GREE
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Installer's Manual

Original Instructions

INVERTER

Air Conditioners

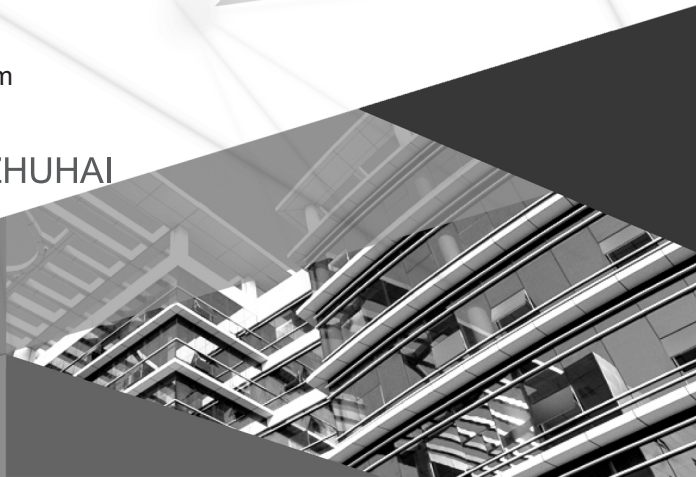
Air-to-water Heat Pump

GRS-CQ4.0Pd/NpG4-E
GRS-CQ6.0Pd/NpG4-E
GRS-CQ8.0Pd/NpG4-E
GRS-CQ10Pd/NpG4-E
GRS-CQ12Pd/NpG4-E
GRS-CQ14Pd/NpG4-E
GRS-CQ16Pd/NpG4-E
GRS-CQ8.0Pd/NpG4-M
GRS-CQ10Pd/NpG4-M
GRS-CQ12Pd/NpG4-M
GRS-CQ14Pd/NpG4-M
GRS-CQ16Pd/NpG4-M

Thank you for choosing this product. Please read this Manual carefully before operation and retain it for future reference.

If you have lost it, please contact the local agent or visit www.gree.com or send an email to global@cn.gree.com for the electronic version.

GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI



To Users

Thank you for selecting this product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

(1) This equipment should be installed, operated or maintained by the qualified servicemen who have had specific training. During operation, all safety issues covered in the labels, User's Manual and other literature should be followed strictly. This equipment 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. Children should be supervised to ensure that they do not play with the appliance.

(2) This product has gone through strict inspection and operational test before leaving the factory. In order to avoid damage due to improper disassembly and inspection, which may impact the normal operation of unit, please do not disassemble the unit by yourself. You can contact our designated dealer or local service center for professional support if necessary.

(3) When the product is faulted and cannot be operated, please contact our designated dealer or local service center as soon as possible by providing the following information..

- Contents of nameplate of product (model, cooling/heating capacity, product No., ex-factory date).
- Malfunction status (specify the situations before and after the error occurs).

(4) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation without further notice.

Contents

Safety Notices (Please be sure to abide)

⚠ **WARNING**: If not abide strictly, it may cause severe damage to the unit or the people.

⚠ **NOTE**: If not abide strictly, it may cause slight or medium damage to the unit or the people.

This sign indicates that the operation must be prohibited. Improper operation may cause severe damage or death to people

This sign indicates that the items must be observed. Improper operation may cause damage to people or property.

⚠ NOTE
1. Qualified maintenance site: it shall meet the requirements for maintenance of flammable refrigerant products proposed by relevant countries, governments and institutions. It shall comply with the following points, including but not limited to: (1) The site shall be well ventilated; (2) There is no ignition source; (3) When repairing products, personnel should take anti-static measures, such as wearing anti-static clothing, wearing anti-static bracelets, etc. (4) Maintenance tools should meet the safety requirements for flammable refrigerant. (5) The leak detector shall be in working condition. (6) Corresponding fire safety measures should be available. (7) Before welding, ensure that refrigerant inside system has been fully emptied and filled with nitrogen, and ensure that there is no flammable refrigerant in the maintenance site.
2. Qualified personnel: they shall meet qualification corresponding to flammable refrigerant products issued by the state, government and institutions, and pass training and relevant certification, including but not limited: (1) take and pass professional training about flammable refrigerant air conditioning units. (2) proficient at professional knowledge of flammable refrigerant air conditioning units. (3) obtain the relevant required certificates.

3. Safety requirements for the product installation site: it shall meet the installation requirements for flammable refrigerant products proposed by relevant countries, governments and institutions, including but not limited:

(1) Unpacking inspection before installation:
- Open the box in a well-ventilated area for inspection, and no ignition source is allowed around;
- Check whether there is refrigerant leakage in the box before opening the box, and if leakage is found, the installation cannot be continued;
- Check whether the product has collision marks and whether the appearance is good.

(2) The unit must be installed outdoors, and the site should be well ventilated.

(3) Ignition sources are prohibited on site.

(4) Installation personnel should take anti-static measures, such as: wear anti-static clothing, wear anti-static bracelet, etc.

(5) Installation tools should meet the safety requirements of flammable refrigerant.

(6) The leak detector should be in working condition.

(7) When the length of the power cord and signal lines of the product is not enough, the whole cable should be replaced, and connection between cables is strictly prohibited.

(8) The following faults are forbidden to be repaired at the installation site. In these cases, the unit needs to be returned to a qualified site for maintenance:
- Faults that need to be welded to the internal refrigerant pipeline;
- Faults that need to disassemble the refrigerant system for maintenance.

⚠ NOTE

After receipt of the unit, check it for appearance, unit model compared with your desire and attachments.

Maintenance and installation work of the unit must be performed by authorized personnel according to applicable laws and regulations and this Instruction.

After installation work, the unit cannot be energized unless there is not any problem in check.

Ensure periodical clean and maintenance of the unit after normal operation of the unit for longer life and reliable operation.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

The appliance shall be installed in accordance with national wiring regulations.

This product is a kind of comfort air conditioning, and is not allowed to be installed where there are corrosive, explosive and inflammable substances or smog; otherwise it would lead to operation failure, shortened service life, five hazard or even severe injuries. Special air conditions are required for where mentioned above.

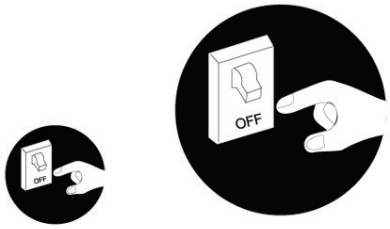
Correct Disposure

This marking indicates that this product should not be disposed with other household wastes throughout the EU.To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device,please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

R290:0.02

⚠ WARNING

Once abnormality like burning smell occurs, please cut off the power supply immediately and then contact with service center.



If the abnormality still exists, the unit may be damaged and electric shock or fire may result.

Don't operate the unit with wet hand.

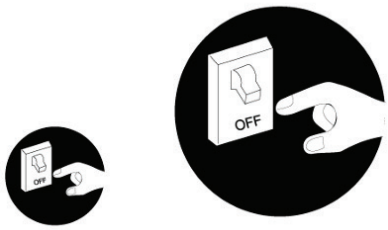
Otherwise, it may cause electric shock.

Before installation,please see if the voltage of local place accords with that on nameplate of unit and capacity of power supply, power cord or socket is suitable for input power of this unit.

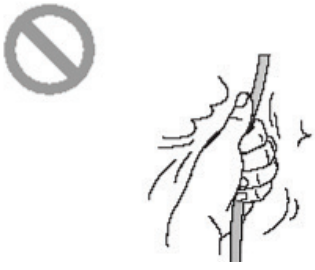
Special circuit must be adopted for power supply to prevent fire.

Do not use octopus multipurpose plug or mobile terminal board for wire connection.

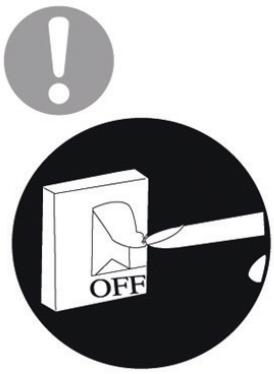
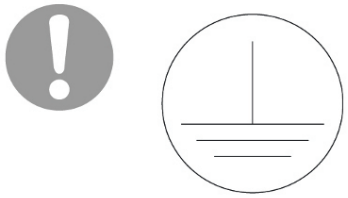
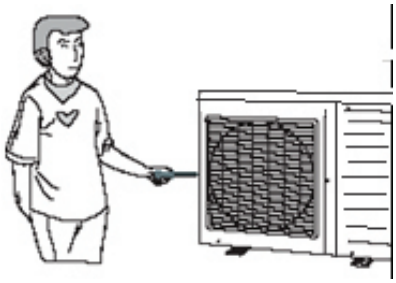
Be sure to pull out the power plug and drain the water system when the unit is not in use for a long time.

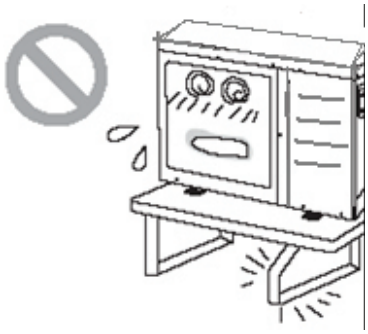


Never damage the electric wire or use the one which is not specified.



Otherwise, it may cause overheating or fire.

Before cleaning please cut off the power supply.  Otherwise, it may cause electric shock or damage.	The power supply must adopt special circuit with leakage switch and enough capacity.	User can not change power cord socket without prior consent. Wiring working must be done by professionals. Ensure good earthing and don't change earthing mode of unit.
Earthing: the unit must be earthed reliably ! The earthing wire should connect with special device of buildings.  If not, please ask the qualified personnel to install. Furthermore, don't connect earth wire to gas pipe, water pipe, drainage pipe or any other improper places which professional does not recognize.	Never insert any foreign matter into outdoor unit to avoid damage . And never insert your hands into the air outlet of outdoor unit. 	Don't attempt to repair the unit by yourself.  Improper repair may cause electric shock or fire, so you should contact the service center to repair.

Don't step on the top of the unit or place anything on it.  There is the danger of fall of things or people.	Never block the air inlet and outlet of unit.  It may reduce efficiency or cause stop of the unit and even fire.	Keep pressurized spray, gas holder and so on away from the unit above 1m .  It may cause fire or explosion.
Please note whether the installation stand is firm enough or not.  If damaged, it may cause fall of the unit and injury of people.	Unit should be installed at the place with good ventilation to save energy.	When there is no water in the system, do not start the unit.

⚠ WARNING

This unit is filled with refrigerant R290, which is a highly flammable and explosive gas. During maintenance, it is important to ensure that it is performed by the qualified personnel in a qualified site. See above for details.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. Should repair be necessary, contact your nearest authorized service centre. Any repairs carried out by unqualified personnel may be dangerous.This appliance shall be stored in a well-ventilated area without ignition sources, and ensure that it meets the fire safety requirements for products charged with flammable refrigerant proposed by relevant countries, governments, and institutions. Do not pierce or burn.

As this appliance is filled with flammable gas R290, For repairs, strictly follow manufacturer's instructions. Be aware that refrigrants not contain odour.

If a stationary appliance is not fitted with a supply cord and a plug, or with other means for disconnection from the supply mains having a contact separation in all poles that provides full disconnection under overvoltage category III conditions, the instructions shall state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.A circuit breaker with leakage protection is required for the fixed line and shall be open in all poles with a breaking distance of at least 3mm for contacts.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

This appliance shall not be installed indoor and shall be installed in a well-ventilated oudoor area.

This appliance shall be stored so as to prevent mechanical damage from occurring.

This machine is a hermetically sealed equipment.The annual refrigerant leakage of the whole unit is less than 1g. Its refrigerant charge is required on the nameplate.

⚠ NOTE	
	Appliance filled with flammable gas R290.
	Before use the appliance, read this Installer's Manual first.

To realize the function of the air conditioner unit, a special refrigerant circulates in the system. The used refrigerant is R290, which is specially cleaned.The refrigerant is flammable and inodorous. Furthermore, it can leads to explosion under certain conditions.

Compared to common refrigerants, R290 is a nonpolluting refrigerant with no harm to the ozonosphere. The influence upon the greenhouse effect is also lower. R290 has got very good thermodynamic features which lead to a really high energy efficiency. The units therefore need a less filling.

Before installation, please check if the adopted power is accordance with that listed on nameplate, and check the safety of power.

The unit shall contact with the supply mains by a full disconnection device under overvoltage category Ⅲ.

Before using, please check and confirm if wires and water pipes are connected correctly to avoid water leakage, electric shock or fire etc.

Don't operate the unit with wet hand, and don't allow children to operate the unit.

The On/off in the instruction is for the operation to on and off button of PCB for users; cut off power means to stop supplying power to the unit.

Don't directly expose the unit under the corrosive ambient with water or dampness.

Don't operate the unit without water in the unit. The air outlet/inlet of unit cannot be blocked by other objects.

The water in unit and pipeline should be discharged if the unit is not in use, to prevent the main unit, pipe line and water pump from frost-cracking.

Never press the screen of the control panel with sharp objects. Never use other wires instead of special communication line of the unit to protect control elements. Never clean the manual controller with benzene, thinner or chemical cloth to avoid fading of surface and failure of elements. Clean the unit with the cloth soaked in neutral eradicator. Slightly clean the display screen and connecting parts to avoid fading.

The power cord must be separated with the communication line.

Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.

Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.

Maximum and minimum water operating temperatures

Item	Minimum water operating temperatures	Maximum water operating temperatures
Cooling	5°C	25°C
Heating	20°C	80°C*
Water heating	40°C	80°C**

Maximum and minimum water operating pressures

Item	Minimum water operating pressures	Maximum water operating pressures
Cooling	0.05MPa	0.25MPa
Heating		
Water heating		

Maximum and minimum entering water pressures.

Item	Minimum entering water pressures	Maximum entering water pressures
Cooling	0.05MPa	0.25MPa
Heating		
Water heating		

*: The leaving water temperature varies at different environment. 80°C is the highest leaving water temperature at -5~5°C ambient temperature.

**: When the electric heater for the water tank prepared by the user themselves has been activated, the leaving water temperature can go up to 80°C.

The range of external static pressures at which the appliance was tested (add-on heat pumps, and appliances with supplementary heaters, only); If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

The appliance is intended to be permanently connected to the water mains and not connected by a hose-set.

If there is any question, please contact with local dealer, authorized service center, agencies or our company directly.

⚠ WARNING
If any hot work is to be conducted on the refrigeration equipment or any associated parts, it must be ensured that the system is free of refrigerant and operated by qualified personnel in a qualified maintenance site with appropriate fire extinguisher.
Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants: – the ventilation machinery and outlets are operating adequately and are not obstructed; – the equipment shall be installed outdoors with good ventilation, free of any ignition source and chemical contamination; and equipped with appropriate fire extinguisher. This equipment is strictly forbidden to be installed indoors. – marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected; – refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include: that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking; that no live electrical components and wiring are exposed while charging, recovering or purging the system; that there is continuity of earth bonding.

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment.

Intrinsically safe components do not have to be isolated prior to working on them.

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

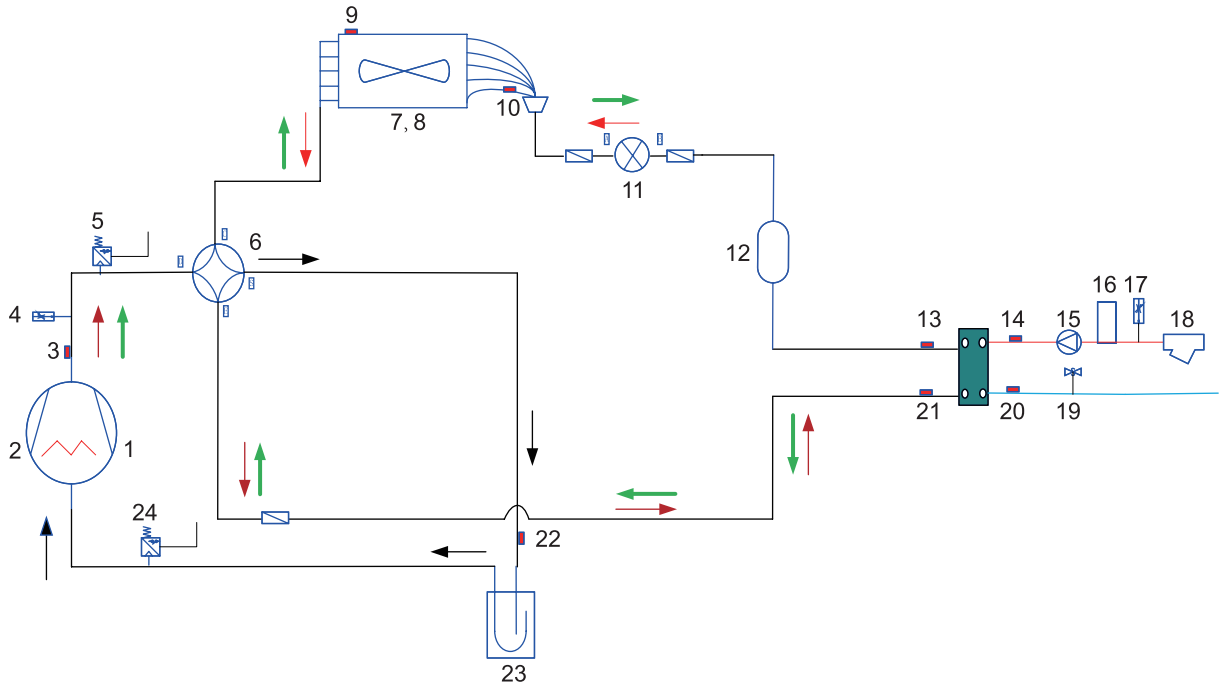
Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of ageing or continual vibration from sources such as compressors or fans.

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.

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant. The insulation for fixed wiring must be protected by, for example, insulation sleeve with an appropriate temperature resistance level.

1. Diagram of the Operating Principle



Item	Description	Item	Description
1	Compressor	13	Liquid line temperature bulb
2	Electric heater for the compressor	14	Water inlet temperature bulb
3	Discharge temperature sensor	15	Water pump
4	High pressure switch	16	Expansion tank
5	High pressure sensor	17	Flow switch
6	4-way valve	18	Filter
7	Finned heat exchanger	19	Micro air bubble processor
8	Electric heater for the base	20	Water outlet temperature bulb
9	Ambient temperature sensor	21	Gas line temperature bulb
10	Defrosting sensor	22	Suction temperature bulb
11	Electronic expansion valve	23	Gas-liquid separator
12	Refrigerant receiver	24	Low pressure sensor

Note: it is the system schematic diagram. The manufacturer is committed to continuously improving this product to ensure the highest quality and reliability standards and to meet local regulations and market requirements. All features and specifications are subject to change without prior notice.

2. Operating Principle of the Unit

DC Inverter Air to Water Heat Pump is composed of outdoor unit, indoor unit and internal-fan coil water tank. Operation functions:

Item	Function	Item	Function
1	Cooling	10	Quiet mode
2	Heating	11	Disinfection mode
3	Water heating	12	Compensation mode
4	Cooling +water heating	13	Floor debugging
5	Heating+ water heating	14	Air removal of the water system
6	Emergency mode	15	Other thermal
7	Fast hot water	16	Solar heating
8	Holiday mode	17	Zone control
9	Forced operation mode	18	Modularization

(1) Cooling: in the cooling mode, the refrigerant is condensed and evaporated at the heat exchangers of the main unit. Water lowers the temperature and releases heat, while refrigerant absorbs heat and evaporates. With the help of wired controller, the leaving water temperature can meet the needs of users. Through the control of the valve, the low-temperature water in the system is goes to the indoor fan coil units and underfloor coils, and exchanges heat with the indoor air to reduce the indoor temperature to the required range.

(2) Heating: in the heating mode, the refrigerant is condensed and evaporated at the heat exchangers of the main unit. Water absorbs heat and heats up, while refrigerant releases heat and condenses. With the help of wired controller, the leaving water temperature can meet the needs of users. Through the control of the valve, the high-temperature water in the system goes to the indoor fan coil units and underfloor coils, and exchanges heat with the indoor air to make the indoor temperature rise to the required range.

(3) Water heating: in the water heating mode, the refrigerant is condensed and evaporated at the heat exchangers of the main unit. Water absorbs heat and heats up, while refrigerant releases heat and condenses. With the help of wired controller, the leaving water temperature can meet the needs of users. Through the control of the valve, the high-temperature water in the system goes to the coils of the water tank, and exchanges heat with the water in the water tank, so that the water temperature inside the water tank rises to the required range.

(4) Cooling + water heating: when cooling mode exists together with the water heating mode, the user can set the priority of these two modes based on the needs. The default priority is heat pump. That is under the default setting, if cooling mode exists together with the water heating mode, the heat pump gives priority to cooling. In that case, water heating can only realized with e-heater of the water tank. Inversely, the heat pump gives priority to water heating and switches to cooling after finishing water heating.

(5) Heating+ water heating: when heating mode exists together with the water heating mode, the user can set the priority of these two modes based on the needs. The default priority is heat pump. That is under the default setting, if heating mode exists together with the water heating mode, the heat pump gives priority to heating. In that case, water heating can only realized with e-heater of the water tank. Inversely, the heat pump gives priority to water heating and switches to heating after finishing water heating.

(6) Emergency mode: this mode is only applicable to heating and water heating. When the main unit stops due to a fault, it enters the corresponding emergency mode. In the heating mode, once the unit goes to the emergency mode, heating can only be realized by the auxiliary electric heater of the main unit. When leaving water temperature set point or indoor temperature set point is reached, the auxiliary electric heater will stop working. In the water heating mode, the auxiliary electric heater of the main unit will stop working while the auxiliary electric heater of the water tank will work. When the temperature set point or water tank temperature is reached, this auxiliary electric heater will stop working.

(7) Fast hot water: at the fast hot water mode, the unit runs according to the water heating control of heat pump and the e-heater of water tank runs at the same time.

(8) Holiday mode: this mode is only available for heating mode. This mode is set to keep indoor temperature or leaving water temperature in a certain range, so as to prevent water system of the unit from freezing or protect certain indoor articles from freezing damage. When the outdoor unit stops due to malfunction, the two e-heaters of the unit will run.

(9) Forced operation mode: this mode is only used for refrigerant recovery and debugging for the unit.

(10) Quiet mode: this mode is available in cooling, heating and water heating modes. Once this mode has bee activated, the main unit will reduce the operating noise through automatic control.

(11) Disinfection mode: in this mode, the water heating system can be disinfected. When starting up the disinfection function and setting corresponding time to meet the requirement of disinfection mode, the function will start. After the setting temperature is reached, this mode will terminate.

