

HEIKO

Thermal Plus 6
Thermal Plus 9
Thermal Plus 12



DC Inverter Air to Water Heat Pump

User's manual

Before operating this product, please read the instructions carefully and keep this manual for future use.

This product may only be installed or serviced by qualified personnel.

This appliance is filled with R32 refrigerant.

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1. Before use

1.1 Advanced Important Notice

Cautions:

1. Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
2. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.).
3. Do not pierce or burn.
4. Be aware that refrigerants may not contain an odour.
5. Appliance shall be installed, operated and stored in a room with a floor area larger than X m² (refer to specifications sheet).
6. The installation of pipe-work shall be kept to a minimum X m² (refer to specifications sheet).
7. Spaces where refrigerant pipes shall be compliance with national gas regulations.
8. Servicing shall be performed only as recommended by the manufacturer.
9. The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
10. All working procedure that affects safety means shall only be carried by competent persons.

General Notice:

1. Transport of equipment containing flammable refrigerants

Compliance with the transport regulations

2. Marking of equipment using signs

Compliance with local regulations

3. Disposal of equipment using flammable refrigerants

Compliance with national regulations

4. Storage of equipment/appliances

The storage of equipment should be in accordance with the manufacturer's instructions.

5. Storage of packed (unsold) equipment

Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.

The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

6. Information on servicing

1) Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

2) Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

1. Before use

3) General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

4) Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

5) Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

6) No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

7) Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

8) Checks to the refrigeration equipment

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 charge size is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- 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.

1. Before use

9) Checks to electrical devices

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 there no live electrical components and wiring are exposed while charging, recovering or purging the system;
- .That there is continuity of earth bonding.

7.Repairs to sealed components

1)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.

2) 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.

8.Repair to intrinsically safe components

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.

1. Before use

9. Cabling

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 aging or continual vibration from sources such as compressors or fans.

10. Detection of flammable refrigerants

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.

11. Leak detection methods

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

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. 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.

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

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.

12. Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge again with inert gas;
- Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place. Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

1. Before use

13. Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

14. 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.

15. Labelling

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.

16. 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

1. Before use

the total system charge is 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.

Included Accessories



Below are the accessories that are included with your purchase. Please check to ensure that none are missing or damaged. If so, please contact your local distributor.

1

X1



Installation Manual

2

X1



User's Manual

3

X1



Safety Valve Kit

4

X1



Mixing Circuit 1 Temperature Sensor

5

X1



Extension cable for Mixing Circuit 1 Temperature Sensor

6

X1



Mixing Circuit 2 Temperature Sensor

7

X1



Extension cable for Mixing Circuit 2 Temperature Sensor

8

X1



TR-Room Temperature Sensor

9

X1



Extension cable for Room Temperature Sensor

10

X1



Communication Cable between Indoor and Outdoor Unit

11

X1



Cable for Flow Switch (for monblock only)

12

X1



Sensor Cable for Water Inlet Temperature (for monblock only)

13

X1



Sensor Cable for Water Inlet Temperature (for monblock only)

14

X1



Sensor Cable for Water Outlet Temperature (for monblock only)

15

X1



Power cable for outdoor unit E-heater (for monoblock unit only)

2. Introduction

2.1 Preliminary Information

Thank you for your purchase of our quality heat pump.

This manual is intended to provide detailed instructions for the successful installation of your newly purchased heat pump product. Please ensure that this manual, along with the User's and Service manuals, are kept in an easy-to-access location for your reference later on.

DISCLAIMER

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

- Purchasing, installing, and/or operating this product with the intention of using it outside of its established, technical purpose.
- Carrying out improper work upon the unit, or any of its components, that has not been given explicit, prior consent in the form of writing.
- Installation attempts of this system by anyone other than a properly trained and licensed professional.
- Negligence of properly-worn personal protection (safety glasses, gloves, etc.) while performing installation, maintenance, or servicing of this product.
- The operation of this system during ambient temperatures which are below or beyond the temperature range intended (-25°C to 45°C)

SAFETY

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

Please pay attention to the following pages, which detail important precautions that should be closely followed, to ensure safe installation and operation .

The unit contains fluorinated greenhouse gases. The refrigerant must not be released into the air!

All products comply with the following EU regulations:

Low Voltage Directive, Electromagnetic Compatibility.

2. Introduction

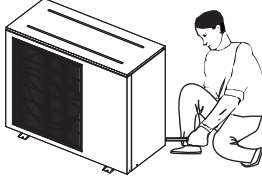
2.2.Safety Precautions

To ensure both your personal safety, as well as the safety of the product, note the symbols below and be sure to understand their correlation to each of the precautions depicted.

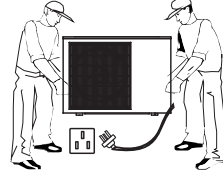
 Warning

 Caution


 Prohibition



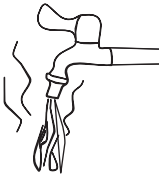
The installation, dismantlement and maintenance of the unit must be performed by qualified personnel. It is forbidden to do any changes to the structure of the unit. Otherwise injury of person or unit damage might happen.



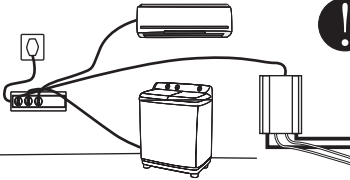
To avoid electrical shock, make sure to disconnect the power supply 1 minute or more before servicing the electrical parts. Even after 1 minute, always measure the voltage at the terminals of main circuit capacitors or electrical parts and, before touching, make sure that those voltages are lower than the safety voltage.



Be sure to read this manual before use.

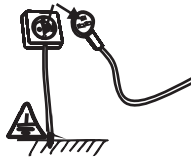


For sanitary hot water, please always add a mixture valve before water tap and set it to proper temperature.




Use a dedicated socket for this unit, otherwise malfunction may occur.

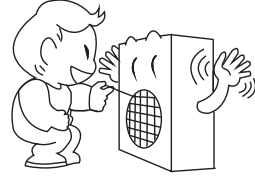
Ground wire



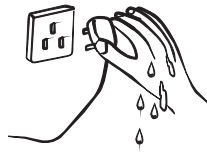
The power supply to the unit must be grounded.



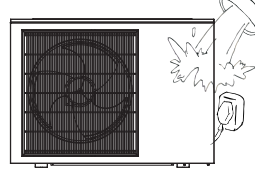
This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.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



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




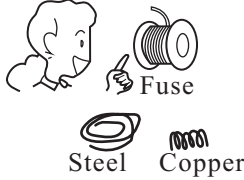
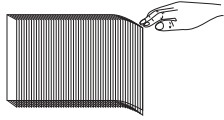
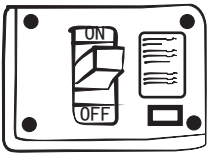

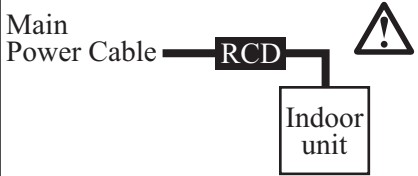

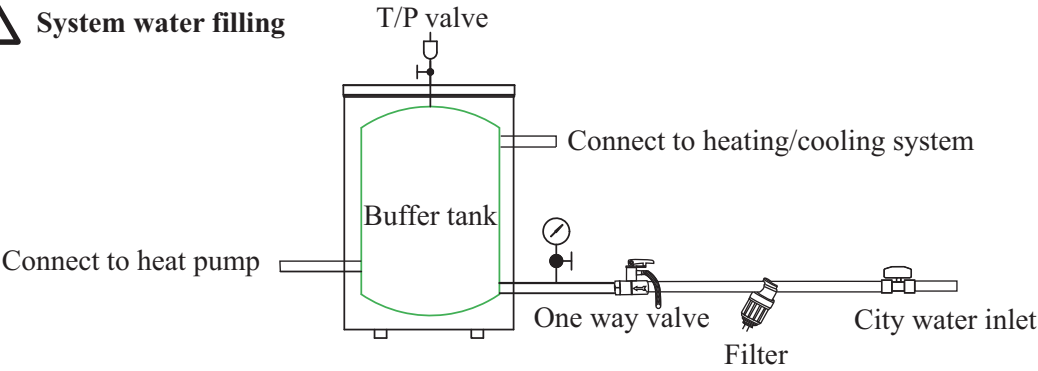


Do not touch the power plug with wet hands. Never pull out the plug by pulling the power cable.



Water or any kind of liquid is strictly forbidden to be poured into the product, or may cause electric creepage or breakdown of the product.

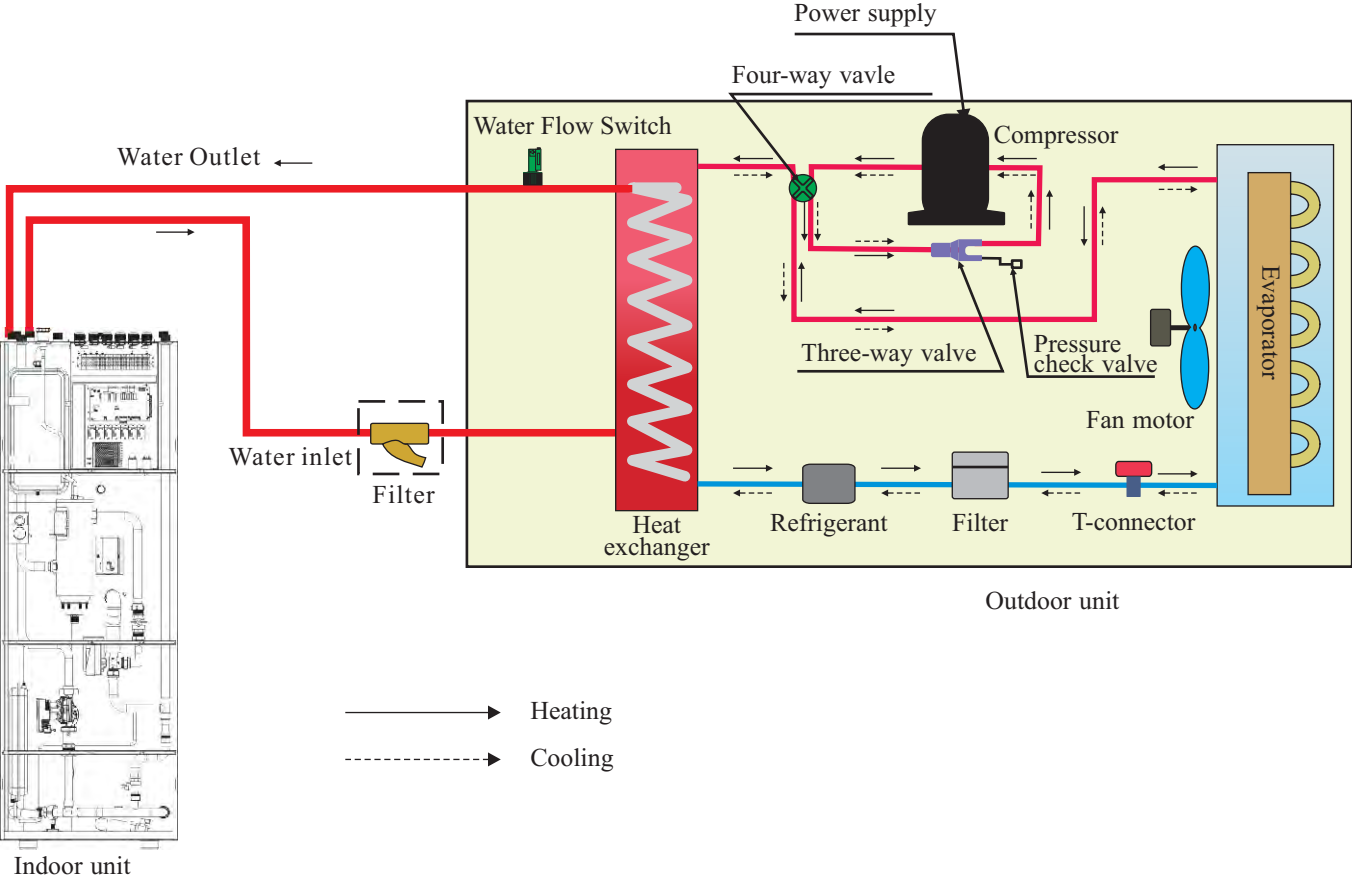
2. Introduction

2.2.Safety Precautions

 <p>When the power cord gets loose or damaged, always get a qualified person to fix it.</p>	 <p>Please select the correct fuse or breaker as per recommended. Steel wire or copper wire cannot be taken as substitute for fuse or breaker. Otherwise, damages maybe caused.</p>	 <p>Be aware fingers might be hurt by the fin of the coil.</p>
 <p>It is mandatory to use a suitable circuit breaker for the heat pump and make sure the power supply to the unit corresponds to the specifications. Otherwise the unit might be damaged.</p>	 <p>Disposal of Scrap Batteries (if there is). Please discard the batteries as sorted municipal waste at the accessible collection point.</p>	 <p>Installation of a residual current device (RCD) having a rated residual operating current not exceeding 30 mA is advisable.</p>
<p> System water filling</p> 		
<p>1. It's suggested to use pure water for filling the system. 2. If use city water for filling, please soften the water and add a filter. Note: After filling, the system of water system should be 0.15~0.6MPa.</p>		
<p> </p> <p>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.</p>		

2. Introduction

2.3. Functioning Principles



2. Introduction

2.4. Water Pump

Pump information



basic parameters

Energy Efficiency Index (EEI)	≤ 0.21
Max. delivery head	9 m
Max. volume flow	4,50 m ³ /h

Power

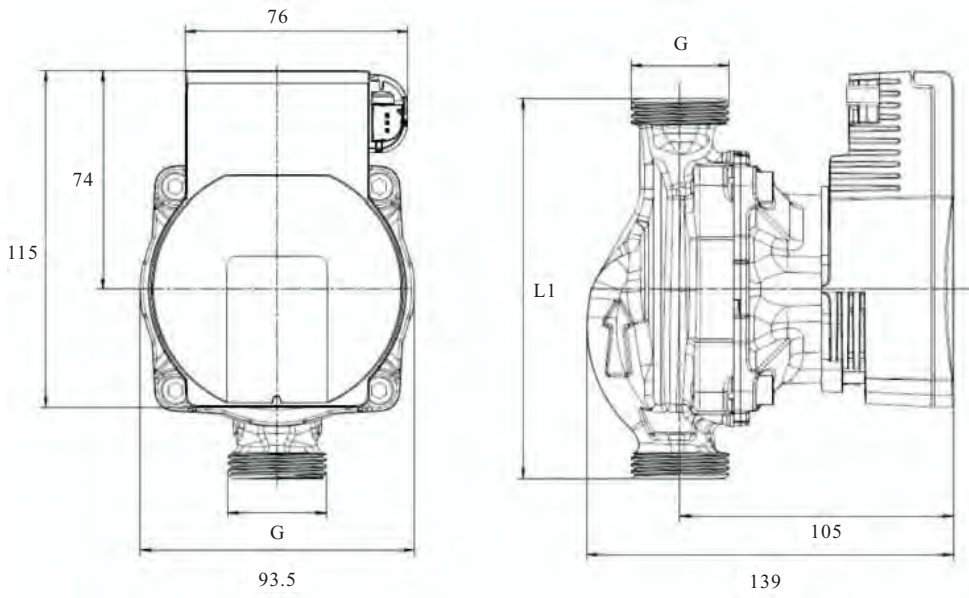
Mains connection	1~230 V +10%/-15%, 50/60 Hz (IEC 60038 standard voltage)
Power (W)	3-87
Electric current (A)	0.03-0.66

