve: Place outside, with the opening AND outlet of the heat pump. Place these valves lower than the opening and outlet of the heat pump. The valve will open when the water temperature is below the set value. This low temperature will only be caused by a large electrical breakdown.
B) Automatic venting: **PAY ATTENTION!** Air in the pipes is a common cause of disruption. That is why it is advised to install an automatic air vent both in the supply and return of the distribution system. The heat pump also has an internal automatic vent.

C) Pressure meter: To check if there is sufficient water pressure in the system, install a pressure gauge. (The pressure cannot be digitally read from the thermostat)
D) Expansion Valve: The heat pump is provided with a pressure safety valve that opens when the water pressure becomes too high. For extra safety measures, install an extra expansion valve.
E) Expansion tank: The heat pump has a small internal expansion tank. If the water content of the system is too high, (see paragraph 5.3.3) Then an extra expansion tank will be needed.
F) Filter: Install the standard supplied water filter in the system, preferably in the supply line to the heat pump.

5.3.3 Expansion tank and water content.

The heat pump has an internal expansion tank. The storage of this expansion tank is not very large, but generally sufficient to create a good installation. An extra expansion tank will not be needed. Read below when it is required to install an extra expansion tank.

Table for deciding whether an extra expansion tank is required.

Type	Built-in expansion tank	Maximum system storage without extra expansion tank	Maximum stretched-out 1" pipe length
HPX6A	2 litres	35 litres	70 metres
HPX12A / HPX16A	3 litres	55 litres	100 metres

Maximum system storage: Do not take the contents of the heat pump and the distribution system in this calculation. This only refers to the piping and any additional fittings. If the system capacity is exceeded, an extra expansion tank must be installed.

Maximum stretched 1" pipe length: The total length of the supply and return pipes combined. If the pipe diameter is larger than 1 inch (25,4mm), the volume should be calculated and checked against the maximum system capacity. If the system capacity is exceeded, an additional expansion tank must be installed.

5.3.4 Pipe diameter:

Do not use pipe diameters smaller than 1 inch. The heat pump moves a large volume of water. If the pipe diameter is too small, it will create excessive flow resistance and cause malfunctions in the heat pump.

5.3.5 Filling pressure:

The expansion tank in the unit has a pre-pressure of 1.5 bar. The system filling pressure should preferably be between 1.5 and 2 bar. The device has a hydraulic working range of 0.5-2.5 bar. If the pressure exceeds 2.5 bar, the safety mechanism will be triggered, and water will be discharged.

5.3.6 If the air heater is installed at a higher location than the heat pump

If the air heater is installed 12 metres higher than the heat pump, the pressure in the built-in expansion tank will be too low. The pressure will need to be increased in such cases. Please contact your distributor if this applies to your installation. It is possible that the installation may not be feasible.

5.3.7 Maximum resistance pipe system and delivery height of the internal water pump

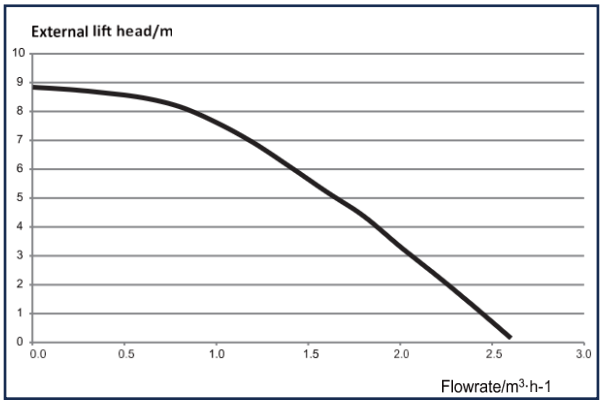
The heat pump is equipped with an internal modulating water pump. The maximum flow required by this pump to function properly is:

type	Maximum needed flow (m^3/hr)	Maximum resistance pipe system (kPa)
HPX06A	1,1	70
HPX12A	2,0	50
HPX16A	2,7	25

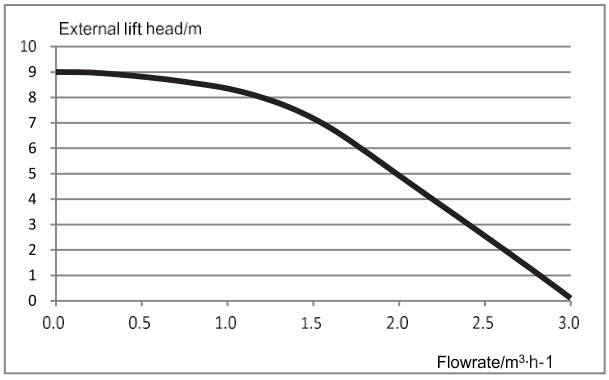
Note: if the maximum flow is not achieved, the heat pump will not be at its full capacity and might malfunction.

5.3.8 Available external static pressure on the exhaust pipe

HPX06A



HPX12A, HPX16A



Notes:

See the curve above for the maximum external static pressure. The water pump has a variable frequency. While operating the water pump will change the power based on the actual loading.

5.3.9 Requirements for water quality

To prevent issues in the water circuit, the water has to meet the quality criteria below.

Parameter	Parameter value	Unit
pH(25°C)	6,8 - 8,0	/
Turbidity	< 1	NTU
Chloride	< 50	mg/L
Fluoride	< 1	mg/L
Iron	< 3	mg/L
Sulfate	< 50	mg/L
SiO2	< 30%	mg/L
Hardness ($CaCO_3$)	< 70	mg/L
Nitrate (telling N)	< 10	mg/L
Conductivity (25°C)	< 300	µs/cm
Ammonia (aantal N)	< 0.5	mg/L
Alkalinity (amount $CaCO_3$)	< 50	mg/L
Sulfide	Under the range of detectability	mg/L
Oxygen	< 3	mg/L
Sodium	< 150	mg/L

Note: When the circulation water does not meet the criteria in the table, add a water softener

5.4 Electric connection

5.4.1 General principles

- Cables, wires, devices, and connectors that are used at the location, have to comply with the applicable regulations and technical requirements.
- Only installers with the right qualifications are allowed to operate the wiring at the location.
- The power supply has to be shut off before the connection work begins.
- The installer is responsible for possible damages that may be caused by connecting the external switch incorrectly.

5.4.2 A general reference for connecting the power supply to the heat pump

- Power cables have to be installed via cable trays, pipes, or cable channels.
- Power cables that are connected to the electrical box have to be protected with rubber or plastic, to prevent scratches through the edge of metal plates.
- Power cables close to the electrical box have to be reliably installed, to ensure that the connection points in the box do not experience external force.
- The power cable has to be reliably grounded.

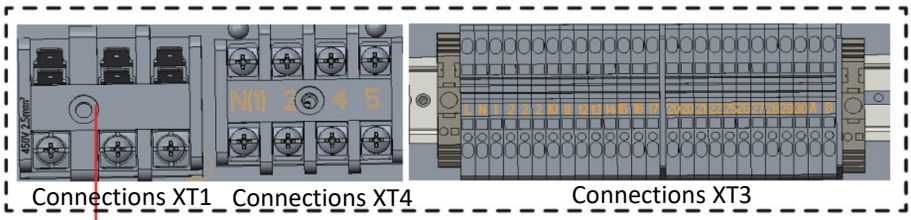
5.4.3 Specification of the power supply and earth leakage circuit breaker

type	EL supply	Work switch	Minimum diameter	Earth leakage protection
HPX06A	230V AC, 50Hz	16A	2,5mm^2	<0,1s, 30mA
HPX12A / HPX16A	400V AC, 3P+N 50Hz	16A	2,5mm^2	<0,1s, 30mA

- If the distance from the heat pump to the power distribution device is larger than 75m, then the wire diameter must be increased.
- The heat pump must have its own electrical circuit.
- The cable specifications mentioned above apply to the multi-core cable protected by a conduit (for example, YJC XLPE insulated power cable) used at 40°C and withstanding 90°C (see IEC 60364-5-52). If the installation conditions change, they must be adjusted according to the relevant national standard.
- The specifications of the switch listed in the table above apply to the switch with an operating temperature of 40°C. If the operating conditions change, they must be adjusted according to the relevant national standard.

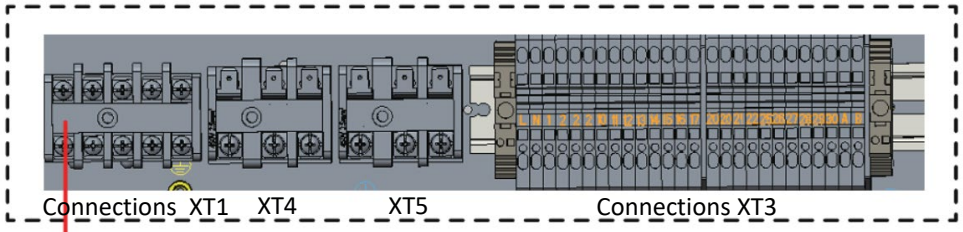
Open the side panel to make the connection.
The power supply voltage should be connected to terminal block XT1.

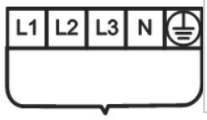
5.4.4 Unit type HPX06A, 1-Phase 230V connection



XT1
Supply
230V AC

5.4.5 Model type HPX12A / HPX16A 3-Phase +N 400V connection





XT1
Supply
3P+N, 400V AC

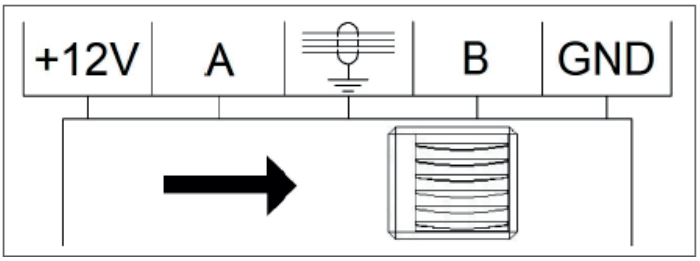
5.4.6 Connecting the communication cable

In all cases, the communication between the heat pump, air heater, and the thermostat is based on a four-wire low-voltage connection (refer to the electrical diagram). Follow these instructions to prevent installation malfunctions and damage to the heat pump, thermostat, or air heater.

Use a cable with the following specifications:

- Signal cable
- Shielded
- Minimum wire diameter: 4 x Ø0,34 mm^2
- Maximum length: 200 m

CAUTION! Keep the communication cable separate from the power cables.
CAUTION! Connect the cable's shielding only to the grounding terminal in the heat pump. Do not connect the other end of the cable's shielding.
PAY ATTENTION! A cable with a wire diameter of less than 0.34mm^2 will result in poor signal quality.
PAY ATTENTION! A non-shielded cable may cause disrupted communication in an EMC-unfriendly environment.

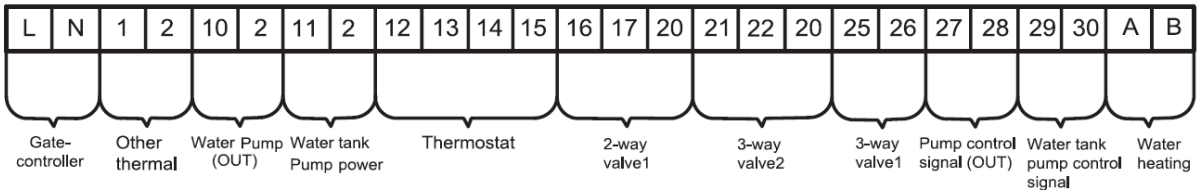


Connect the 4-core cable to the terminal strip as shown above.

5.4.7 Other optional connections

The device has more optional connections, besides the power cable and control cable. These are not required when a (hybrid) air heater is used. Below is a short description of the optional connections:

XT3: Not applicable to (hybrid) air heaters



XT4 & XT5: Optional connections for extra electronic heating elements are not described further in this manual.

6 Activities related to the refrigerant circuit

6.1 General

- Generally, NO actions have to be performed on the refrigerant circuit during the installation. There is no F-gasses certification requirement for the installation.
- Actions on the refrigerant circuit can only be done by certified individuals.

6.1.1 Safe usage of flammable refrigerants

6.1.1.1 Qualification requirements for installation and maintenance

Every employee involved with the cooling system has to be in possession of a valid certificate that is given by an acknowledged organization and needs to have the required qualification to operate cooling systems, as recognized in this industry. If other technicians are required to maintain or repair the device, they must be supervised by someone qualified to work with flammable refrigerant. Repairs can only be executed according to the methods proposed by the manufacturer of the appliance.

6.1.1.2 Installation-instructions

The device cannot be used in a place where open flames are present (such as open flames, a functioning gas installation, or an operating heat system). Only install the device outdoors. A leak test must be performed after installation.

6.1.2 Maintenance instructions for refrigerant circuit

Check whether the maintenance area or space meets the requirements.
Operating the device is only allowed in spaces that meet the requirements.
Check whether the maintenance area is properly ventilated.
Continuous ventilation needs to be maintained during operations.
Check whether sources of ignition or flames are present in the maintenance area. Open flames are prohibited in the maintenance area, and a “no smoking” warning sign must be displayed. Check if the device label is in good condition Replace a faded or damaged warning sticker.

6.1.3 Welding

If the pipes of the cooling system have to be cut or welded during the maintenance process, follow the following steps:
a. Turn off the device and interrupt the power supply.
b. Remove the refrigerant.
c. Vacuuming.
d. Clean the device with N_2-gas.
e. Cut or weld.
f. Bring it back to the service station for welding. The refrigerant has to be regained in the special storage tank. Ensure that there is no open fire near the exhaust of the vacuum pump and that it is well-ventilated.