(12) Compensation operation: this mode is only available for space heating or space cooling. At the compensation mode, the setting value (remote room air temperature or leaving water temperature) is detected and contolled automatically when the outdoor air temperature is changed.

(13) Floor commissioning: this function is intended to preheat the floor periodically for the initial use.

(14) Air removal of the water system: this function is intended to replenish water and remove air in the water system to make the equipment run at the stabilized water pressure.

(15) Other thermal: when the outdoor temperature is lower than the set point for starting other thermal and the unit is under the error condition and the compressor has stopped for three minutes, the other thermal will start to supply heat or hot water to the room.

(16) Solar heating: in the "**Water heating**" mode, this function can be turned on to convert solar energy into heat energy so as to produce hot water by this clean energy.

(17) Zone control: in the "**Cooling**" and "**Heating**" modes, this function can control the water temperature in different areas through the proportional control value.

(18) Modularization: this function is to meet the user's demand for the use of multiple units, which can work together through communication in the "**Cooling**", "**Heating"**, "**Water heating**", "**Heating + Water heating**", and "**Cooling + Water heating**" modes.

3. Nomenclature

G	RS	-	C	Q	16	Pd	/	Np	G	-	M
1	2		3	4	5	6		7	8		9

NO.	Description	Options
1	GREE	G-GREE Air to water heat pump
2	Heat Pump Water Heater	RS
3	Heating Mode	S= Static; C=Circulating
4	Function	Q=Multi-function; Omit=Single-function
5	Nominal Heating Capacity	4.0=4.0kW; 6.0=6.0kW; 8.0=8.0kW; 10=10kW; 12=12kW; 14=14kW; 16=16kW
6	Compressor Style	Pd=DC Inverter; Omit=On/Off
7	Refrigerant	Na=R410A; Nh=R32; Np=R290
8	Design Serial Number	G3,G4, G4 series is the same with G3 series but without the electric heater.
9	Power Supply	E/M=230/400V,~50Hz

Model Line-Up

Model	Heating*,kW	Power Input,kW	COP,W/W	Power supply
GRS-CQ4.0Pd/NpG4-E	4.5	0.87	5.2	230VAC,1Ph,50Hz
GRS-CQ6.0Pd/NpG4-E	6.2	1.24	5	
GRS-CQ8.0Pd/NpG4-E	8.4	1.68	5	
GRS-CQ10Pd/NpG4-E	10	2.105	4.75	
GRS-CQ12Pd/NpG4-E	12	2.424	4.95	
GRS-CQ14Pd/NpG4-E	14	2.978	4.7	
GRS-CQ16Pd/NpG4-E	15.5	3.298	4.7	
GRS-CQ8.0Pd/NpG4-M	8.4	1.68	5	400VAC,3Ph,50Hz
GRS-CQ10Pd/NpG4-M	10	2.105	4.75	
GRS-CQ12Pd/NpG4-M	12	2.424	4.95	
GRS-CQ14Pd/NpG4-M	14	2.978	4.7	
GRS-CQ16Pd/NpG4-M	15.5	3.298	4.7	

Model	Cooling**,kW	Power Input,kW	EER,W/W	Power supply
GRS-CQ4.0Pd/NpG4-E	4.5	0.797	5.65	230VAC,1Ph,50Hz
GRS-CQ6.0Pd/NpG4-E	6.2	1.192	5.2	
GRS-CQ8.0Pd/NpG4-E	8.3	1.596	5.2	
GRS-CQ10Pd/NpG4-E	10	2.083	4.8	
GRS-CQ12Pd/NpG4-E	12	2.608	4.6	
GRS-CQ14Pd/NpG4-E	14	3.255	4.3	
GRS-CQ16Pd/NpG4-E	15.5	3.523	4.4	
GRS-CQ8.0Pd/NpG4-M	8.3	1.596	5.2	400VAC,3Ph,50Hz
GRS-CQ10Pd/NpG4-M	10	2.083	4.8	
GRS-CQ12Pd/NpG4-M	12	2.608	4.6	
GRS-CQ14Pd/NpG4-M	14	3.255	4.3	
GRS-CQ16Pd/NpG4-M	15.5	3.523	4.4	

Notes

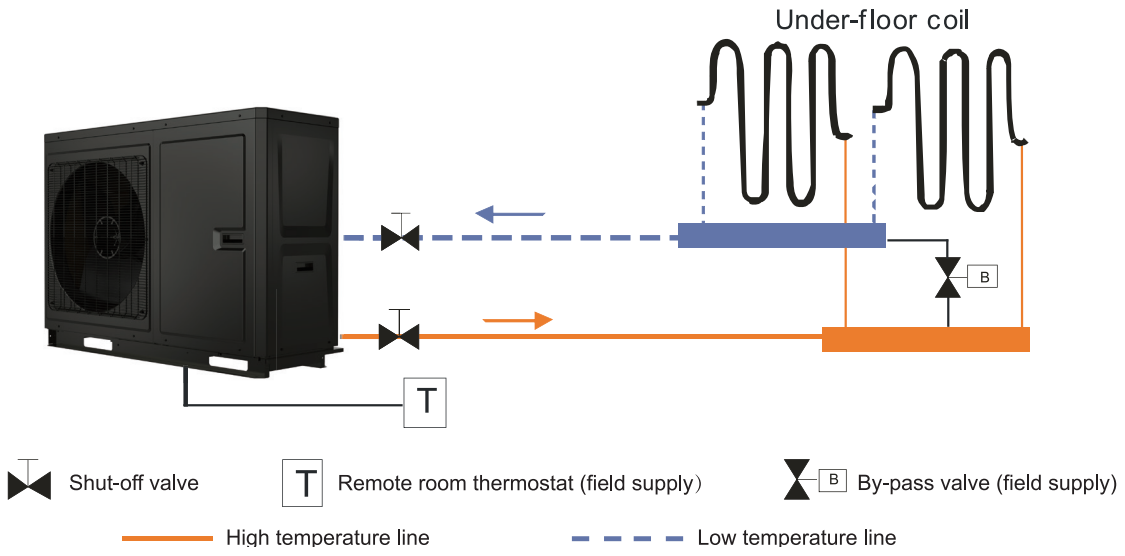
(a) *: Capacities and power inputs are based on the following conditions:
Entering/leaving Water Temperature 30°C/35°C, Outdoor Air Temperature 7°C DB/6°C WB;

(b) **:Capacities and power inputs are based on the following conditions:
Entering/leaving Water Temperature 23°C/18°C, Outdoor Air Temperature 35°C DB/24°C WB.

Mode	Heat Source Side Temperature (°C)	User Side Temperature (°C)
Heating	-25~35	20~80
Cooling	-15~48	5~25
Water Heating	-25~45	40~80

4. Installation Example

CASE 1: Connecting Under-floor Coil for Heating and Cooling

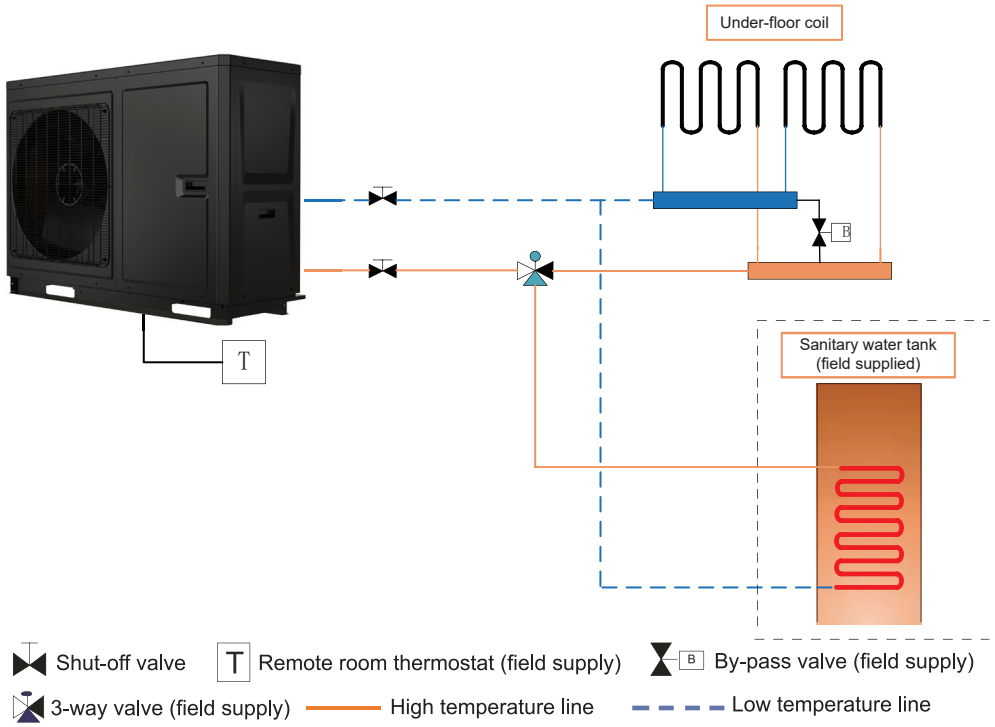


Notes

(a) The type and specification of the thermostat should be complied with what specified in this manual;

(b) The by-pass valve must be installed to secure enough water flow rate, and should be installed at the collector.

CASE 2: Connecting Sanitary Water Tank and Under-floor Coil

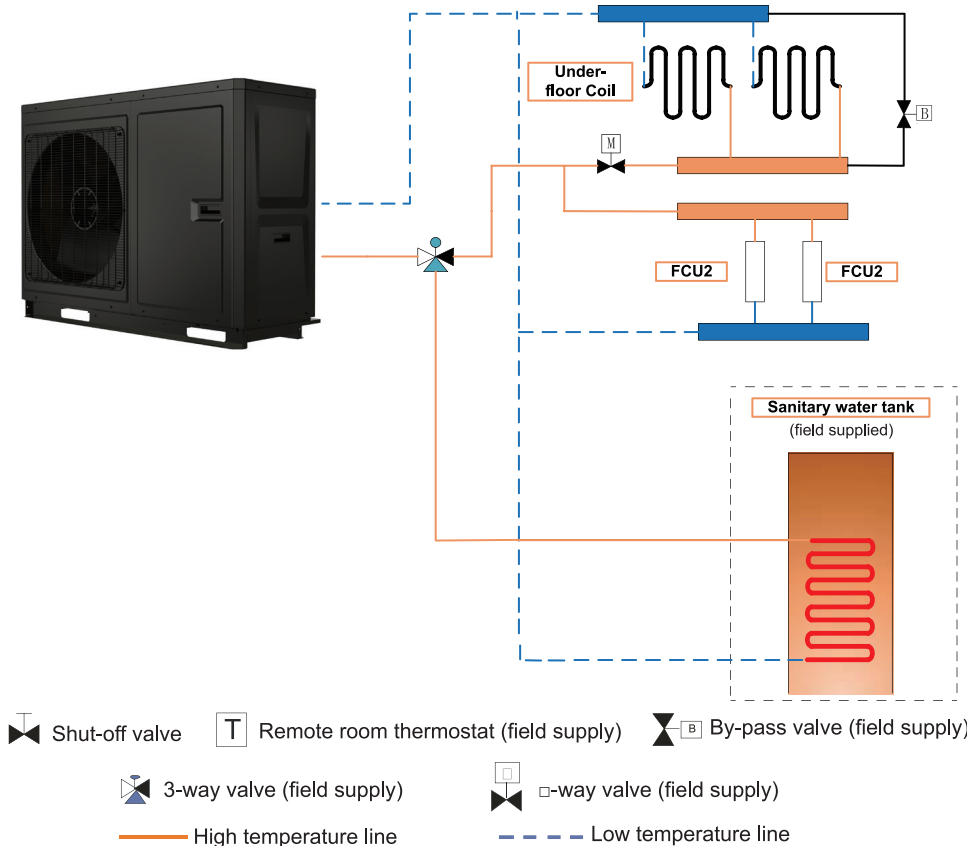


Notes

(a) In this case, the three-way valve should be installed in accordance with what specified this manual;

(b) The sanitary water tank should be equipped with an internal electric heater to secure enough heat energy in the very cold days.

CASE 3 : Connecting Sanitary Water Tank, Under-floor Coil and FCU



Note

The two-way valve is very important to prevent dew condensation on the floor and radiator under the cooling mode.

5. Installation Guideline of Monobloc Unit

5.1 Instruction to installation

(1) Installation of the unit must be in accordance with national and local safety codes.

(2) Installation quality will directly affect the normal use of the air conditioner unit. The user is prohibited from installation. Please contact your dealer after buying this machine. Professional installation workers will provide installation and test services according to installation manual.

(3) Do not connect to power until all installation work is completed.

(4) The foot brackets of the compressor is used to reduce vibration during transport. Before commissioning, they must be removed, otherwise it would lead to unnecessary faults. When foot brackets have been removed, the fastening screws must be tightened so as to prevent the compressor from jumping out during operation.

5.2 Installation of monobloc unit

5.2.1 Selection of installation location of monobloc unit

(1) Monobloc unit must be installed on a firm and solid support.

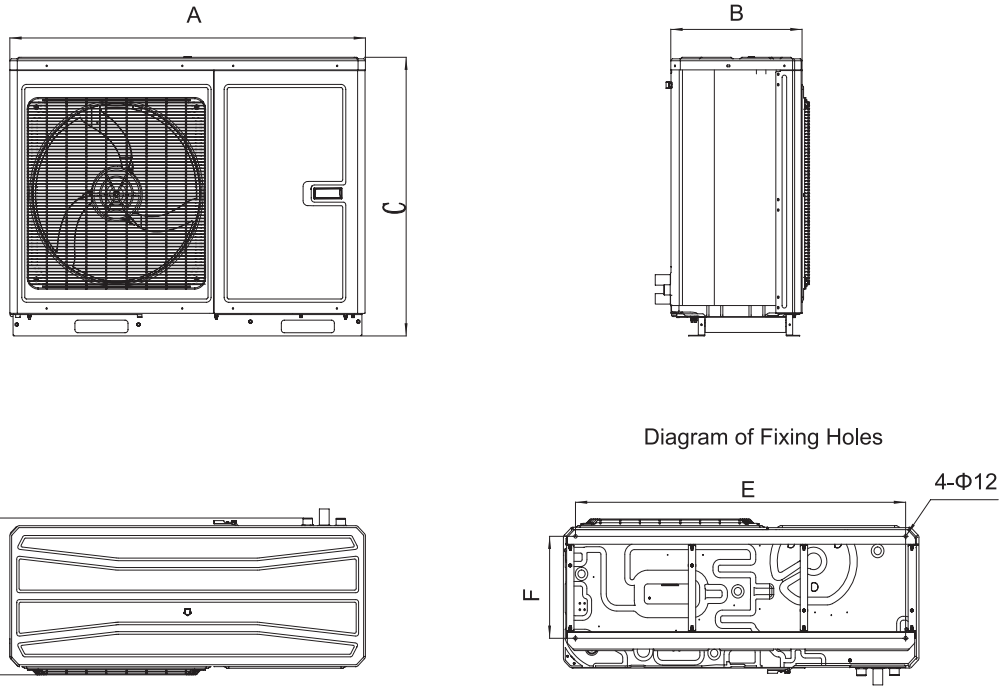
(2) Avoid placing the monobloc unit under window or between two constructions, hence to prevent normal operating noise from entering the room.

(3) Air flow at inlet and outlet shall not be blocked.

(4) Install at a well-ventilated place, so that the machine can absorb and discharge sufficient air.

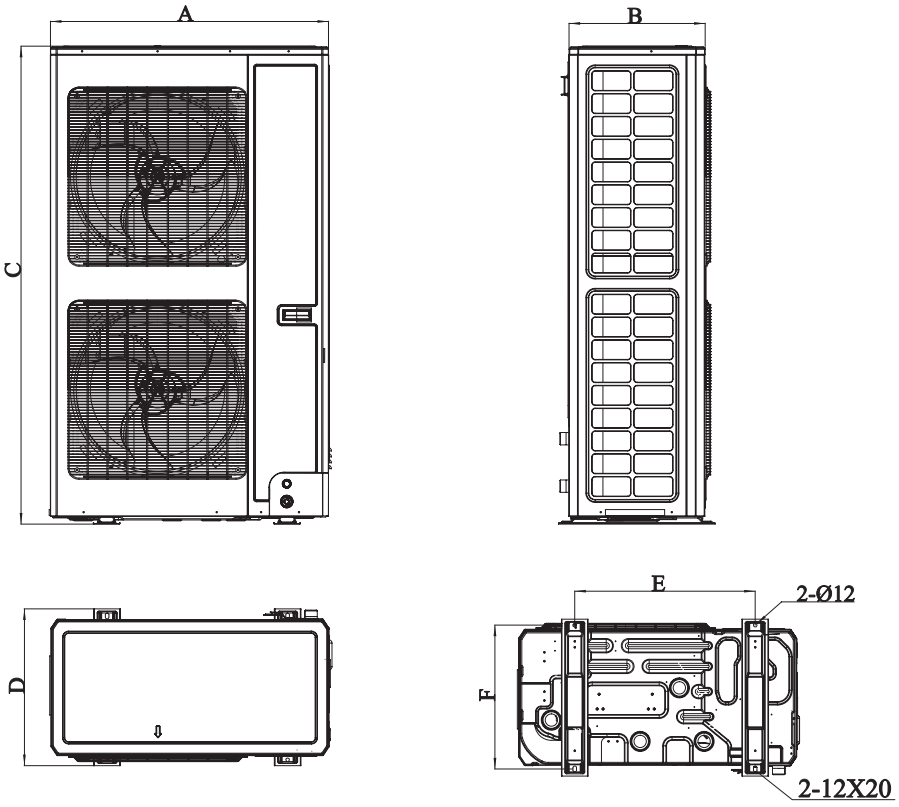
(5) Do not install at a place where flammable or explosive goods exist or a place subject to severe dust, salty fog and polluted air.

5.2.2 Outline dimension of monobloc unit



Unit: mm

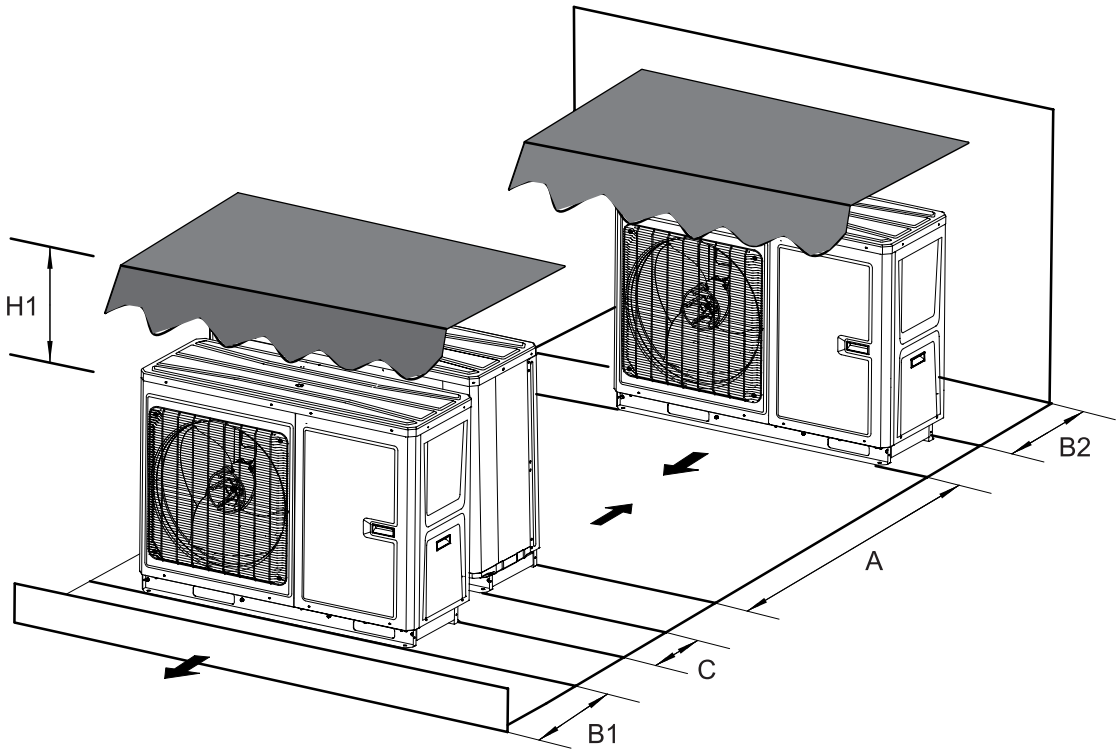
Model	A	B	C	D	E	F
4/6/8/10/12/14kW	1206	445	880	490	1120	322

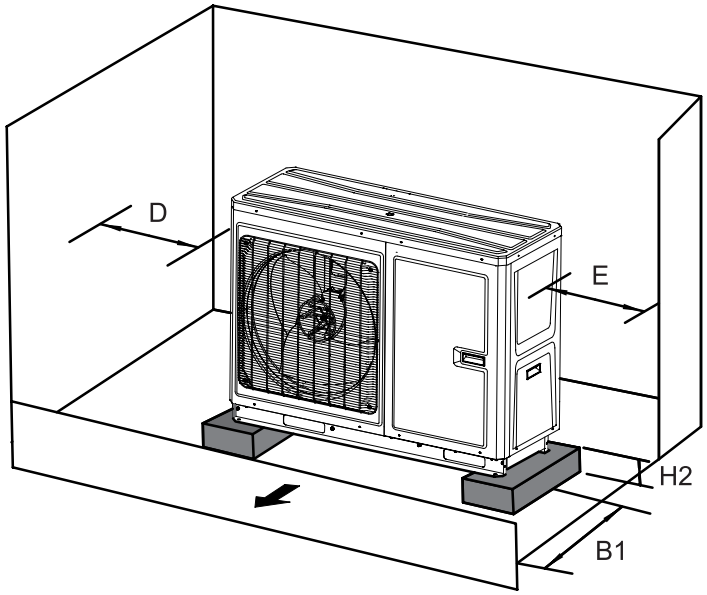


Unit: mm

Model	A	B	C	D	E	F	G
16kW	943	464	1615	530	610	482	\

5.2.3 Space requirements for installation





Unit	A(mm)	B1(mm)	B2(mm)	C(mm)	H1(mm)	H2(mm)	D(mm)	E(mm)
4~16kW	＞2000	＞1000	＞200	＞400	＞500	＞200	＞200	＞500

Notes:

(1) For areas with frequent snowfall, please clean up the snow in time to avoid covering unit.

(2) The unit is installed in areas expecting snow are suggested to be raised with support frames.

(3) If possible, avoid locations that are likely to accumulate snow. If not possible, a snow guard should be installed on the unit to prevent accumulation of snow on the top of the unit.

(4) Height of the installation foundation should be higher than the height of the annual average snallfall.