Permitted field of application

Temperature range for applications in HVAC systems at max. ambient temperature. Limit values for continuous operation at maximum rated power	Of 50°C = 0 to 105°C
	Of 55°C = 0 to 90°C
	Of 60°C = 0 to 77°C
	Of 65°C = 0 to 60°C
Maximum static pressure	Pn10

2. Introduction

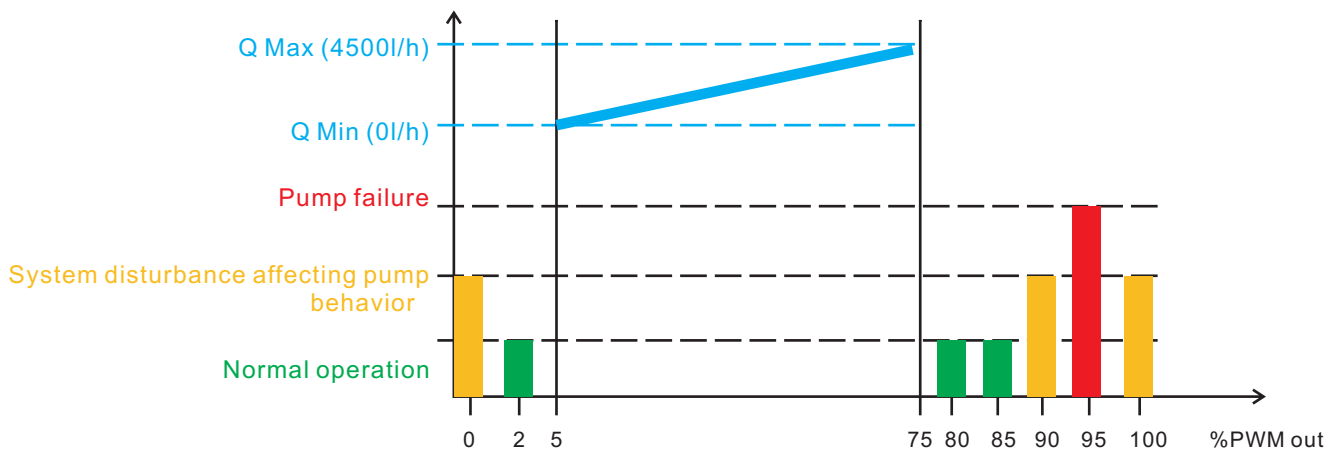
2.4. Water Pump



Type	G	L1	Weight
		mm	kg
25-130/9	G11/2	130	2
25-180/9	G11/2	180	2.2

Pump control

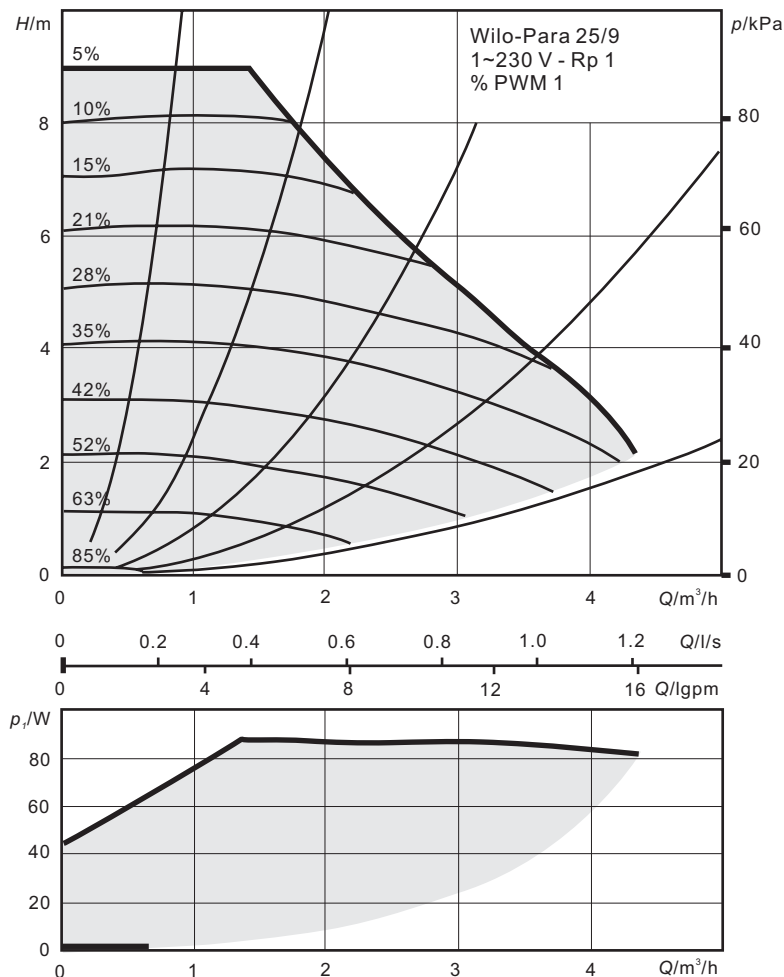
iPWM-out signal logic (heating) (%)



2. Introduction

2.4. Water Pump

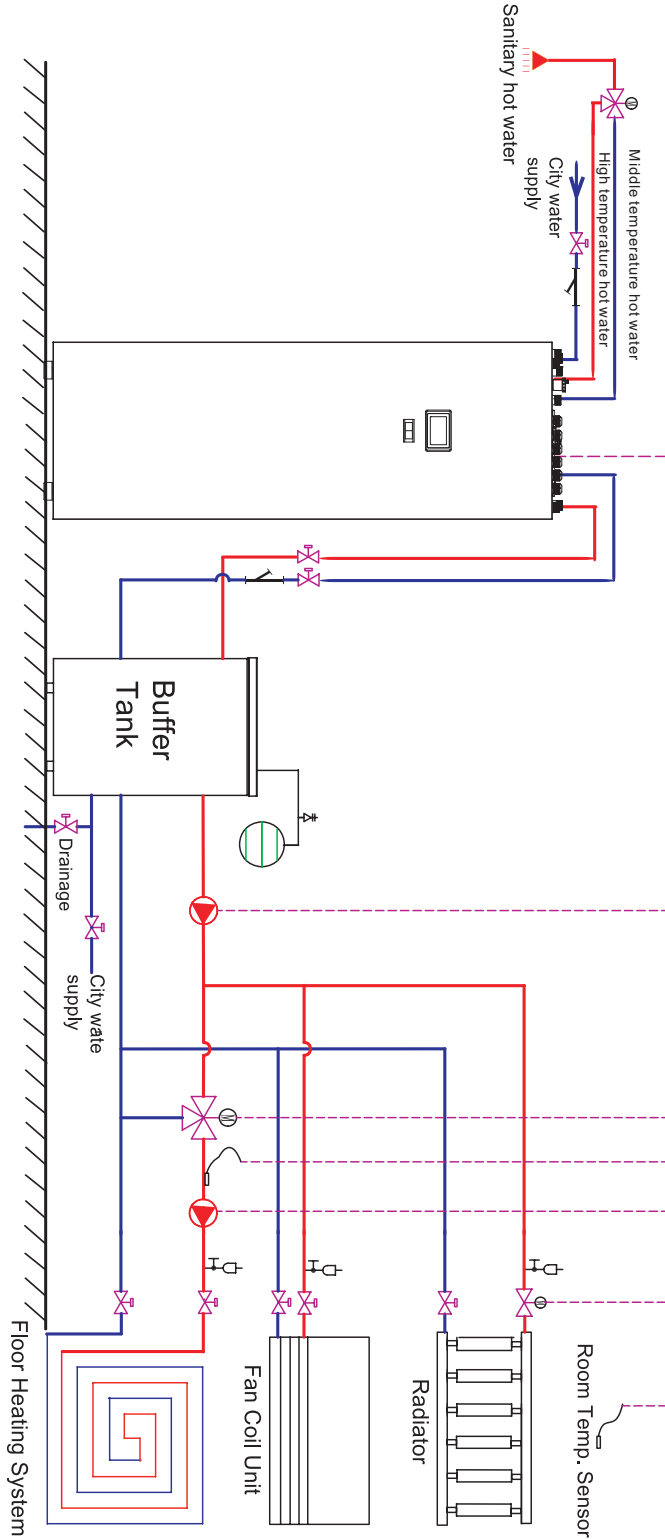
%PWM- out	Status	Potential causes
0	Pump output iPWM interface damaged	iPWM interface in short circuit
2	Stand-by, pump is ready to run	/
5-75	Pump is running normally, flow information is supplied	/
80	Abnormal running mode Pump is running but not at optimal performance	-Undervoltage 160/170-194V -Self thermal protecting mode
85	Abnormal function mode Pump has stopped but is still functional	-Undervoltage < 160/170V -Overvoltage -Unexpected external flow
90	Abnormal function mode Pump has stopped but is still functional Check the installation setup and medium	-Failure on another component than pump -Debris in the installation -Bad temperature satup
95	The pump has stopped due to permanent failure	-Pump blocked -Electronic module out of order
100	Problem of iPWM connection	iPWM interface in open circuit



2. Introduction

2.5. Product Components Diagram

Below is a general system application of the heat pump. Any specific configurations should be a variation of this “master” system drawing. All suggested assembly variations are given in Chapter 3.



Name	Symbol	Name	Symbol
Temp. Sensor		Water pump	
Safety valve Kit		Mixing valve	
Ball valve		Motorized valve	
Water filter		Expansion tank	
Air purging valve			

Note: Dotted lines mean “able to be controlled by the Heat Pump”.

2. Introduction

2.6. Technical Specifications

Model			Thermal Plus 6	Thermal Plus 9	Thermal Plus 12
Type	Outdoor unit		Air/water 6kW R32 Monobloc outdoor unit Grey	Air/water 9kW R32 Monobloc outdoor unit Grey	Air/water 12kW R32 Monobloc outdoor unit Grey
IP rating		IPXX	IP34	IP34	IP34
Indoor unit tank version					
Model	Indoor unit tank version		Thermal Plus 6/9/12		
Type			Air/water/tank6-12 kW Monobloc indoor unit White		
IP rating		IPXX	IP34		
Min/max heating capacity (1)		kW	3.5 / 6.5	4.3/9.2	5.5 / 11.6
El. heating power input min/max(1)		W	758 / 1410	927/2097	1107 / 2683
C.O.P min/max(1)		W/W	4.5 / 4.7	4.38/4.71	4.3 / 4.9
Min/max heating capacity (2)		kW	3.15 / 6	3.9/8.6	4.9 / 11.2
El. heating power input min/max(2)		W	943 / 1732	1162/2550	1401 / 3263
C.O.P min/max(2)		W/W	3.34 / 3.56	3.37/3.58	3.3 / 3.5
SCOP - Average climate, low temperature		W	4.74	4.73	4.71
Energy class			A+++	A+++	A+++
Min/max cooling capacity(3)		kW	6.22/7.45	6.7/9.5	- / 9.8
El. cooling power input min/max(3)		W	1400/1863	1679/2242	- / 2510
E.E.R.min/max(3)		W/W	4.05/4.45	4.0/4.6	- / 3.8
Min/max cooling capacity (4) (A35/W7)		kW	3.5/4.5	4.9/7.2	4.9 / 6.5
El. cooling power input min/max(4)		W	1330/1680	1451/2366	1358 / 2444
E.E.R. min/max(4)		W/W	2.5/2.74	2.8/3.1	2.6 / 3.5
Min/max ambient working temp. in heating mode		°C	-25~45		
Min/max ambient working temp. in cooling mode		°C	-1~50		
Max flow temp. in heating mode		°C	55		
Min flow temp. in heating mode		°C	20		
Min flow temp. in cooling mode		°C	7		
WiFi module integrated			yes		
Defrost upon demand			yes		
Heating cable for defrosting			yes		
Compressorpre-heat			yes		
Electronic expansion valve			yes		
Max. Operation High Pressure		bar	42		
Min. Operation Low Pressure		bar	14		
PS Hydrauliccircuit		bar	3		
Min. Floor Area for installation, operation and storage		m2	3.1		
Min. Area Pipe-work		m2	3.1		
Anti- Freeze el. heater	Power supply	V/Hz/	220V/1PH/50Hz		
Anti- Freeze el. heater	Rated power	kW	0.08		
DHW tank indoor unit data					
DHW tank volume neto	Indoor unit tank version	L	250		
DHW tank tube exchangerlength	Indoor unit tank version	m	20+15		
DHW tank tube exchanger diameter	Indoor unit tank version	mm	28		
DHW el heater insered in tank	Indoor unit tank version	kW	0.5		
El. heater for heating water (flow)	Indoor unit tank version	kW	9 (3 X 3)		
Expansions vessel 1 upper one	Heating water tank version	L	6		
Expansions vessel 2 lower one	Heating water tank version	L	5		
DHW tank piping connection	Piping connection heating water	Inch	1		
	Piping connection city water	Inch	1		
	Piping connection city water	Inch	3/4		

2. Introduction

Model			Thermal Plus 6	Thermal Plus 9	Thermal Plus 12
ErP approved circulation pump	Manufacturer		Wilo	Wilo	Wilo
	type		Para 25-130/9-87/IPWM1	Para 25-130/9-87/IPWM1	Para 25-130/9-87/IPWM1
Compressor	Manufacturer		Mitsubishi	Mitsubishi	Mitsubishi
	type		DC inverter (twin rotary)		
Fan	Quantity	pcs	1	1	1
	Airflow	m ³ /h	2500	3150	3150
	Rated power	W	34	45	45
	Blade diameter	mm	φ 496	φ 550	φ 550
	Fan rotation	Direction	counter-clockwise	counter-clockwise	counter-clockwise
Sound power level	Outdoor unit	dB (A)	52	53	52
	Indoor unit tank version	dB (A)	44dB(A)	44dB(A)	44dB(A)
Plate heat exchanger	Manufacturer		SWEP		
	Water press. drop	kPa	26	26	26
	Piping connection	Inch	G1"	G1"	G1"
Minimum water flow for triggering the flow switch		m ³ /h - l/s	0.75/0.21	0.94/0.26	1.44/0.40
Nominal water flow		m ³ /h	1.04	1.55	2.05
Residual current device and overvoltage protection			Required		
Power supply (grounded) Outdoor unit	Outdoor unit	V / Hz / Ph	220/50/1	220/50/1	220/50/1
	Fuse Outdoor unit	A	10A/C	16A/C	25A/C
Power supply (grounded) Indoor unit tank version	Indoor unit tank version	V / Ph / Hz	380V/3PH/50Hz		
	Fuse Indoor unit tank version	A	20A/C-380V		
Refrigerant	type		R 32		
	charge	kg	0.9	1.4	1.8
	GWP (global warming potential)	GWP	GWP: 675	GWP: 675	GWP: 675
	Quantity of hydrofluorocarbons in tonnes of CO ₂ equivalent	t CO ₂ Equiv.	0.608	0.945	1.215
Dimensions net (L x D x H)	Outdoor unit	mm	1010x370x700	1165x370x845	1165x370x845
	Indoor unit tank version	mm	600x680x1780		
Dimensions Brutto (L x D x H) including carton box and palette	Outdoor unit	mm	1040x455x730	1210x455x875	1210x455x875
	Indoor unit tank version	mm	650x750x1960		
Net weight	Outdoor unit	kg	67	80	85
	Indoor unit tank version	kg	125		
Brutto weight including carton box, added manuals, sensors and palette	Outdoor unit	kg	78	95	105
	Indoor unit tank version	kg	135		

- (1) Heating condition: water inlet/outlet temperature: 30 °C/35°C, Ambient temperature: DB 7 °C /WB 6 °C
- (2) Heating condition: water inlet/outlet temperature: 40°C/45°C, Ambient temperature: DB 7 °C /WB 6 °C
- (3) Cooling condition: water inlet/outlet temperature: 23 °C/18°C, Ambient temperature: DB 35 °C /WB 34 °C
- (4) Cooling condition: water inlet/outlet temperature: 12°C/7°C, Ambient temperature: DB 35 °C /WB 34 °C

Thermal Plus 6

GWP: 675: 0,61 tonnes equivalent CO₂, refrigerant/quantity: R32/0,9kg

Thermal Plus 9

GWP: 675: 0,95 tonnes equivalent CO₂, refrigerant/quantity: R32/1,4kg.