6.1.4 Filling the refrigerant

Use the refrigerant filling equipment specialized for R32. Ensure that different types of refrigerants are not mixed. Keep the refrigerant tank upright during the filling process. Attach the label on the system after the filling is completed (or not quite yet). Do not overfill the refrigerant. After filling, a leak detection test has to be performed before starting the test run; leak detection has to be performed again when it is removed.

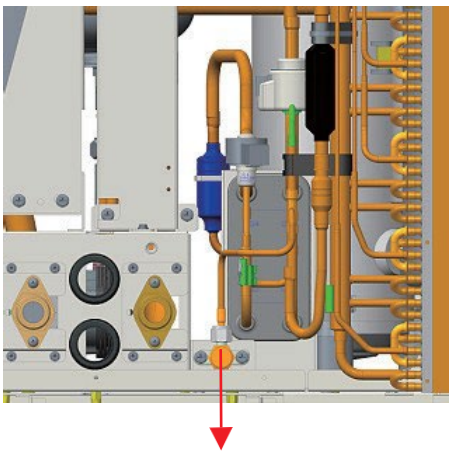
6.1.5 Safety instructions for transport and storage

Use an inflammable gas detector to verify before unloading and opening the container. open flames and smoking are dangerous. Respect the local rules and laws.

6.2 Filling and draining the refrigerant

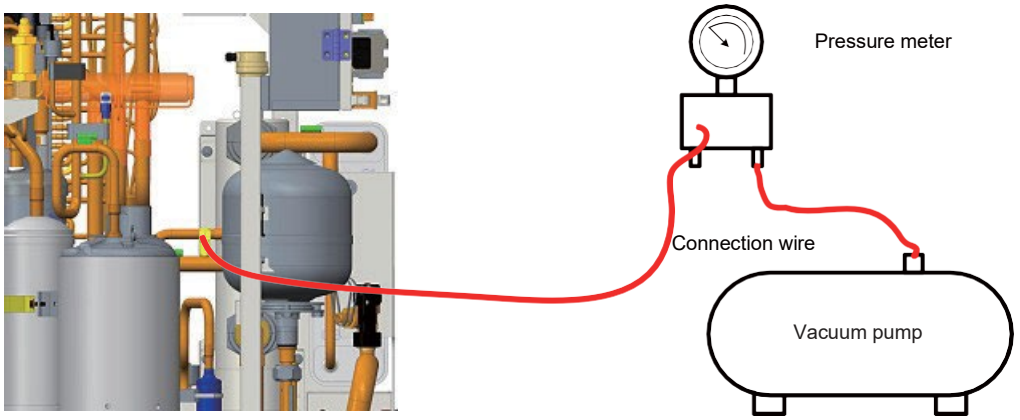
The device will be filled with refrigerant prior to delivery. A shortage or excess of refrigerant can lead to suboptimal functioning of the compressor or damage. When filling or draining refrigerant is necessary during the installation, for maintenance or other reasons, follow the steps below and the quantity mentioned on the rating plate.

Filling valve 1



Filling valve 2

Note:
(a) Discharge is not allowed unless the unit has stopped. (Switch off the power and turn it on 1 minute later)
(b) While discharging, take protective measures to prevent freezing.
(c) When the draining process is complete and vacuuming cannot be performed immediately, remove the pipe to prevent air and foreign substances from entering the unit.
(d) Vacuuming: After the drainage is completed, connect the pipes to the filling valve, the pressure gauge, and the vacuum pump to vacuum the unit.



Note: When the vacuuming is completed, keep the pressure lower than 80Pa for at least 30 minutes to verify that there are no leaks. Both filling valves 1 and 2 can be used for vacuuming.

Filling: When the vacuuming is completed and it is verified that there are no leaks, the filling can start.

6.3 Leakage detection

(1) Use leak detection methods considered acceptable for systems containing flammable refrigerants.
(2) The electronic leak detector can be used to discover flammable refrigerants, but the sensitivity may not be sufficient or may require recalibration (detection equipment needs to be calibrated in a refrigerant-free space).
(3) Verify that the detector is not a potential source of ignition and that it is suitable for the refrigerant used.
(4) Leak detection equipment has to be set to a percentage of the refrigerant's LFL and calibrated to the specific refrigerant used, with the correct gas percentage confirmed (up to 25%).
(5) Leak detection fluids are suitable for most refrigerants, but the use of chlorine-containing substances should be avoided as chlorine can react with the refrigerant and corrode copper piping.
(6) If a leak is suspected, all open flames need to be removed/extinguished. If refrigerant leakage

requiring soldering is found, all refrigerant must be recovered or isolated (Using shut-off valves) in a part of the system away from the leak. Oxygen-free nitrogen has to be flushed through the system both before and during the soldering process.

PAY ATTENTION! Use a suitable refrigerant leak detector to monitor the environment before and during use, ensuring that technicians can be well-informed of potential or actual leakage of flammable gas. Make sure the leak detection device is suitable for flammable refrigerants, for example, free of sparks, fully sealed, and safe in nature.

7 Commissioning

7.1 Checklist

Before using the device, the checklist below has to be filled in.

This table has to be filled in by the installer.		
Confirm with the installer, dealer, and customer that the following tasks have been completed		
No.	Description	
	If the list below is not filled in correctly, it may lead to rejection of service requests	
	Has the installation been carried out by properly qualified individuals?	
	Are the installation and troubleshooting manuals stored correctly?	
	Is the appearance of the device undamaged?	
	Is the internal piping in the device undamaged?	
	Is the delivery of the device and accessories complete?	
	Are the installation drawings for the piping and the electricity available?	
	Verify that the device is stable and that there is sufficientnt space for servicing.	
	Are the distances in relation to obstructions maintained, and is there at least 300mm space between the bottom of the heat exchanger and the installation surface?	
	The refrigerant circuit is undamaged, and there are no leaks detected.	
	The frost protection valves have been installed, or the system is filled with glycol.	
	Water-side fittings are connected properly (filter, pressure gauge, thermometer, vents, ball valves, etc.)	
	The water system is properly vented, pressurized and free of leaks, the valves are opened.	
	The electrical supply is in line with the nameplate specifications.	
	The device is properly grounded and the cable diameters are consistent with the requirements.	
	The cables are strain-relieved	
	The device can be turned off with a main power switch.	

7.2 Test run:

Before starting the testing, check the following: The main power switch must be easily accessible so that in case of abnormal operation, the device can be quickly powered off. This can prevent damage to the device and ensure safety for individuals.

Before starting up the device, it should be powered on for 8 hours. This is necessary to preheat the system and the compressor oil. Failure to do so may result in damage to the compressor. The voltage should be within +/- 10% of the required voltage.

After powering the device, use a multimeter to measure the voltages between the terminal connections. Check if the phases are connected correctly and if there is no voltage on the ground.

After starting up the device, observe (look and listen) the operation of the compressor, expansion valve, fan, and water pump. If any abnormal observations are made, the device should be turned off.

8 Daily usage and maintenance:

8.1 General maintenance

To prevent damage to the device, all safety components are adjusted and sealed. Do not modify or remove them. During the initial start-up of the device or after a long period of inactivity (more than 1 day) with the power cut off, it is necessary to preheat the device by applying power for at least 8 hours. Never place objects on the device and its accessories. Keep the area around the device dry, clean, and well-ventilated. Regularly remove accumulated dust from the condenser fins to ensure optimal performance and prevent the device from shutting down due to protection mechanisms. To prevent damage or blockage of the water system, clean the filter in the water system periodically and regularly check the water pressure. To ensure protection against freezing, do not turn off the power if the ambient temperature in winter drops below freezing. To prevent frost damage to the device, drain the water in the device and the piping system that is not used for an extended period. During device operation, avoid frequently closing any manually operated ball valves in the water system. Regularly check the operation of each component to ensure there are no oil stains at pipe connections and filling openings, preventing refrigerant leakage. If there is a malfunction beyond the control of the users, quickly contact the authorized service center.

Notes: The water pressure indicator is installed in the return line of the device.

(1) If the pressure is less than 0.5 bar, immediately add water.

(2) When refilling, the pressure in the hydraulic system should not exceed 2.5 bar.

8.2 Important for usage in the winter

1. Check that the air inlets and outlets of the indoor and outdoor units are not blocked.
2. Verify that the grounding connection is reliable.
3. If the unit has been out of operation for an extended period, it should be powered on for 8 hours before starting normal operation to preheat the compressor.
4. Winter frost protection precautions: During temperatures below freezing in winter:

    a. Antifreeze liquid should be added to the water system, and external water pipes should be properly insulated. Glycol liquid is recommended as an antifreeze agent.

    b. Anti-freeze valves should be installed in the water pipes connected to the heat pump.

8.3 Regaining refrigerant

When removing refrigerant from a system, both for maintenance and decommissioning purposes, it is recommended to safely remove all refrigerants. When transferring refrigerant into cylinders, ensure that only suitable refrigerant recovery cylinders are used. Make sure the correct number of cylinders is available to hold the total system charge. All cylinders to be used should be designated for the recovered refrigerant and labeled for that specific refrigerant (e.g., dedicated cylinders for refrigerant recovery). Cylinders should be equipped with pressure relief valves and appropriate shut-off valves that function properly.
Empty recovery cylinders should be evacuated and, if possible, cooled before the recovery process takes place. The recovery equipment should be in good condition and come with a set of instructions related to the equipment being used, suitable for recovering flammable refrigerants. Additionally, a set of calibrated weighing scales should be available and in good condition.
Hoses should be complete with leak-free disconnect couplings and be in good condition. Before using the recovery machine, check that it is functioning properly, well-maintained, and that any associated electrical components are sealed to prevent ignition in case of refrigerant release. Consult the manufacturer if in doubt. The recovered refrigerant should be returned to the refrigerant supplier in the appropriate recovery cylinder, and the relevant waste transfer documentation should be arranged.

Do not mix refrigerants in recovery equipment, especially not in cylinders. If compressors or compressor oil are being removed, ensure they are evacuated to an acceptable level to ensure no flammable refrigerant remains in the lubricating oil. The evacuation process should be carried out before returning the compressor to suppliers. Only electric heating of the compressor body may be used to speed up this process. When draining oil from a system, it should be done safely.

8.4 Putting out of operation

Before performing this procedure, it is essential for the technician to be fully familiar with the equipment and all its details. It is recommended to safely recover all refrigerants. Before starting the task, a sample of oil and refrigerant should be taken in case analysis is needed before reusing the recovered refrigerant. It is essential to have electricity available before starting the task.

a) Familiarize yourself with the equipment and its operation.

b) Electrically isolate the system.

c) Ensure that before performing the procedure: mechanical tools are available, if needed, for handling refrigerant cylinders; all personal protective equipment is available and correctly used; the recovery process is supervised by a qualified person at all times; recovery equipment and cylinders comply with the appropriate standards.

d) Drain the refrigerant system, if possible.

e) If a vacuum is not possible, create a manifold so that refrigerant can be removed from different parts of the system.

f) Ensure the cylinder is placed on the weighing scale before recovery takes place.

g) Start the recovery machine and operate it according to the manufacturer's instructions.

h) Do not overfill the cylinders. (Not more than 80% of the liquid volume).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) Once the cylinders are properly filled and the process is complete, ensure that the cylinders and equipment are promptly removed from the location and that all shut-off valves on the equipment are closed.

k) The recovered refrigerant should not be charged into another refrigeration system unless it has been cleaned and checked.

9. Malfunctions

9. 1 Malfunction index

Malfunctions	Reasons	Solutions
The compressor does not start.	An issue with the power supply or the connection wire is loose. Malfunction of the motherboard. Malfunction of the compressor.	The phase sequence is reversed. Turn off and repair again. Find the cause and repair. Replace the compressor.
Heavy sound of the fan	The locking nut of the fan is loose. The fan blade is touching the edge of the grille. The operation of the fan is unreliable.	Reattach the fan locking nut. Identify the cause and adjust. Replace the fan
Heavy sound of the compressor	Fluid clumping occurs when fluid refrigerant enters the compressor. Internal components in the compressor are broken.	Verify if the expansion valve is defective and if the temperature sensor is loose. Repair if necessary.
The water pump is not functioning or abnormally	Malfunction of the power supply. Malfunction of the relay. There is water in the water pipe.	Identify the cause and repair accordingly. Replace the relay and vent the system.
The compressor starts and stops regularly	Excessive quantity or poor quality of the refrigerant in the system. Poor circulation of the water system. Low load	Drain or add refrigerant. The water system is cluttered or it contains air. Check the water pump, valve, and water system. Clean or vent the water filter. Modify the load or add extra dispensing devices.
The device does not heat while the compressor is on.	Leakage of the refrigerant. Malfunction of the compressor.	Repair the leak and add refrigerant. Replace the compressor.
Bad efficiency of warm water heating	Poor isolation of the water system. Poor heat exchange of the evaporator. The poor refrigerant in the device, Water-side blockage of the heat exchanger.	Improve the insulation efficiency of the system. Verify if the airflow through the device is at a normal level and clean the evaporator. Check if there is a refrigerant leak. Clean or replace the heat exchanger.

9.2 Error code list

Errors of the complete outdoor unit:

Code-indication	Error name	Origin of error	Description of the control element
F4	Error of the outdoor temperature sensor	① The plug of the temperature sensor is not correctly connected to the contact of the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
d6	Error defrost temperature sensor	① The plug of the temperature sensor is not correctly connected to the contact of the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.