(5) Snow and other litters shall be removed within at least one meter distance from the unit so as to keep the unit in normal operation.

5.2.4 Precautions on installation of monobloc unit

(1) When moving outdoor unit, it is necessary to adopt 2 pieces of long enough rope to hand the unit from 4 directions. Included angle between the rope when hanging and moving must be 40° below to prevent center of the unit from moving.

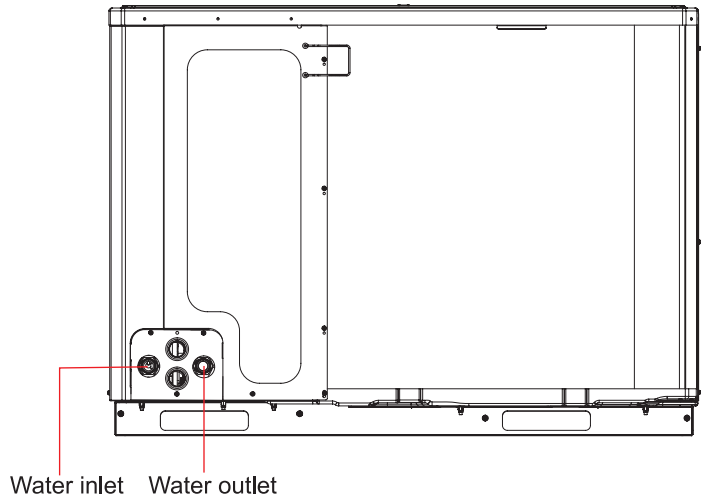
(2) Adopt M12 bolts components to tighten feet and under frame when installing.

(3) Monobloc unit should be installed on concrete base that is 20cm height.

(4) Requirements on installation space dimension of unit's bodies are shown in following drawing.

(5) Monobloc unit must be lifted by using designated lifting hole. Take care to protect the unit during lift. To avoid rusting, do not knock the metal parts.

5.2.5 Usage of rubber rings



(1) Take away the original rubber rings, replace the long tail rubber rings of accessory;

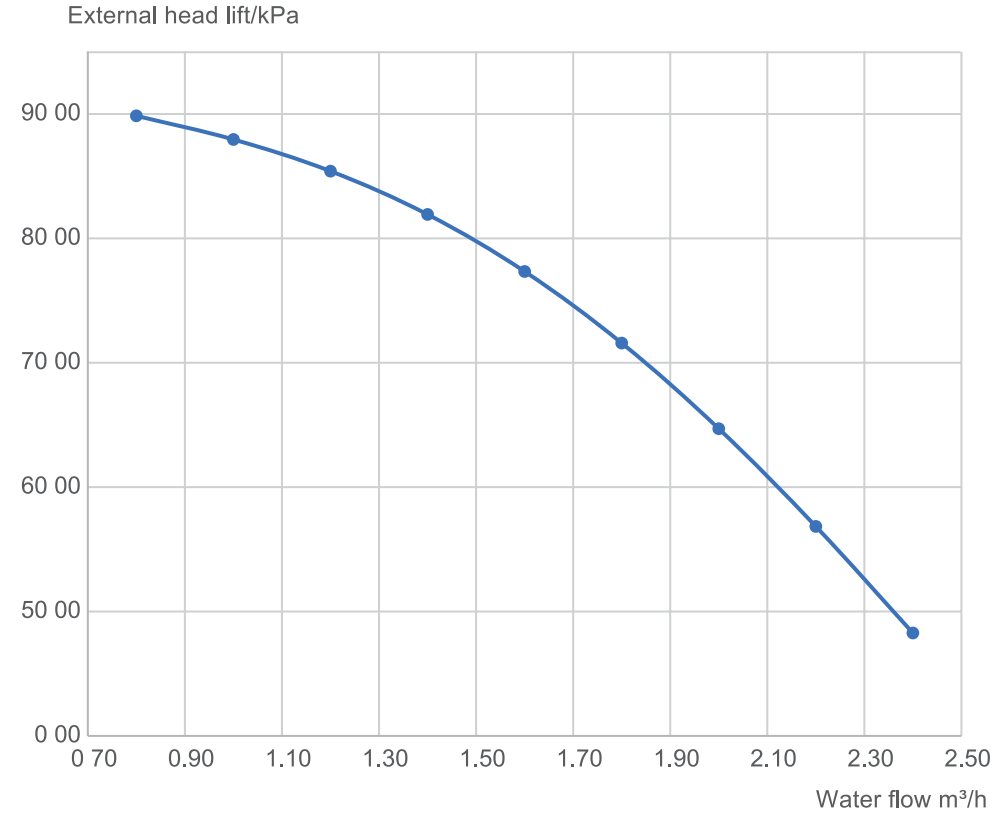
(2) Wires installed by field supply get through the rubber rings,such as 2-way valve,3-way valve,power cable and so on.Be careful of separating electrical wire and light current wire.

(3) Tie the rubber rings after finishing wire connection.

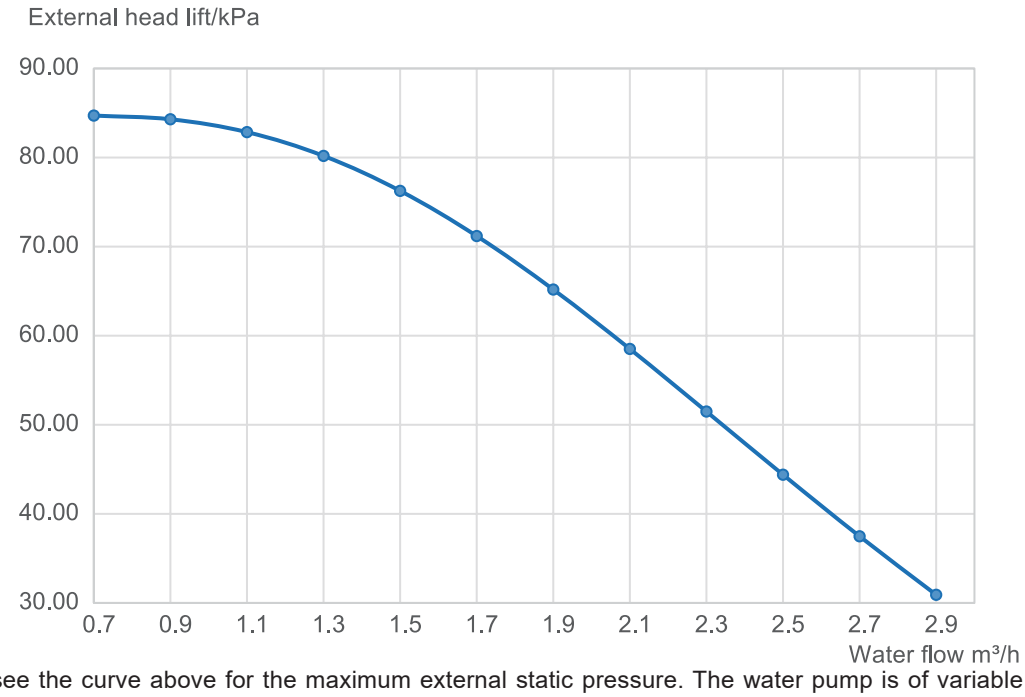
6. Installation of Hydraulic Unit

6.1 Available external static pressure of outlet

(1) Available external static pressure of outlet for 4/6/8/10/12/14kW units



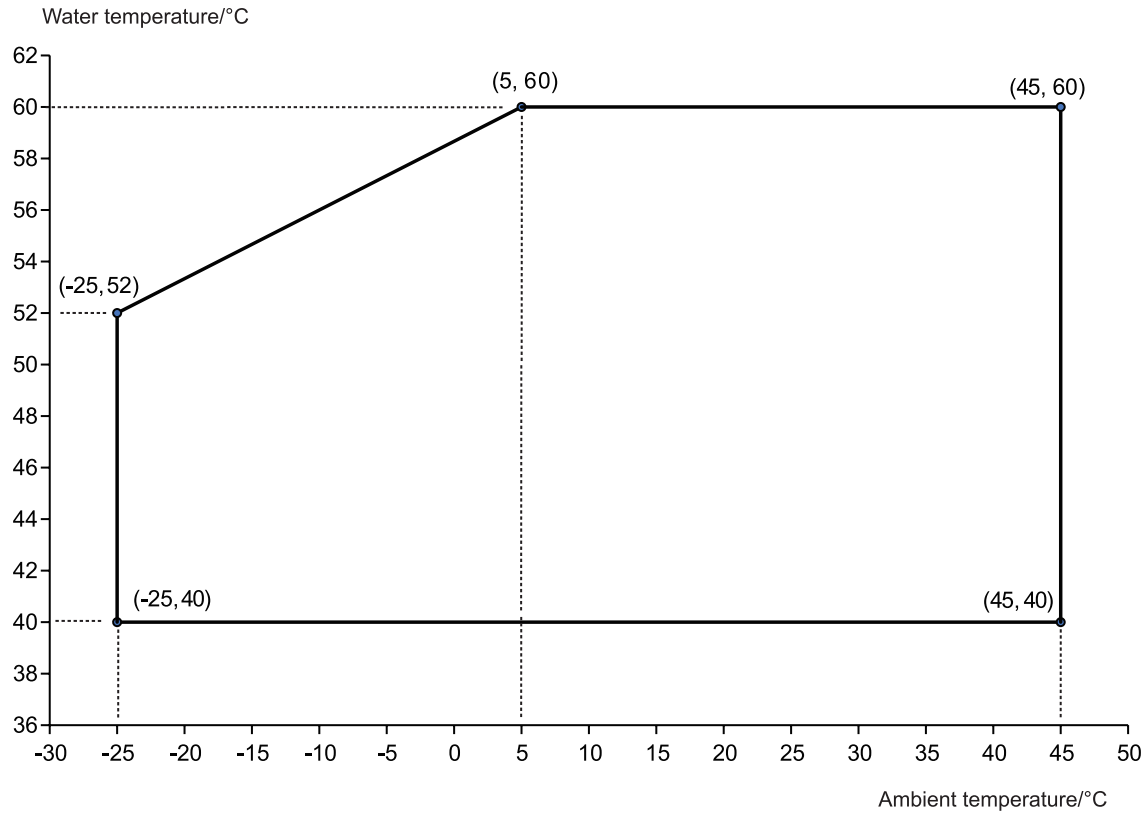
(2) Available external static pressure of outlet for 16kW units



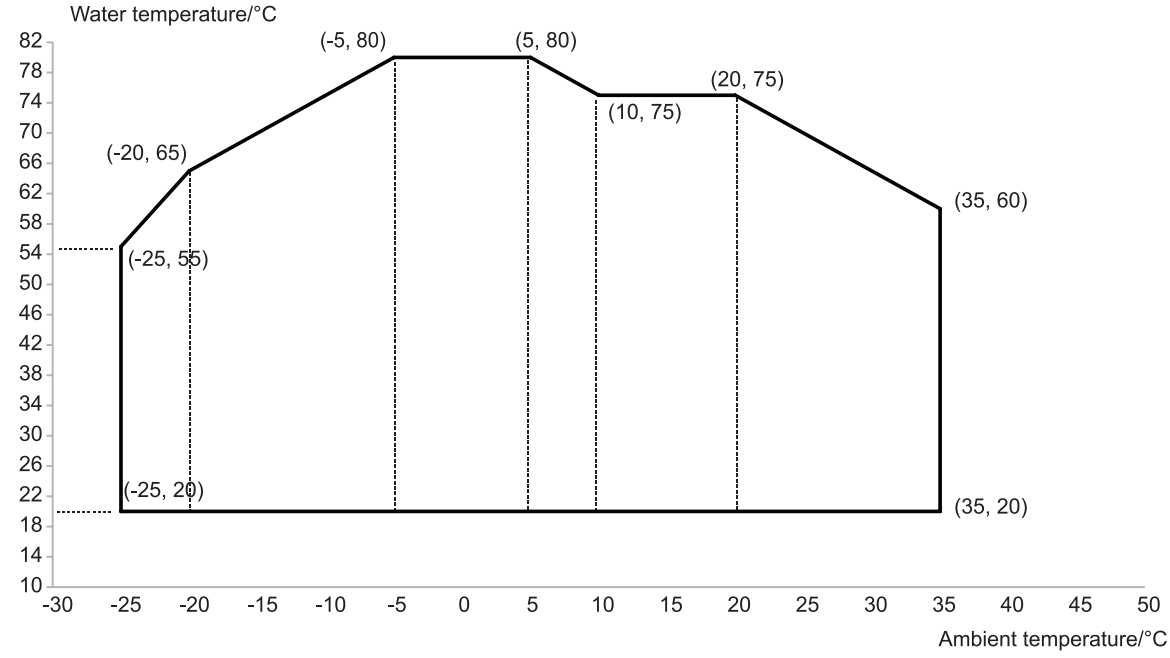
Note: see the curve above for the maximum external static pressure. The water pump is of variable frequency. And during operation, the water pump will adjust its output based on the actual load.

6.2 Ambient temperature and leaving water temperature upper limit

(1) Water heating for 4/6/8/10/12/14/16kW units

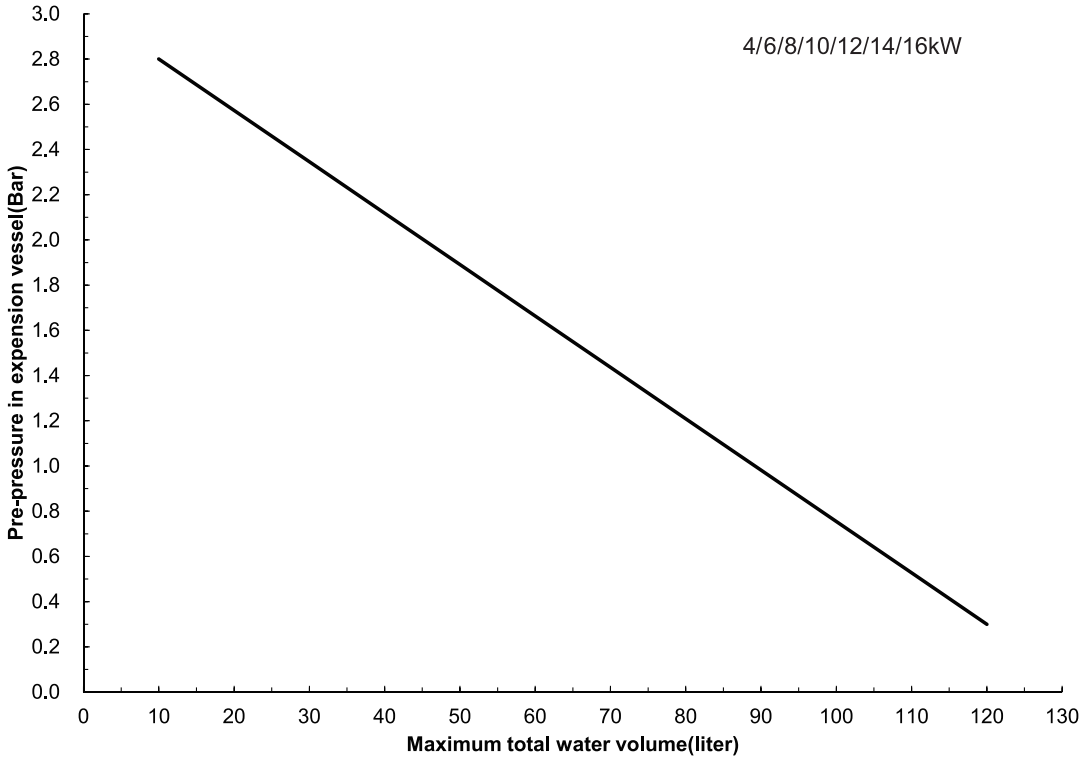


(2) Space heating for 4/6/8/10/12/14/16kW units



Note:the ambient temperature and water temperature should be subject to the actual operation of the unit.

6.3 Water volume and expansion vessel pressure



Notes

(a) The expansion vessel is 5 liters and 1.5bar pre-pressurized for 4/6/8/10/12/14/16kW units;

(b) Total water volume of 66 liters is default for 4/6/8/10/12/14/16kW unit; if total water is changed because of installation condition, the pre-pressure should be adjusted to secure proper operation. If the unit is located at the highest position, adjustment is not required;

(c) To adjust pre-pressure, use nitrogen gas by certificated installer.

(d) Buffer tank specifications should be calculated based on 8-10L/KW for the primary system and 12L/kW for the secondary system.

6.4 Method of calculating the charging pressure of expansion vessel

The method of calculating the charging pressure of expansion vessel needed to be adjusted is as follows.

During installation, if the volume of water system has changed, please check if the pre-set pressure of the expansion vessel needs to be adjusted according to the following formula:

$P_g = (H/10 + 0.3)$ Bar (H ---the difference between installing location of indoor unit and the highest spot of water system)

Ensure that the volume of water system is lower than the maximum volume required in the above figure. If it exceeds the range, the expansion vessel does not meet the installing requirement.

For 4/6/8/10/12/14/16kW units

Installation height [1] difference	Water volume	
	<66L	>66L
<12 m	Adjustment is not necessary	1. Pre-set pressure needs to be adjusted according to the above formula. 2. Check if the water volume is lower than the maximum water volume. (with help of the above figure)
> 12 m	1. Pre-set pressure needs to be adjusted according to the above formula. 2. Check if the water volume is lower than the maximum water volume. (with help of the above figure)	The expansion vessel is too small and adjustment is not available.

Notes

(a) Installation height difference: the difference between installing location of indoor unit and the highest spot of water system; if the indoor unit is located at the highest point of the installation,the installation height difference is considered 0m.

(b) Example 1: The 16kW unit is installed 5m below the highest spot of water system and the total volume of the water system is 60L.

(c) Referring to the above figure, it is not necessary to adjust the pressure of the expansion vessel.

(d) Example 2: The unit is installed on the highest spot of the water system and the total water volume is 100L.

(e) As the volume of water system is higher than 66L, it is necessary to adjust the pressure of the expansion vessel be lower.

(f) The formula of calculating pressure

$$P_g = (H/10 + 0.3) = (0/10 + 0.3) = 0.3 \text{ Bar}$$

(g) The maximum volume of the water system is about 118L. As the actual volume of the water system is 100L, the expansion vessel meets the installing requirement.

(h) Adjust the pre-set pressure of the expansion vessel from 1.5Bar to 0.3Bar.

6.5 Selection of expansion vessel

Formula:

$$v = \frac{c \cdot e}{1 - \frac{1 + p_1}{1 + p_2}}$$

V--- Volume of expansion vessel

C--- Total water volume

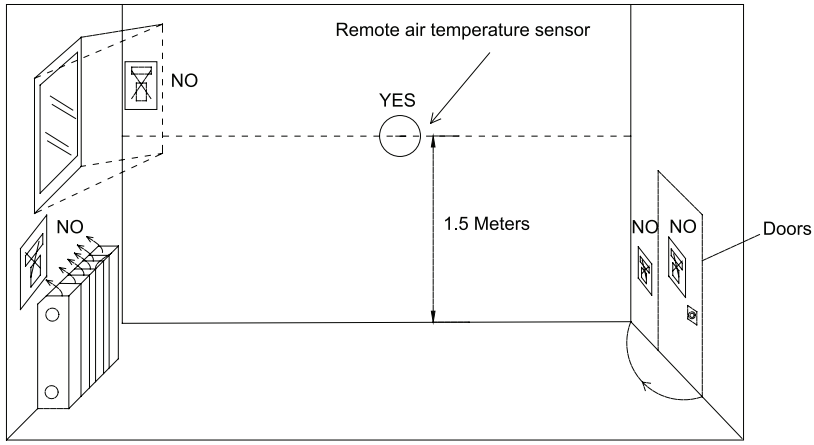
P_1--- Pre-set pressure of expansion vessel

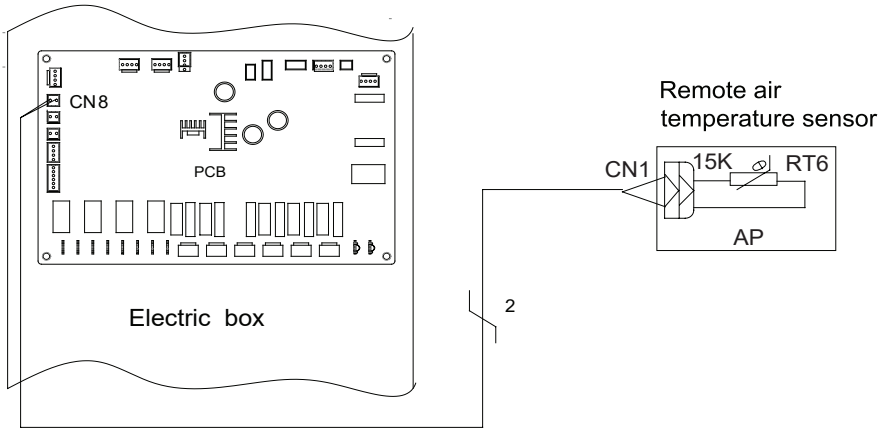
P_2-- The highest pressure during running of the system (that is the action pressure of safety valve.)

e---The expansion factor of water (the difference between the expansion factor of the original water temperature and that of highest water temperature.)

Water expansion factor in different temperatures	
Temperature (°C)	Expansion factor e
0	0.00013
4	0
10	0.00027
20	0.00177
30	0.00435
40	0.00782
45	0.0099
50	0.0121
55	0.0145
60	0.0171
65	0.0198
70	0.0227
75	0.0258
80	0.029
85	0.0324
90	0.0359
95	0.0396
100	0.0434

7. Remote Air Temperature Sensor





Notes

(a) Distance between the unit and the remote air temperature sensor should be less than 15m due to length of the connection cable of remote air temperature sensor;

(b) Height from floor is approximately 1.5m;

(c) Remote air temperature sensor cannot be located where the area may be hidden when door is open;

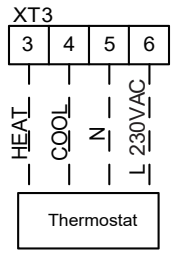
(d) Remote air temperature sensor cannot be located where external thermal influence may be applied;

(e) Remote air temperature sensor should be installed where space heating is mainly applied;

(f) After the remote air temperature sensor is installed, it should be set to “With” through the wired controller so as to set the remote air temperature to the control point.

8. Thermostat

Installation of the thermostat is very similar to that of the remote air temperature sensor.



How to Wire Thermostat

(1) Uncover the front cover of the unit and open the control box;

(2) Identify the power specification of the thermostat, if it is 230V, find terminal block XT3 as NO.3~6;

(3) If it is the heating/cooling thermostat, please connect wire as per the figure above.