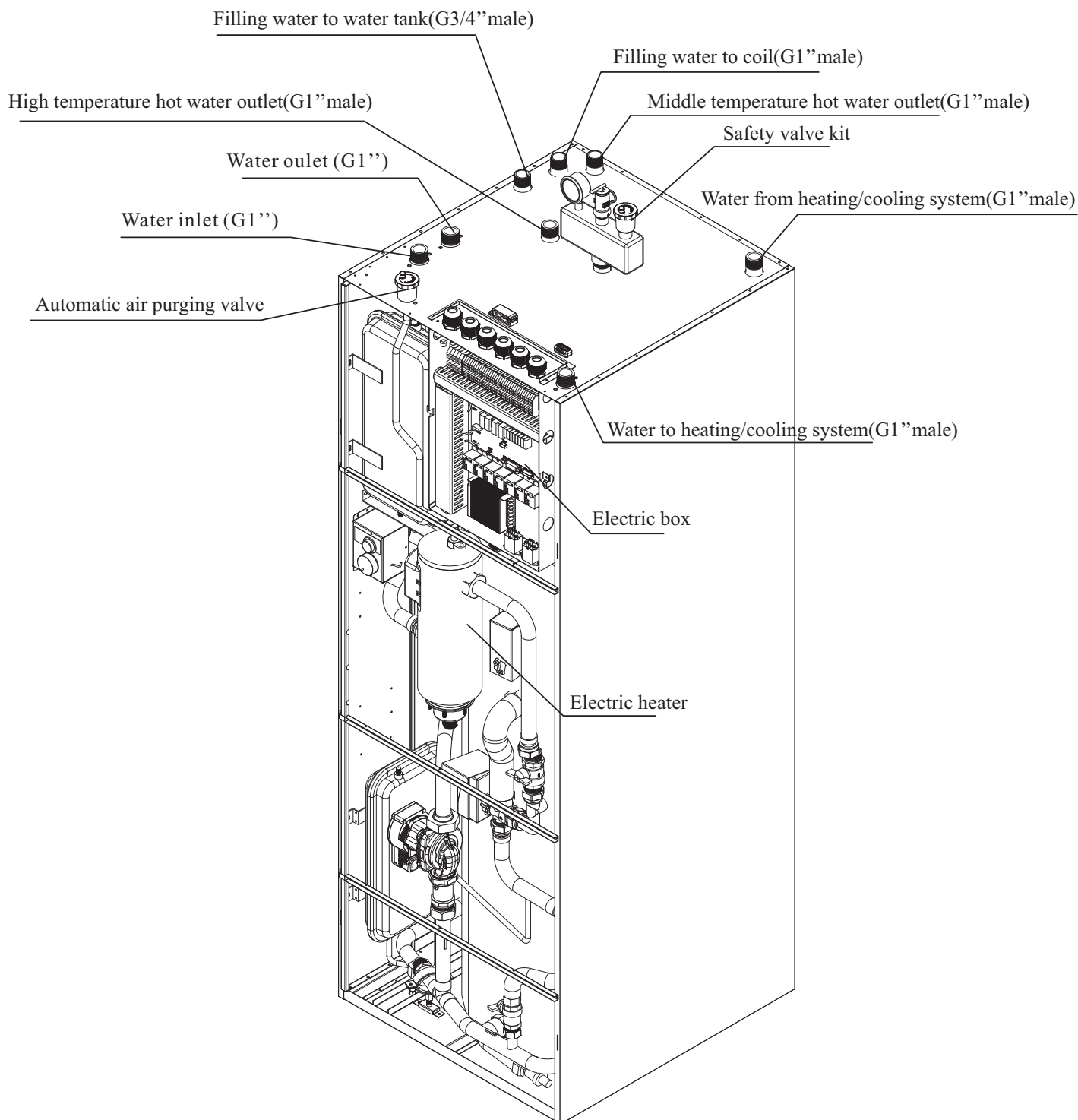
Thermal Plus 12

GWP: 675: 1,22 tonnes equivalent CO₂, refrigerant/quantity: R32/1,8kg.

3. Overview of the Units

3.1. Functional Diagrams

【 Indoor unit 】

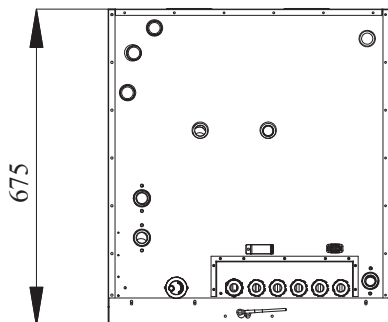
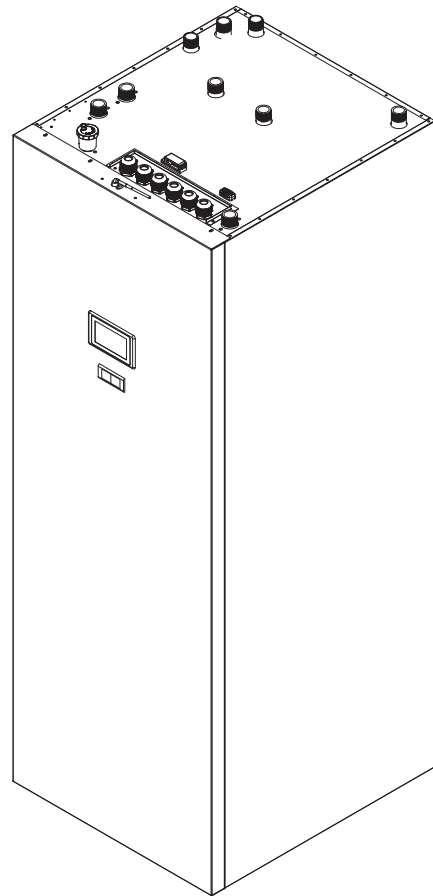
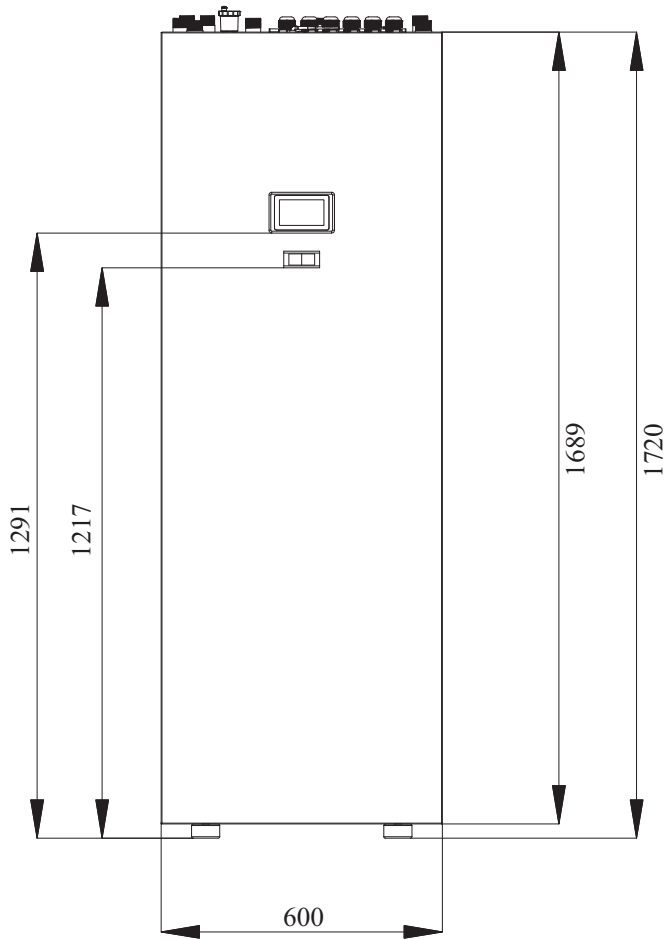


3. Overview of the Units

3.2.Outlines and Dimensions

【 Indoor unit 】

Unit:mm



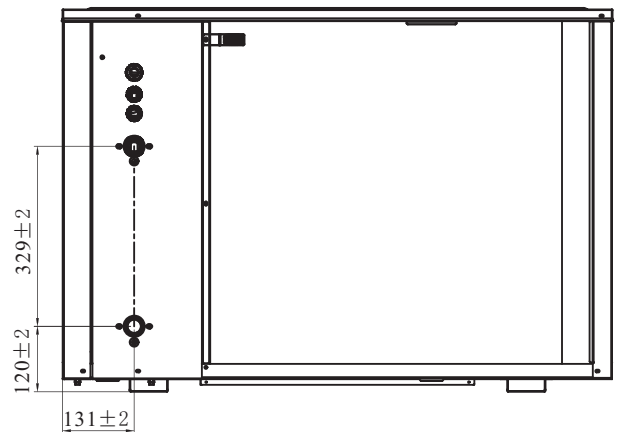
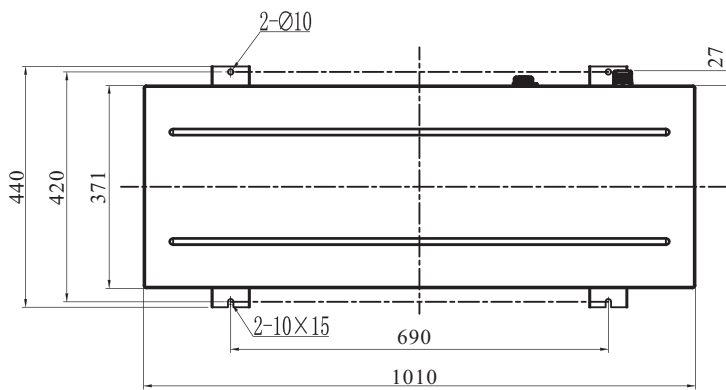
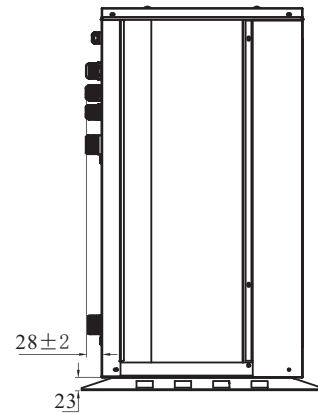
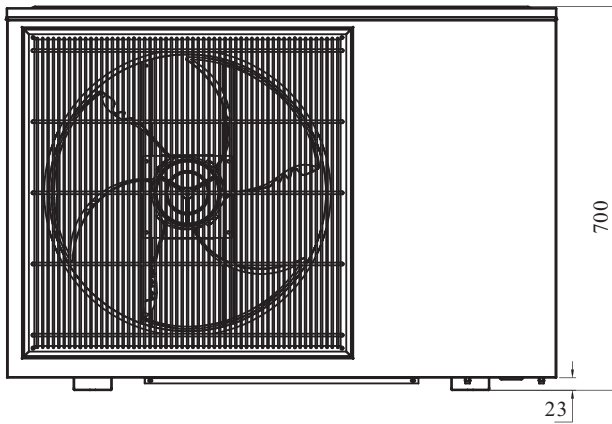
3. Overview of the Units

3.2.Outlines and Dimensions

【Monoblock unit】

Thermal Plus 6

Unit:mm



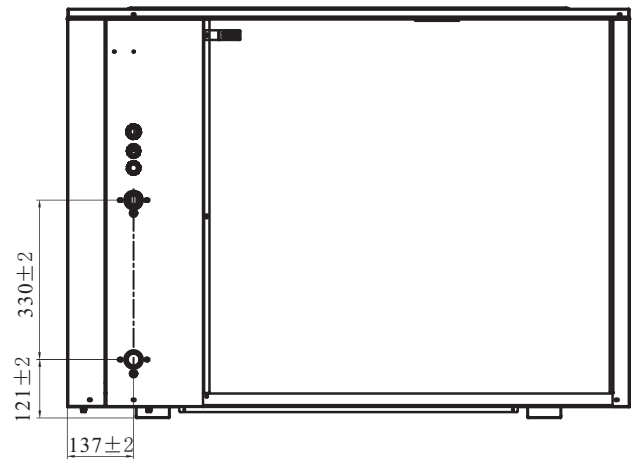
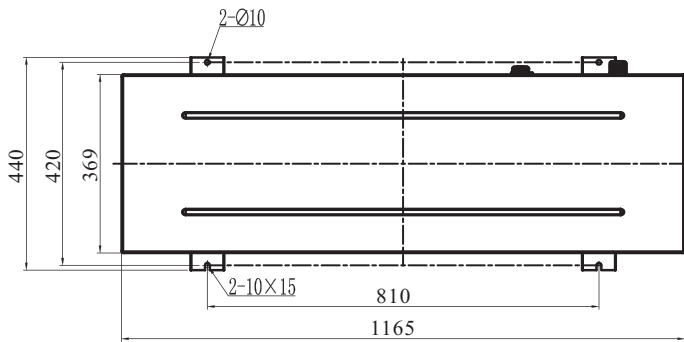
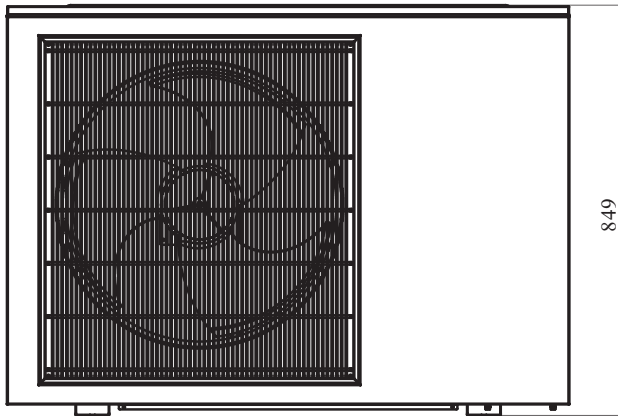
3. Overview of the Units