Code-indication	Error name	Origin of error	Description on the control element
F7	Outlet temperature sensor error	① The plug of the temperature sensor is not correctly connected to the motherboard. ② The resistance of the Temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
F5	Inlet temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
EF	Fan error	① The motherboard of the outdoor unit is damaged. ② The wire connecting the wiring terminals to the motherboard is broken.	If it occurs 6 times within an hour, it can be cleared by restarting. If it occurs less than 6 times, it will be automatically cleared.
E1	Compressor high-pressure protection	① Compressor high-pressure switch is broken or the wiring is loose. ② Insufficient water quantity in the system. ③ Incorrect installation of the tank temperature sensor. ④ The gas valve and liquid valve are not fully open. ⑤ The electronic expansion valve is not functioning properly.	Start the unit again. If the error is removed, the code will be cleared.
E3	Compressor low-pressure protection	① Compressor low-pressure switch is broken or the wiring is loose. ② The system has leaked. ③ The fan is not running or running in reverse.	It will be automatically cleared after the defect has been resolved.
E4	Compressor discharge temperature protection	① The resistance of the temperature sensor is incorrect. ② The electronic expansion valve is blocked. ③ The system has leaked. ④ The outdoor unit motherboard is damaged.	It will be cleared if the discharge temperature is lower than 92℃.
C5	Capacity setting error	① The jumper is off.	Turn off the device and restart it. If the error is deleted, the code will be cleared.

Code-indication	Error name	Origin of error	Description of the control element
E6	Communication error between indoor and outdoor unit)	①The plug of the communication cable is not correctly connected to the contact of the motherboard. ② The communication cable is defect. ③ The communication cable is not correctly connected. ④ The shield of the communication cable is not connected on the side of the heat pump. ⑤ The outdoor unit is not powered.	It will be restored as soon as the communication is restored or it will be displayed the whole time.
E6	Communication error (between outside mother board and controller inside)	①The plug of the communication cable is not correctly connected to the contact of the motherboard. ② The communication cable is defect. ③ The communication cable is not correctly connected. ④ The shield of the communication cable is not connected on the side of the heat pump. ⑤ The outdoor unit is not powered.	It will be restored as soon as the communication is restored or it will be displayed the whole time.
Fc	High-pressure switch error	① The sensor is damaged. ② The wire of the sensor is loose. ③ Sensor position is wrong	It will be automatically cleared after the defect has been resolved.
F9	Outlet temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
dH	Backup Outlet temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
F1	Liquid line temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.

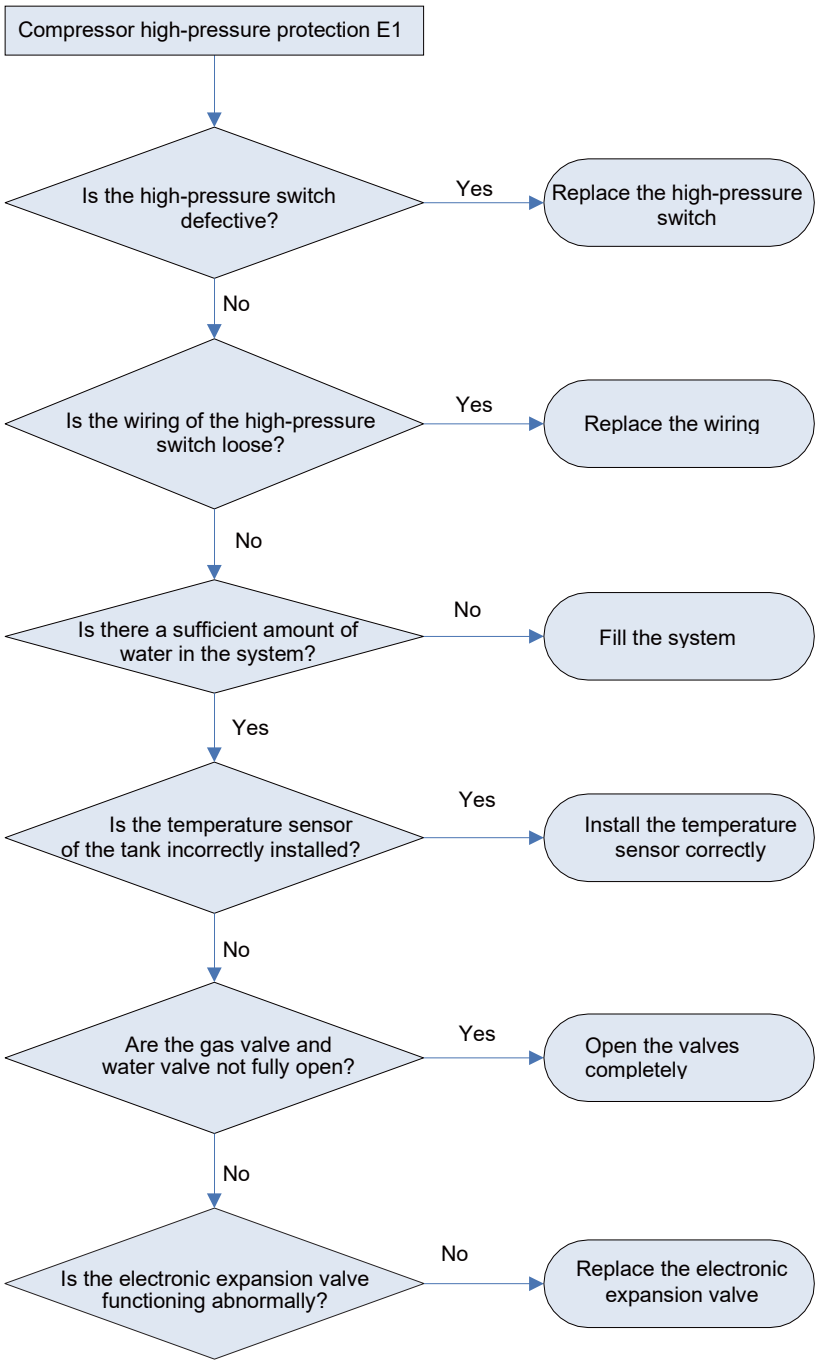
Code-indication	Error name	Origin of error	Description on the control element
FE	First sanitary (potable) water tank temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
F3	Gas line temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
F0	External air temperature sensor error	① The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ② The resistance of the temperature sensor is incorrect.	It will be automatically cleared after the defect has been resolved.
Ec	Water flow switch error	① The switch is damaged. ② The wiring of the switch is loose. ③ The position of the switch is wrong.	It will be restored after the unit is turned off.
E2	Indoor antifreeze protection	① The resistance of the temperature sensor is incorrect. ② The electronic expansion valve is not functioning normally.	It will be cleared once the fault is removed or it will be displayed all the time, but it will be immediately cleared when switching mode.
Ed	Outdoor temperature MAX protection	① The resistance of the temperature sensor is incorrect. ② The plug of the temperature sensor is not correctly connected to the contact on the motherboard. ③ The motherboard of the outer unit is damaged.	Start the unit again. If the error is removed, the code will be cleared.
EH	Malfunction of the first internal connection of the electric heating.	① The alternating current relay is defective	Start the unit again. If the error is removed, the code will be cleared.
EH	Error of the second electrical heating element.	① The alternating current relay is defective	Start the unit again. If the error is removed, the code will be cleared.
EH	Error electrical element sanitary (potable) water.	① The alternating current relay is defective	Start the unit again. If the error is removed, the code will be cleared.

Errors of the inverter:

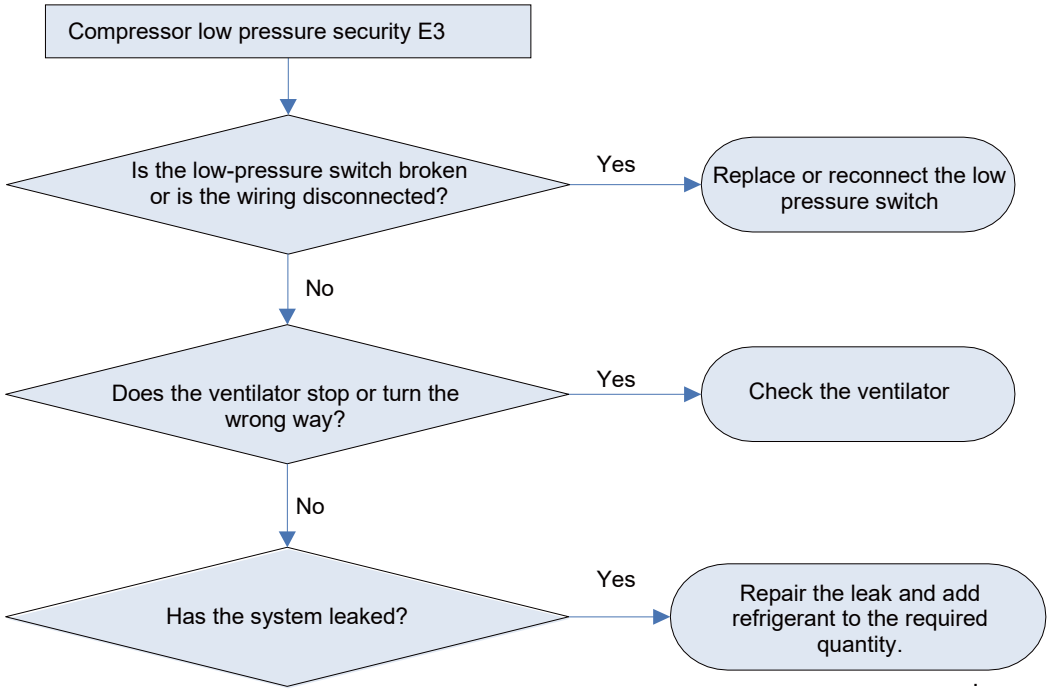
Function		Display on segment display of the device	Display on the wired controller	Others
Inverter Driver Error	Reset of the drive system	P0	Reset of the drive system	
	Startup error of the compressor	Lc	Startup error of the compressor	
	Phase protection	Ld	Phase protection	
	Power protection of the compressor	P5	Power protection of the compressor	
	Communication error	P6	Communication error	
	Sensor error of the heat sink	P7	Sensor error of the heat sink	
	Protection against overheating heat sink	P8	Protection against overheating heat sink	
	AC-power protection (input side)	PA	AC-power protection (input side)	
	Current sensor error	Pc	Current sensor failure	
	Connection protector of the sensor	Pd	Connection protector of the sensor	
	Overvoltage protection	PH	Overvoltage protection	
	Undervoltage protection	PL	Undervoltage protection	
	Abnormality of the power supply voltage	PP	Abnormality of the power supply voltage	
	Error in charging circuit	PU	Error in charging circuit	
	IPM-protection	H5	IPM-protection	
	Desynchronising the motor	H7	Desynchronising the motor	
	PFC-deviation	Hc	PFC-deviation	

9.3 Flow chart troubleshooting

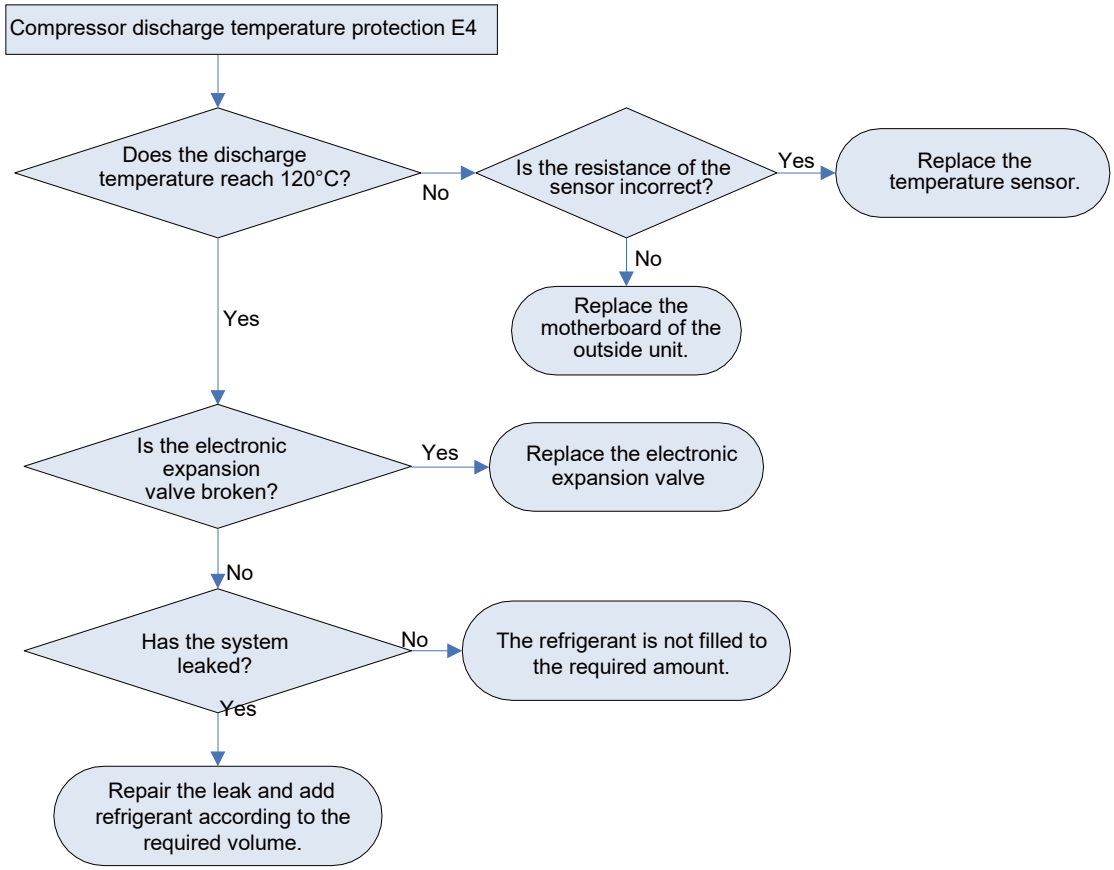
9.3.1 Compressor high-pressure protection E1