⚠ NOTE

- 230V power supply can be provided to the thermostat by the main unit.
- Setting temperature by the thermostat(heating or cooling) should be within the temperature range of the product ;
- For other constrains, please refer to previous pages about the remote air temperature sensor;
- Do not connect external electric loads. Wire 230V AC should be used only for the electric thermostat;
- Never connect external electric loads such as valves, fan coil units, etc. If connected, the mainboard of the unit can be seriously damaged;
- Installation of the thermostat is very similar to that of the remote air temperature sensor.

9. 2-Way Valve

The role of 2-way valve 1 is to control the water flow into the underfloor loop. When “Floor Config” is set to “With” for either cooling or heating operation, it will keep open. When “Floor Config” is set to “ Without”, it will keep closed.

General Information

Type	Power	Operating Mode	Supported
NO 2-wire	230V 50Hz ~AC	Closing water flow	Yes
		Opening water flow	Yes
NC 2-wire	230V 50Hz ~AC	Closing water flow	Yes
		Opening water flow	Yes

(1) Normal Open type. When electric power is NOT supplied, the valve is open. (When electric power is supplied, the valve is closed.)

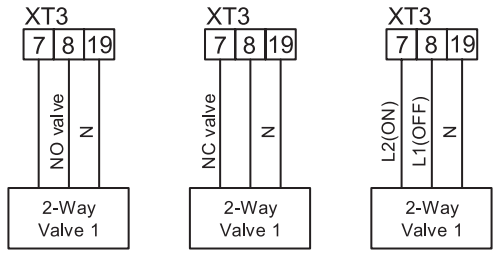
(2) Normal Closed type. When electric power is NOT supplied, the valve is closed. (When electric power is supplied, the valve is open.)

(3) How to Wire 2-Way Valve:

Follow steps below to wire the 2-way valve.

Step 1. Uncover the front cover of the unit and open the control box.

Step 2. Find the terminal block and connect wires as below.



⚠ WARNING

- Normal Open type should be connected to wire (OFF) and wire (N) for valve closing in cooling mode.
- Normal Closed type should be connected to wire (ON) and wire (N) for valve closing in cooling mode.

(OFF) : Line signal (for Normal Open type) from PCB to 2-way valve

(ON) : Line signal (for Normal Closed type) from PCB to 2-way valve

(N) : Neutral signal from PCB to 2-way valve

10. 3-Way Valve

The 3-way valve 2 is required for the sanitary water tank. Its role is flow switching between the under floor heating loop and the water tank heating loop.

General Information

Type	Power	Operating Mode	Supported
SPDT 3-wire	230V 50Hz ~AC	Selecting “Flow A” between “Flow A” and “Flow B”	Yes
		Selecting “Flow B” between “Flow B” and “Flow A”	Yes

(1) SPDT = Single Pole Double Throw. Three wires consist of Live1 (for selecting Flow B), and Neutral (for common).

(2) Flow A means 'water flow from the indoor unit to under floor water circuit'.

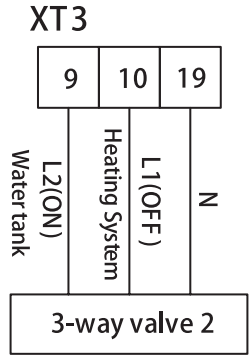
(3) Flow B means 'water flow from the indoor unit to sanitary water tank'.

Follow steps below to wire the 3-way valve:

Follow below procedures Step 1 ~ Step 2.

Step 1. Uncover front cover of the unit and open the control box.

Step 2. Find terminal block and connect wires as below.



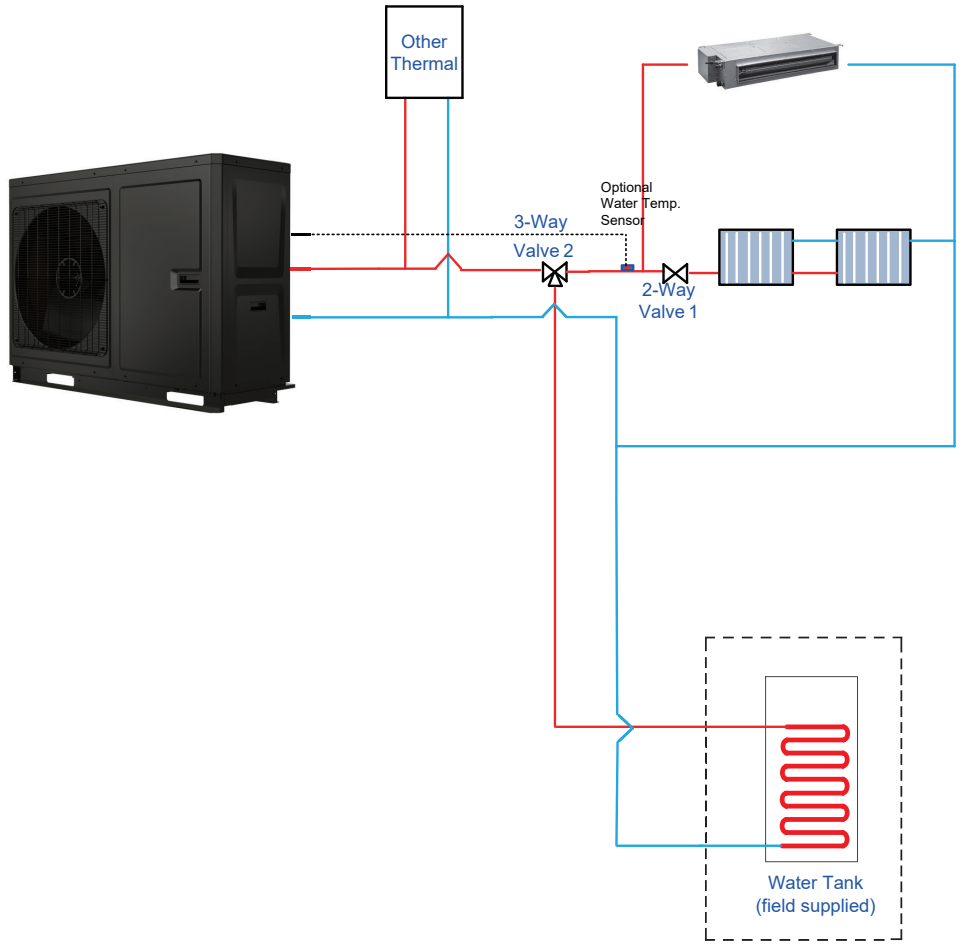
⚠ WARNING

- The 3-way valve should select water tank loop when electric power is supplied to wire (ON) and wire (N).
- The 3-way valve should select under floor loop when electric power is supplied to wire (OFF) and wire (N).
- (ON): Line signal (Water tank heating) from the main board to the 3-way valve
- (OFF): Line signal (Under floor heating) from the main board to the 3-way valve
- (N): Neutral signal from the main board to the 3-way valve

11. Other Thermal

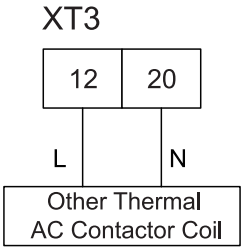
Other thermal is allowed for the equipment and controlled in such a way that the mainboard will output 230V when outdoor temperature is lower than the set point of "T-other switch'.

Note: Other thermal and Optional Electric Heater CANNOT be installed at the same time.

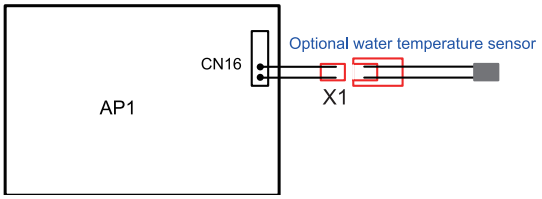


Step 1. Electric wiring

The wiring diagram stuck to the main body of the unit always prevails.

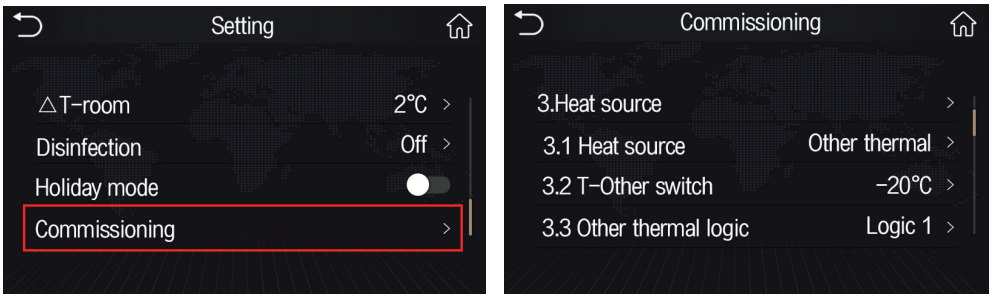


Optional water temperature sensor is connected to AP1 CN16.



Step 2. Setting of the wired controller

At the "Setting" page, select "Commissioning" and go to the "Commissioning" page. There, set "Heat source" to "Other thermal", and then go on to set "T-other switch" and "Other thermal logic".



12. Optional Electric Heater

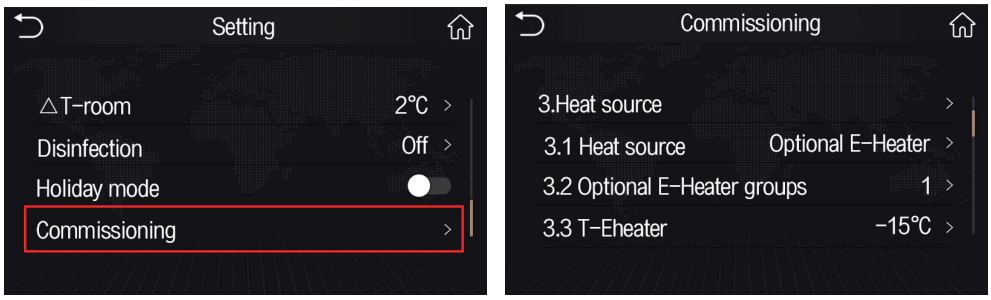
Optional electric heater is allowed for the equipment and controlled in such a way when outdoor temperature is lower than the set point for "T-Eheater"

Step 1. Optional electric heater installation

Optional electric heater should be installed with the main unit in series.Moreover, an accessory called optional water temperature sensor (5 meter long) shall be installed at the same time. "Optional E-Heater groups" can be set to "1" or "2", which only works for space heating.

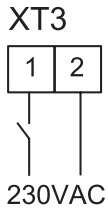
Step 2. Setting of the wired controller

At the "Setting" page, select "Commissioning" and go to the "Commissioning" page. There, set "Heat source" to "Optional E-heater", and then go on to set "Optional E-heater groups" and "T-Eheater".



13. Gate-controller

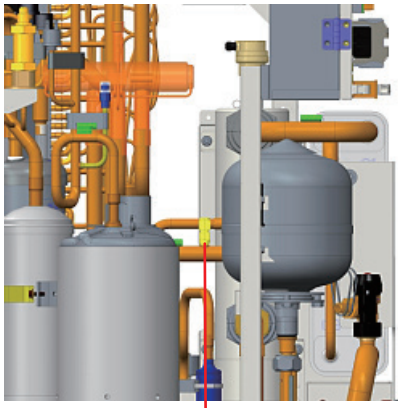
If there is gate control function, the gate-controller should be wired as shown in the figure below.



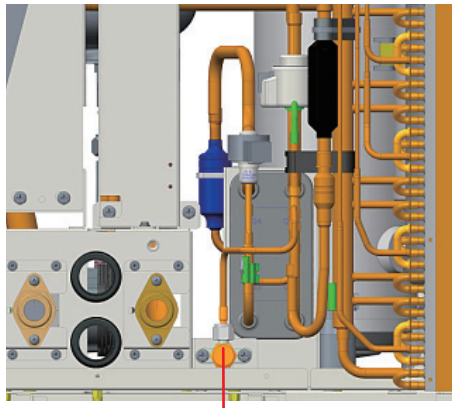
14. Charging and Discharging of Refrigerant

The unit has been charged with refrigerant before delivery. Overcharging or undercharging will cause the compressor to run improperly or be damaged. When it is necessary to charge or discharge refrigerant, it must be done by qualified personnel at the qualified maintenance site according to the following steps and the nominal charging volume stated at the nameplate.

Discharging: remove metal sheets of the outer casing, connect a hose to the charging valve and then discharge refrigerant.



Charging valve 1



Charging valve 2

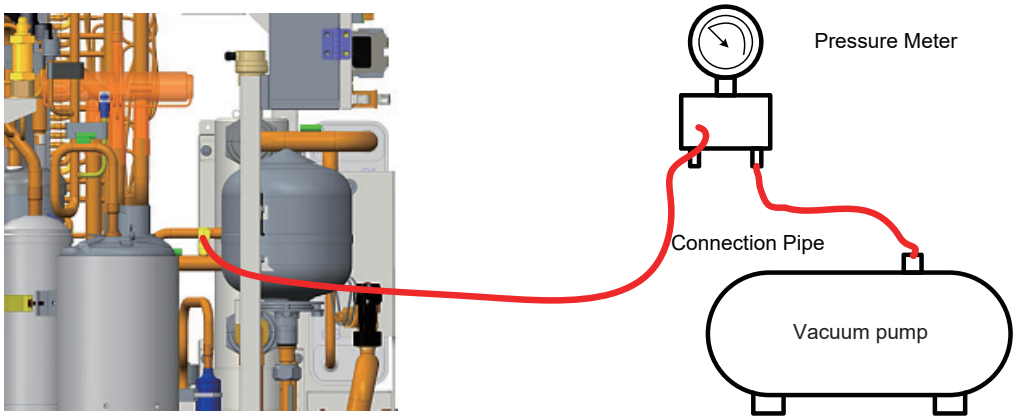
Notes

(a) Discharge is allowed only after the unit has stopped. (Cut off the power and repower it 1 minutes later)

(b) Protective measures should be taken during discharging to avoid frost bites.

(c) When discharging is finished, if vacuuming cannot be done immediately, remove the hose to avoid air or foreign matters entering the unit.

(d) Vacuuming: when discharging is finished, use hoses to connect the charging valve, pressure meter and vacuum pump to vacuum the unit.



Note

When vacuuming is finished, pressure inside the unit should be kept lower than 80Pa for at least 30 minutes to make sure there is no leak. Either charging valve 1 or charging valve 2 can be used for vacuuming.

Charging: when vacuuming is finished and it is certain that there is no leak, charging can be done.

Leak Detection Methods:

(1) The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

(2) Electronic leak detector shall be used to detect flammable refrigerant, but the sensitivity may not be adequate, or may need re-calibration(Detection equipment shall be calibrated in a refrigerant-free area).

(3) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.

(4) Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.

(5) Leak detection fluids are suitable for us with most refrigerant but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

(6) If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

Note

Before and during operation, use an appropriate refrigerant leak detector to monitor the operation area and make sure the technicians can be well aware of any potential or actual leakage of inflammable gas. Make sure the leak detecting device is applicable to inflammable refrigerant. For example, it should be free of sparks, completely sealed and safe in nature.

15. Requirements on Water Quality

Parameter	Parametric value	Unit
pH(25°C)	6.8~8.0	/
Cloudy	< 1	NTU
Chloride	< 50	mg/L
Fluoride	< 1	mg/L
Iron	< 0.3	mg/L
Sulphate	< 50	mg/L
SiO_2	< 30	mg/L
Hardness(count $CaCO_3$)	< 70	mg/L
Nitrate(count N)	< 10	mg/L
Conductance(25°C)	< 300	μs/cm
Ammonia (count N)	< 0.5	mg/L
Alkalinity(count $CaCO_3$)	< 50	mg/L
Sulfid	Cannot be detected	mg/L
Oxygen consumption	< 3	mg/L
Natrium	< 150	mg/L

Note: when circulation water fails to meet requirements listed in the table above, please add anti-scale composition to keep the unit always in normal operation.

16. Electric Wiring

16.1 Wiring principle

General principles

(1) Wires, equipment and connectors supplied for use on the site must be in compliance with provisions of regulations and engineering requirements.

(2) Only electricians holding qualification are allowed to perform wire connection on the site.

(3) Before connection work is started, the power supply must be shut off.

(4) Installer shall be responsible for any damage due to incorrect connection of the external circuit.

(5) Caution --- MUST use copper wires.

(6) Connection of power cable to the electric cabinet of the unit

(7) Power cables should be laid out through cabling trough, conduit tube or cable channel.

(8) Power cables to be connected into the electric cabinet must be protected with rubber or plastic to prevent scratch by edge of metal plate.

(9) Power cables close to the electric cabinet of the unit must be fixed reliably to make the power terminal in the cabinet free from an external force.

(10) Power cable must be grounded reliably.

16.2 Specification of power supply wire and leakage switch

Power cable specifications and Leakage switch types in the following list are recommended.

Model	Power Supply	Power Supply Air Break Switch	Air Break Switch (Electric heater)	Minimum Section Area of Earth Wire	Minimum Section Area of Earth Wire (Electric heater)	Minimum Section Area of Power Wire	Minimum Section Area of Power Wire (Electric heater)
	V,Ph, Hz	A	A	mm²	mm²	mm²	mm²
GRS-CQ4.0Pd/NpG4-E	230V, 1Ph,50Hz	25	/	2.5	/	3*2.5	/
GRS-CQ6.0Pd/NpG4-E	230V, 1Ph,50Hz	25	/	2.5	/	3*2.5	/
GRS-CQ8.0Pd/NpG4-E	230V, 1Ph,50Hz	32	/	4	/	3*4	/
GRS-CQ10Pd/NpG4-E	230V, 1Ph,50Hz	32	/	4	/	3*4	/
GRS-CQ12Pd/NpG4-E	230V, 1Ph,50Hz	40	/	6	/	3*6	/
GRS-CQ14Pd/NpG4-E	230V, 1Ph,50Hz	40	/	6	/	3*6	/
GRS-CQ16Pd/NpG4-E	230V, 1Ph,50Hz	40	/	6	/	3*6	/
GRS-CQ8.0Pd/NpG4-M	400V, 3Ph,50Hz	25	/	2.5	/	5*2.5	/
GRS-CQ10Pd/NpG4-M	400V, 3Ph,50Hz	25	/	2.5	/	5*2.5	/
GRS-CQ12Pd/NpG4-M	400V, 3Ph,50Hz	25	/	2.5	/	5*2.5	/
GRS-CQ14Pd/NpG4-M	400V, 3Ph,50Hz	25	/	2.5	/	5*2.5	/
GRS-CQ16Pd/NpG4-M	400V, 3Ph,50Hz	25	/	2.5	/	5*2.5	/

Notes

(a) The leakage switch is necessary for additional installation. If circuit breakers with leakage protection are in use, action response time must be less than 0.1 second, leakage circuit must be 30mA.

(b) The above selected power cable diameters are determined based on assumption of distance from the distribution cabinet to the unit less than 75m. If cables are laid out in a distance of 75m to 150m, diameter of power cable must be increased to a further grade.

(c) The power supply must be of rated voltage of the unit and special electrical line for air-conditioning.

(d) All electrical installation shall be carried out by professional technicians in accordance with the local laws and regulations.

(e) Ensure safe grounding and the grounding wire shall be connected with the special grounding equipment of the building and must be installed by professional technicians.

(f) The specifications of the breaker and power cable listed in the table above are determined based on the maximum power (maximum amps) of the unit.

(g) The specifications of the power cable listed in the table above are applied to the conduit-guarded multi-wire copper cable (like, YJV XLPE insulated power cable) used at 40°C and resistible to 90°C (see IEC 60364-5-52). If the working condition changes, they should be modified according to the related national standard.

(h) The specifications of the breaker listed in the table above are applied to the breaker with the working temperature at 40°C. If the working condition changes, they should be modified according to the related national standard.

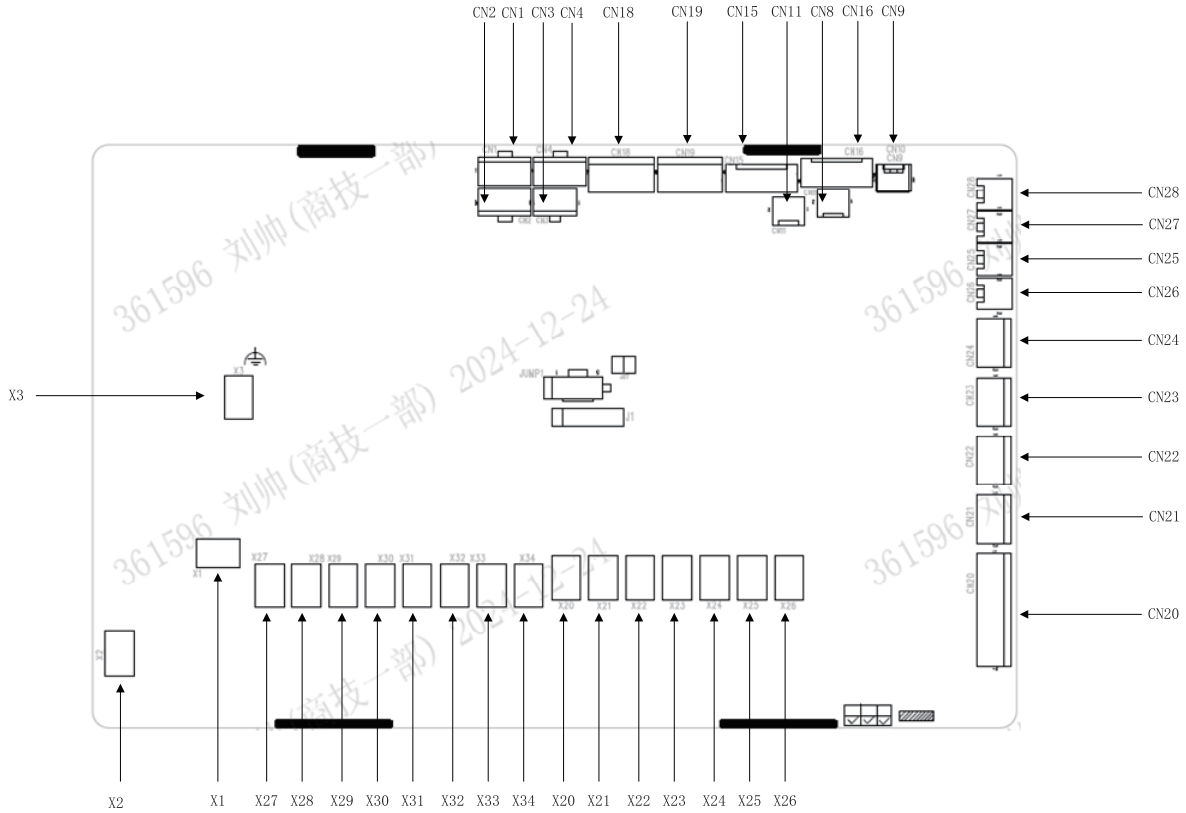
(i) For the single-phase unit, its operating voltage is 230V±10%; for the three-phase unit, it is 400V±10%.