3.2.Outlines and Dimensions

【Monoblock unit】

Thermal Plus 9/12

Unit:mm

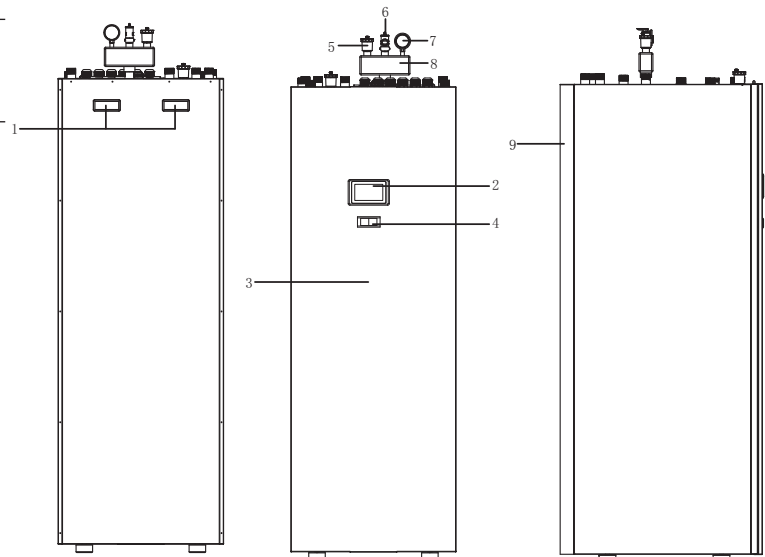


3. Overview of the Units

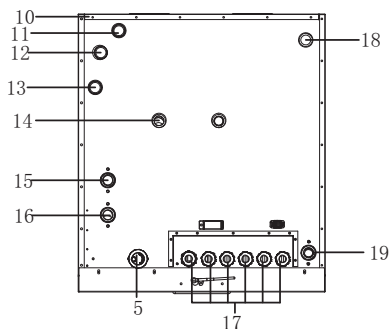
3.3. Exploded view

【 Indoor unit 】

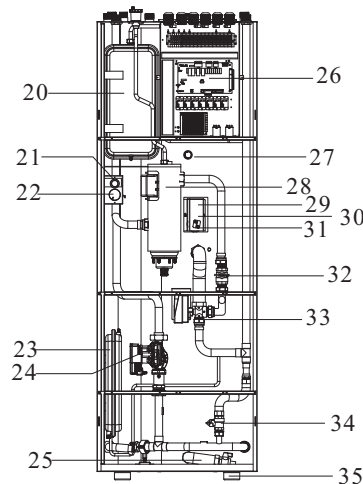
Outside



Top



Inside



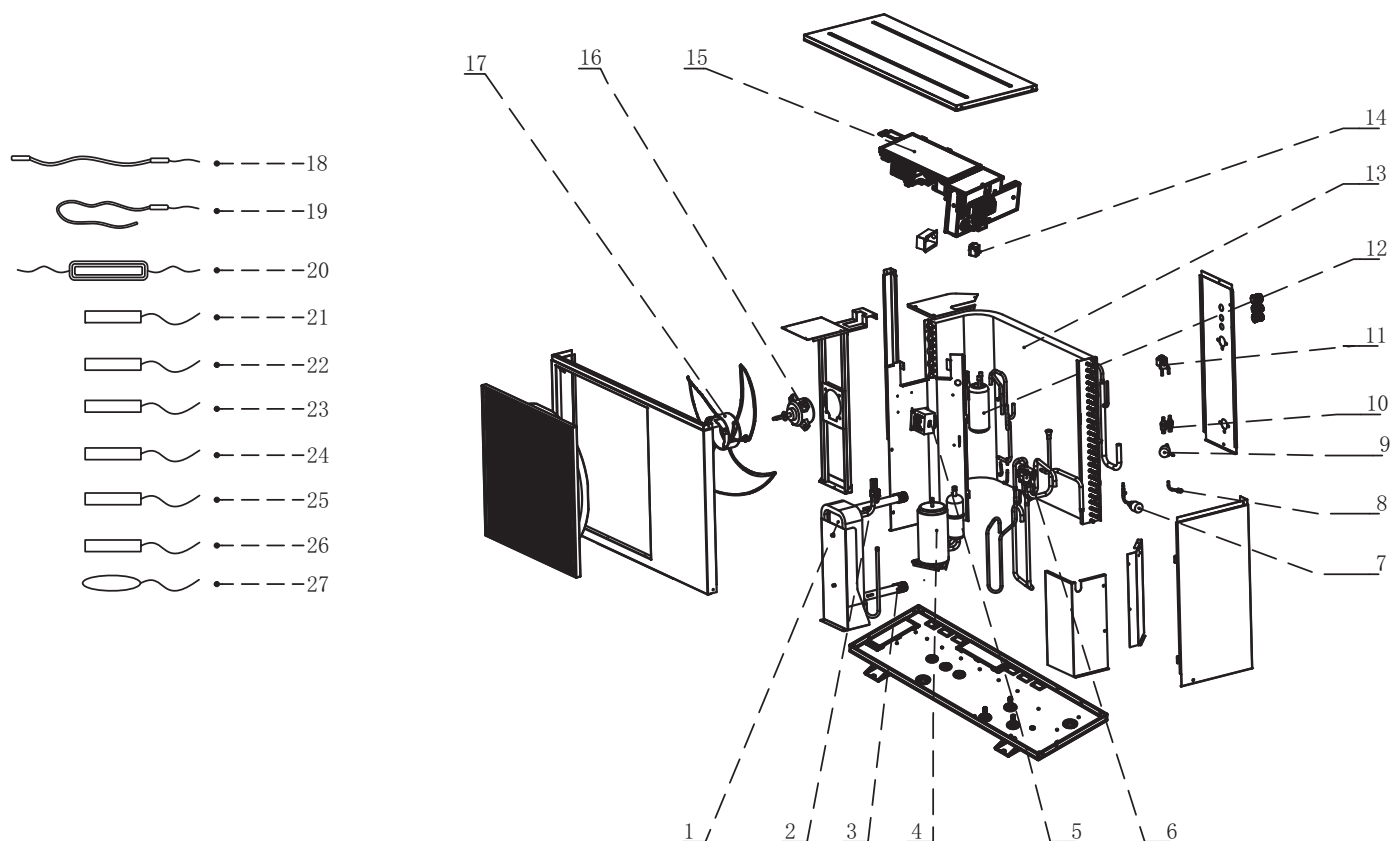
NO.	Name
1	Handle
2	Touch screen operation panel
3	Front panel
4	Digital thermostat
5	Automatic air purging valve
6	T/P valve
7	Water pressure gauge
8	Four-way safety valve kit
9	L type decorative panel in back side 1
10	L type decorative panel in back side 2
11	Middle temperature hot water outlet(G1"male)
12	Filling water to coil(G1"male)
13	Filling water to water tank(G3/4"male)
14	High temperature hot water outlet(G1"male)
15	Water outlet(G1"male)
16	Water Inlet(G1"male)
17	Cable gland
18	Water inlet from heating/cooling system(G1"male)
19	Water outlet to heating/cooling system(G1"male)

NO.	Name
20	Water expansion tank
21	Emergency Switch for 9KW electric heater
22	Thermostat knob
23	5L Expansion Tank
24	Water pump
25	Drainage
26	Indoor PCB
27	Anode Rod
28	9KW electric heater 400V/50Hz/1Ph
29	Overheating protector for 500W electric heater
30	Temperature sensor for 500W electric heater
31	500W electric heater 230V/50Hz/1Ph
32	Water valve(G1")
33	Motorized three-way valve
34	Water valve(G3/4")
35	Rubber absorber feet

3. Overview of the Units

3.3. Exploded view

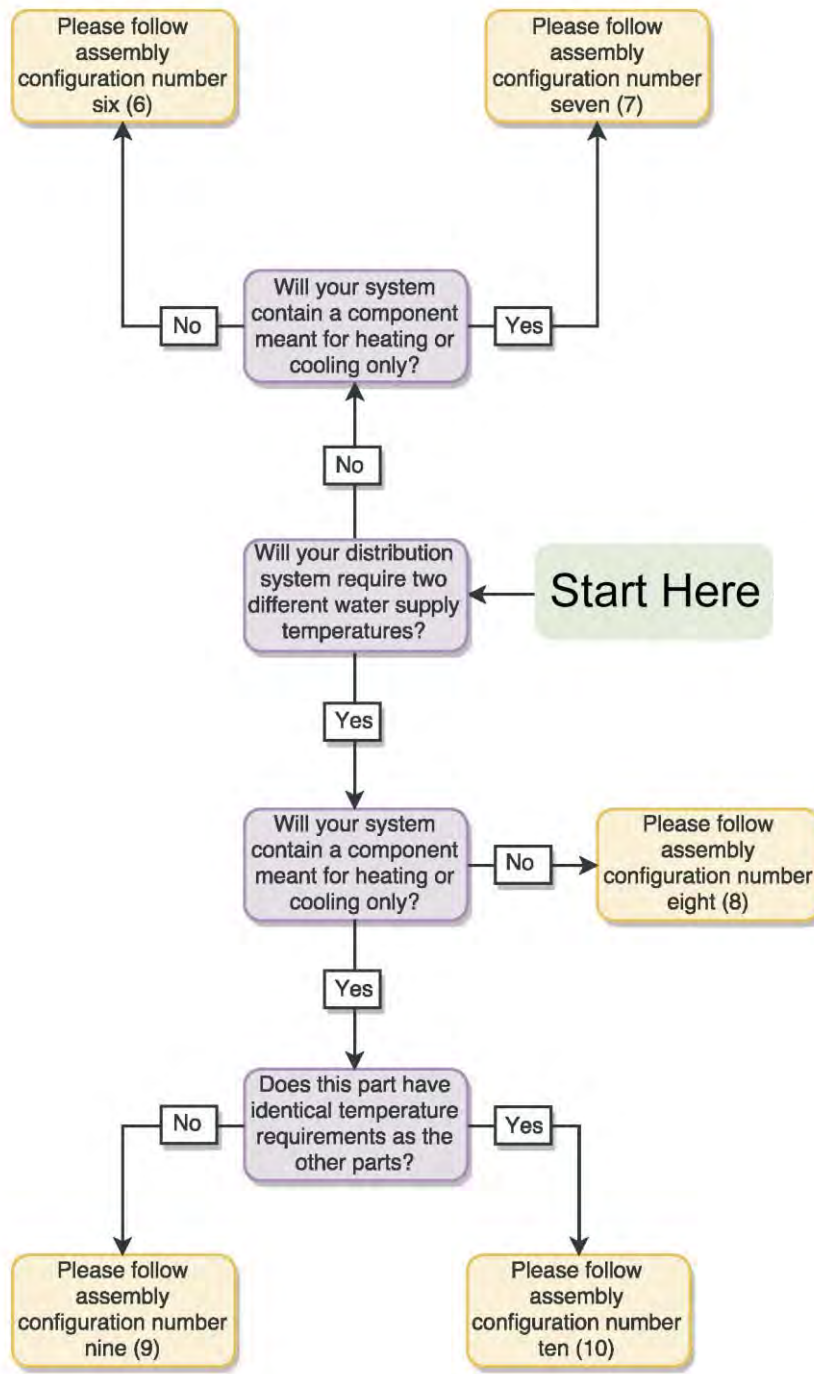
Outdoor unit:



NO	Name	NO	Name	NO	Name
1	Plate heat exchanger	10	Filter	19	Bottom tray heater
2	Water flow switch	11	Electronic expansion valve	20	Heater for plate heat exchanger
3	water inlet pipe	12	Liquid receiver	21	Water inlet temperature sensor
4	Compressor	13	Evaporator	22	Water outlet temperature sensor
5	Inductor	14	Thermostat	23	Compressor discharge temperature sensor
6	Four-way valve	15	Main PCB	24	Compressor suction temperature sensor
7	High pressure sensor	16	Fan motor	25	Outdoor coil temperature sensor
8	Needle valve	17	Fan blade	26	Indoor coil temperature sensor
9	Low pressure sensor	18	Compressor crankcase heater	27	Ambient temperature sensor

4. Assembly Configurations - Flowchart

Locate the Configuration that Meets Your Needs



Follow the flowchart on the right in order to locate which of the assembly configuration matches the needs of the end user, each of which contains specific assembly and wiring diagrams, with software instructions.

Beginning from the green "Start Here" bubble, follow the appropriate arrows to each question, which are dependent on the needs of the user.

The corresponding assembly instructions will be found by turning to the page number in the end bubble.

Note: *The instructions in this section are meant to achieve the minimum requirements for successful system operation only.*

For more in-depth settings explanations, please refer to the user's manual.

4. Assembly Configurations – Drawing 1

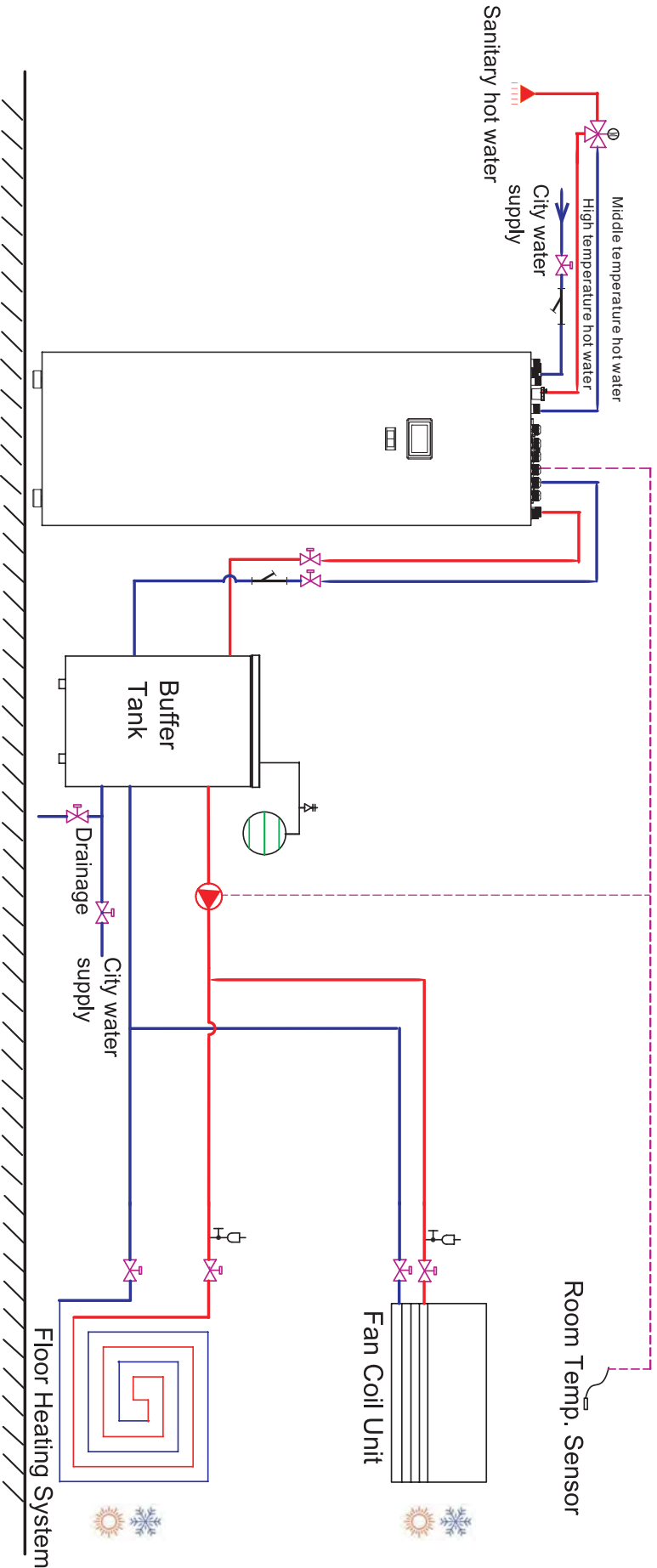
Please ensure that the configuration matches the assembly drawing depicted on the right for a one temperature zone setup that includes domestic hot water.