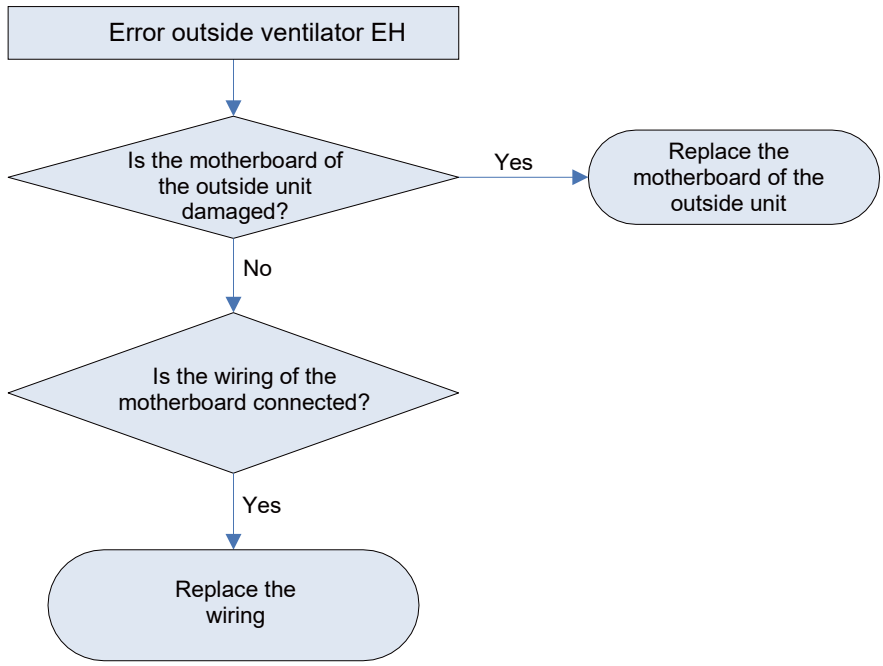
9.3.2 Compressor Low-pressure protection E3



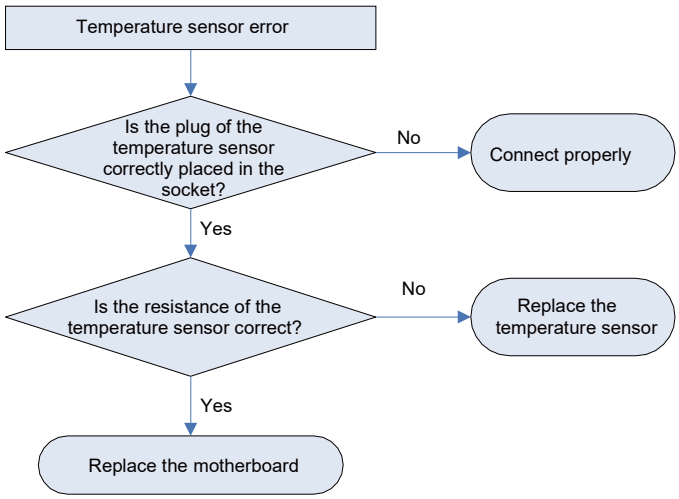
9.3.3 Compressor discharge temperature protection E4



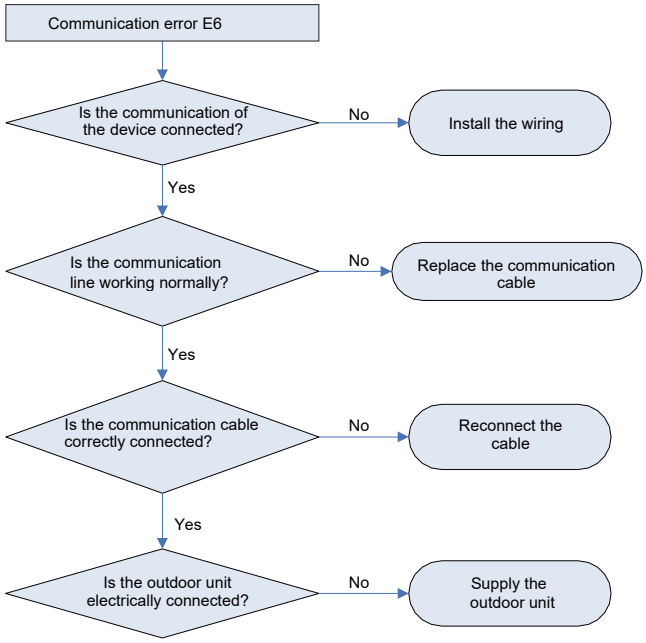
9.3.4 Error outside ventilator EH



9.3.5 Temperature sensor error



9.3.6 Communication error E6

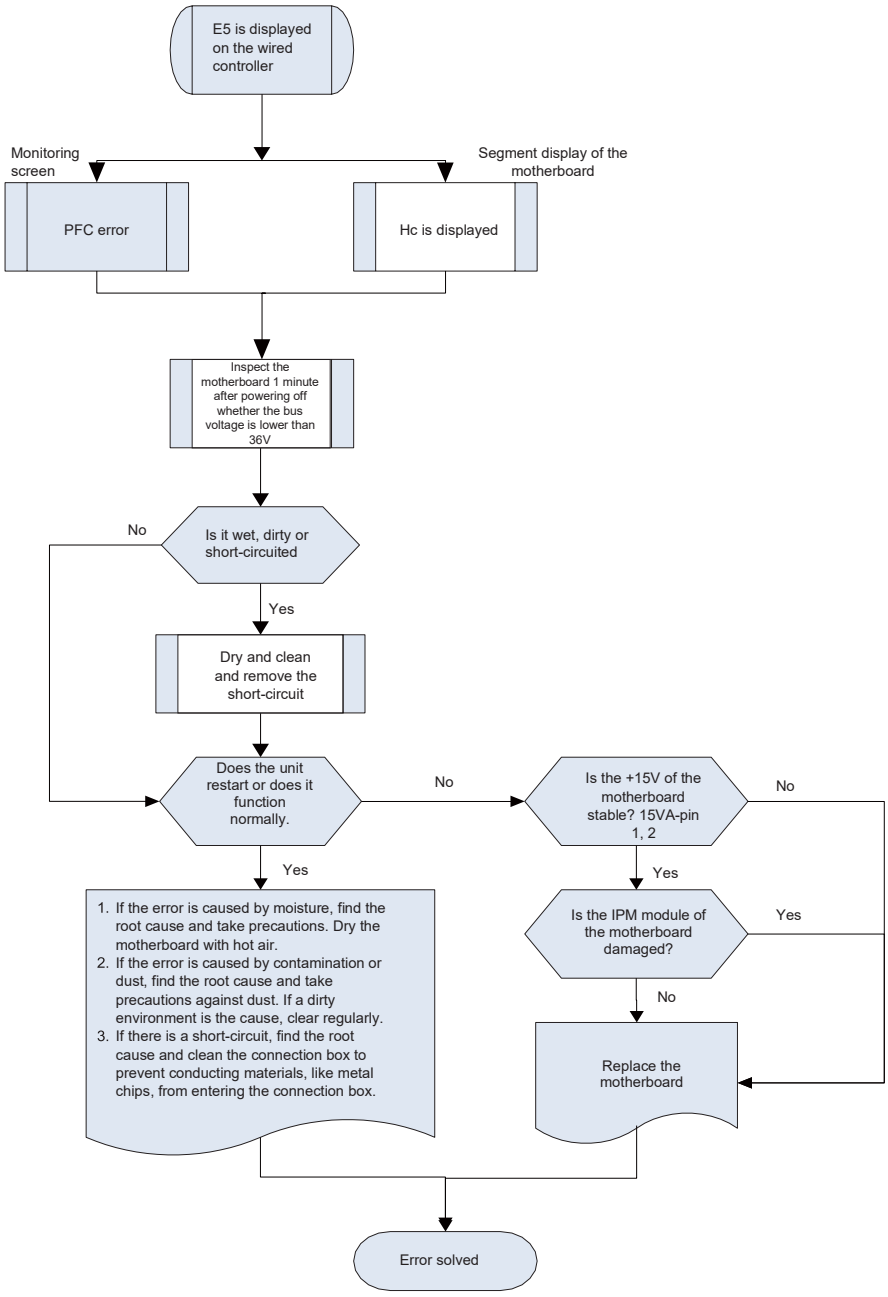


9.4 Diagnosis of the PCB

- DC Overvoltage: It is detected that the direct current voltage exceeds 420V after activation. If the protection occurs 6 times within an hour, it cannot be resumed unless it is deactivated and reactivated.
- Under Voltage: It is detected that the supply voltage is below 200V after device startup. If the protection occurs 6 times within an hour, it cannot be resumed unless it is deactivated and reactivated.
- PFC Deviation: Protection against PFC deviations is detected after PFC has been operating for 10 seconds. If the protection occurs 6 times within an hour, it cannot be resumed unless it is deactivated and reactivated.
- IPM Drive Line Protection: Protection against IPM deviations is detected after IPM has been operating for 10 seconds. If the protection occurs 6 times within an hour, it cannot be resumed unless it is deactivated and reactivated.
- Compressor Overcurrent Protection: Protection occurs when the instantaneous current is detected above 45A. If the protection occurs 6 times within an hour, it cannot be resumed unless it is deactivated and reactivated.
- IPM Drive Plate Overheating Protection: Protection occurs when the internal temperature of the IPM exceeds 105°C. If the protection occurs 6 times within an hour, it cannot be resumed unless it is restarted.
- Abnormal Cooling Fin Sensor Value: Protection occurs when there is a break or short circuit in the temperature sensor on top of the IPM module. If the protection occurs 6 times within an hour, it cannot be resumed unless it is deactivated and reactivated.
- Communication Error between Conversion Driver and Main Control: The drive board cannot communicate with the main board. This error can be automatically resolved.