(j) After wiring of the incoming power line at ther user side, tie the tail of the rubber ring tightly, and then seal it with mastic.

16.3 Wiring of Control boards

(1) Main board 1

GRS-CQ4.0Pd/NpG4-E	GRS-CQ6.0Pd/NpG4-E	GRS-CQ8.0Pd/NpG4-E	GRS-CQ10Pd/NpG4-E
GRS-CQ12Pd/NpG4-E	GRS-CQ14Pd/NpG4-E	GRS-CQ16Pd/NpG4-E	GRS-CQ8.0Pd/NpG4-M
GRS-CQ10Pd/NpG4-M	GRS-CQ12Pd/NpG4-M	GRS-CQ14Pd/NpG4-M	GRS-CQ16Pd/NpG4-M

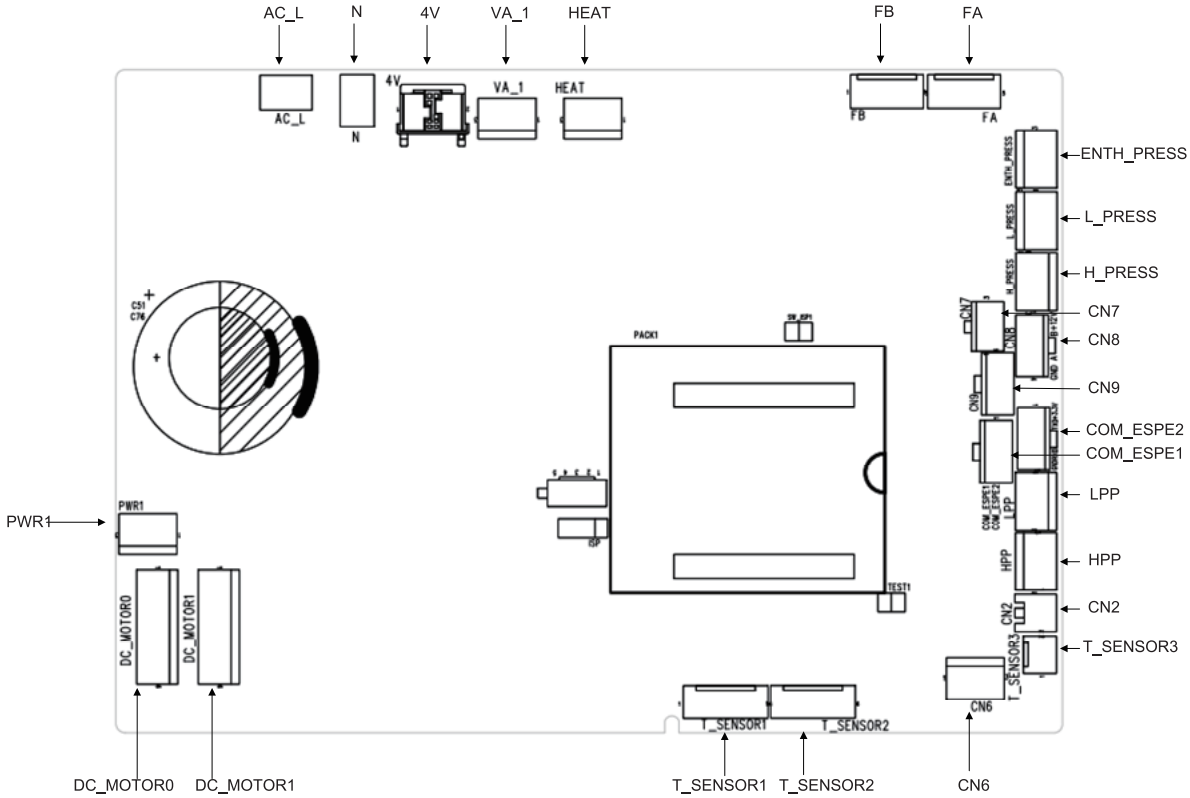


Silk Screen	Introduction
X1	Power supply
X2	Power supply
X3	To the ground
CN3	Communication with the ODU
CN1	Communication with the display panel
CN4	Communication with control panel
CN18	Build-in water pump signal(PWM)
CN19	Proportional valve interface
CN15	20K temperature sensor (inlet water);20K temperature sensor (outlet water);20K temperature sensor (refrigerant liquid line)
CN16	20K temperature sensor (refrigerant vapor line);10K temperature sensor (leaving water for the optional electric heater); 20K temperature sensor(leaving water of the two-zone kit)
CN9	Water tank temperature sensor
CN8	Remote room temperature sensor
CN28	SG signal
CN27	EVU signal
CN25	Flow switch
CN26	Water pump of the two-zone kit
CN24	Gate-control detection

Silk Screen	Introduction
CN23	Detection to welding protection for the water tank electric heater
CN22	Detection to welding protection for the optional electric heater 2
CN21	Detection to welding protection for the optional electric heater 1
CN20	Thermostat
CN11	50K temperature sensor (leaving water temperature sensor of the solar kit)
X26	Reserved
X25	Plate heat exchanger anti-freezing
X24	Field supplied water pump
X23	Other thermal by 230VAC
X22	E-heater 2
X21	E-heater 1
X20	E-heater of water tank
X34	Electric three-way valve 2 closed
X33	Electric three-way valve 2 open
X32	Reserved
X31	Field supplied 3-way valve 1
X30	Reserved
X29	Water pump of the water tank/solar water pump
X28	2-way valve 1 is normally closed
X27	2-way valve 1 is normally open

(2) Main board 2

GRS-CQ4.0Pd/NpG4-E	GRS-CQ6.0Pd/NpG4-E	GRS-CQ8.0Pd/NpG4-E	GRS-CQ10Pd/NpG4-E
GRS-CQ12Pd/NpG4-E	GRS-CQ14Pd/NpG4-E	GRS-CQ16Pd/NpG4-E	GRS-CQ8.0Pd/NpG4-M
GRS-CQ10Pd/NpG4-M	GRS-CQ12Pd/NpG4-M	GRS-CQ14Pd/NpG4-M	GRS-CQ16Pd/NpG4-M

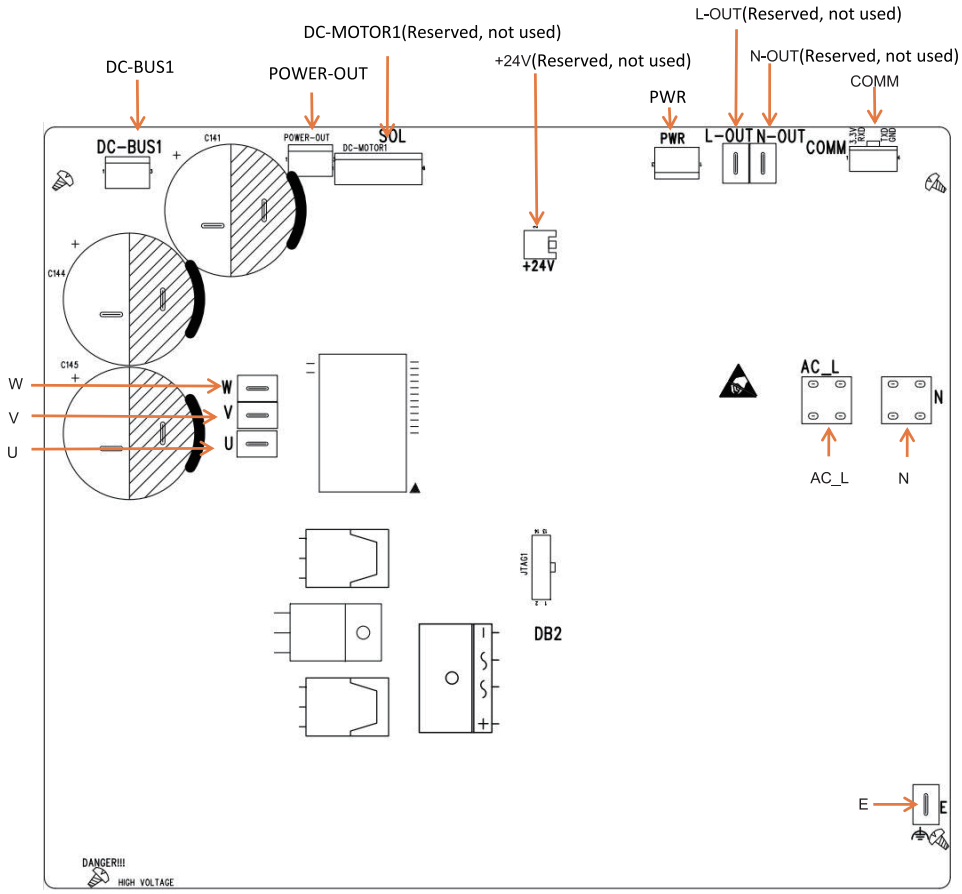


Silk Screen	Introduction
AC-L	Power supply
N	Power supply
4V	4-way valve
VA-1	E-heater of chassis
HEAT	Electric heating tape
FB	1, 2, 3, 4 signals, 5 power supply to EXV2, pipe electronic expansion valve,1-4 pin: driving impulse output; 5 pin: +12V
FA	1, 2, 3, 4 signals, 5 power supply to EXV1,pipe electronic expansion valve,1-4 pin: driving impulse output; 5 pin: +12V
ENTH_PRESS	Reserve
L_PRESS	Reserve
H_PRESS	5V signal input of pressure sensor 1 pin: GND; 2 pin: signal input; 3 pin:+5V
CN7	Communication between AP1 and AP2;communication cable 2-pin: B,3-pin: A;
CN8	1-pin:12V, 2-pin:B, 3-pin: A, 4-pin: ground, To the control panel,communication cable;
CN9	1-pin:+12V, 2-pin:B;3-pin:A, 4-pin: ground
COM_ESPE2	1-pin:+3.3V, 2-pin:TXD, 3-pin:RXD, 4-pin:ground
COM_ESPE1	1-pin:+3.3V, 2-pin:TXD, 3-pin:RXD, 4-pin:ground
LPP	1-pin: +12V, 3-pin: signal
HPP	1-pin:+12V, 3-pin: signal
CN2	1-pin:+12V, 2-pin: signal

Silk Screen	Introduction
T_SENSOR3	Reserve
CN6	Reserve
T_SENSOR2	1,2: environment; 3,4:discharge; 5,6: suction
T_SENSOR1	1,2: economizer inlet; 3,4: economizer outlet; 5,6:defrost
DC-MOTORO1	1-pin: fan power supply;3-pin: fan GND; 4-pin: +15V; 5-pin: control signal;6-pin: feedback signal
DC-MOTORO0	1-pin: fan power supply; 3-pin: fan GND; 4-pin: +15V; 5-pin:control signal;6-pin:feedback signal
PWR1	310V Supply 310V DC power to the drive

(3) Drive board

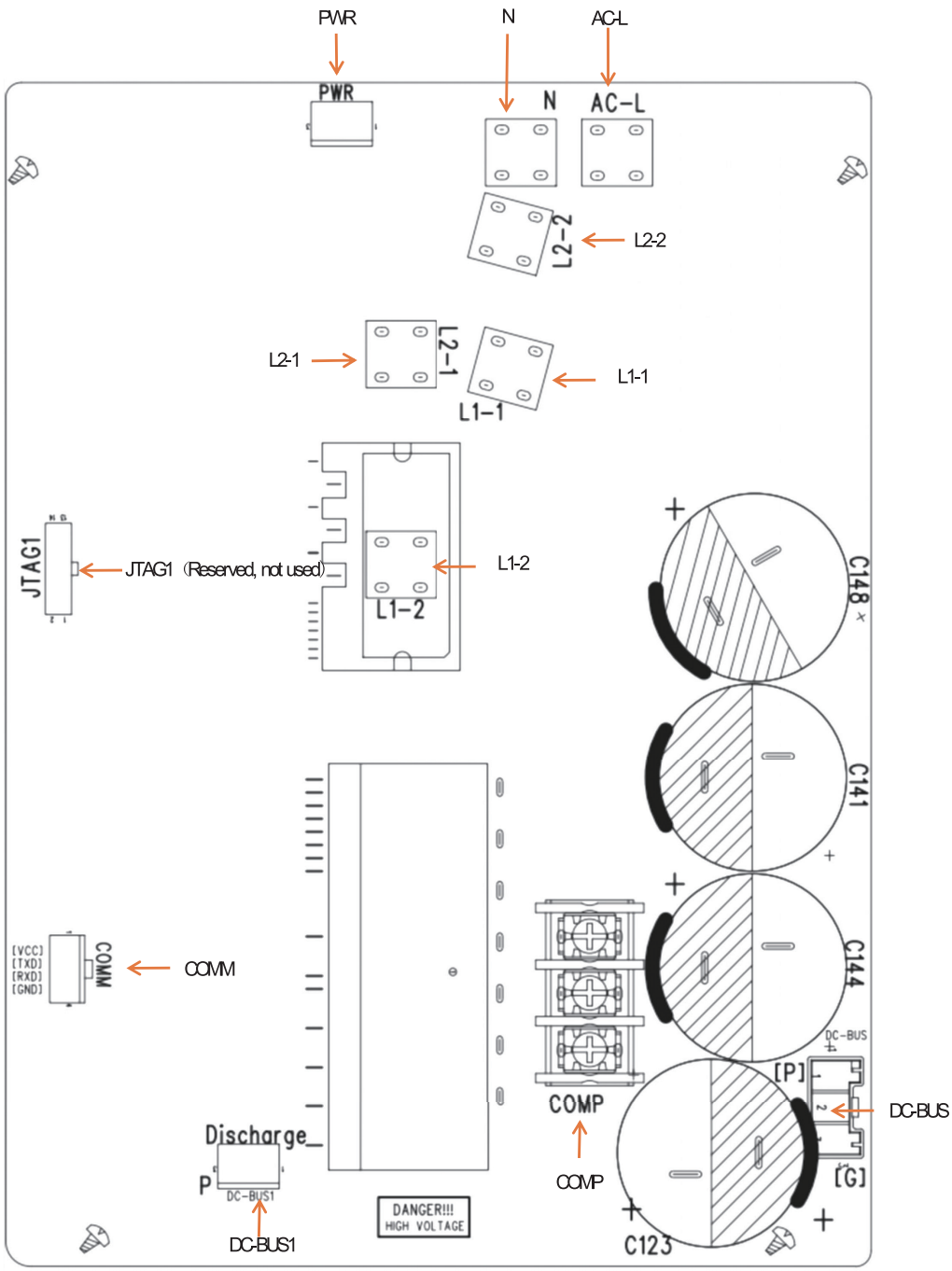
GGRS-CQ4.0Pd/NpG4-E GRS-CQ6.0Pd/NpG4-E GRS-CQ8.0Pd/NpG4-E GRS-CQ10Pd/NpG4-E



Silk Screen	Introduction
DC-BUS1	DC Bus Terminal
POWER-OUT	Open DC link voltage
+24V	Provide 24V voltage to the main board
L-OUT	Live line output (to the main boards)
N-OUT	Neutral line output (to the main boards)
COMM	Communication interface[1-3.3V,2-RX,3-TX,4-GND]
U	Connector to the compressor phase-U
V	Connector to the compressor phase-V
W	Connector to the compressor phase-W
AC_L	Live Wire for Driver Board Power Supply
N	Neutral Wire for Driver Board Power Supply
E	Grounding line

(4) Drive board

GRS-CQ12Pd/NpG4-E GRS-CQ14Pd/NpG4-E GRS-CQ16Pd/NpG4-E

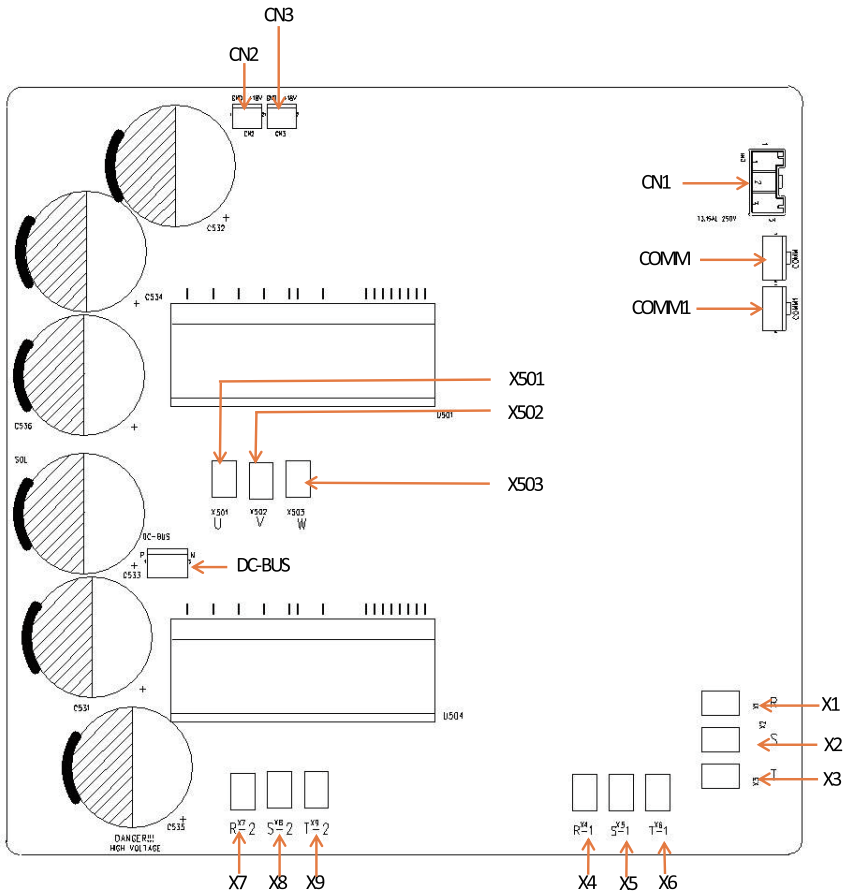


Silk Screen	Introduction
AC-L	AC Input Live Wire
N	AC Input Neutral Wire
COMP1	[U:Connector to the compressor phase-U V:Connector to the compressor phase-V W:Connector to the compressor phase-W]
L1-1	PFC Inductor (Brown Wire)
L1-2	PFC Inductor (White Wire)
L2-1	PFC Inductor (Yellow Wire)
L2-2	PFC Inductor (Blue Wire)
COMM	Communication interface[1-3.3V,2-TX,3-RX,4-GND]
PWR	Switching Power Supply Input

Silk Screen	Introduction
DC-BUS1	DC Bus Terminal
DC-BUS	Bus Capacitor for Connecting Driver Board and Filter Board

(5) Drive board

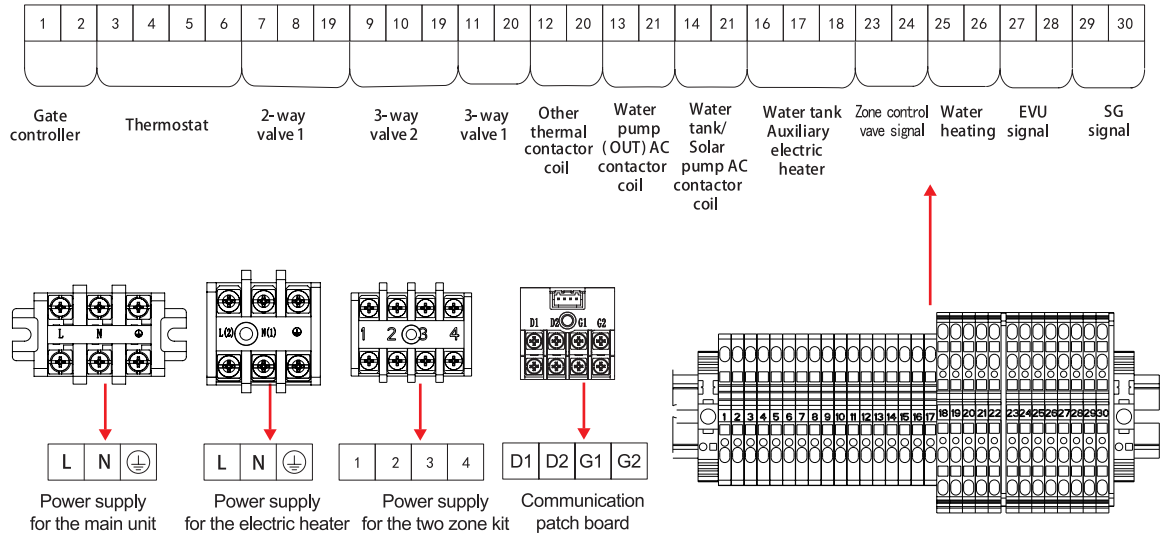
GRS-CQ8.0Pd/NpG4-M GRS-CQ10Pd/NpG4-M GRS-CQ12Pd/NpG4-M GRS-CQ14Pd/NpG4-M
GRS-CQ16Pd/NpG4-M



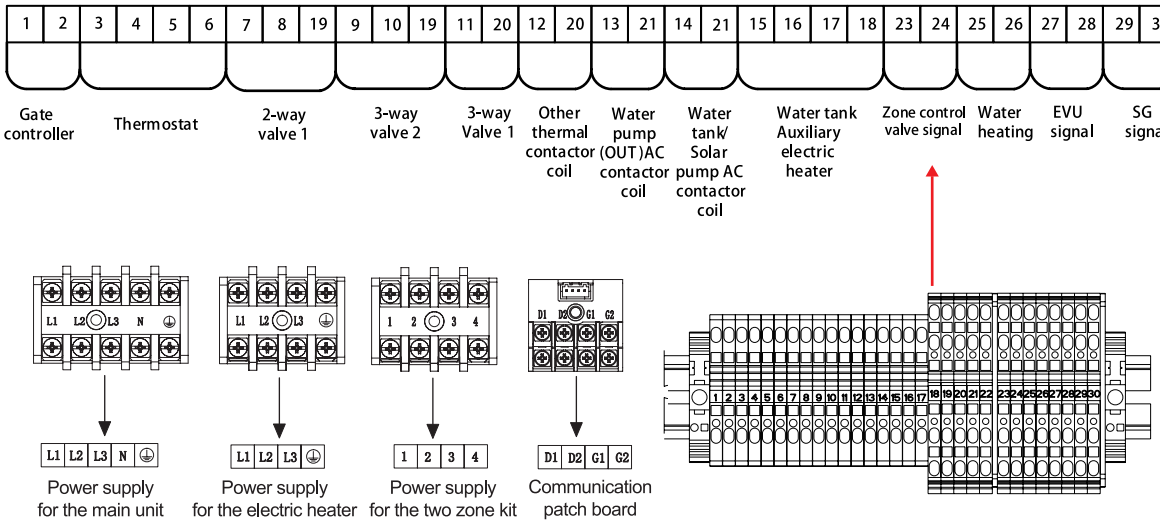
Silk Screen	Introduction
CN1	Driver Board switch Power input pin
CN2	18VDC output
CN3	18VDC output
COMM	Communication interface[1-3.3V,2-RX,3-TX,4-GND]
COMM1	Communication interface[1-3.3V,2-RX,3-TX,4-GND]
X501	Connector to the compressor phase-U
X502	Connector to the compressor phase-V
X503	Connector to the compressor phase-W
DC-BUS	DC Bus Terminal
X1	Driver Board Power input pin
X2	Driver Board Power input pin
X3	Driver Board Power input pin
X4	Connector to the Reactor phase-R-1[input terminal]
X5	Connector to the Reactor phase-S-1[input terminal]
X6	Connector to the Reactor phase-T-1[input terminal]
X7	Connector to the Reactor phase-R-2[output terminal]
X8	Connector to the Reactor phase-S-2[output terminal]
X9	Connector to the Reactor phase-T-2[output terminal]

16.4 Electric wiring of terminal boards

(1) GRS-CQ4.0Pd/NpG4-E,GRS-CQ6.0Pd/NpG4-E,GRS-CQ8.0Pd/NpG4-E, GRS-CQ10Pd/NpG4-E, GRS-CQ12Pd/NpG4-E, GRS-CQ14Pd/NpG4-E, GRS-CQ16Pd/NpG4-E



(2) GRS-CQ8.0Pd/NpG4-M, GRS-CQ10Pd/NpG4-M, GRS-CQ12Pd/NpG4-M, GRS-CQ14Pd/NpG4-M, GRS-CQ16Pd/NpG4-M



Note: the wiring diagram stuck to the main unit shall always prevail.