Note: Refer to the next page for wiring and software operation instructions.

Name	Symbol	Name	Symbol
Temp. Sensor		Water pump	
Safety valve Kit		Mixing valve	
Ball valve		Motorized valve	
Water filter		Expansion tank	
Air purging valve			

Note: Dotted lines mean "able to be controlled by the Heat Pump". distribution systems.

Notice: The Fan Coil Unit, Floor Heating System, and Radiator are placeholder distribution systems only and can be substituted by any other appropriate

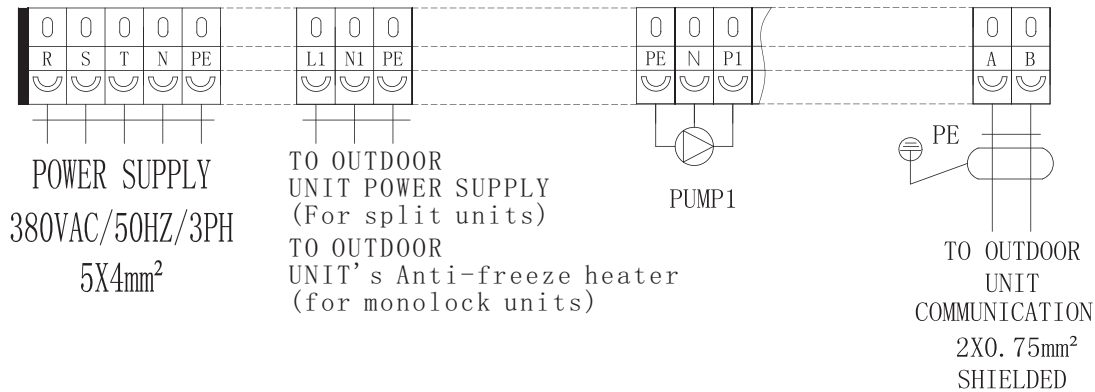


One Temperature Zone, without DHW

4. Assembly Configurations – Drawing 1

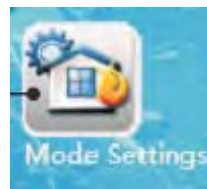
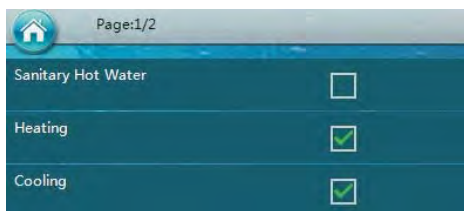
Assembly 1: Wiring Diagram

To achieve successful operation at a minimum, ensure the ports below are properly connected.



Software: Basic Settings

1. Set the needed working modes of the unit via the menu



2. Temperature configuration options for Heating/Cooling circuit 1 are found under

H.Configuring the set water heating temperatures:

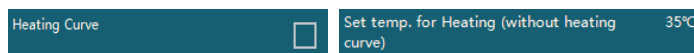
H.1.Setting a heating curve:



Ambient Temp. 1	25°C
Ambient Temp. 2	-15°C
Ambient Temp. 3	-5°C
Ambient Temp. 4	5°C
Ambient Temp. 5	10°C

Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:

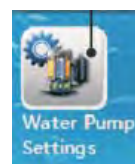
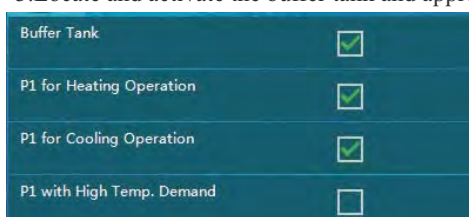


C.Configuring the set water cooling temperature (if applicable):



If cooling function is desired, ensure these sections are configured.

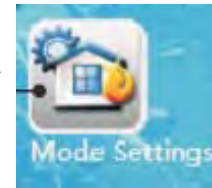
3. Locate and activate the buffer tank and appropriate pumps under



4. Assembly Configurations – Drawing 1

Software: Basic Settings (continued)

4. Double-check to ensure that the Domestic Hot Water option is enabled under



5. Configure the desired setpoint for water temperature (default set to 50°C):



4. Assembly Configurations – Drawing 2

Please ensure that the configuration matches the assembly drawing depicted on the right for a one temperature zone setup that includes domestic hot water; that also includes a component circuit capable of heating or cooling only, through the use of a two-way motorized valve.

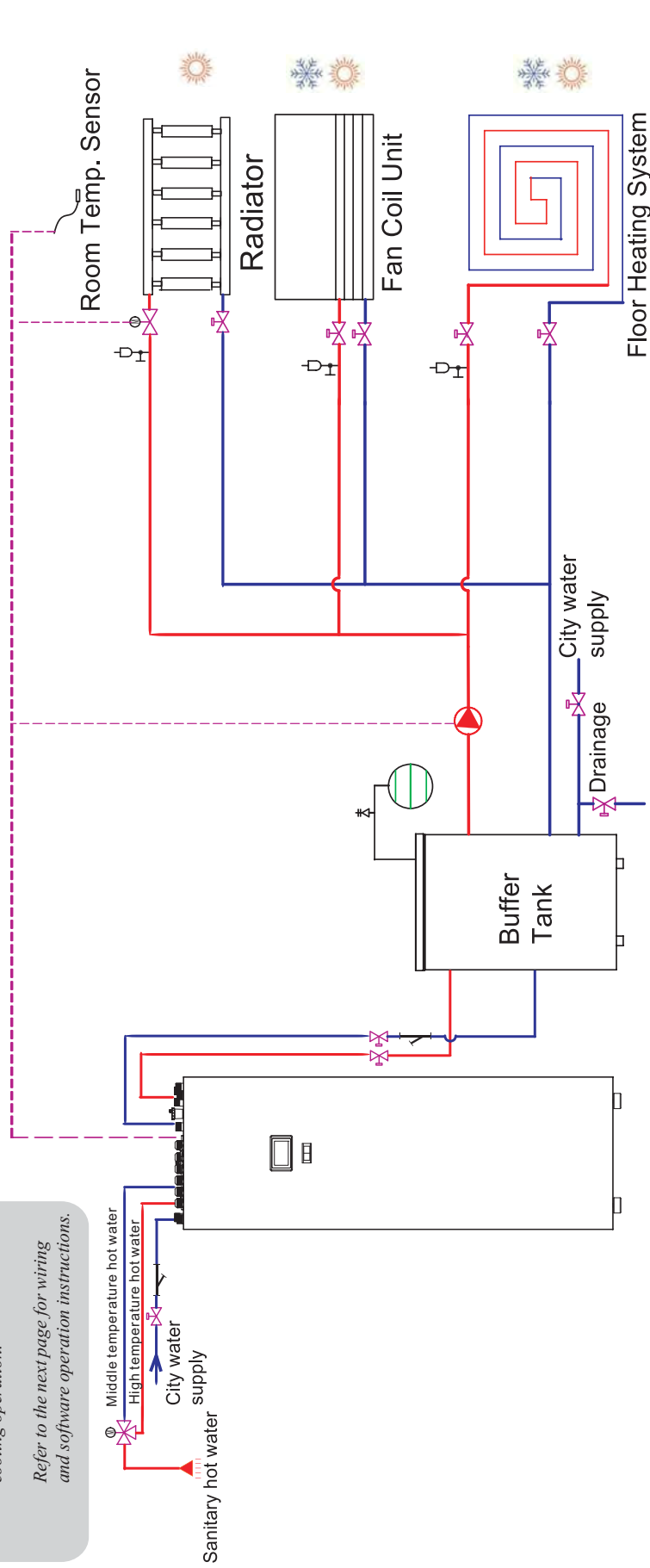
Note: For the cooling-only or heating-only circuit, a motorized two-way valve can be connected to the unit, to cut the water supply during heating or cooling operation.

Refer to the next page for wiring and software operation instructions.

Name	Symbol	Name	Symbol
Temp. Sensor		Water pump	
Safety valve Kit		Mixing valve	
Ball valve		Motorized valve	
Water filter		Expansion tank	
Air purging valve			

Notice: The Fan Coil Unit, Floor Heating System, and Radiator are placeholder distribution systems only and can be substituted by any other appropriate distribution systems.

Note: Dotted lines mean "able to be controlled by the Heat Pump".

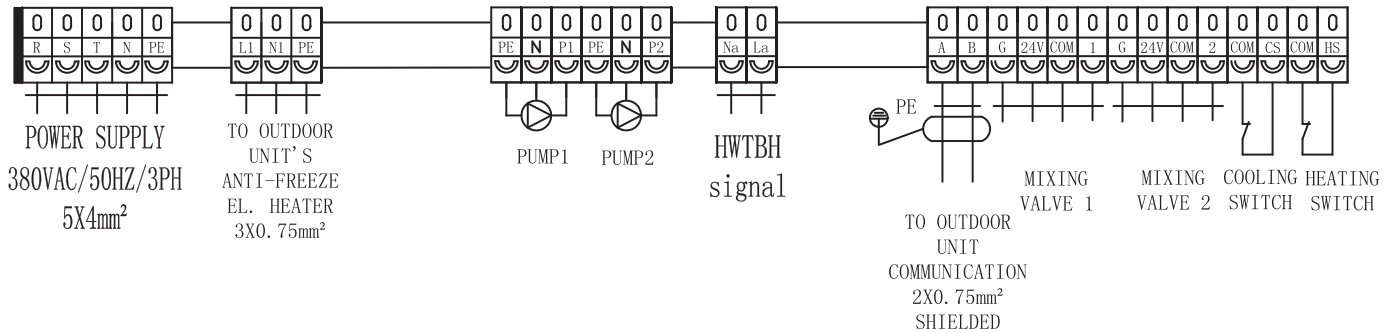


One Temperature Zone, without DHW, with a heating-only (or cooling-only) circuit, by usage of a motorized 2-way valve

4. Assembly Configurations – Drawing 2

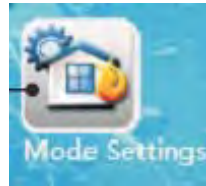
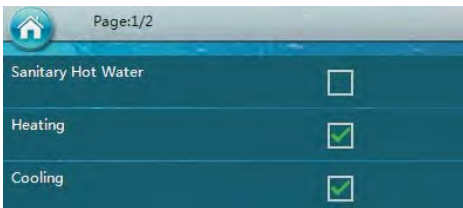
Assembly 2: Wiring Diagram

To achieve successful operation at a minimum, ensure the ports below are properly connected.



Software: Basic Settings

1. Set the needed working modes of the unit via the menu



2. Temperature configuration options for Heating/Cooling circuit 1 are found under

H. Configuring the set water heating temperatures:

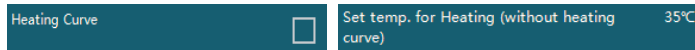
H.1. Setting a heating curve:



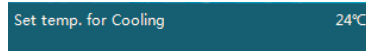
Ambient Temp. 1	25°C
Ambient Temp. 2	-15°C
Ambient Temp. 3	-5°C
Ambient Temp. 4	5°C
Ambient Temp. 5	10°C

Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:

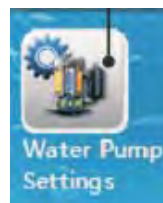


C. Configuring the set water cooling temperature (if applicable):



If cooling function is desired, ensure these sections are configured.

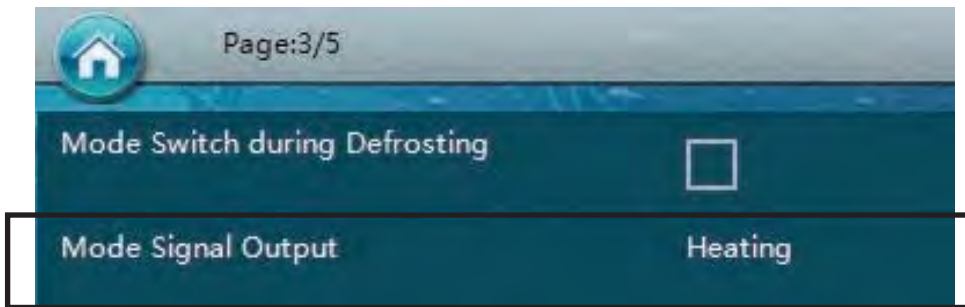
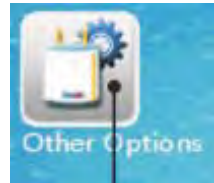
3. Locate and activate the buffer tank and appropriate pumps under



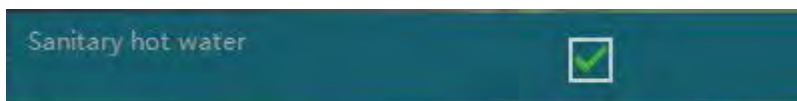
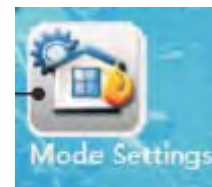
4. Assembly Configurations – Drawing 2

Software: Basic Settings (continued)

4. The location of the configuration for heating-only or cooling-only system is under



5. Double-check to ensure that the Domestic Hot Water option is enabled under



6. Configure the desired setpoint for water temperature (default set to 50°C):



4. Assembly Configurations – Drawing 3

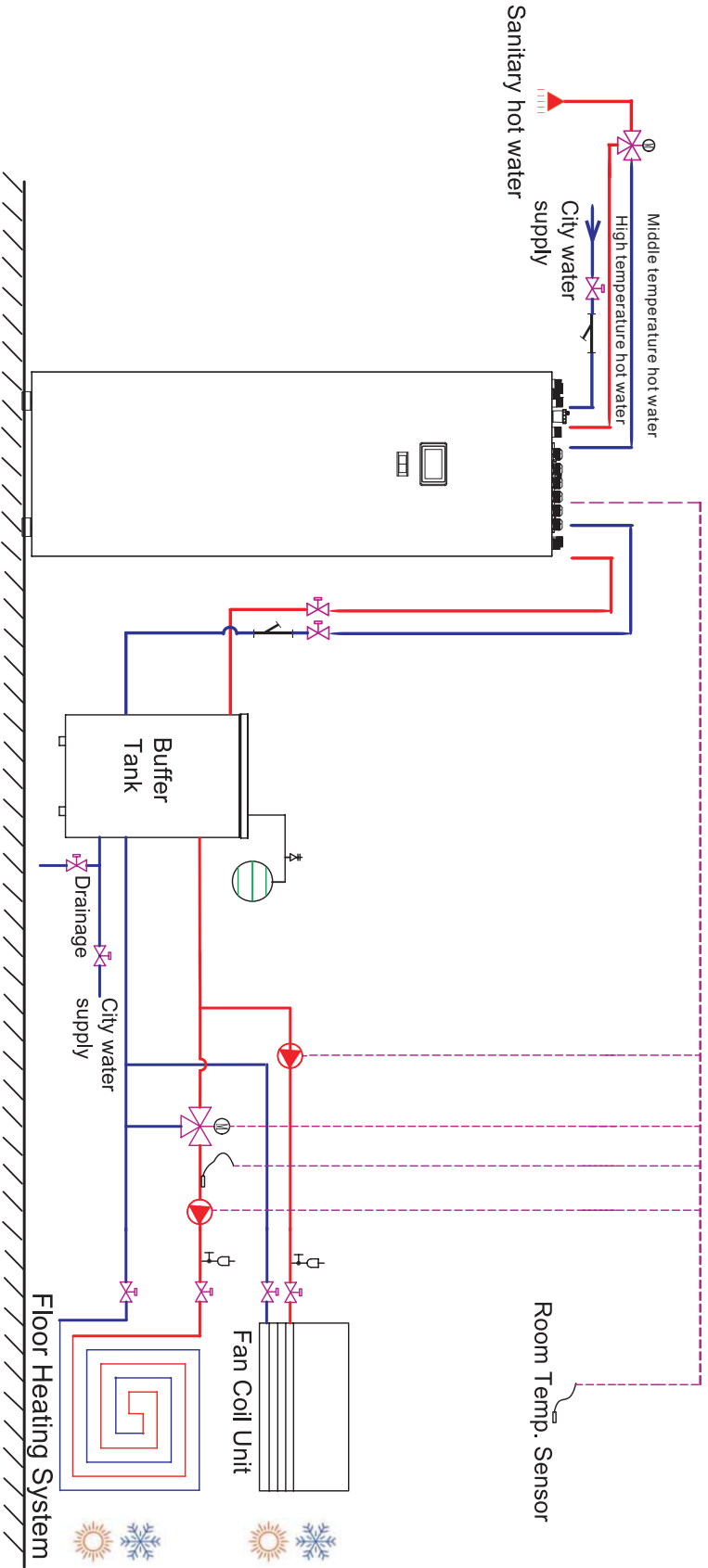
Please ensure that the configuration matches the assembly drawing depicted on the right for a two temperature zone setup that includes domestic hot water.