9.5 Flow chart diagnosis of the PCB

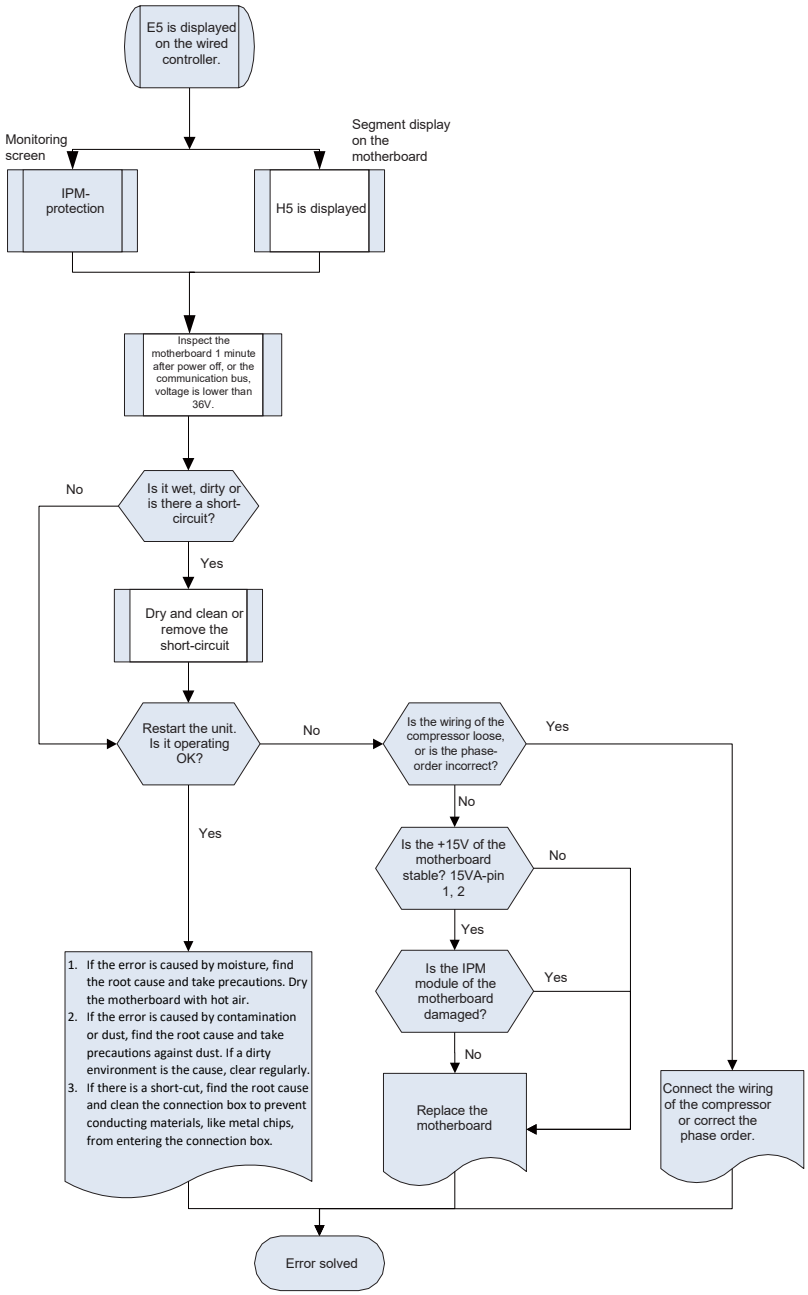
9.5.1 PFC-flashing



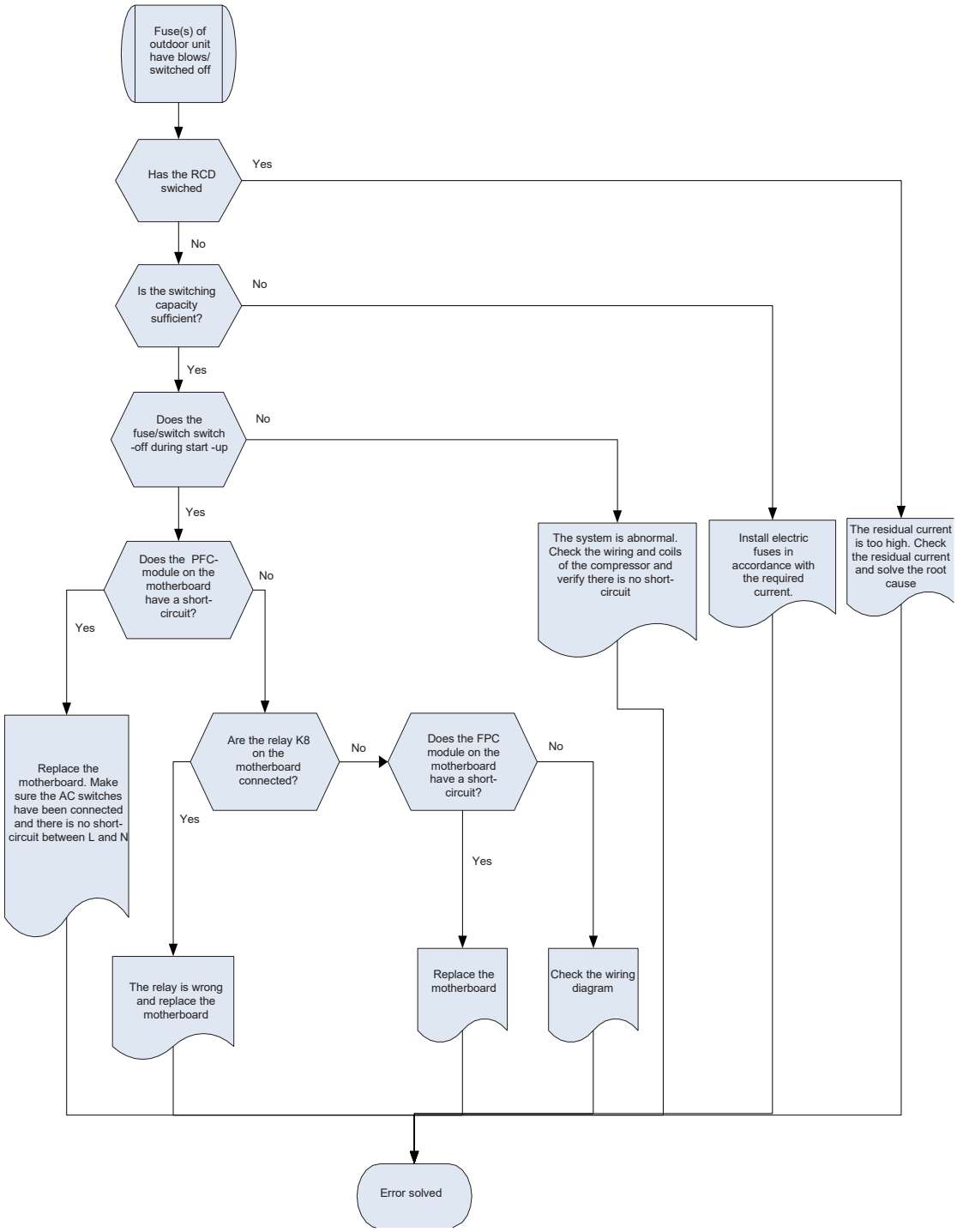
9.5.2 IPM-protection

The reasons could be:

- Loose screws of the IPM module
- Damaged IPM module
- Abnormal +15V power strip
- Abnormal PFC-module
- Wire connecting error with PFC
- Wrong selection resistor RS1-RS3 on the PCB
- Abnormal operation of the compressor
- Interference



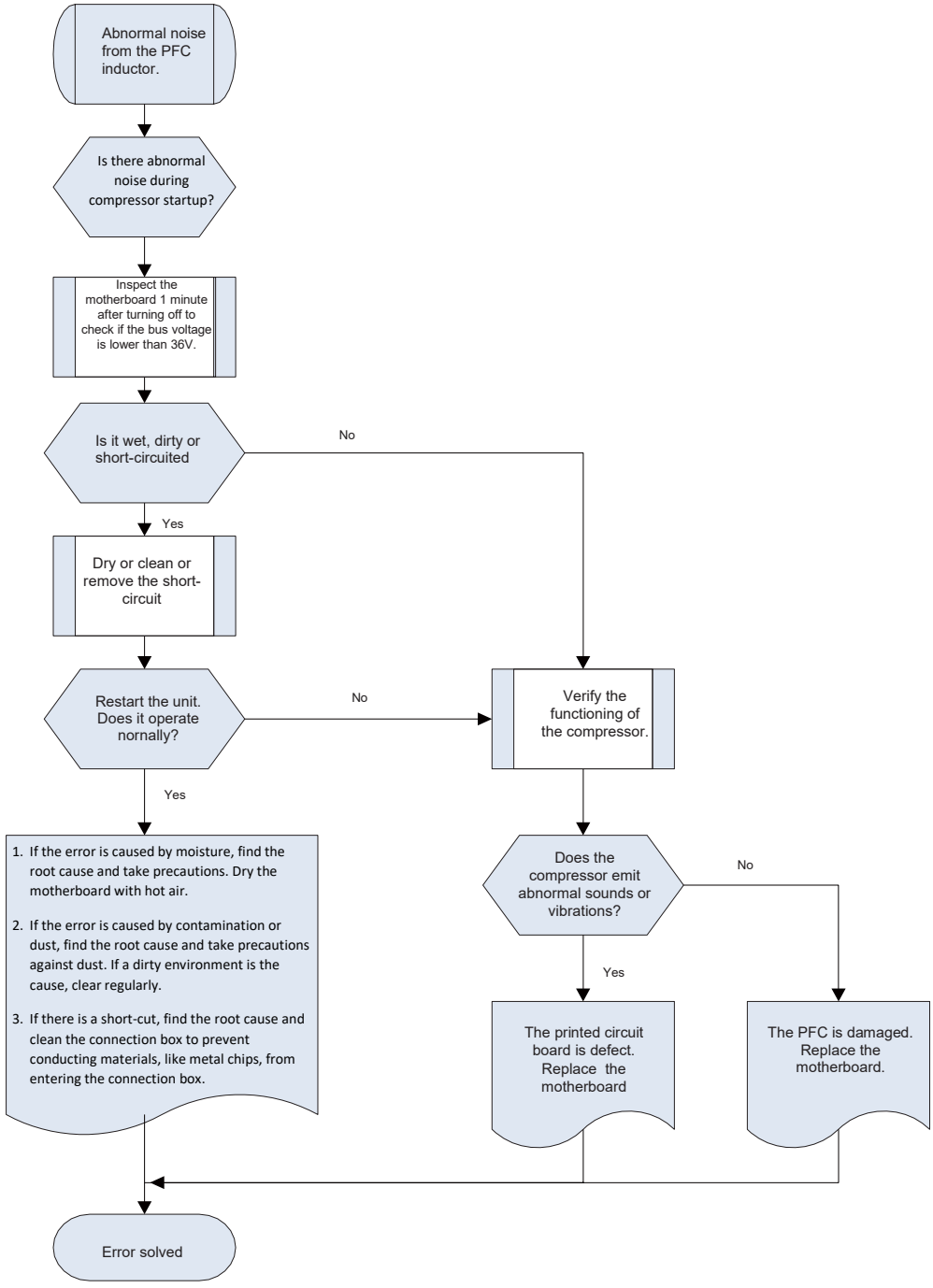
9.5.3 Switching



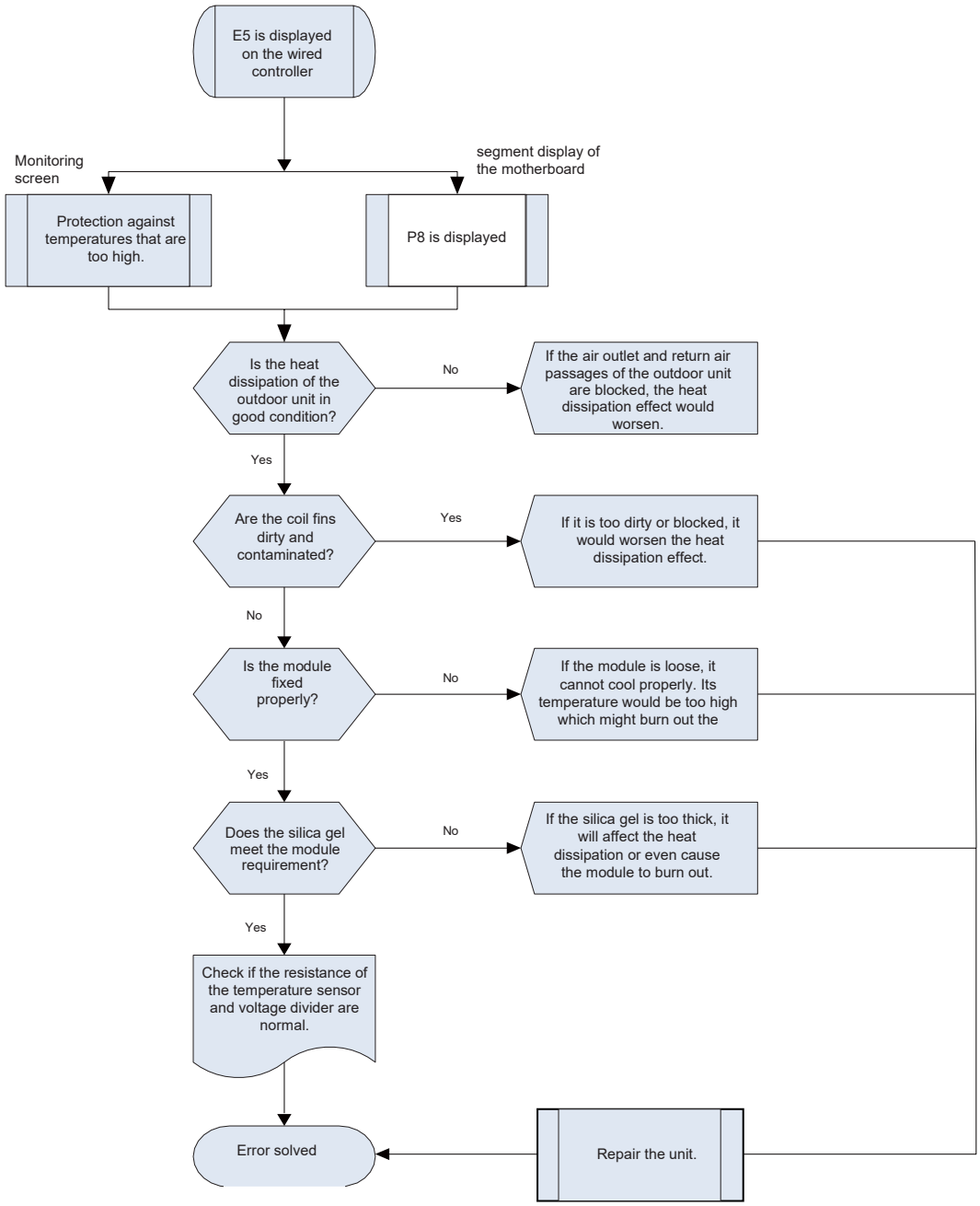
9.5.4 Abnormal sound of the PFC-inductor

During normal operation, a continuous and monotonous sound of the inductor can be heard. An abnormal sound of the PFC-inductor could be discontinuity or an dissenting sound. This can be caused by:

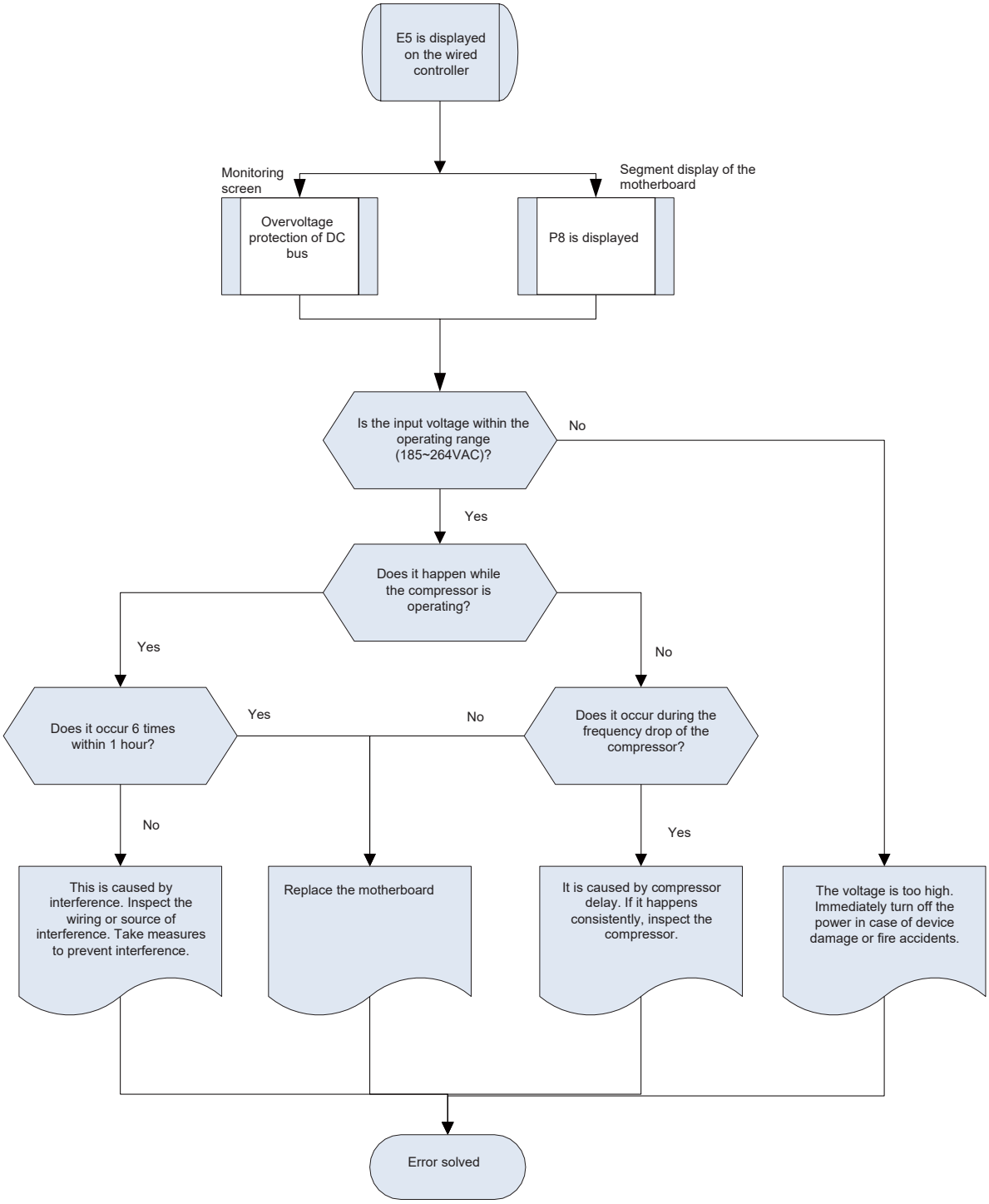
- PFC-failure
- abnormal output of the printed circuit board



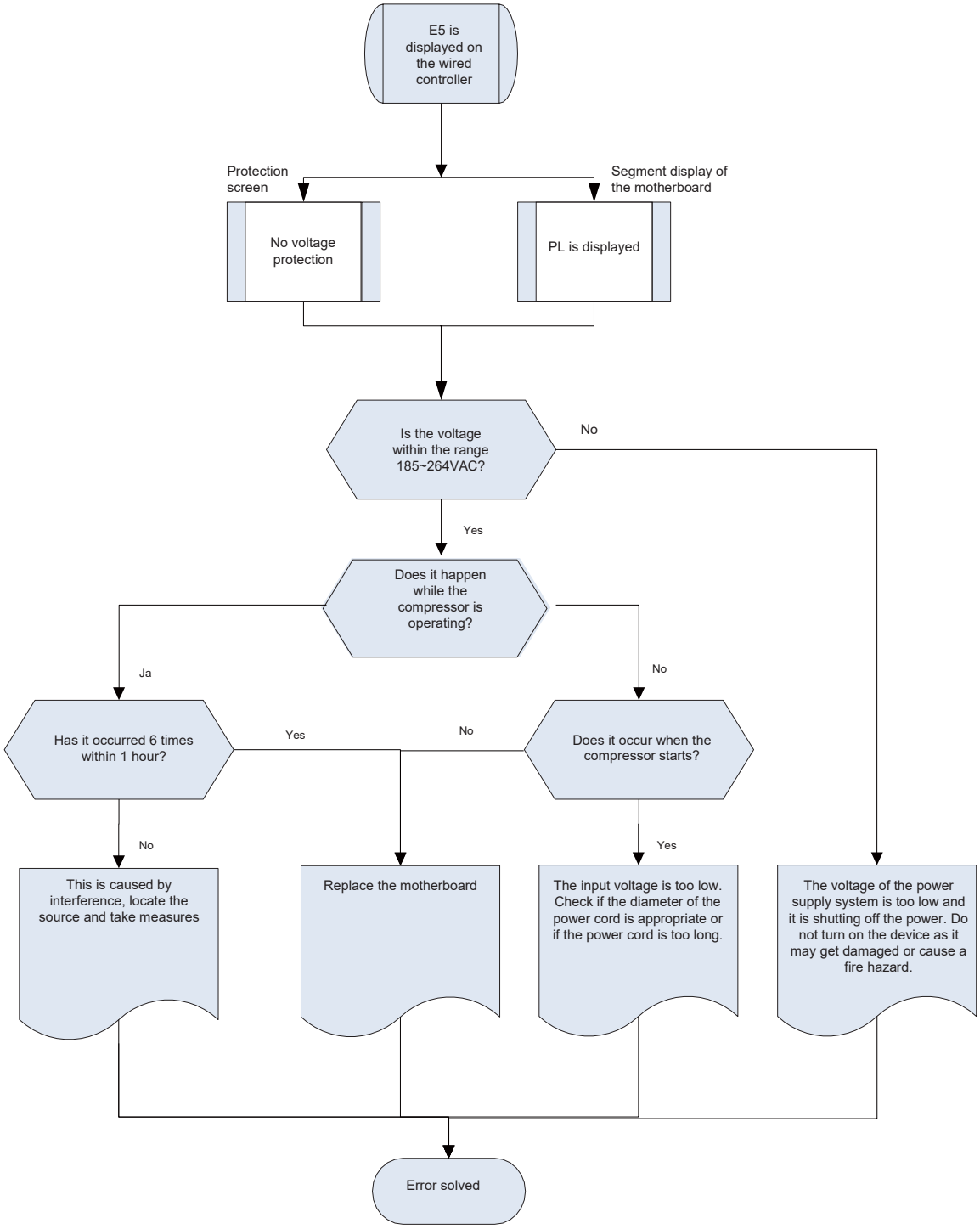
9.5.5 Protection against overheating of the external coil