17. Commissioning

17.1 Check before startup

For safety of users and unit, the unit must be started up for check before debugging. The procedures are as below:

The following items shall be performed by qualified repair persons.		
Confirm together with the sales engineer, dealer, installing contractor and customers for the following items finished or to be finished.		
No.	**Confirmation of Installation**	√
1	Does the maintenance site meet the above qualification requirements?	□
2	Does the personnel meet the above qualification requirements?	□
3	Does the product installation site meets the above safety requirements?	□
1	If the contents of Application for Installation of this Unit by Installer are real. If not, debugging will be refused.	□
2	Is there written notice in which amendment items are shown in respect of unqualified installation?	□
3	Are Application for Installation and Debugging list filed together?	□
No.	**Pre-check**	√
1	Is appearance of the unit and internal pipeline system ok during conveying, carrying or installation?	□
2	Check the accessories attached with the unit for quantity, package and so on.	□
3	Make sure there is drawings in terms of electricity, control, design of pipeline and so on.	□
4	Check if installation of the unit is stable enough and there is enough space for operation and repair.	□
5	Completely test refrigerant pressure of each unit and perform leakage detection of the unit.	□
6	Is the water tank installed stably and are supports secure when the water tank is full?	□
7	Are heat insulating measures for the water tank, outlet/inlet pipes and water replenishing pipe proper?	□
8	Are the nilometer of water tank, water temperature indicator, controller, manometer, pressure relief valve and automatic discharge valve etc. installed and operated properly?	□
9	Does power supply accord with the nameplate? Do power cords conform to applicable requirements?	□
10	Is power supply and control wiring connected properly according to wiring diagram? Is earthing safe? Is each terminal stable?	□
11	Are connection pipe, water pump, manometer, thermometer, valve etc. are installed properly?	□
12	Is each valve in the system open or closed according to requirements?	□
13	Confirm that the customers and inspection personnel of Part A are at site.	□
14	Is Installation Check-up Table completed and signed by the installation contractor?	□
Attention: If there is any item marked with ×, please notify the contractor. Items listed above are just for reference.		

Confirmed Items after pre-checking	**General Evaluation: Debugging □ Amendment □**
	Judge the following items (if there is not any filling, qualification will be regarded.)
	a: Power supply and electric control system b: Loading calculation
	c: Heating problems of Unit d: Noise problem
	e: Pipeline problem f: Others
	Normal debugging work can't be performed unless all installation items are qualified. If there is any problem, it must be solved firstly. The installer will be responsible for all costs for delay of debugging and re-debugging incurred by any problem which is not solved immediately.
	Submit schedule of amending reports to installer.
	Is the written amending report which should be signed after communication provided to installer?
	Yes ( ) No ( )

17.2 Test run

Test run is testing whether the unit can run normally via preoperation. If the unit cannot run normally, find and solve problems until the test run is satisfactory. All inspections must meet the requirements before performing the test run. Test run should follow the content and steps of the table below:

The following procedure should be executed by experience and qualified maintenance men.	
No.	**Start up the pretest procedure**
Notice: before test, ensure that all power must be cut off, including the far- end power switch, otherwise, it may cause casualty.	
1	Ensure that the compressor of the unit is preheated for 8h.
⚠Caution: heat the lubricating oil at least 8h in advance to prevent refrigerant from mixing with the lubricating oil, which may cause damage to the compressor when starting up the unit.	
2	Check whether the phase sequence of the main power supply is correct. If not, correct the phase sequence firstly.
⚠Recheck the phase sequence before start-up to avoid reverse rotation of the compressor which may damage the unit.	
3	Apply the universal electric meter to measure the insulation resistance between each outdoor phase and earth as well as between phases.
⚠Caution: defective earthing may cause electric shock.	
No.	**Ready to start**
1	Cut off all temporary power supply, resume all the insurance and check the electricity for the last time.
	Check the power supply and voltage of the control circuit; _____V must be ±10% within the range of rated operating power.
No.	**Start up the unit**
1	Check all the conditions needed to start up the unit: operation mode, required load etc.
2	Start up the unit, and observe the operation of compressor, electronic expanding valve, fan motor and water pump etc.
	Note: the unit will be damaged under abnormal running state. Do not operate the unit in states of high pressure and high current.
Others:	

Items for acceptance after commissioning	Estimation or suggestion on the general running situation: good, modify
	Identify the potential problem (nothing means the installation and commissioning are in accordance with the requirements.)
	a. problem of power supply and electric control system: b. problem of load calculation:
	c. outdoor refrigerant system: d. noise problem:
	e. problem of indoor and piping system: h. other problems:
	During operation, it is needed to charge for the maintenance due to non-quality problems such as incorrect installation and maintenance.
	Acceptance
	Is the user trained as required? Please sign. Yes( ) No( )

18. Daily Operation and Maintenance

In order to avoid damage of the unit, all protecting devices in the unit had been set before delivery, so please do not adjust or remove them.

For the first startup of the unit or next startup of unit after long-period stop (above 1 day) by cutting off the power, please electrify the unit in advance to preheat the unit for more than 8 hours.

Never put sundries on the unit and accessories. Keep dry, clean and ventilated around the unit.

Remove the dust accumulated on the condenser fin timely to ensure performance of the unit and to avoid stop of the unit for protection.

In order to avoid protection or damage of the unit caused by blockage of the water system, clean the filter in water system periodically and frequently check water replenishing device.

In order to ensure anti-freezing protection, never cut off the power if ambient temperature is below zero in winter.

In order to avoid frost crack of the unit, water in the unit and pipeline system not used for a long period should be drained. In addition, open the end cap of the water tank for drainage.

When the water tank has been installed but the water tank is set to “Without”, functions relative with the water tank will not work and the displayed water tank temperature will always be “-30”. In this case, the water tank would suffer frostbite and even other severe influences under low temperature. Therefore, once the water tank has been installed, the water tank must be set to ‘’With”, otherwise will will not be responsible for this abnormal operation.

Never frequently make the unit on/off and close the manual valve of the water system during operation of the unit by users.

Ensure frequent check to the working condition of each part to see if there is oil stain at pipeline joint and charge valve to avoid leakage of refrigerant.

If malfunction of the unit is out of control of users, please timely contact with authorized service center.

Notes

The water pressure gage is installed in the returning water line in the unit. Please adjust the hydraulics system pressure according to next item:

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

(2) When recharging, the hydraulics system pressure should be not more than 2.5 Bar.

Malfunctions	Reasons	Troubleshooting
Compressor does not start up	Power supply has problem. Connection wire is loose. Malfunction of mainboard. Malfunction of compressor.	Phase sequence is reverse. Check out and re-fix. Find out the reasons and repair. Replace compressor.
Heavy noise of fan	Fixing bolt of fan is loose. Fan blade touches shell or grill. Operation of fan is unreliable.	Re-fix fixing bolt of fan. Find out the reasons and adjust. Replace fan.
Heavy noise of compressor	Liquid slugging happens when liquid refrigerant enters into compressor. Internal parts in compressor are broken.	Check if expansion valve is failure and temp. sensor is loose. If that, repair it. Replace compressor.
Water pump does not run or runs abnormally	Malfunction of power supply or terminal. Malfunction of relay. There is air in water pipe.	Find out the reasons and repair. Replace relay. Evacuate.
Compressor starts or stops frequently	Poor or excess refrigerant. Poor circulation of water system. Low load.	Discharge or add part of refrigerant. Water system is blocked or there is air in it. Check water pump, valve and pipeline. Clean water filter or evacuate. Adjust the load or add accumulating devices.
The unit does not heat although compressor is running	Leakage of refrigerant. Malfunction of compressor.	Repair by leakage detection and add refrigerant. Replace compressor.
Poor efficiency of hot water heating	Poor heat insulation of water system. Poor heat exchange of evaporator. Poor refrigerant of unit. Blockage of heat exchanger at water side.	Enhance heat insulation efficiency of the system. Check if air in or out of unit is normal and clean evaporator of the unit. Check if refrigerant of unit leaks. Clean or replace heat exchanger.

18.1 Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants.

In addition, a set of calibrated weighing scales shall be available and in good working order.

Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

18.2 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure ensure that: mechanical handling equipment is available, if required, for handling refrigerant cylinders; all personal protective equipment is available and being used correctly; the recovery process is supervised at all times by a competent person; recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

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

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with manufacturer's instructions.

h) Do not overfill cylinders. (No more than 80 % volume liquid charge).

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

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

18.3 Notice before seasonal use

(1) Check whether air inlets and air outlets of indoor and outdoor units are blocked

(2) Check whether ground connection is reliable or not

(3) If unit starts up after not operating for a long time, it should be power on 8 hours before operation starts so as to preheat the outdoor compressor

(4) As the unit has been installed with a micro air bubble processor, no antifreeze is allowed. Additionally, a automatic antifreeze valve shall be installed at the lowest point of the water system.

18.4 Error codes

(1) Complete unit code

Code Indication	Error Name	Source of Error Signal	Control Description
F4	Outdoor environment temp sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
d6	Defrost temp sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
F7	Discharge temp sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
F5	Suction temp sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
EF	Outdoor fan error	① Mainboard of outdoor unit is damaged. ② The wire connecting the wiring terminals of the mainboard breaks.	If it occurs for 6 times during one hour, it is cleared by de-energization. If it occurs for less than 6 times, it will be automatically cleared.
E1	Comp High-pressure protection	① Comp High-pressure switch is broken or the wiring is loose. ② The water in the tank is not enough. ③ The installation of tank temp sensor is not correct. ④ The gas valve and liquid valve are not fully open. ⑤ The electronic expansion valve can not work normally.	De-energize the unit and then, energize it again. If the malfunction is removed, the code will be cleared.

Code Indication	Error Name	Source of Error Signal	Control Description
E3	Comp Low- pressure protection	① Comp Low-pressure switch is broken or the wiring is loose. ② The system has leaked. ③ The fans stop running or reverse.	It will be cleared if the malfunction is removed after the unit has been turned off.
E4	Comp Discharge temp protection	① The resistance of temperature sensor is not correct. ② The electronic expansion valve is blocked. ③ The system has leaked. ④ Mainboard of outdoor unit is damaged.	It will be cleared if the discharge temp is lower than 92℃.
C5	Cpacity switch error	① The jumper trips off.	De-energize the unit and then energize it again. If the malfunction is removed, the code will be cleared.
E6	Communication malfunction(between outdoor and indoor mainboard).	① The communication line of the unit is not connected. ② The communication line is not through. ③ The communication line of the unit is not connected correctly. ④ The two ends of communication line are not mounted with magnetic ring. ⑤ The outdoor unit is not electrically powered	It will be cleared once communication recovers or it will be shown all the time
E6	Communication malfunction(between outdoor mainboard and wired controller)	① The communication line of the unit is not connected. ② The communication line is not through. ③ The communication line of the unit is not connected correctly. ④ The two ends of communication line are not mounted with magnetic ring. ⑤ The outdoor unit is not electrically powered	It will be cleared once communication recovers or it will be shown all the time
Fc	High pressure switch error	① The sensor is damaged. ② The wire of the sensor is loose. ③ The position of the sensor is wrong	It will be automatically cleared after the failure is removed.
F9	Outlet temperature sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.

Code Indication	Error Name	Source of Error Signal	Control Description
dH	Backup outlet temperature sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
F1	Lliquid pipe temperature sensor Inside refrigerant error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
FE	The first sanitary water tank temperature sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
F3	Gas pipe temperature sensor inside refrigerant error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
F0	Remote room temperature sensor error	① The plug on temperature sensor is not correctly connected to the socket on mainboard. ② The resistance of temperature sensor is not correct.	It will be automatically cleared after the failure is removed.
Ec	Water switch error	① The switch is damaged. ② The wire of the switch is loose. ③ The position of the switch is wrong	It will be cleared after the unit is turned off.
E2	Indoor anti-frozen protetion	① The resistance of temperature sensor is not correct. ② The electronic expansion valve can not work normally.	It will be cleared once malfunction is removed or it will be shown all the time; but it will be cleared immediately when switching operation mode.
Ed	outlet temperature High-temp protection	① The resistance of temperature sensor is not correct. ② The plug on temperature sensor is not correctly connected to the socket on mainboard. ③ Mainboard of outdoor unit is damaged.	De-energize the unit and then, energize it again. If the malfunction is removed, the code will be cleared.

Code Indication	Error Name	Source of Error Signal	Control Description
EH	the first internal electric heater connection Malfunction	① The AC contactor is damaged.	De-energize the unit and then, energize it again. If the malfunction is removed, the code will be cleared.
EH	second internal electric heater connection Malfunction	① The AC contactor is damaged.	De-energize the unit and then, energize it again. If the malfunction is removed, the code will be cleared.
EH	sanitary water tank electric heater connection Malfunction	① The AC contactor is damaged.	De-energize the unit and then, energize it again. If the malfunction is removed, the code will be cleared.

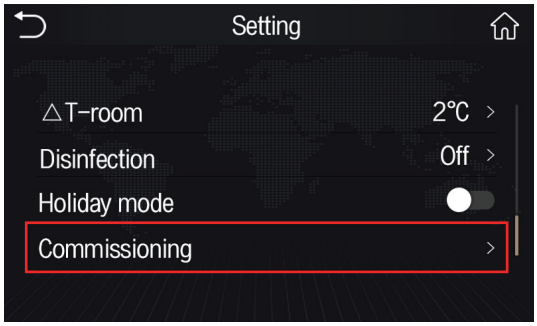
(2) Drive failure code

Item		Display on Nixie Tube of the Unit	Display on Wired Controller	Others
Inverter Drive Failure	Reset of Drive System	P0	Reset of Drive System	
	Startup Failure of Compressor	Lc	Startup Failure of Compressor	
	Phase Protection	Ld	Phase Protection	
	Current protection of compressor	P5	Current protection of compressor	
	Communication failure	P6	Communication failure	
	Sensor failure of heat sink	P7	Sensor failure of heat sink	
	Overheat protection of heat sink	P8	Overheat protection of heat sink	
	AC current protection (input side)	PA	AC current protection (input side)	
	Current sensor failure	Pc	Current sensor failure	
	Connection protection of sensor	Pd	Connection protection of sensor	
	Overvoltage protection	PH	Overvoltage protection	
	Under-voltage protection	PL	Under-voltage protection	
	Abnormality of input AC voltage	PP	Abnormality of input AC voltage	
	Charge circuit failure	PU	Charge circuit failure	
	IPM protection	H5	IPM protection	
	Desynchronizing of motor	H7	Desynchronizing of motor	
	PFC abnormality	Hc	PFC abnormality	

19. Commissioning

19.1 Commissioning setting

At the “Setting” page, click "Commissioning" and a password input box will pop up, requiring to enter the correct password to enter the commissioning parameter setting pages. For the first time, you need to set a 6-digit password, which can be reset at the commissioning parameter setting page. 3 times of continuous incorrect input will lock the input box for 1 minute, 5 times for 10 minutes, and 10 times for 30 minutes. The correctness of the input password will not be judged within the lock time, therefore it is very important to keep the passowrd properly. As there are quite a lot of commissioning parameters, they are displayed by folding categories for more convenient setting and checking. The illustrations and information in this section are for reference only. In order to make our products more perfect, we will continue to improve and innovate them without prior notice.



Item	Options	Range and Default	Additional Remarks
1.Control mode	1.1 Remote sensor	On/Off (default)	It can be set when the control panel is turned off.
	1.2 Control mode	T-water out (default) /T-room/ T-controller	It can be set when the control panel is turned off . “T-room” is available when the room temperature sensor is configured.However, "T-room" is unavailable when modularization has been activated.
	1.3 Correction T-controller	-10.0~10.0°C(0.0°C)	It is used to correct the temperature collected by the temperature sensor of the control panel.
2.DHW	2.1 Water tank	On/Off (default)	It can be set when the control panel is turned off.
	2.2 T-HP max	40~60°C(50°C)	It is available when the water tank is configured.
	2.3 Tank heater	Logic 1 (default)/Logic 2	It is available when the water tank is configured and the control panel is turned off.
	2.4 Solar setting	On/Off (default)	It will be displayed when the water tank is available and can be set when the control panel is turned off.
	2.4.1 T-antifreeze solar	-15~5°C(3°C)	/
	2.4.2 Solar separate operation	On/Off (default)	/

Item	Options	Range and Default	Additional Remarks
3.Heat source	3.1 Heat source	Off (default)/Other thermal/ Optional E-Heater	It can be set when the control panel is turned off.
	3.2 T-Other thermal	-20~18°C (-20°C)	It can be set when “Heat source” is set to “Other thermal” and the control panel is turned off.
	3.3 Other thermal logic	Logic 1 (default)/Logic 2/ Logic 3	It can be set when “Heat source” is set to “Other thermal” and the control panel is turned off.
	3.2 Optional E-Heater groups	1~2	It can be set when “Heat source” is set to “Optional E-Heater” and the control panel is turned off.
	3.3 T-Eheater	-20~18°C (-15°C)	It can be set when “Heat source” is set to “Optional E-Heater” and the control panel is turned off.
	3.4 Optional E-Heater logic	Logic 1/Logic 2	It can be set when “Heat source” is set to “Optional E-Heater” and the control panel is turned off.
4.Water pump	4.1 Lowest speed limit	Off(default)/On	It can be set when the control panel is turned off.
	4.1.1 Lowest speed	6~10(8)	It can be set when the control panel is turned off.
	4.1.2 Commissioning pump	Off(default)/On	It can be set when the control panel is turned off.
	4.1.3 Commissioning pump speed	6~10(10)	/
	4.2 Highest speed limit	Off(default)/On	It can be set when the control panel is turned off.
	4.2.1 Highest speed	8-10(default)/8-9/8/7/6	It can be set when the control panel is turned off.
	4.3 Water pump antistall	Off(default)/On	/
	4.3.1 Interval	1~12h(2h)	/
	4.3.2 Duration	10~100s(30s)	/
	4.4 Water pump standby	Logic 1(default)/Logic 2/ Logic 3	/
	4.4.1 Speed	6~10(10)	/
	4.4.2 Interval	5~120min(10min)	/
	4.4.3 Duration	1~10min(2min)	/
	4.5 Engineering pump standby	Logic 1(default)/Logic 2/ Logic 3/Logic 4	/
	4.5.1 Interval	5~120min(10min)	/
	4.5.2 Duration	1~10min(2min)	/
5. Valve	5.1 Cool 2-Way valve	Off (default)/On	It can be set when the control panel is turned off.
	5.2 Heat 2-Way valve	Off/On(default)	It can be set when the control panel is turned off.
	5.3 3-Way valve 1	Without(default)/DHW/HP	It can be set when the control panel is turned off.