Note: Refer to the next page for wiring and software operation instructions.

Name	Symbol	Name	Symbol
Temp. Sensor		Water pump	
Safety valve Kit		Mixing valve	
Ball valve		Motorized valve	
Water filter		Expansion tank	
Air purging valve			

Note: Dotted lines mean "able to be controlled by the Heat Pump".

Notice: The Fan Coil Unit, Floor Heating System, and Radiator are placeholder distribution systems only and can be substituted by any other appropriate distribution systems.

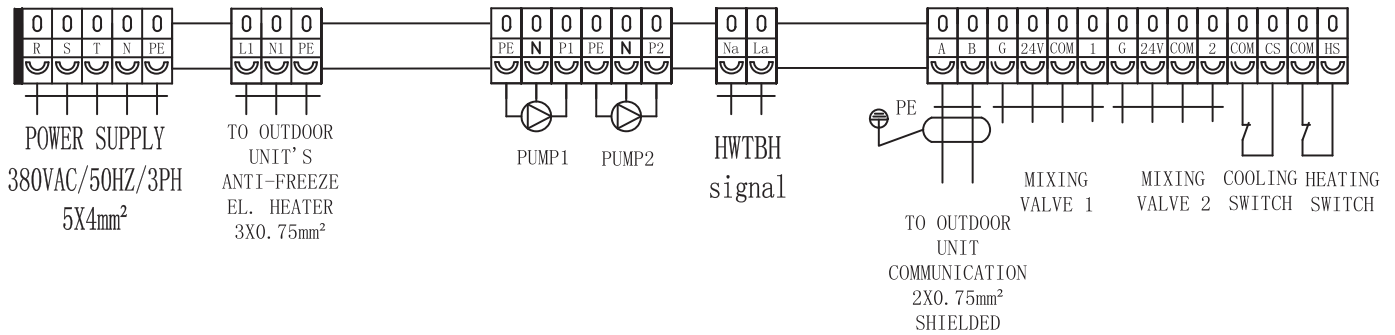


Two Temperature Zone, with DHW

4. Assembly Configurations – Drawing 3

Assembly 3: Wiring Diagram

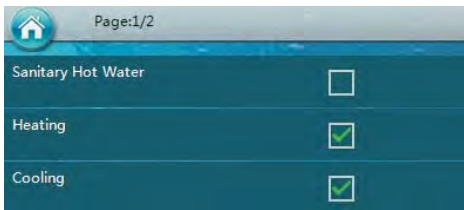
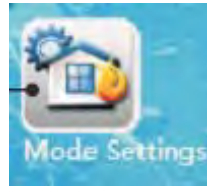
To achieve successful operation at a minimum, ensure the ports below are properly connected.



For connection for mixing valve 2, please refer to the appendix A (on page 106-107) of this manual for more information.

Software: Basic Settings

1. Set the needed working modes of the unit via the menu



2. Temperature configuration options for Heating/Cooling circuit 1 are found under

H.Configuring the set water heating temperatures:

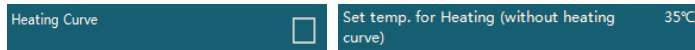


H.1.Setting a heating curve:

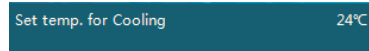


Ambient Temp. 1	25°C	Water Temp. A/Ambient Temp. 1	40°C
Ambient Temp. 2	-15°C	Water Temp. B/Ambient Temp. 2	37°C
Ambient Temp. 3	-5°C	Water Temp. C/Ambient Temp. 3	33°C
Ambient Temp. 4	5°C	Water Temp. D/Ambient Temp. 4	29°C
Ambient Temp. 5	10°C	Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:

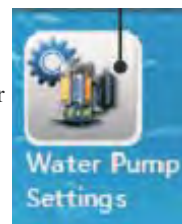


C.Configuring the set water cooling temperature (if applicable):



If cooling function is desired, ensure these sections are configured.

3. Locate and activate the buffer tank and appropriate pumps under



4. Assembly Configurations – Drawing 3

Software: Basic Settings (continued)

3.(cont.) Configure the water pump to operate for heating or cooling:



4. Temperature configuration options for Heating/Cooling circuit 2 are found under

Please activate entire Heating/Cooling circuit 2 setting

H. configuring the set water heating temperatures:

H.1. Setting a heating curve:



Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:



Set Temp. for Heating (without heating curve)	35°C
---	------

C. Configuring the set water cooling temperature (if applicable):

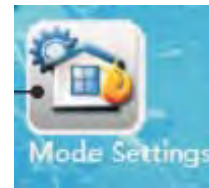


4.1. Activate the mixing valve to manage the second circuit:



Note: This pair of settings will interpret “Heating/Cooling Circuit 2 as the low demand distribution system, requiring a lower set temperature for heating and higher set temperature for cooling.

5. Double-check to ensure that the Domestic Hot Water option is enabled under



6. Configure the desired setpoint for water temperature (default set to 50°C):



Dependent on whether cooling is needed

4. Assembly Configurations – Drawing 4

Please ensure that the configuration matches the assembly drawing depicted on the right for a two temperature zone setup that includes domestic hot water, also that includes a component circuit capable of heating or cooling only, through the use of a two-way motorized valve.

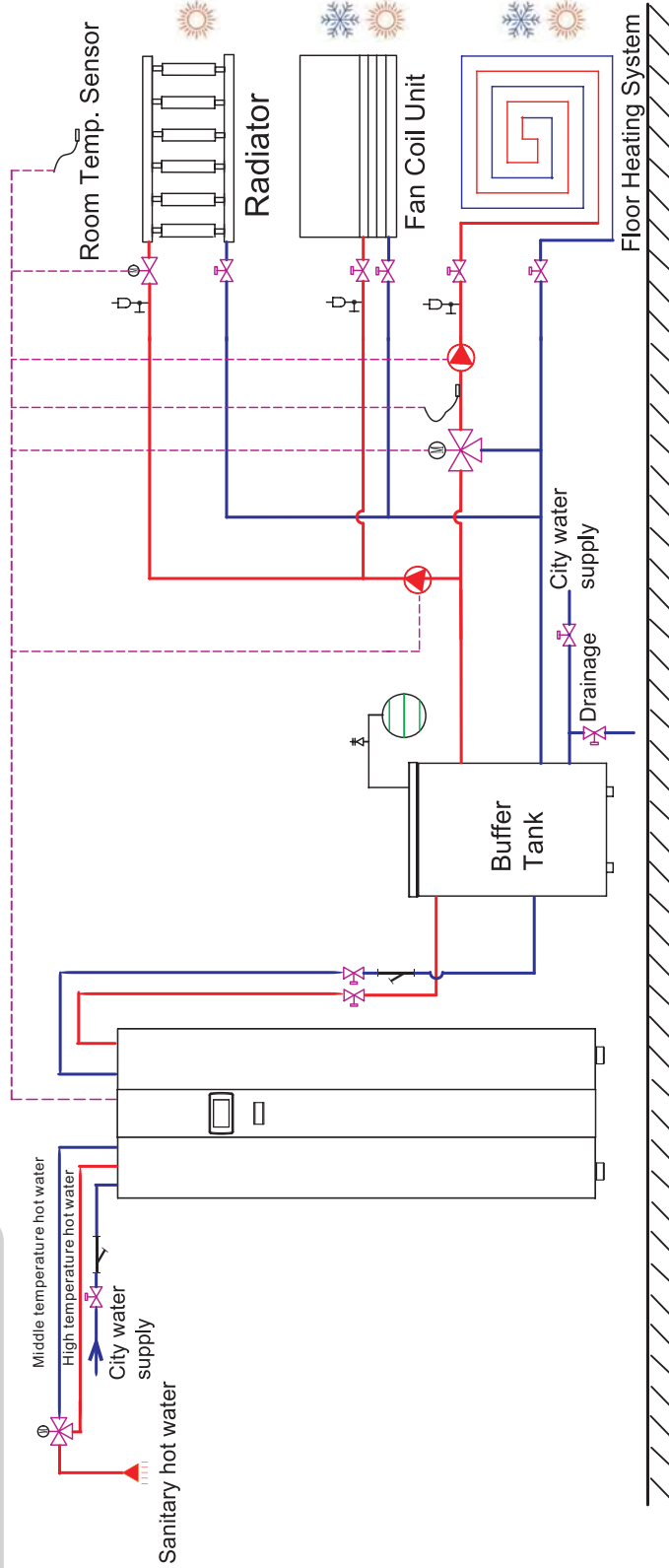
Note: For the cooling-only or heating-only circuit, a motorized two-way valve can be connected to the unit, to cut the water supply during heating or cooling operation.

Refer to the next page for wiring and software operation instructions.

Notice: The Fan Coil Unit, Floor Heating System, and Radiator are placeholder distribution systems only and can be substituted by any other appropriate distribution systems.

Name	Symbol	Name	Symbol
Temp. Sensor		Water pump	
Safety valve Kit		Mixing valve	
Ball valve		Motorized valve	
Water filter		Expansion tank	
Air purging valve			

Note: Dotted lines mean "able to be controlled by the Heat Pump".

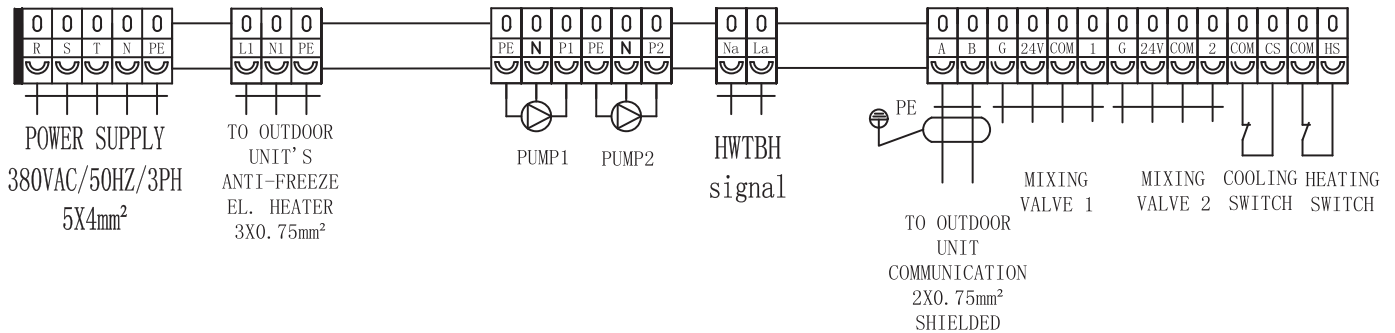


Two Temperature Zones , without DHW, with a heating-only (or cooling-only) circuit, by usage of a motorized 2-way valve

4. Assembly Configurations – Drawing 4

Assembly 4: Wiring Diagram

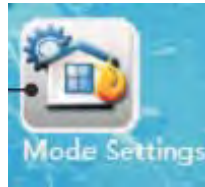
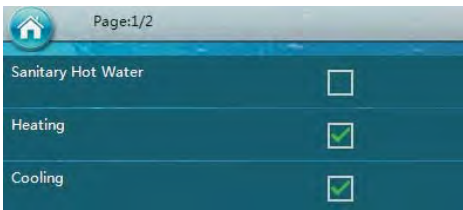
To achieve successful operation at a minimum, ensure the ports below are properly connected.



For connection for mixing valve 2, please refer to the appendix A (on page 106-107) of this manual for more information.

Software: Basic Settings

1. Set the needed working modes of the unit via the menu



2. Temperature configuration options for Heating/Cooling circuit 1 are found under

H. Configuring the set water heating temperatures:

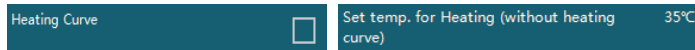
H.1. Setting a heating curve:



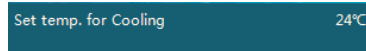
Ambient Temp. 1	25°C
Ambient Temp. 2	-15°C
Ambient Temp. 3	-5°C
Ambient Temp. 4	5°C
Ambient Temp. 5	10°C

Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:

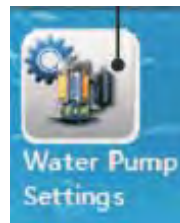


C. Configuring the set water cooling temperature (if applicable):



If cooling function is desired, ensure these sections are configured.

3. Locate and activate the buffer tank and appropriate pumps under



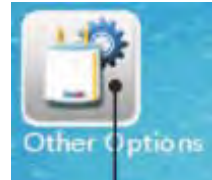
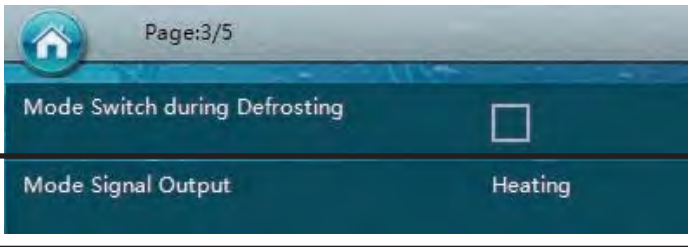
4. Assembly Configurations – Drawing 4

Software: Basic Settings (continued)

3.(cont.) Configure the water pump to operate for heating or cooling:



4. The location of the configuration for heating-only or cooling-only system is under



5. Temperature configuration options for Heating/Cooling circuit 2 are found under

H. configuring the set water heating temperatures:

H.1. Setting a heating curve:



Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:



Set Temp. for Heating (without heating curve)	35°C
---	------

C. Configuring the set water cooling temperature (if applicable):

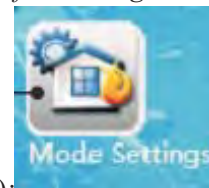


5.1. Activate the mixing valve to manage the second circuit:



Note: This pair of settings will interpret “Heating/Cooling Circuit 2 as the low demand distribution system, requiring a lower set temperature for heating and higher set temperature for cooling.

6. Double-check to ensure that the Domestic Hot Water option is enabled under



7. Configure the desired setpoint for water temperature (default set to 50°C):



Dependent on whether cooling is needed

4. Assembly Configurations – Drawing 5

Please ensure that the configuration matches the assembly drawing depicted on the right for a two temperature zone setup that includes domestic hot water, also that utilizes the secondary pump for a heating-only operation.