9.5.6 Overvoltage protection of DC-bus

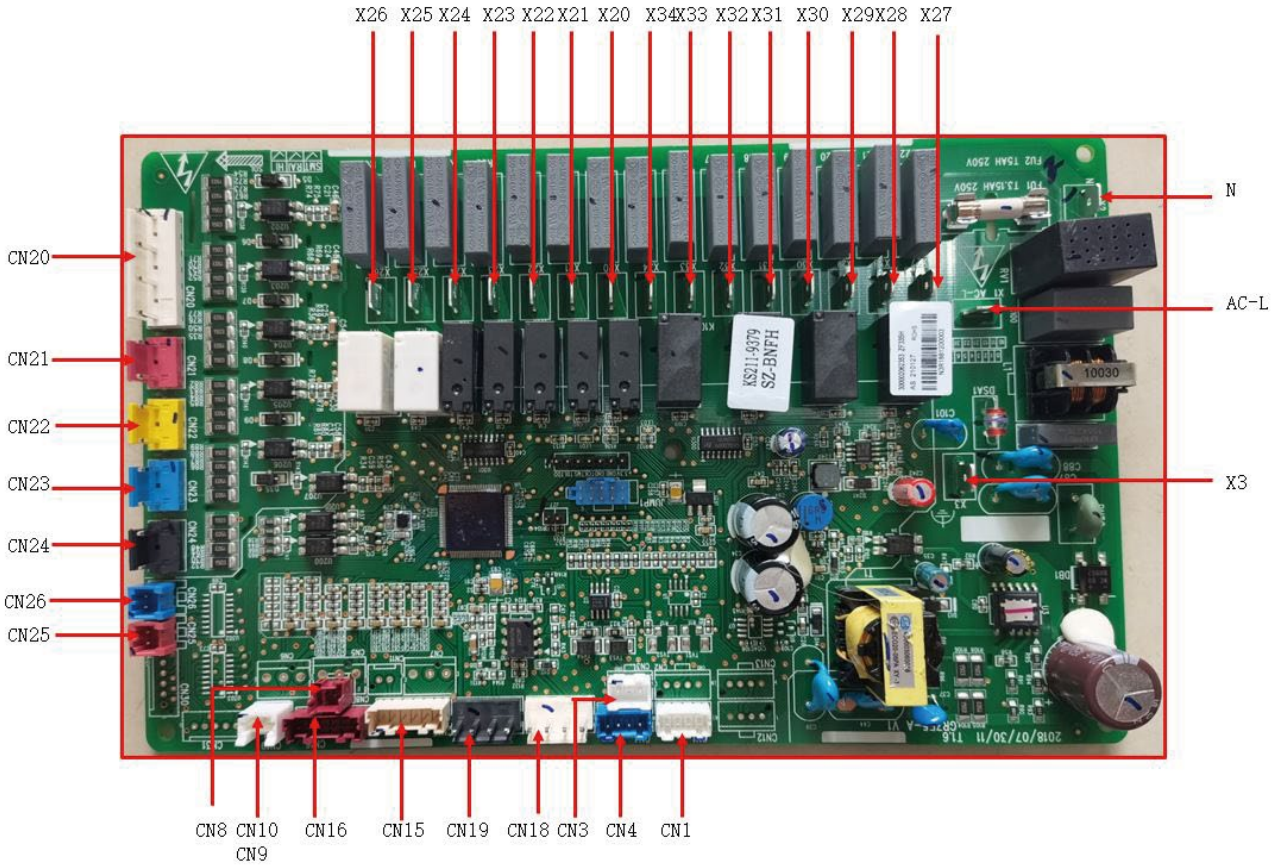


9.5.7 Undervoltage protection of DC-bus



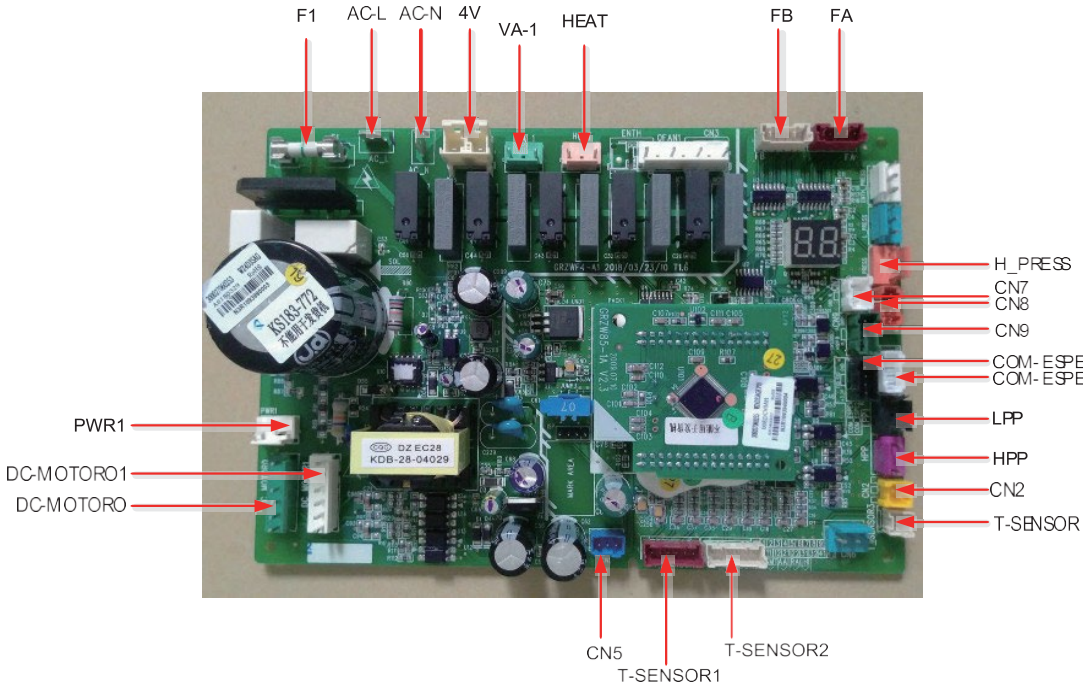
10 Electrical wiring scheme

10.1 Control board HPX06A / HPX12A / HPX16A



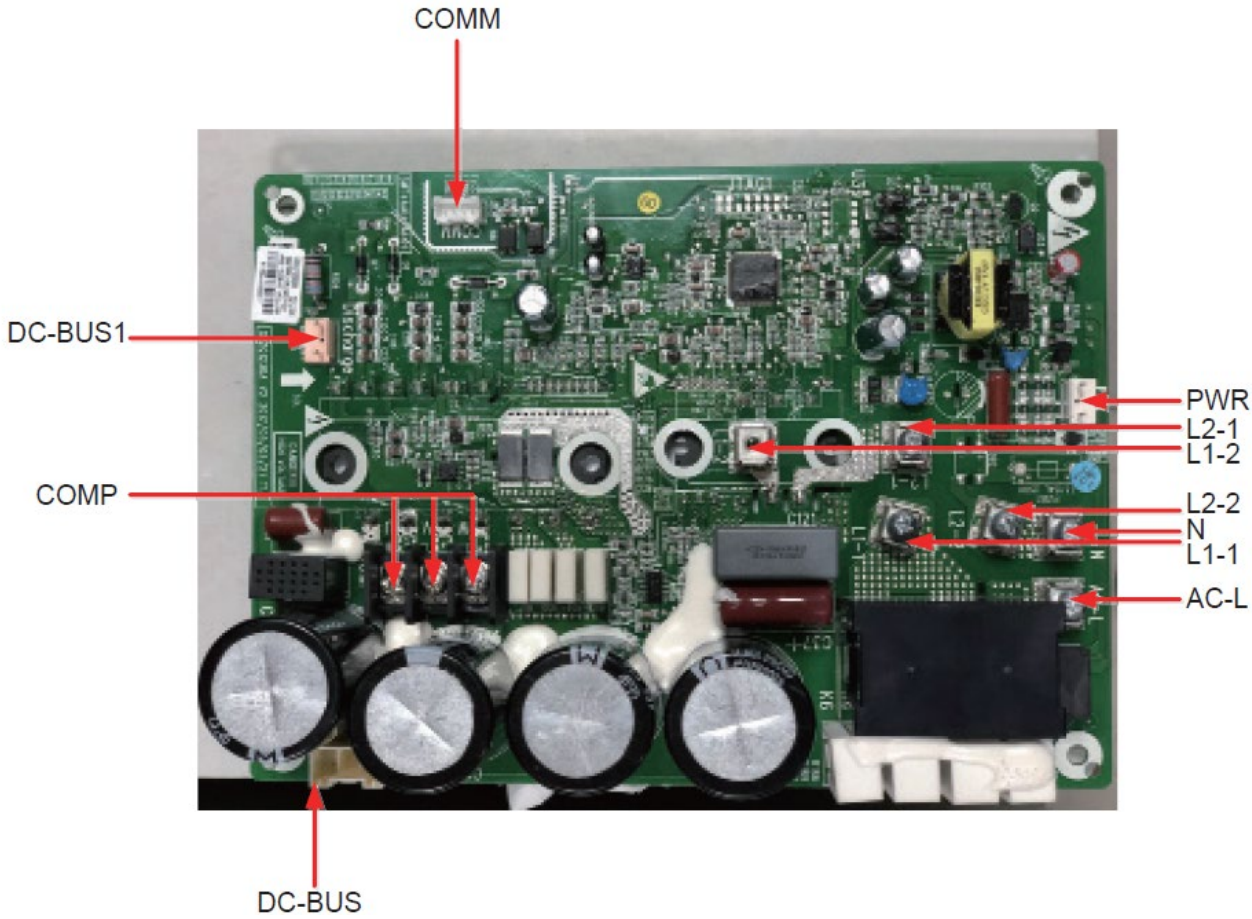
Screen printing	Introduction
AC-L	Live power wire
N	Neutral power wire
X3	To ground
X20	E-heating of the water tank
X21	E-heater 1
X22	E-heater 2
X23	Other heating by 230VAC
X24	External water pump
x25	Reserved
X26	Reserved
X27	2-way valve 1 is normally open
X28	2-way valve 1 is normally closed

Screen printing	Introduction
X29	Water pump of the water reservoir
X30	Reserved
X31	External 3-way valve 1
X32	Reserved
X33	Electrical three-way valve 2 open
X34	Electrical three-way valve 2 closed
CN18	Built-in water pump signal (PWM)
CN19	Backup water pump signal (PWM) -field supply
CN15	20K temperature sensor (inlet water)
CN15	20K temperature sensor (outlet water)
CN15	20K temperature sensor (liquid refrigerant line)
CN16	20K temperature sensor (refrigerant vapor line)
CN16	10K temperature sensor (outgoing temperature optional electrical heater)
CN16	Reserved
CN8	External air temperature sensor
CN9	Water tank temperature sensor
CN7	Reserved
CN6	Reserved
CN5	Reserved
CN20	Thermostat
CN21	Safety for optional electric heating 1
CN22	Safety for optional electric heating 2
CN23	Safety for the electric heater of the water tank
CN24	Gate control detection
CN25	Flow switch
CN26	Reserved
CN3	Communication with outdoor unit
CN1	Anode
CN4	Communication with the control panel



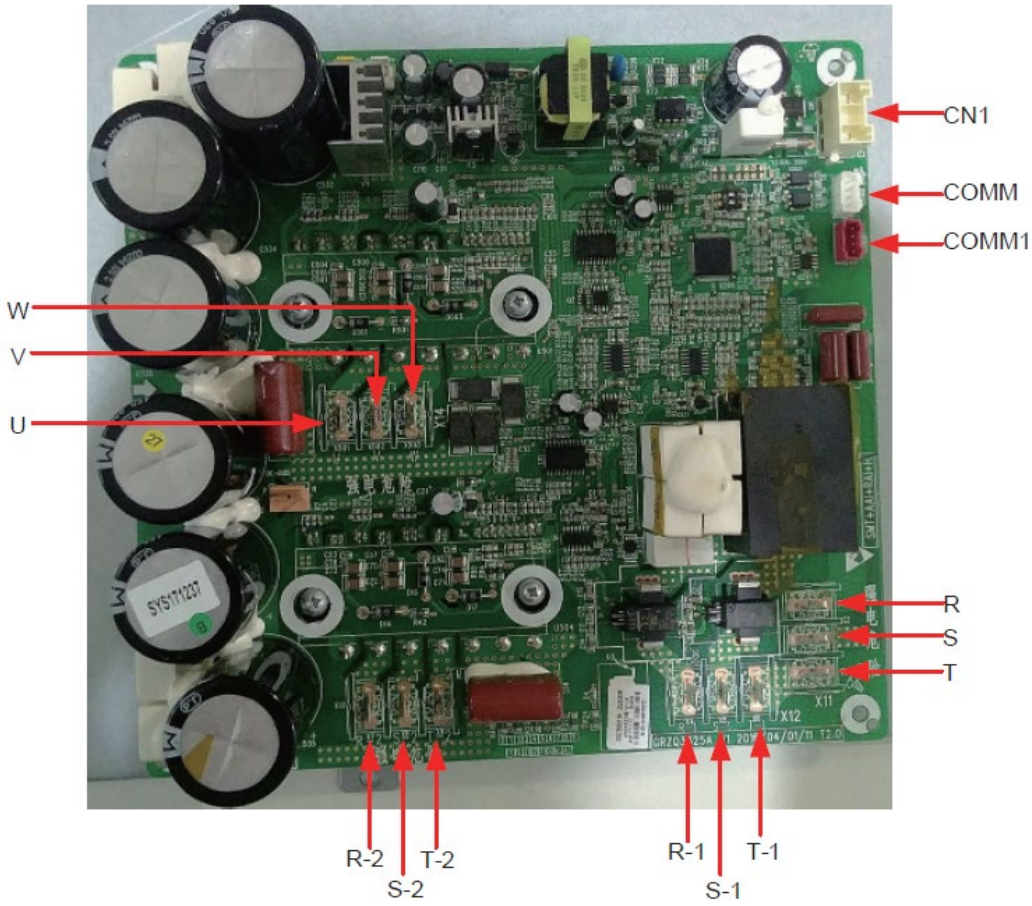
Screen printing	Introduction
AC-L	L power supply
N	Neutral wire of the power supply
PWR1	310V supply 310V direct current of the drive
F1	Fuse
4 V	4-way valve
VA-1	E-heating chassis
HEAT	Electrical heating tape
DC-MOTOR	1-pins: fan supply; 3-pins: fan GND; 4-pins: +15V; 5-pins: control signal; 6-pin:feedback signal
DC-MOTOR1	1-pins: fan supply; 3-pins: fan GND; 4-pins: +15V; 5-pins: control signal; 6-pin: feedback signal
FA	1, 2, 3, 4 signals, supply to EXV1, electronic expansion valve, 1-4 pin: driving impulse output; 5 pin: +12V
FB	1, 2, 3, 4 signals, 5 supply to EXV2, electronic expansion valve, 1-4 pin: driving impulse output; 5 pin: +12V
T_SENSOR2	1,2: environment; 3,4:discharge; 5,6: suction
T_SENSOR1	1,2: economizer inlet; 3,4: economizer 5,6:defrosting
H_PRESS	5V signal input of the pressure sensor 1 pin: GND; 2 pin: signal input; 3 pin:+5V
HPP	1-pin:+12V, 3-pin: signal
LPP	1-pin: +12V, 3-pin: signal
CN2	1-pin:+12V, 2-pin: signal
CN7	Communication between AP1 and AP2;communication cable 2-pin: B, 3-pin: A;
CN8	1-pin:12V, 2-pin:B, 3-pins: A, 4-pins: grounding, To the wired controller, Communication cable
CN9	1-pin:+12V, 2-pin:B; 3-pole:A, 4-pole: ground
COM_ESPE1	1-pin:+3,3V, 2-pins:TXD, 3-pins:RXD, 4-pins:ground
COM_ESPE2	1-pin:+3,3V, 2-pin:TXD, 3-pin:RXD, 4-pin:ground
CN5	1-pin: ground, 2-pin:+18V, 3-pin:+15V

For the HPX06A



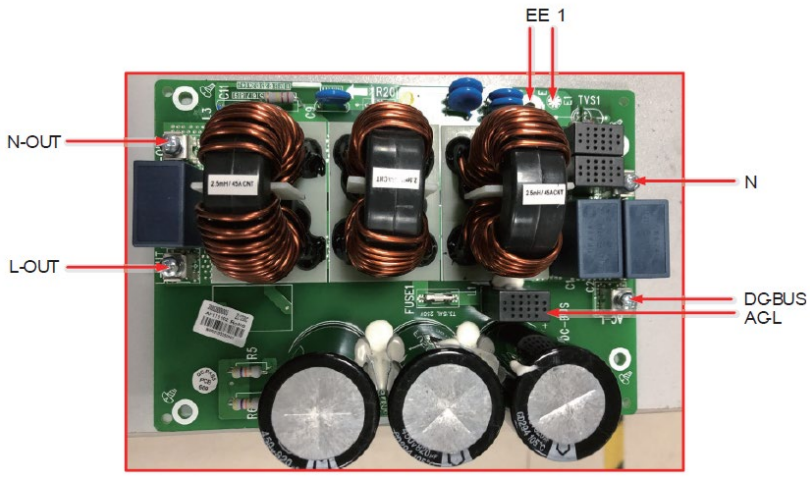
Screen printing	Introduction
AC-L	L-OUT Live input of the filter board
N	N-OUT Neutral line input of the filter board
L1-1	To PFC inductor brown cable
L1-2	To white wire PFC-inductor
L2-1	To yellow wire PFC-inductor
L2-2	To blue wire PFC-inductor
COMP	Wiring board (3-pin)(DT-66BO1W-03)(variable frequency)
COMM	Communication-interface[1-3.3V, 2-TX,3-RX, 4-GND]
DC BUS	DC-BUS-PIN for electrical discharge of the high voltage bar during the test
PWR	Power supply of the drive card [1-GND, 2-18V, 3-15V]
DC-BUS1	PIN for electrical discharge of the high voltage bar during the test

For the models HPX06A, HPX012A, HPX16A



Screen printing	Introduction
W	Connection to the compressor phase-W
U	Connection to the compressor phase-U
V	Connection to the compressor phase-V
R-2	Connection to the inverter board (entrance)
S-2	
T-2.	
R-1	Connection to the inverter board (entrance)
S-1.	
T-1.	
R	Connector to the filter L1-F
S	Connector to the filter L2-F
T	Connector to the filter L3-F
Comm1	Reserved
COMM	Communication
CN1	Switch of the power input

HPX06A



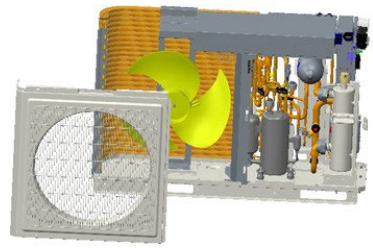
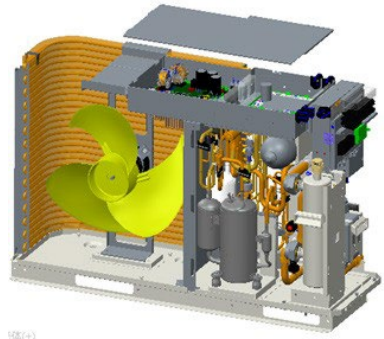
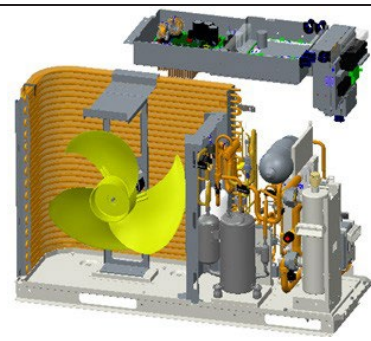
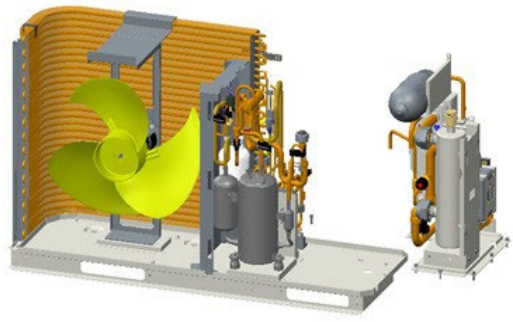
Screen printing	Introduction
AC-L	Live supply wire of motherboard
N	Neutral supply wire of motherboard
L-OUT	Live line output of the filter board (to the drive and main boards)
N-OUT	Neutral line output of the filter board (to the drive board)
N-OUT1	Output neutral line
L-OUT1	Output live line
DC BUS	DC-BUS, the other end of the driving force
E	Screw hole for grouding
E1	Ground, reserved