Item	Options	Range and Default	Additional Remarks
6. Test run	6.1 Air removal	Off/HP/Water tank	It can be set to “Water tank” when the water tank is configured and the control panel is turned off.
	6.2 Manual defrost	Off(default)/On	It can be set when the control panel is turned off.
	6.3 Refri. Recovery	Off(default)/On	It can be set when the control panel is turned off.
	6.4 Force mode	Off(default)/Force-cool/ Force-heat	It can be set when the control panel is turned off.
	6.5 Floor heating	Off(default)/On	It can be set when the control panel is turned off.
	6.5.1 Segments	1~10(default:1)	It can be set when “Floor heating” is set to “Off”.
	6.5.2 Period 1 temp	25~35°C(25°C)	It can be set when “Floor heating” is set to “Off”.
	6.5.3 Segment time	12/24/36/48/60 /72h(12h)	It can be set when “Floor heating” is set to “Off”.
	6.5.4 ΔT of segment	2~10°C(5°C)	It can be set when “Floor heating” is set to “Off”.
	6.5.5 Floor heating On/Off	Off(default)/On	It can be set when the control panel is turned off.
7. Load test	7.1 Load test	Off(default)/On	It can be set when the control panel is turned off.
	7.2 Fan	0~9(0)	/
	7.3 Water pump	0~10(0)	/
	7.4 3-way valve 2	Off(default)/On	/
	7.5 2-way valve	Off(default)/On	/
8.Thermostat	//	Off/Air/Air+DHW/Air+DHW2	It can be set to “Air+DHW” and “Air+DHW2” when the water tank is configured.
9.SG	SG	Off(default)/On	It can be set when the control panel is turned off.
	ΔWT-Cool AT	-10~0°C(-5°C)	/
	ΔWT-Heat AT	0~15°C(5°C)	/
	ΔWT-DHW AT	0~15°C(5°C)	/
	WT min	5~25°C(5°C)	/
	WT-Heat max	20~80°C(65°C)	/
	WT-DHW max	40~80°C(80°C)	/
	WOT-Cool Range	5~25°C(10°C)	/
	WOT-Heat Range	20~80°C(55°C)	/
	T-DHW Range	40~80°C(60°C)	/
10. Address	/	1~247(1)	
11.Gate control	Gate control	Off(default)/On	/
	Gate control memory	Off(default)/On	/

Item	Options	Range and Default	Additional Remarks
12. Frequency/ Speed	12.1 Cool control mode	Off(default)/On	It can be set when the control panel is turned off.
	12.1.1 Maximum frequency	65~85Hz(75Hz)	It can be set when the control panel is turned off.
	12.2 Heat control mode	Off(default)/On	It can be set when the control panel is turned off.
	12.2.1 Maximum frequency	65~85Hz(75Hz)	It can be set when the control panel is turned off.
	12.3 DHW control mode	Off(default)/On	It can be set when the control panel is turned off.
	12.3.1 Maximum frequency	65~85Hz(75Hz)	It can be set when the control panel is turned off.
	12.4 Quiet frequency	20~90%(60%)	/
	12.5 Quiet speed-Cool	1~9 (4/6kW:4, 8/10/16kW:5, 12/14kW:6)	/
	12.6 Quiet speed-Heat/ DHW	1~9 (4/6kW:3, 8/16kW:4, 10/12/14kW:5)	/
	12.7 Highest fan speed-Cool	Off(default)/On	It can be set when the control panel is turned off.
	12.7.1~12.7.6 HFS-Cool 1~6	1~9(9)	It can be set when the control panel is turned off.
	12.8 Highest fan speed-Heat	Off(default)/On	It can be set when the control panel is turned off.
	12.8.1~ 12.8.7 HFS-Heat 1~7	1~9(9)	It can be set when the control panel is turned off.
	12.9 Higheset fan speed-DHW	Off(default)/On	It can be set when the control panel is turned off.
	12.9.1~12.9.7 HFS-DHW 1~7	1~9(9)	It can be set when the control panel is turned off.
	12.10 T-cool drop rate	0.1~2.0°C/min(0.2°C/min)	/
	12.11 T-heat rise rate	0.1~2.0°C/min(0.2°C/min)	/
	12.12 Comp. heat duration	30~300s(120s)	/
	12.13 Comp. cool duration	30~300s(120s)	/
	12.14 Cool low freq. duration	5~15min (10min)	/
	12.15 Heat low freq. duration	5~15min (10min)	/

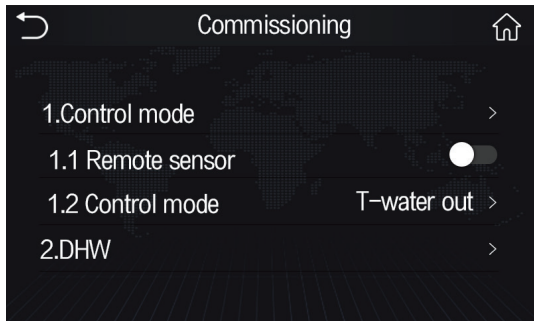
Item	Options	Range and Default	Additional Remarks
13.Current/ Power limit	13.1 Current/Power limit	Off(default)/Current limit/ Power limit	It can be set when the control panel is turned off and it is unavailable when modularization has been activated.
	13.2 Value	Current limit: 4/6kW(1-ph):5~70A(13A) 8/10kW(1-ph):5~70A (27A) 8/10kW(3-ph):5~25A (13A) 12/14/16kW(1-ph):5~70A (33A) 12/14/16kW(3-ph):5~25A (13A) Power limit: 4/6kW(1-ph): 1.2~16.1kW(3.0kw) 8/10kW(1-ph):1.2~16.1kW (6.2kW) 8/10kW(3-ph):3.5~17.3kW (9.0kW) 12/14/16kW(1-ph): 1.2~16.1kW (7.6kW) 12/14/16kW(3-ph): 3.5~17.3kW (9.0kW)	It can be set when the control panel is turned off.
	13.3 ΔValue min	1~15%(5%)	It can be set when the control panel is turned off.
	13.4 Electric heater	No(Default)/Yes	It can be set when “Current/Power limit” is set to “Power limit” and the control panel is turned off.
	13.4.1 AUX E-heater	Standard(default)/Field-supplied	It can be set when “Current/Power limit” is set to “Power limit” and the control panel is turned off.
	13.4.1.1 EH Power 1	0~3kw(3kw)	It can be set when “AUX E-heater” is set to “/ Field-supplied” and the control panel is turned off.
	13.4.1.2 EH Power 2	0~3kw(3kw)	It can be set when “AUX E-heater” is set to “/ Field-supplied” and the control panel is turned off.
	13.4.2 Tank heater	Standard(default)/Field-supplied	It can be set when “Current/Power limit” is set to “Power limit” and the control panel is turned off.
	13.4.2.1 Tank heater Power	0~3kw(3kw)	It can be set when “Tank heater” is set to “/ Field-supplied” and the control panel is turned off.
14. Zone control	14.1 Prop. valve action cycle	30~300 s (120s)	
	14.2 Prop. valve max. open	85-100% (100%)	
	14.3 Prop. valve min. open	0-15% (0%)	
	14.4 Zone air removal	On/Off (Off)	It can be set when the control panel is turned off.

Item	Options	Range and Default	Additional Remarks
15. Modularization	15.1 Total modular quantity	1~6 (1)	It can be set when the control panel is turned off, and is imcompatible with "T-room' and "Current/Power limi".
	15.2 Compressor optimal freq.	40~100% (70%)	
	15.3 Comp. cool start interval	1~5min (3min)	
	15.4 Comp. heat start interval	1~5min (3min)	
	15.5 Comp. cool stop interval	1~5min (3min)	
	15.6 Comp. heat stop interval	1~5min (3mi)	
	15.7 Optimal freq. hold time	10~120min(30min)	
	15.8 DHW modular quantity	1~6 (1)	It can be set when the control panel is turned off and the water tank is available.
16. System type	/	Heat pump(default)/Only heating/Only cooling/ Only DHW/Cool+DHW/ Heat+DHW	It can be set when the control panel is turned off.
17. Password modification	/	/	It is for entering the commissioning setting page.
18.Power consumption	Power consumption	On/Off (Off)	
19.Temperature limits	19.1 T-out heat upper limit	30~80℃ (55°C)	
	19.2 T-out cool lower limit	7~25℃ (18°C)	
	19.3 Heat mode limit	On/Off (Default)	It can be set when the control panel is turned off.
	19.3.1 T-ambient upper	10~35℃ (22°C)	It can be set when the control panel is turned off.

19.1.1 Control mode

When “Remote sensor” is active, “Control mode” can be set to “T-water out”, “T-room” or “T-controller”; when it is inactive, “Control mode” can be set to “T-water out” or "T-controller".

In order to improve the accuracy of detected temperature of the control panel's temperature sensor, the control panel needs to be installed in a ventilated position. If the temperature difference is large, the temperature can be calibrated by setting the correction value. The temperature value collected by the control panel is displayed as --°C on the home page within 35 seconds, and can be displayed normally after 35 seconds.



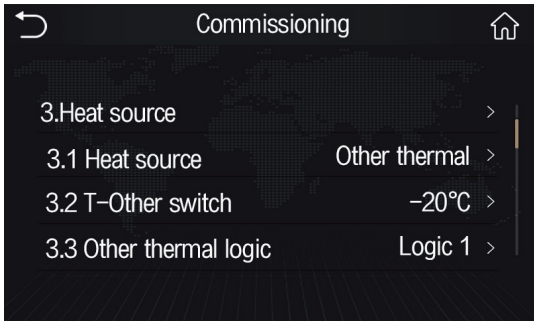
19.1.2 DHW

It can be set only when the water tank is configured.

"Solar separate operation": when this function is deactivated, solar function still works once the main unit is turned on. When this function is activated, no matter the main unit is turned on or not, solar function always works.

19.1.3 Heat source

It can be set to “Other thermal” or “Optional E-Heater”. For the former, there are three available logic options.



◆ Logics for "Other thermal"

(1) Logic 1

1.The set point of other thermal should be equal to that of “**WOT-Heat**” in “**Heat**” mode and “**Heat + DHW**” mode; The set point should be the smaller one between “**T-Water tank**” +5°C and 60°C in “**DHW**” mode.

2.The water pump for other thermal must be always active under the “Heat” mode.

3.Under the “**Heat**” mode, the 2-way valve will be controlled based on the setting of the control panel. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start but the other thermal will stop.

Under the “**DHW**” mode, the 3-way valve will switch to the water tank, the water pump of the heat pump will always stop but the other thermal will start.

Under the “**Heat + DHW**” mode, the other thermal only works for space heating, and the electric heater of the water tank works for water heating. In this case, the 2-way valve is controlled base d on the setting of the control panel, and the 3-way valve will always stop. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start.

(2) Logic 2

1.The set point of other thermal should be equal to that of “**WOT-Heat”**and both are or lower than 60℃ in “**Heat**” mode and “**Heat + DHW**”mode; The set point should be the smaller one between “**T-Water tank**” +5°C and 60°C in “**DHW** mode.

2.The water pump for other thermal must be always active under the “**Heat**” mode.

3.Under the “**Heat**” mode, the 2-way valve will be controlled based on the setting of the control panel. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start but the other thermal will stop.

Under the “**DHW**” mode, the 3-way valve will switch to the water tank, the water pump of the heat pump will always stop but the other thermal will start.

Under the "**Heat + DHW** mode ("**Heat**" takes the priority), the other thermal only works for space heating, and the electric heater of the water tank works for water heating. In this case, the 2-way valve is controlled base d on the setting of the control panel, and the 3-way valve will always stop. During heating operation, the water pump of the heat pump unit will be stopped; however, during standby status, the water pump will start.

Under the "**Heat + DHW**" mode ("**Hot water**" takes the priority), the other thermal works for space heating and water heating. The other thermal will work for water heating firstly, after reached "**T-water tank**", other thermal turns to space heagting.

(3) Logic 3

The heat pump will only send a signal to other thermal, but all the logic of control must be "**stand alone**".

Other Thermal Control			
No.	**Mode**	**Remark**	**Required accessories**
Logic 1	Heat	Available	RT5 temperature sensor
	DHW	Available	Extra 3-way valve, water tank sensor
	Heat+DHW	Available	RT5 temperature sensor, water tank sensor
Logic 2	Heat	Available	RT5 temperature sensor
	DHW	Available	Extra 3-way valve, water tank sensor
	Heat+DHW	Available	Extra 3-way vlave,RT5 temperature sensor, Water tank sensor
Logic 3	Heat	Available	/
	DHW	Available	/
	Heat+DHW	Available	/

◆ Logics for "Optional E-Heater"

For the "Optional E-Heater", there are two available logic options.

Logic 1: either the heat pump or the E-heater is allowed to be turned on at the same time.

Logic 2: both the heat pump and the E-heater are allowed to be turend on at the same time.

19.1.4 Water pump

The water pump automatically adjusts the operation speed according to the difference between the inlet and outlet water temperatures.

"**Lowest speed limit"**: this function will make the lowest speed of the water pump not lower than "Lowest speed limit". When this function is deactivated, the lowest is speed 8.

"**Highest speed limit**": when this function has been activated, the maximum running speed of the water pump can not be higher than this setting range.

"**Water pump antistall**": when the unit is turned off, this function will make the water pump runs at the highest gear based on "Interval" and "Duration" settings.

"**Water pump standby**": you can set the operation mode of the water pump during standby.

Logic 1: the water pump runs continuously based on the "Speed" setting.

Logic 2: the water pump runs intermittently based on the "Speed", "Interval" and "Duration" settings.

Logic 3: the water pump remains stopped.

"**Engineering pump standby**:during cooling/heating standby, the engineering water pump can be set to start and stop according to the actual use.

Logic 1: stop;

Logic 2: consistent with the operation state of the water pump of the main unit;

Logic 3: intermittent start and stop;

Logic 4: normally start.

19.1.5 Valve

The working mode of the 3-way valve and the 3-way valve 1 can be set.

When "3-way valve 1" is set to "Air", the 3-way valve will keep closed in the "Heat"/"Cool" mode and keep open in the "DHW" mode.

When "3-way valve 1" is set to "DHW", the 3-way valve will keep open in the "Heat"/"Cool" mode and keep closed in the "DHW" mode.

Notes

1. The field supplied three-way valve will act according to the corresponding settings by the control panel once the unit is started.

2. The action time of the field supplied three-way valve is consistent with that of the internal three-way valve of the unit.

19.1.6 Test run

This function makes the unit run in specific modes to achieve the purpose of commissioning.

Function	Description
Air removal	It is used to expel air inside the system.
Manual defrost	In addition to automatic defrosting, you can also choose manual defrosting. It can not be set when the unit is turned on or under the “Disinfection mode”, “Emergency heating”, “Force mode”, “Refrigerant recovery”,and “Load test”. If this activated function fails to work within 10min, then it will quit automatically.
Refrigerant recovery	This mode is used for the unit to recover refrigerant. It is only allowed to enter this mode after power is cut off and the unit is not turned on. It cannot be set when “Force mode”/“Thermostat” is active or the unit is in error. It will quit automatically after 5 minutes of operation.
Force mode	Only after the main unit is powered on again and has not turned on, the forced mode is allowed. It cannot be set when “Refrigerant recovery”/“Thermostat” is active or the unit is in error. It will quit automatically after 15 minutes of operation.
Floor heating	It can be activated when the main unit is turned off and there is no any error. It cannot be set when “Holiday mode”, “Emergency heating”, “Disinfection mode”, “Manual defrost”, “Refrigerant recovery”, “Thermostat”, or “Load test” is active. When it works, the home page will display the icon and “Timer” goes invalid. When a fault occurs, the control panel will tell "Floor heating unusual". If the fault is recovered within 6 hours, it will run continuously. If not, it will quit automatically.

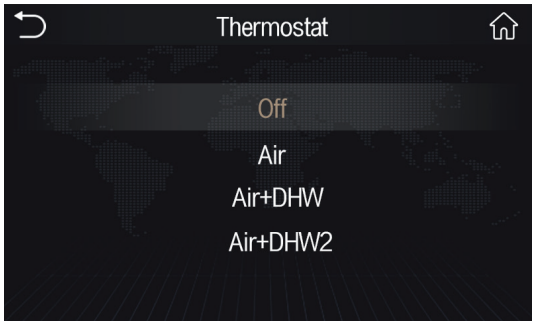
This function will become inactive upon power cut-off.

19.1.7 Load test

It is used to test a single load for commissioning. The fan, water pump, 3-way valve, 2-way valve can be set separately. After setting, the test can be enabled to verify whether the load can work normally. This function will become inactive upon power cut-off.

19.1.8 Thermostat

The unit can realize gang control with the thermostat.



●When “**Water tank**” is set to “**Without**”, the “**Air+DHW"** or "**Air+DHW2**" mode is unavailable.

●When “**Floor heating**” and “**Emergency mode**” have activated, function of the thermostat will be invalid.

●When “**Thermostat**” is set to “**Air**”, “**Air+DHW** or "**Air+DHW2**”, “**Temp.timer**” will be deactivated automatically and the main unit will run based on the mode set by the thermostat. Meanwhile, mode setting and On/Off operation by the control panel will be ineffective.

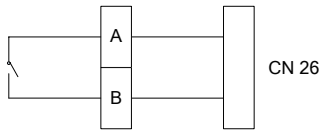
●When “**Thermostat**” is set to “**Air**”, the main unit will run based on the setting of the thermostat.

●When “**Thermostat**” is set to “**Air+DHW**”, when the thermostat is turned off, the main unit can still perform the “**DHW**” mode. In this case, the ON/OFF icon at the homepage does not indicate the running status of the main unit. Running parameters are available at the parameter viewing pages.

●When “**Thermostat**” is set to “**Air+DHW**, operation priority can be set by the control panel.

●When "**Thermostat**" is set to "**Air+DHW2**, there comes two different situations according to the switch state received by CN26. If CN26 is closed, it indicates there is a demand for hot water; If CN26 is open, it indicates there is no hot water demand. The control panel panel will set different modes according to the state of CN26 and the thermostat, as shown in the following table:

	Thermostat: Cool	Thermostat:Heat	Thermostat: OFF
CN26: OPEN	Mode: Cool	Mode: Heat	Unit Stop
CN26: CLOSE	Mode: Cool+DHW	Mode: Heat+DHW	Mode: DHW



●The status of the thermostat can be changed only when the control panel is turned off.

●When it has been activated, “**Floor heating**”, “**Air removal**”, and “**Emergency heating**” are not allowed to be activated.

●This setting will be memorized upon power failure.

Note: when the main unit is under the control of the thermostat, the operation mode set at the control panel varies with the thermostat, that is, the actual operation status of the main unit, as shown in the table below. Once the thermostat is disabled, restart the main unit after check if the operation mode set at the control panel is expected or not.

Thermostat setting	Thermostat status	Priority	Control panel	Main unit
Off	Off	/	/	/
Air	Heating	/	Heat	On for heating
	Cooling	/	Cool	On for cooling
	Off	/	Last operation mode	Off
Air+DHW	Heating	DHW	DHW+ heat	Frist water heating and then heating
		Heat/cool	Heat + DHW	On for heating; water heated by the water heater electric heater
	Cooling	DHW	DHW + cool	Frist water heating and then cooling
		Heat/cool	Cool + DHW	On for cooling; water heated by the water heater electric heater
	Off	/	DHW	On for water heating
Air+DHW2	Heating	/	Heat	On for heating
	Cooling	/	Cool	On for cooling
	Water heating	/	DHW	On for water heating
	Heating + Water heating	DHW	DHW + heat	Frist water heating and then heating
		Heat/cool	Heat + DHW	On for heating; water heated by the water heater electric heater
	Cooling + water heating	DHW	DHW + cool	First water heating and then cooling
		Heat/cool	Cool + DHW	On for cooling; water heated by the water heater electric heater
	Off	/	Last operation mode	Off

19.1.9 SG

When it has been activated, the operating main unit will receive and execute control commands from the smart grid, except when the control panel has been turned off. See the table below for the SG control commands.

SG smart grid	EVU Photovoltaic signal	Command	Remarks
1	0	Switch-off command	Switch-off command
0	0	Standard operation	Switch-on command
0	1	Switch-on signal	Switch-on signal
1	1	Switch-on command	Switch-on signal

Parameter Setting

No.	Full Name	Displayed Name	Range (°C)	Range (°F)	Default	Remarks
1	Temperature difference between actual and target water for cooling	ΔWT-Cool AT	-10~0°C	-18~0°F	-5°C/-9°F	/
2	Temperature difference between actual and target water for heating	ΔWT-Heat AT	0~15°C	0~27°F	5°C/9°F	/
3	Temperature difference between actual and target water for water heating	ΔWT-DHW AT	0~15°C	0~27°F	5°C/9°F	/
4	Minimal allowable water temperature by users	WT min	5~25°C	41~77°F	5°C/41°F	/
5	Maximal allowable water temperature by users for heating	WT-Heat max	20~65°C	68~149°F	65°C/149°F	/
6	Maximal allowable water temperature by users for water heating	WT-DHW max	40~80°C	104~176°F	80°C/176°F	/
7	Leaving water temperature setting range for cooling	WOT-Cool Range	5~25°C	41~77°F	10°C/50°F	/
8	Leaving water temperature setting range for heating	WOT-Heat Range	20~65°C	68~149°F	55°C/131°F	/
9	Leaving water temperature setting range for water heating	T-DHW Range	40~80°C	104~176°F	60°C/140°F	/

When SG (smart grid) has been activated, the unit after receiving the grid signal will go under the control as stated below.

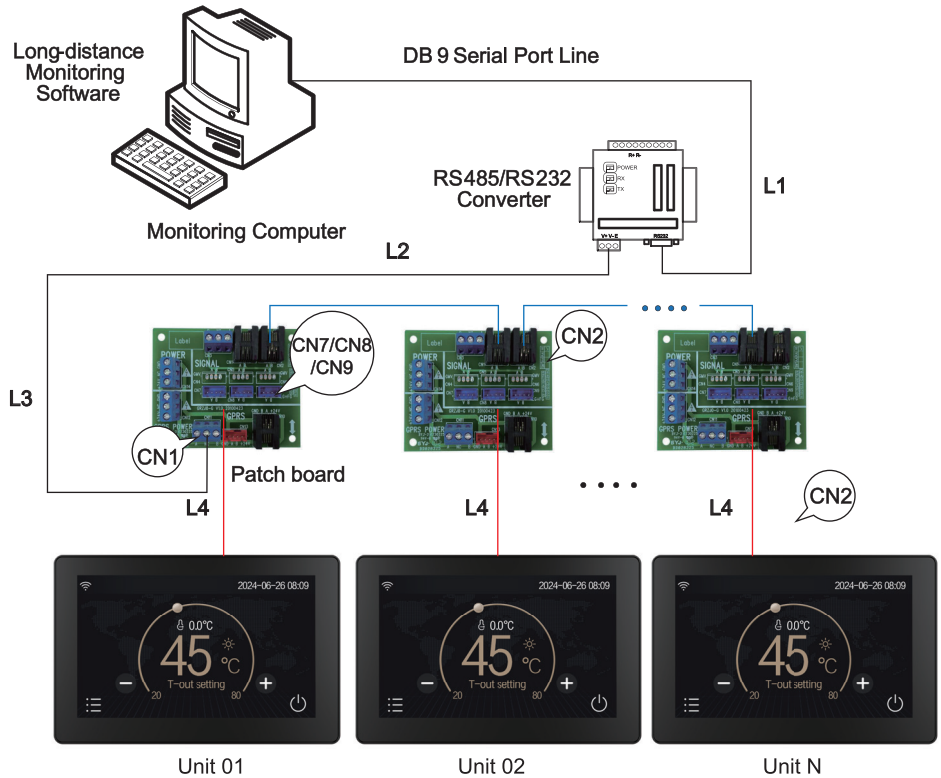
Running mode	Target water temperature			
	Switch-on signal	Switch-on command	Standard operation	Switch-off command
Cool	Take the larger between (T out cool+ΔWT-Cool AT) and WT min.	Take the larger between WOT-Cool Range and WT min.	T out cool	/
Heat	Take the smaller between (T out heat+ΔWT-Heat AT) and WT-Heat max.	When the electric heater works, take the smaller between WOT-Heat Range and WT-Heat max.	T out heat	/
		When the electric heater does not work, take the smaller between WOT-Heat Range and Tmax.Tmax is the highest leaving water temperature corresponding to the current ambient temperature.		/
Hot water	Take the smaller between (T-DHW+ΔWT-DHW AT) and WT-DHW max.	When the electric heater works, take the smaller between T-DHW Range and WT-DHW max.	T-DHW	/
		When the electric heater does not work, take the smaller between T-DHW Range and T-HP max.		/

19.1.10 Address

It is used to set the address of the control panel for being integrated to the centralized control system.

This setting will be memorized upon power failure.