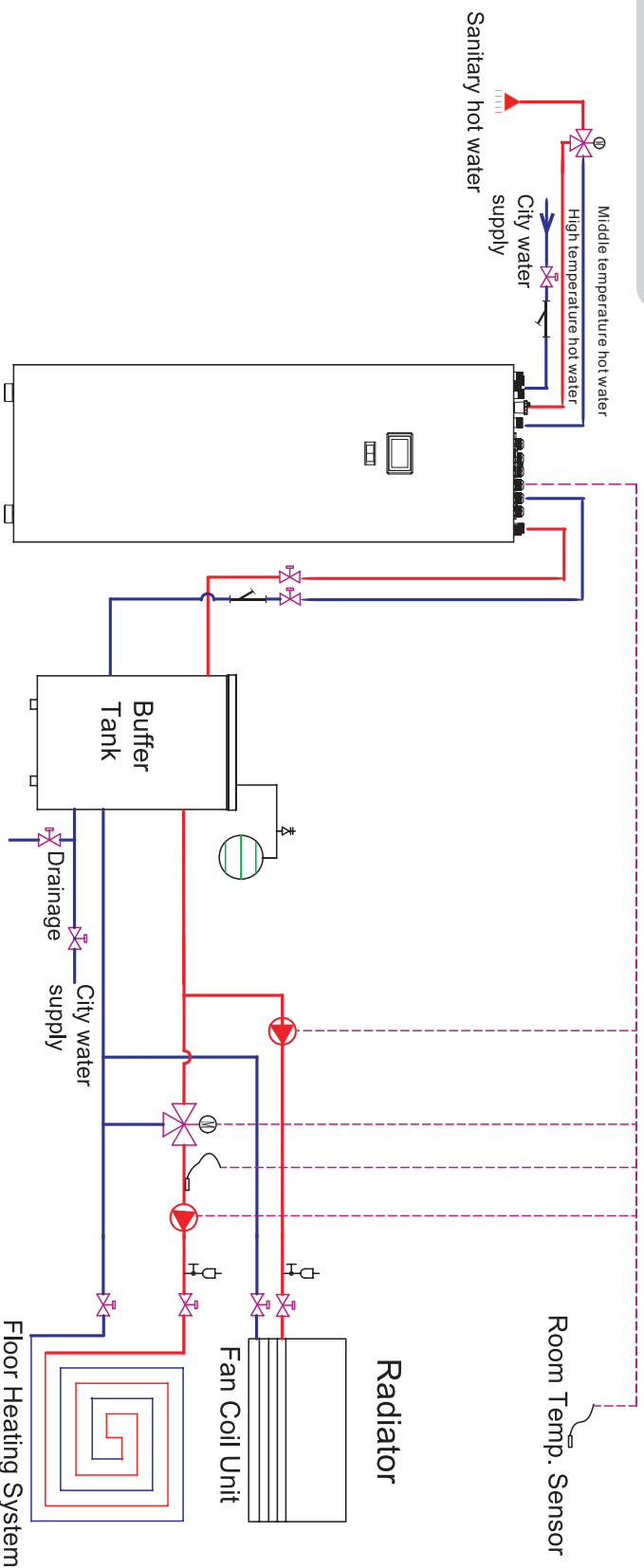
Note: For the heating-only circuit, a motorized two-way valve can be connected to the unit, to cut the water supply during heating operation.

Refer to the next page for wiring and software operation instructions.

Name	Symbol	Name	Symbol
Temp. Sensor		Water pump	
Safety valve Kit		Mixing valve	
Ball valve		Motorized valve	
Water filter		Expansion tank	
Air purging valve			

Note: Dotted lines mean "able to be controlled by the Heat Pump".

Notice : The Fan Coil Unit, Floor Heating System, and Radiator are placeholder distribution systems only and can be substituted by any other appropriate distribution systems.

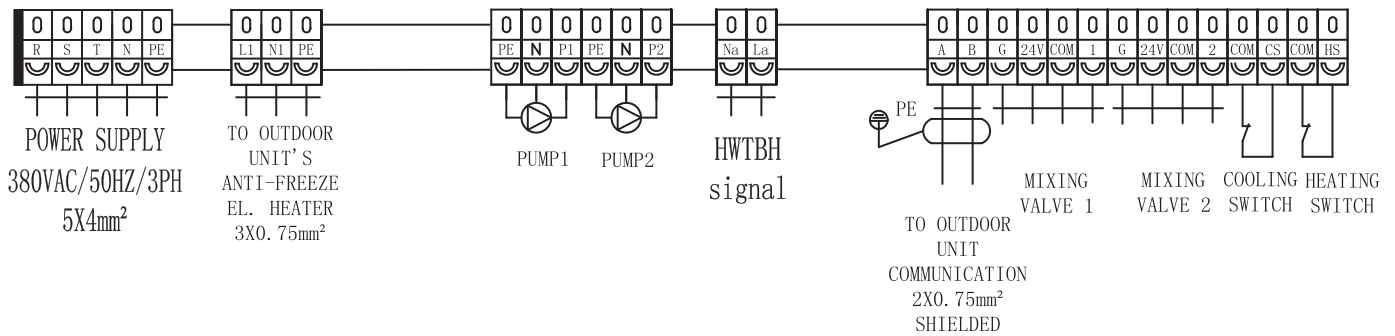


Two Temperature Zones , without DHW, with a heating-only circuit, by setting the secondary pump to heating-only

4. Assembly Configurations – Drawing 5

Assembly 5: Wiring Diagram

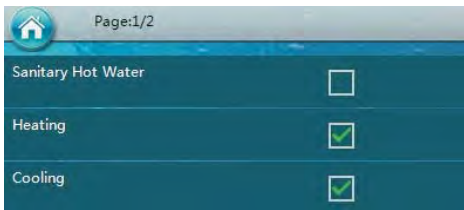
To achieve successful operation at a minimum, ensure the ports below are properly connected.



For connection for mixing valve 2, please refer to the appendix A (on page 106-107) of this manual for more information.

Software: Basic Settings

1. Set the needed working modes of the unit via the menu



2. Temperature configuration options for Heating/Cooling circuit 1 are found under

H. Configuring the set water heating temperatures:

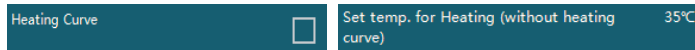
H.1. Setting a heating curve:



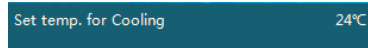
Ambient Temp. 1	25°C
Ambient Temp. 2	-15°C
Ambient Temp. 3	-5°C
Ambient Temp. 4	5°C
Ambient Temp. 5	10°C

Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

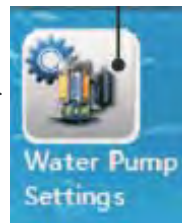
H.2. If no heating curve is desired:



C. Configuring the set water cooling temperature (if applicable):



3. Locate and activate the buffer tank and appropriate pumps under



If cooling function is desired, ensure these sections are configured.

4. Assembly Configurations – Drawing 5

Software: Basic Settings (continued)

3.(cont.) Configure the water pump to operate for heating or cooling:



4. Temperature configuration options for Heating/Cooling circuit 2 are found under

H. configuring the set water heating temperatures:

H.1. Setting a heating curve:



Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:



Set Temp. for Heating (without heating curve)	35°C
---	------

C. Configuring the set water cooling temperature (if applicable):

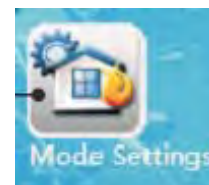


4.1. Activate the mixing valve to manage the second circuit:



Note: This pair of settings will interpret “Heating/Cooling Circuit 2 as the low demand distribution system, requiring a lower set temperature for heating and higher set temperature for cooling.

5. Double-check to ensure that the Domestic Hot Water option is enabled under



6. Configure the desired setpoint for water temperature (default set to 50°C):



5. Installation Walkthrough

5.1. Sanitary Hot Water Configurations

5.1.1. Note about the Heating/Cooling Distribution System

Users are heavily recommended to install a buffer tank into the chosen configuration, especially when the method of hot water distribution is below 20L/W of water volume.

The buffer tank should be installed between the heat pump and the distribution system, in order to:

- Ensure the heat pump unit provides a stable and sufficient water flow rate.
- Minimize fluctuation of the system's heating/cooling load by storing unused heat.
- Increase capacity of water volume distribution, which helps ensure proper heat pump operation.

If the method of hot water distribution is capable of dispersing a large enough flow rate, a buffer tank can be excluded from installation into the configuration. If so, please move the cooling/heating temperature sensor (TC, #10 on page 1) to the water return pipe, so that fluctuations of water temperature due to compressor speed changes are minimized.

5. Installation Walkthrough

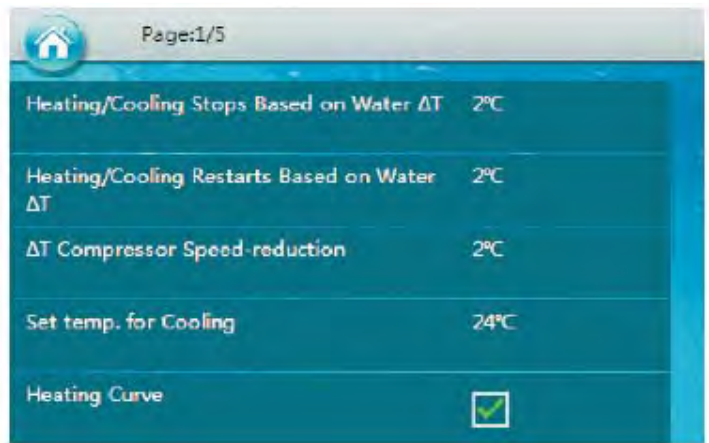
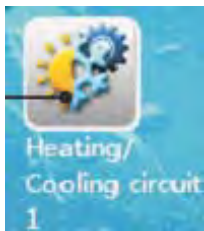
5.2. Heating and Cooling Circuits

This heat pump unit is capable of controlling two completely different heating and cooling circuits, as shown in the following images.

Configuring the temperatures for circuits 1 and 2 can be done via the “Heating and Cooling Circuit” menus.

If only one circuit is desired, then “Heating and Cooling Circuit 2” can be set to OFF.

5.2.1. Heating & Cooling Circuits

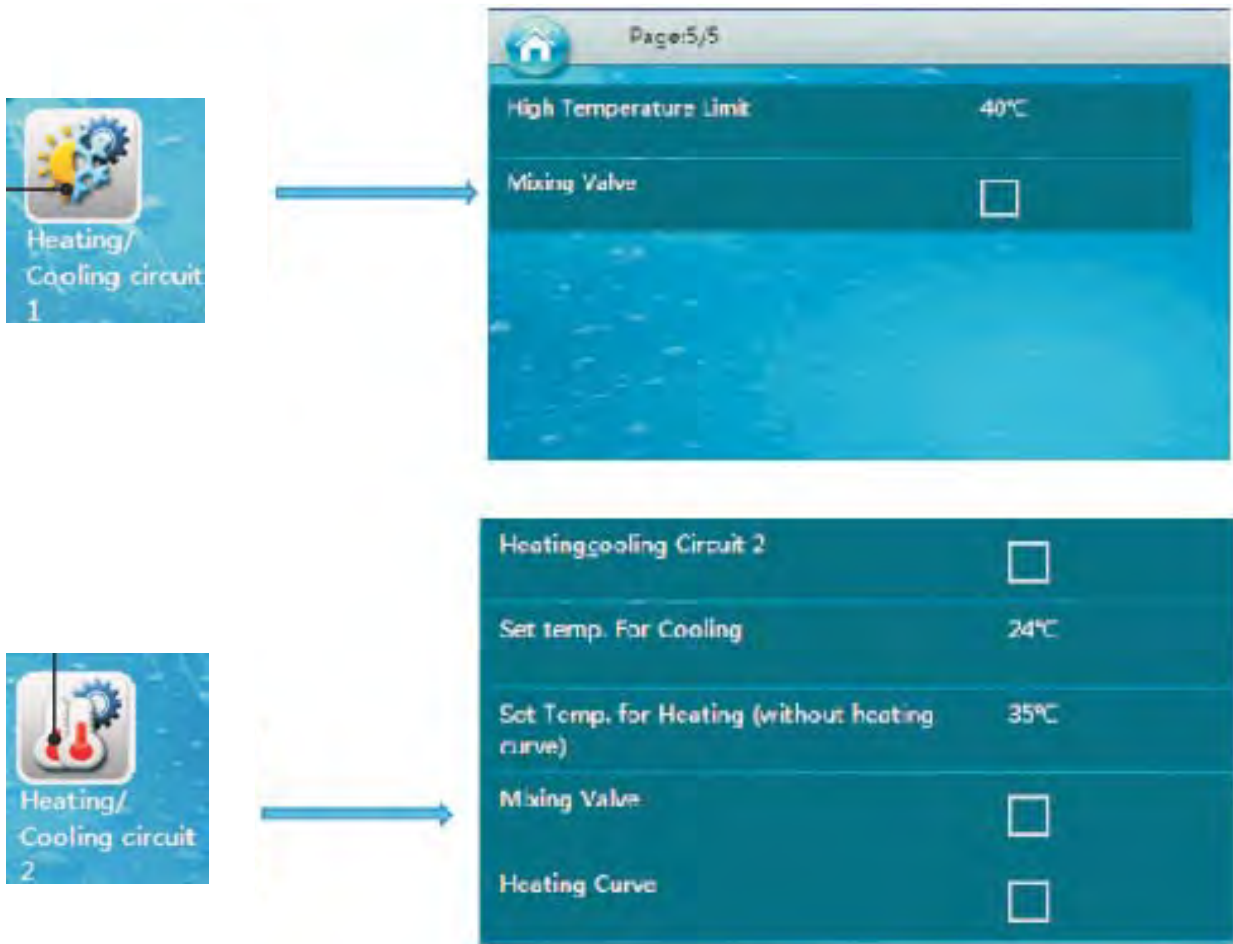


The basic understanding of these settings is found under your the software section of your particular assembly walkthrough in Chapter 3. A more detailed explanation can be located in the user’s manual.

5. Installation Walkthrough

5.2. Heating and Cooling Circuits

5.2.2. Mixing Valves MV1 and MV2



If the system water temperature may be higher (or lower) than the temperatures needed for circuit 1 (or circuit 2) in a heating or cooling operation, then a mixing valve can be added to the circuit, and connected to the MV1 (or MV2) port on the indoor unit.

The unit will control the mixing valve, continuously mix the supply, and return the water of the circuit to have its temperature read via the TV1 (or TV2) until the value set under the above menus is achieved.

TV1 and/or TV2 should be activated on the installer's level via the "Heating and Cooling Circuit" menu.

Note: A mixing valve is needed, if:

- The system has two circuits that require different water temperatures. The heat pump will have to take the higher/lower (depending on whether heating/cooling) settings of the two circuits as the set temperature for the heat pump. The mixing valve ensures correct water temperature circulation in this instance.
- The system has other heating sources inside that are not controlled by the heat pump. In this case, the actual water temperature may exceed the set temperature.