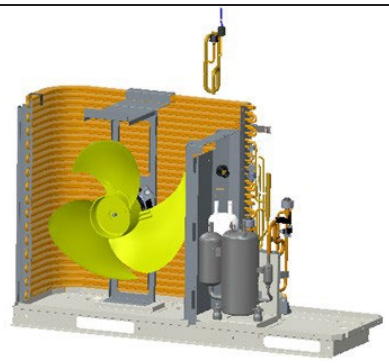
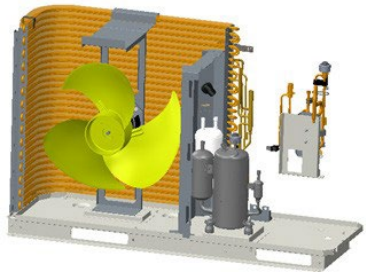
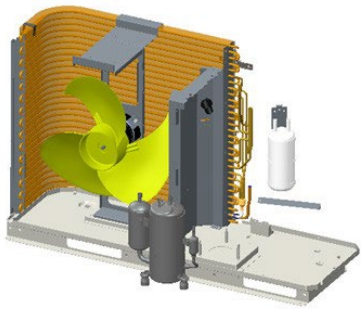
For the models HPX12A / HPX16A,

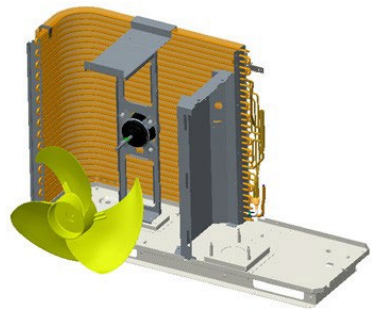
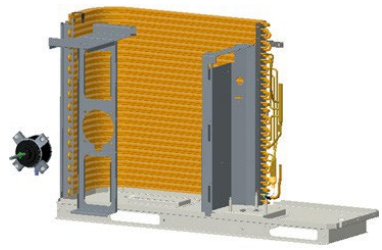
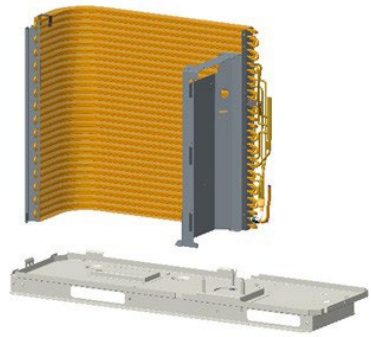
Zeefdruk	Inleiding
AC-L1	Entrance side phase L1 of the entire unit
AC-L2	Entrance side phase L2 of the entire unit
AC-L3	Entrance side phase L3 of the entire unit
N	Entrance side neutral line of the entire unit
L1-F	Connect to the power input of the drive card
L2-F	
L3-F	
N-F	Neutral line for power supply to the main control card
X11	Live line for power supply to the main control card

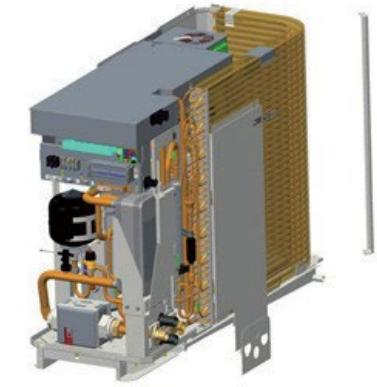
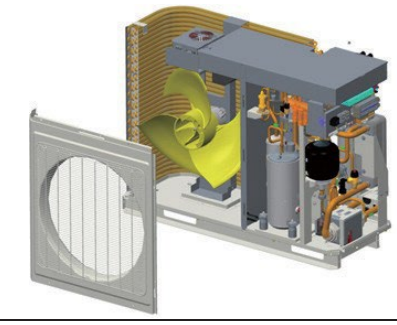
11 Disassembly of the device

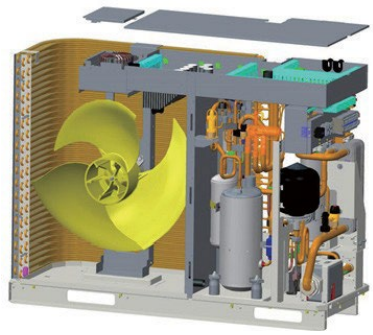
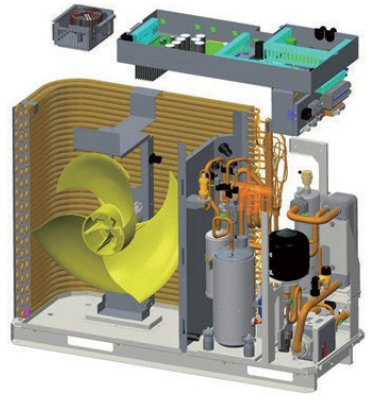
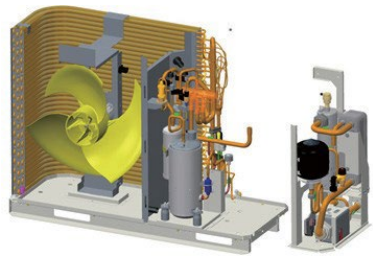
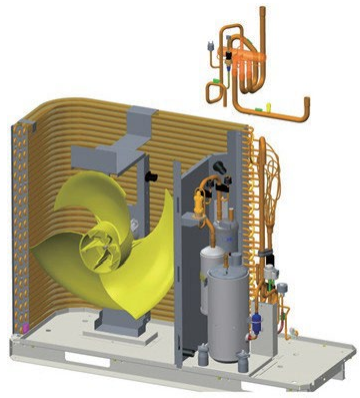
Note: First, turn off the power supply and remove the refrigerant from the device.	
Procedure	Illustration
HPX06A	
Remove the mounting bolts, top cover, front panel, and right panel.	 

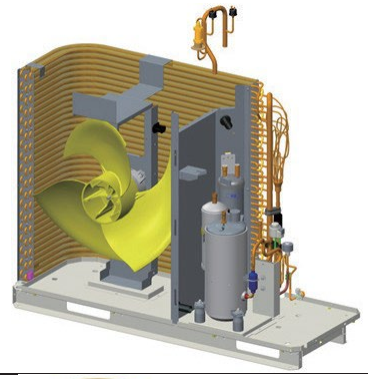
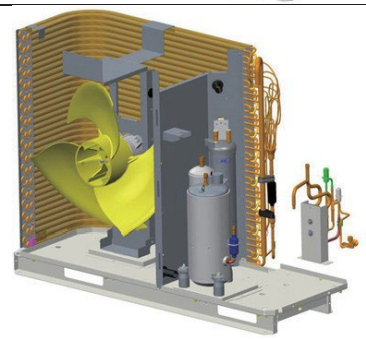
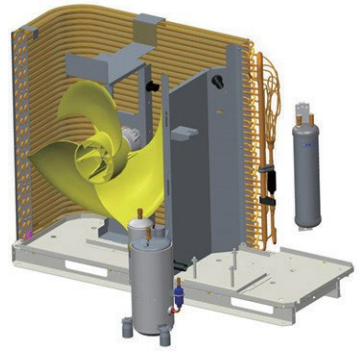
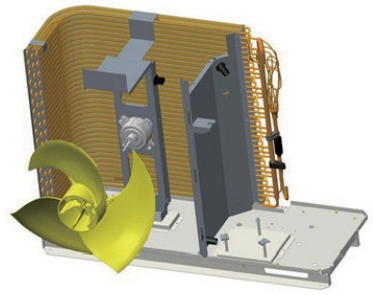
Note: First, turn off the power supply and remove the refrigerant from the device.	
Procedure	Illustration
HPX06A	
Remove the mounting bolts, side panel, connector panel, and support. (upright column)	
Remove the mounting bolts and the outer protective cover.	
Remove the mounting bolts and the cover of the electrical box.	
Remove the mounting bolts and the electrical box.	
Remove the mounting bolts, desolder the connection points between gas/liquid pipes of the plate type heat exchanger and the main unit, and then remove the water system. Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage at high temperatures.	

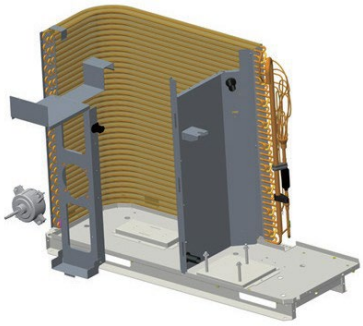
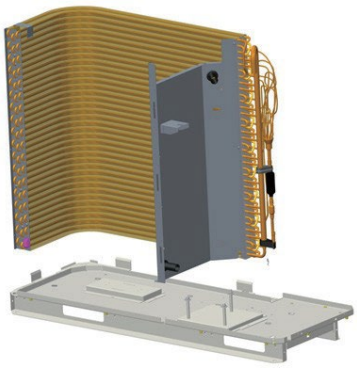
Note: First, turn off the power supply and remove the refrigerant from the device.	
Procedure	Illustration
HPX06A	
Desolder the connection points of the 4-way valve, and remove the pipes of the 4-way valve. Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage at high temperatures.	
Desolder the connection points of the suction lines and remove the suction lines. Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage at high temperatures.	
Desolder the connection points of the economizer, remove the mounting bolts, and then remove the economizer. Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage at high temperatures.	
Remove the mounting bolts of the compressor and gas-liquid separator, and then remove the compressor and gas-liquid separator.	

Note: First, turn off the power supply and remove the refrigerant from the device.	
Procedure	Illustration
HPX06A	
Remove the mounting bolts and then remove the fan.	
Remove the mounting bolts of the motor and motor support, and then move them.	
Remove the mounting bolts and then separate the condenser from the base.	

Note: First, turn off the power supply and remove the refrigerant from the device	
Procedure	Illustration
HPX12A – HPX16A	
Remove the top panel, front panel, and right panel.	 
Remove the mounting nuts, then the back panel, connection panel, and standing frame. Remove the mounting nuts, then the front grille.	 

Note: first, turn off the power supply and remove the refrigerant from the device	
Procedure	Illustration
HPX12A – HPX16A	
Remove the covers of both the electrical box and the inductor box.	
Remove the electrical box and the inductor box.	
Remove the mounting bolts, desolder the connections between the gas/liquid lines of the plate heat exchanger and the cooling system, and then remove the water system. (Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage from high temperatures).	
Remove the 4-way valve. • Loosen the screws securing the coil of the 4-way valve. • Remove the coil of the 4-way valve. • Desolder the tubes connected to the 4-way valve. • Remove the 4-way valve. • Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage from high temperatures.	

Note: First, turn off the power supply and remove the refrigerant from the device	
Procedure	Illustration
HPX12A – HPX16A	
Remove the suction line • Loosen the bolts of the gas valve. • desolder the line connected to the gas valve. • Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage at high temperatures.	
Remove the economizer • Loosen the bolts securing it. • Desolder the line connected to the liquid valve. • Note: When desoldering the connection, make sure to cover the solder joints with a damp cloth to prevent damage at high temperatures.	
Remove the compressor and gas-liquid separator • Remove the connection wire of the compressor. • Desolder the suction line and discharge line. • Loosen the bolts securing the compressor and remove it. Remove the compressor and gas-liquid separator	
Remove the mounting bolts and the fan.	

Note: First, turn off the power supply and remove the refrigerant from the device.	
Procedure	Illustration
HPX12A – HPX16A	
Remove the mounting bolts and motor support nuts, then remove the motor and motor support.	
Separate the condenser from the base by removing the attachment bolts.	

12 Recycling the device

This product cannot be disposed of with other household waste. It is of great importance to recycle the appliance responsibly to promote the sustainable reuse of material resources, and to prevent possible damage to the environment or human health through uncontrolled waste disposal. Make sure to use the return- and collection systems to return the product, or contact the installer where the product has been purchased. They can recycle this product in an environmentally friendly manner.

13 Declaration of conformity

Declaration of conformity

Winterwarm Heating Solutions B.V.
Olden Goorweg 1
7108 AE Winterswijk
The Netherlands

Declares that Heat pump types:

HPX06A, HPX12A, HPX16A

Are in accordance with the essential requirements of the relevant EU directives being:

Directives / Regulations	Test Standard
Low Voltage Directive 2014/35/EU	EN60335-1:2012+A11:2014+A13:2017 EN60335-2-40:2003+A11:2004+A12:2005 +A1:2006+A2:2009+A13:2012+AC:2013 EN62233:2008
EMC Directive:2014/30/EU	EN55014-1:2021 EN55014-2:2021 EN61000-3:2019 EN61000-3-3:2013+A1:2019
Energy-related Products Directive: 2009/125/EC Commission Regulation (EU) No 206/2012	EN 14825:2016 EN 14511-2,3:2013 EN 12102-1:2017

Goods should be installed and used in accordance with our instructions and with the applicable local and international rules. Installation should be done by an authorized, qualified and competent installer.

Signed on behalf of the manufacturer

Winterswijk, July 3rd 2023

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Ir. M. Fiselier
Technical Director