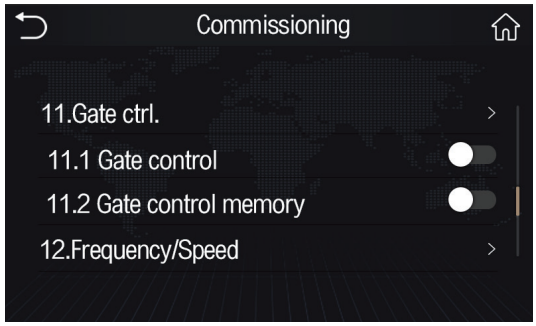
See the figure below for wiring the remote controller. Wherein, “L1”, “L2”, “L3”, “L4”, “Patch board”, “RS485/RS232”, and “Converter” are optional parts and others with similar functions are allowed.



19.1.11 Gate control

If this function has been activated, the control panel will detect the card state of the unit. If the card is inserted, the unit will operate normally; if the card is unplugged, the control panel will be turned off immediately and the home page will display the card-unplugged icon. Once the card is unplugged, it is not allowed to set the “Timer”. When the “Gate control memory” function has been activated, the control panel will be restored to the state before the card is plugged out.

The “Gate control memory” function will decide if to memory the parameter setting state before the control card is plugged out.



19.1.12 Frequency/Speed

“Cool control mode”/“Heat control mode”/”DHW control mode”: when it has been activated, the highest frequency of the compressor in the corresponding mode can be set.

“Quiet frequency”: it is used to set the maximum operating frequency of the compressor when “Quiet mode” is enabled.

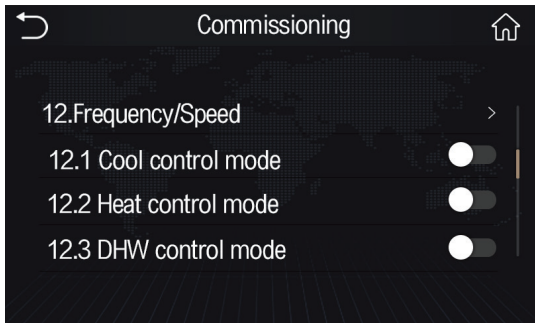
“Quiet speed-Cool”: it is used to set the highest fan speed for the “Cool” mode when “Quiet mode” is enabled.

“Quiet speed-Heat”/“Quiet speed-DHW”: it is used to set the highest fan speed for the “Heat”/”DHW” mode when “Quiet mode” is enabled.

“Highest speed-Cool”/“Highest speed-Heat”/””Highest speed-DHW””: the highest fan speed in the corresponding mode can be set.

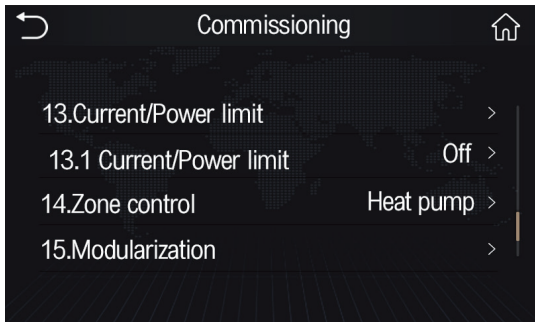
“T-heat rise rate”/“T-cool drop rate”: it is the used for compressor frequency adjustment.

“Comp. heat duration”/ “Comp. cool duration”: it is the used for compressor frequency adjustment.



19.1.13 Current/Power limit

It can be set to “Current limit” or “Power limit”. For the latter, the electric heater can be selected or not. If selected, you are able to set related parameters.



This functions targets for user's electric circuits with poor carrying capacity and unable to let the main unit operates under full load. When it has been activated, the user is allowed to set the current limit value based on the carrying capacity of their electric circuits. However, this value should be higher than 80% of the current for the maximum nominal input power for heating, which is necessary for normal functions (like oil return, defrosting, freeze protection etc.), otherwise it would lead to overcurrent, trip-off and other adverse consequences. If the electric circuit fails to meet this condition, its carrying capacity must be improved. During operation, when the current exceeds this value, the electric heater will first stop working and then frequency of the heat pump will be dropped until the current is less than the limit value. As there is a deviation for the detected current, it can be corrected through "ΔValue min".

Current limit function will limit the action of the load, make heating/cooling/water heating slower, make output capacity much lower, and even limit some functions. Do not activate this function unless necessary. Once it has been activated, do not set it too low, otherwise the main unit's capacity would be degraded and some functions would be limited.

Parameter	Description
C/P limit	There are three options available, "**Off**", "**Current limit**" and "**Power limit**".
Value	Power or current limit
ΔValue min	As there is a deviation for the detected current, it can be corrected through "ΔValue min". When "**ΔValue min**" goes larger/smaller, it is more likely/hardly to trigger the current limit function. For example, when the current limit value is 32A, but the current limit function fails when the actual current exceeds (a clip-style ammeter can be used for current detection), raise "ΔValue min" as so to trigger the current limit function more likely.
Electric heater	There are two options available for the electric heater, "**With**" and "**Without**", which determines if the electric heater should be taken into account for current/power limit. Two power supplies are required, one for the main unit, and the other for the electric heater. (1) when they are separate, it can be set to "Without". In this case, current/power limit works only for the heat pump. (2) when they are supplied together through an air switch, current/power limit works on both the heat pump and the electric heater.
AUX E-heater	(1) when a standard auxiliary electric heater is supplied by the manufacturer, the power is not required to be input but is automatically identified by the main board. (2) when an auxiliary electric heater is field supplied, the user needs to set "**EH Power 1**" and "**EH Power 2**".
Tank heater	
Tank heater power	(1) when a water tank with a standard electric heater is supplied by the manufacturer, the power of the electric heater is not required to be input but is automatically identified by the main board. (2) when a water tank's electric heater is field supplied, the user needs to set its power and meanwhile shall make sure the correctness of the power setting.
EH Power 1	When "**AUX E-heater**" is set to "**Field-supplied**", the user needs to set "**EH Power 1**" and "**EH Power 2**". Then, once the electric heater works, the main unit is able to calculate the current value. In this case, the user shall make sure the correctness of the power settings.
EH Power 2	

When it is set it "Off", current limit and power limit both cannot be set. When it is set to "Current limit" or "Power limit", they can be set.

19.1.14 Zone control

It targets to set the relevant parameters of the proportional valve and the air removal mode.

19.1.15 System type

It can be set when the control panel has been turned off.

For the “Only heating” mode, the unit is only allowed to perform space heating.

For the “Only cooling” mode, the unit is only allowed to perform space cooling.

For the “Only DHW” mode, the unit is only allowed to perform water heating.

For the “Cool + DHW” mode, the unit is only allowed to perform space cooling and water heating.

For the “Heat + DHW” mode, the unit is only allowed to perform space heating and water heating.

19.1.16 Password modification

It is used to modify the commissioning-oriented parameters.

19.1.17 Power consumption

After the function has been activated, data such as power consumption can be recorded and viewed through "**View**"-"**Power consumption**".

The power consumption data are obtained by calculation and are for reference only.

Power consumption data is only stored locally and is not stored to the server.

If the power display function is not required, this function can be set to off.

If you need to delete the power consumption data, you can click the delete icon on the monthly report page.

19.1.18 Temperature limits

This function is intended to prevent problems such as floor damage caused by improper temperature settings.

"**T-out heat upper limit**": it is intended to limit the maximum outlet water temperature that the unit can reach in the heating mode.

"**T-out cool lower limit**": it is intended to limit the minimum outlet water temperature that the unit can reach in the cooling mode.

"**Heat mode limit**": after this function has been activated, the stop temperature for heating can be set.

For the unit under the “Heat+DHW” mode, when the ambient temperature is greater than or equal to "**Heat mode limit**", the priority is invalid and only the unit is only allowed to perform water heating; when the ambient temperature is lower than "**Heat mode limit**", the unit will operate with the priority set by the user.

19.2 Frequently asked questions

19.2.1 Communication error of the control panel

Cause: the control panel fails to communicate with the main board of the main unit normally.

Troubleshooting:

1. According to the wiring diagram, check whether the control panel is connected to the correct terminal of the main board;

2. Check whether the address DIP setting of the main board is correct;

3. Check whether the communication line is in normal condition. If not, replace the it and try again.

20. Modularization

20.1 Overview

Up to 6 units of the same cooling capacity can be modularized to realize heating, cooling and domestic water heating at the same time.

Modularization can reduce the load of a single unit and realize the maximum utilization of the heat exchanger. At the same time, it can alleviate frosting, reduce noise for better user experience.

20.2 Matters to Note

(1) Only units with the same cooling capacity can be modularized.

(2) Ensure that the installation process complies with the requirements of this Manual, local building codes, environmental regulations, and safety standards.

(3) Only the unit installed in front of the electric three-way valve can perform water heating, and the unit installed behind the electric valve three-way valve will not.

20.3 Installation Method

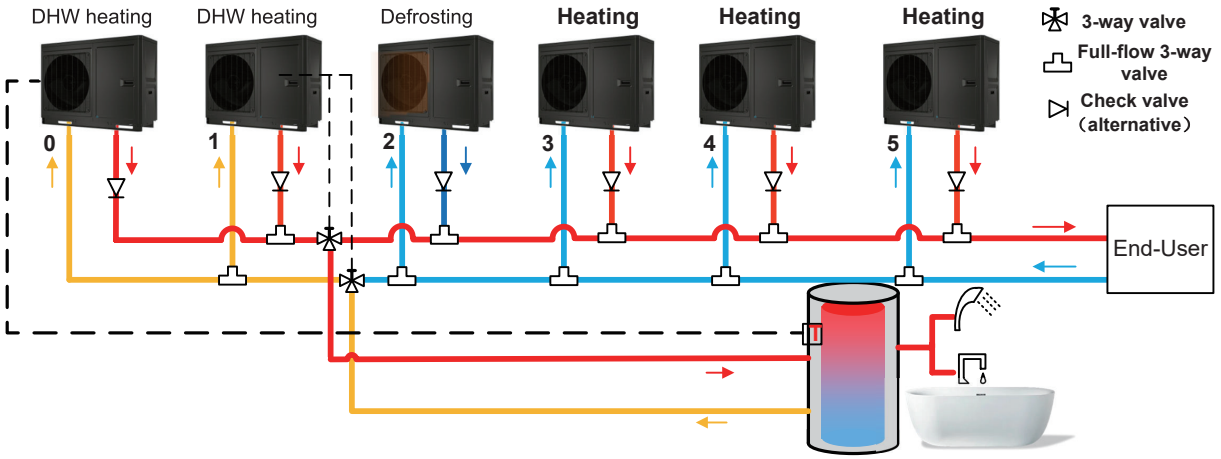
20.3.1 Water Circuit Connection

(1) Material List

Materials	Recommended Code	Quantity	Others
Electric 3-way valve body	072005000003	2	Required for water heating
Electric ball valve actuator	4504800101	2	Required for water heating
Check valve	/	Quantity of modularized units	Required
Full-flow 3-way valve	/	(Quantity of modularized units-1)*2	All three directions are pathways.

(2) Connection Diagram

- As shown in the figure below, a check valve needs to be installed on the outlet pipe of each unit.
- Anti-freezing measures must be taken for the pipes and equipment to prevent damage caused by low temperatures.
- Units required for DHW must be installed close to each other.The electric three-way valve should be installed behind the unit with a larger DIP setting. If there are two units for DHW, the electric three-way valve should be installed on the inlet and outlet pipes of the unit with the DIP setting of "1".

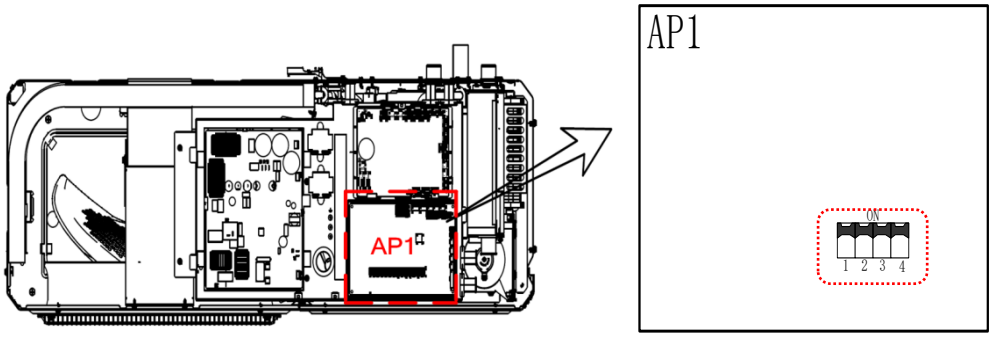


20.3.2 Electrical connection

(1) DIP switch

- When modularization is required, DIP setting is necessary for each unit. The DIP switches are located on the AP1 board. Coding starts from 0. For example, if there are 6 modularized units, the coding sequence would be 0, 1, 2, 3, 4, 5, as shown in the figure below.

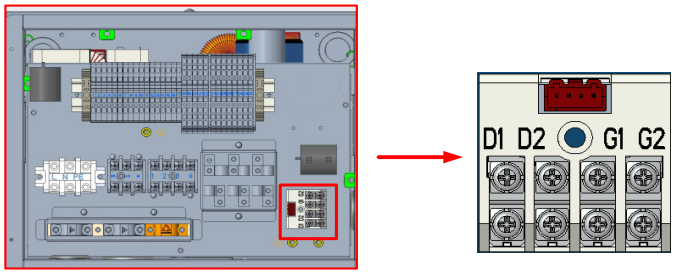
- When some modularized units are required for DHW, first you need to determine how many is required and then set their DIP switches. For instance, if two units are required, the DIP settings for them should be 0 and 1.



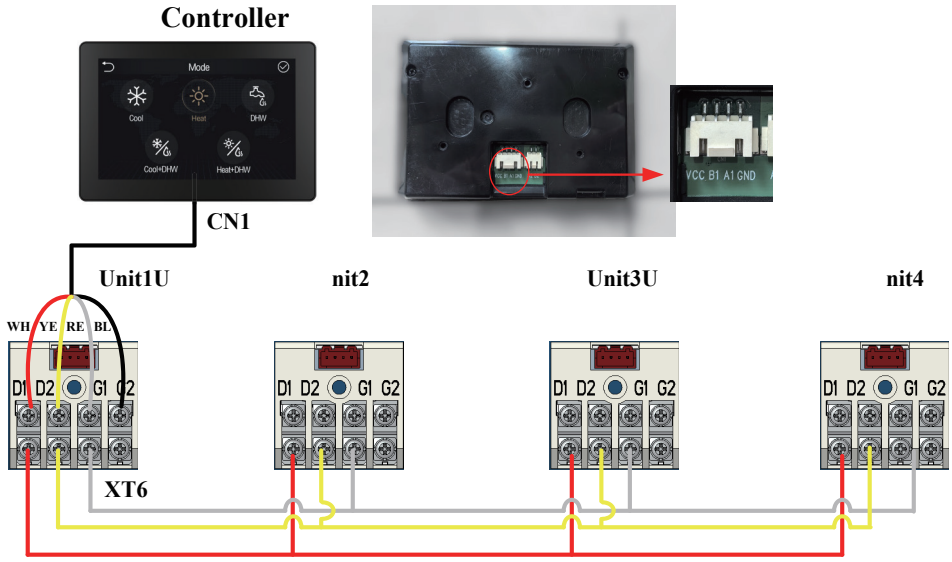
DIP switch	Setting	Main Unit	DIP switch	Setting	Main Unit
ON 1 2 3 4	0	Unit 1	ON 1 2 3 4	3	Unit 4
ON 1 2 3 4	1	Unit 2	ON 1 2 3 4	4	Unit 5
ON 1 2 3 4	2	Unit 3	ON 1 2 3 4	5	Unit 6

(2) Connection of the Wired Controller

- Use a four-core cable to connect the controller 's CN1 to the XT6 board of the unit with the DIP switch set to 0. The wiring sequence is: white wire to D1, yellow wire to D2, red wire to G1, and black wire to G2.
- Each unit 's XT6 board is connected via a three-core cable with the wiring sequence: white wire to D1, yellow wire to D2, and red wire to G1.



XT6



(3) Connection of the Electric Three-Way Valve

When some modularized units are required for DHW, the control lines of two electric three-way valves on the inlet and outlet pipes should be connected to the unit with the DIP switch set to 0. See the circuit diagram attached to the unit for specific wiring.

(4) Connection of the Temperature Sensor

When some modularized units are required for DHW, the water tank temperature sensor must be connected to the unit with the DIP switch set to 0. The standard configured water tank temperature sensor should be connected to the plug-in connector and wiring should be done based on the color of the terminal and marks on the line.

(5) Connection of the Water Tank Electric Heater

At first, it is necessary to distinguish the electric heater is single-phase or three-phase. The single-phase electric heater should be connected to the single-phase main unit and three-phase electric heater to the three-phase main unit. Power of the electric heater shall not be greater than 3KW. See the circuit diagram attached to the unit for specific wiring.

20.4 Commissioning

After the water and electrical systems are installed, connect the wired controller and set parameters based on actual conditions.

20.4.1 Heating/Cooling Settings

(1) Set Parameters

At the "Commissioning" page, set the relevant parameters. After that, return to the homepage to select the operating mode and start the main unit.

15.Modularization			
	Default value	Settable range	Others
15.1 Total modular quantity	1	1-6	Setting is allowed only when the unit is turned off.
15.2 Compressor optimal freq.	70%	40-100%	
15.3 Comp.cool start interval	3min	1-5min	
15.4 Comp.heat start interval	3min	1-5min	
15.5 Comp.cool stop interval	3min	1-5min	
15.6 Comp.heat stop interval	3min	1-5min	

Parameter Explanations:

15.1 Total modular quantity

Number of modularized units on demand.

15.2 Compressor optimal freq.

The maximum operating frequency coefficient (B) for modular units.This allows users to set the maximum operating frequency of the modular units under the current ambient temperature.The frequency is calculated as:Frequency = Single-Unit maximum frequency under current ambient temperature × B.This control is invalid for units for water heating.

15.3 Comp.cool start interval/15.4 Comp.heat start interval

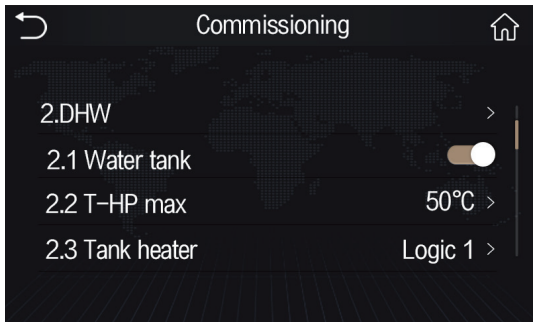
Sart interval (T) of modular units. After the previous unit has been running for T minutes, the next unit can be started.

15.5 Comp.cool stop interval/15.6 Comp.heat stop interval

Shutdown interval time (T) of modular units. After one unit has been shut down for T minutes, the next unit can be allowed to be shut down.

20.4.2 Settings for Water Heating

At the "Commissioning" page, set the relevant parameters under "DHW" and "DHW modular quantity". After that, return to the homepage to select the operating mode and start the main unit.



2.DHW			
	Default value	Settable range	Others
2.1 Water tank	OFF	On/Off	Setting is allowed only when the unit is turned off.
2.2 T-HP max	50°C	40-60°C	
2.3 Tank heater	Logic 1	Logic1/Logic2	Setting is allowed only when the unit is turned off.
15.Modularization			
15.8 DHW modular quantity	1	1-6	Setting is allowed only when the unit is turned off.

Parameter Explanations:

2.1 Water tank

When "Water tank" is set to "On", the water tank temperature sensors should be connected with the main unit in accordance with the connection method described above.

2.2 T-HP max

Maximum water heating temperature by the main unit. The main unit will stop when the water reaches this set point of "T-HP max" or "T-DHW", whichever is smaller.

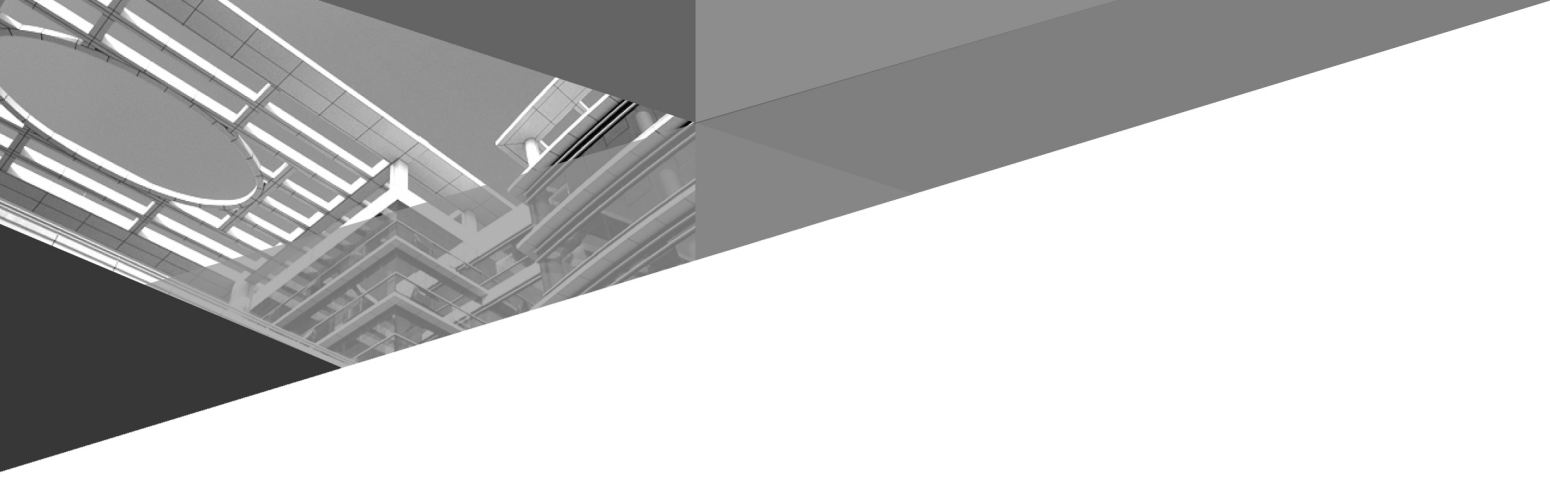
2.3 Tank heater

Logic 1: The main unit and water tank electric heater cannot operate simultaneously. In the "Heat + DHW" mode, the main unit will stop when water tank temperature reaches the set point of "T-HP max" and the water tank electric heater starts working.

Logic 2: The main unit and water tank electric heater can operate simultaneously. In the "Heat + DHW" mode, the main unit will switch to the water heating mode when water tank temperature reaches the set point of "T-HP max" and the water tank electric heater starts working.

15.7 DHW modular quantity

It specifies the number of modularized units for water heating.



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