5. Installation Walkthrough

5.2. Heating and Cooling Circuits

5.2.3. Circulation Pump Control



Buffer Tank	<input type="checkbox"/>
P1 for Heating Operation	<input type="checkbox"/>
P1 for Cooling Operation	<input type="checkbox"/>
P1 with High Temp. Demand	<input type="checkbox"/>
P2 for Heating Operation	<input type="checkbox"/>
P2 for Cooling Operation	<input type="checkbox"/>
P2 with High Temp. Demand	<input type="checkbox"/>

Note: P1 is circulation pump 1, P2 is pump 2

- “Buffer Tank” should be checked if one is installed between the heat pump and distribution system.
- “P1/P2 for Heating/Cooling Operation” sets that circuit’s pump to work for heating or cooling.

If “Buffer Tank” is NOT checkmarked, both P1 and P2 will only work when the compressor is working in the same mode that the pump is set to. So, if P1 is set to “P1 for Heating Operation”, P1 will activate ONLY when the compressor is working in heating mode. If P1 is checkmarked for both “Heating” and “Cooling” operations, then P1 will be ON when the compressor is working in both heating and cooling modes. The pump stops when switched to DHW mode, or after the set temperature is reached.

If “Buffer Tank” IS checkmarked, both P1 and P2 will work as long as there is demand from the distribution system, as per the pump setting. The following must also be fulfilled:

- Actual temperature in the buffer tank (detected via TC) is equal or above 20°C (in heating)
- Actual temperature in the buffer tank (detected via TC) is equal or below 23°C (in cooling)

Even if the unit is working in DHW mode, or the set temperature is reached, the circulation pump will start to work as long as there are heating/cooling demands, and TC is fulfilled as per the above.

- “P1/P2 with High Temp. Demand” sets P1/P2 to automatically stop if the signal for “high demand” is off. For more information regarding this setting, please refer to part D on page 62.

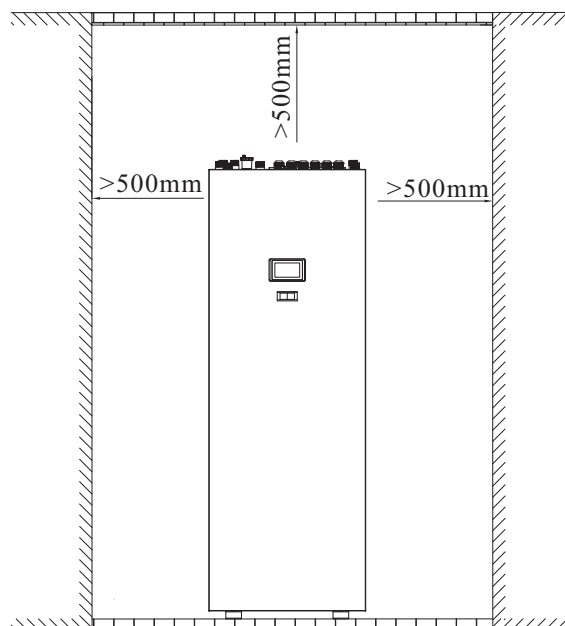
NOTE: It is very important to place the temperature sensor (TR) in a central location with good circulation, with no hot or cold equipment nearby, in a column or interior wall, or somewhere similar.

5. Installation Walkthrough

5.3. Indoor Unit Installation

5.3.1. Choosing an installation location

- A. The indoor unit can be located in a room, corridor, balcony, garage or warehouse.
- B. Indoor unit should be placed on flat and solid ground.
- C. The unit is recommended to be put in a space close to water supply, and drainage.
- D. The outdoor and indoor unit should be placed close, to save the copper tube as well as the energy.
- E. The indoor unit shall be placed in dry and well-ventilated environment.
- F. Indoor unit mustn't be installed in an environment where volatile, corrosive or flammable liquid or gas exists.
- G. During the movement, please be careful to keep the unit vertically. If the unit is tilted by 30° , it may fall down and cause damage to itself or the porter.
- H. Don't expose the operation panel under direct sunshine.
- I. Enough space should be left around the indoor unit for futher maintenance.

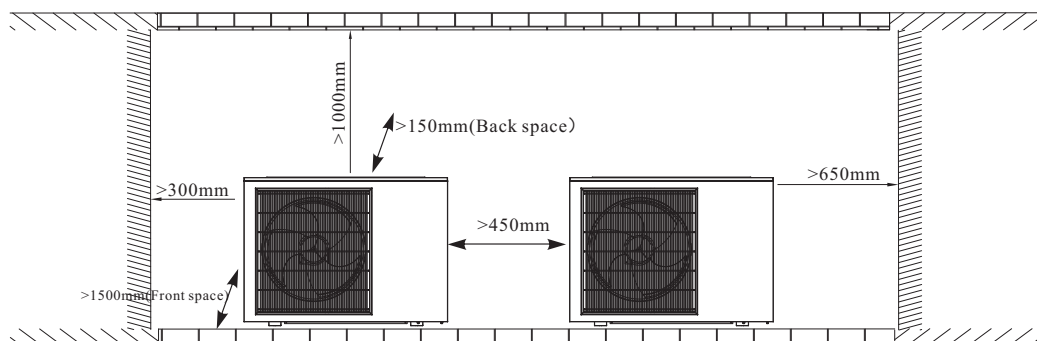


5. Installation Walkthrough

5.4. Outdoor Unit Installation

5.4.1. Choosing an installation location

- A. The outdoor unit can be located in a room, corridor, balcony, and roof or hanged on the wall.
- B. Please don't install outdoor unit close to bedroom or living room, because there is some noise when it's running.
- C. The outdoor unit shall be placed in dry and well-ventilated environment.
- D. Outdoor unit mustn't be installed in an environment where volatile, corrosive or flammable liquid or gas exists.
- E. Please cover a protecting roof over the outdoor unit, lest ice or snow blocks the air inlet. Shield the unit from direct sunshine, rain or snow, but never cover the unit which will cause the bad ventilation.
- F. Please ensure there is drainage system around the location, to drain the condensed water under defrosting mode.
- G. Please don't install the indoor and outdoor unit in damp locations, otherwise it may cause short-circuit or corrosion of some components. The unit should be free from corrosive and moisture surrounding. Otherwise the lifetime of the unit might be shortened.
- H. When installing the unit in harsh climatic conditions, sub-zero temperatures, snow, humidity area, please raise the unit above the ground by about 20cm.
- I. When installing the unit, tilt it by 1cm/cm to left side of the unit (see from front), for better water drainage.
- J. Outdoor unit should be placed on flat and solid ground. When installing the outdoor unit, please ensure enough space around the outdoor unit, for better ventilation and maintenance. Please refer to the illustration below.



5. Installation Walkthrough

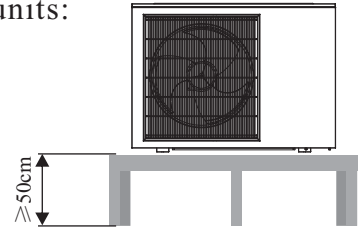
5.4. Outdoor Unit Installation



Please add rubber absorber under the outdoor unit, to reduce the vibration.

【A. On a concrete stand】

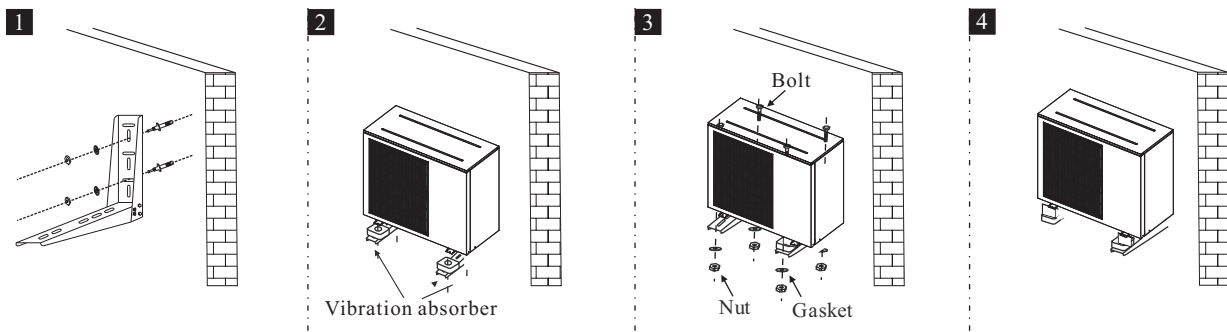
1. The unit must be located on a flat, solid, preferably cemented surface.
2. When installing the unit, introduce a tilt of 1cm/m for rain water evacuation.
3. When installing the unit in harsh climatic conditions, sub-zero temperature, snow, humidity..., it is recommended to raise the unit off the ground by about 50cm.
4. It is recommended to have a base with following size for these units:
5. Rubber vibration absorbing mountings are recommended.
6. When sitting he unit, take care to leave sufficient free space all around it for carrying out maintenance.



【B. On brackets on the wall】

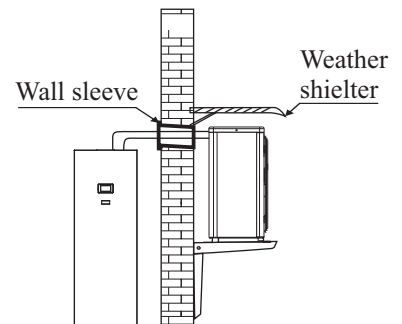
A: If needs to hang the outdoor unit on the wall, please do as followings:

1. Adjust the location of the wall brackets according to the distance between two feet of the unit.
2. Fix the brackets on the wall with expansion bolts.
3. Place the outdoor unit on the brackets. A Vibration absorbers are recommended to reduce vibration and noise.
4. Fix the unit to the bracket.



The water piping and signal cable between indoor and outdoor unit should go through the wall by using a wall sleeve.

The hole should lean to outside a little bit (≥ 8 degrees), to avoid rain water or condensate water flow back to the indoor.

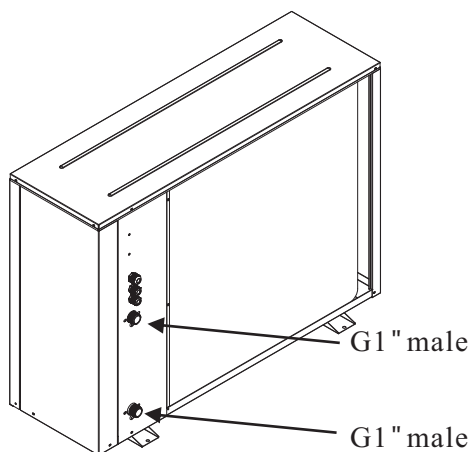


5. Installation Walkthrough

5.5. Water pipe connection

5.5.1. Amount of Refrigerant:

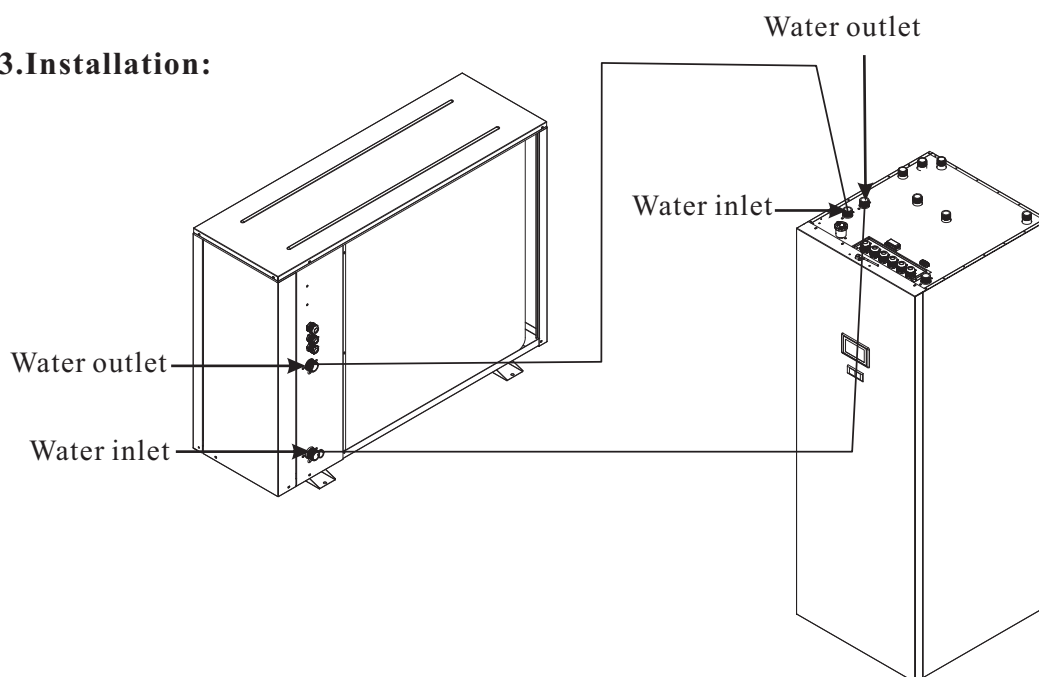
Before connect the water piping between indoor and outdoor unit, please notice the size of water connector, and should choose the proper size of water piping, to avoid leakage.



5.5.2. Precautions:

- Choose the proper water piping, which can afford the max. pressure from the city water system.
- Insulate the pipe before connecting it.
- Before connecting the water piping, please make sure the water piping is clean.

5.5.3. Installation:



5. Installation Walkthrough

5.5. Water pipe connection

After installing the unit, please connect the water inlet and outlet pipe according to the local instructions. Please carefully select and operate the water pipe.

After connection, the water piping should be pressure tested, cleaned before use.

【Water filling】

▲ One way valve:

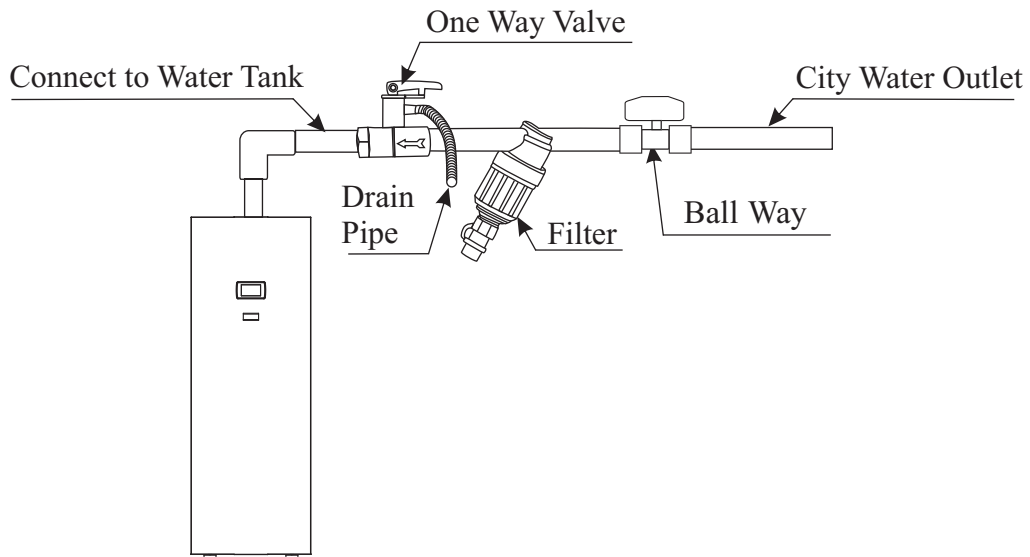
One way valve must be installed to water filling connector, to avoid back-flow of water when water supply stops or water pressure not enough (one way valve is packed with the unit).

▲ Filter:

A filter (20 mesh/cm²) should be installed at the water inlet of water tank as well as that of indoor unit, to avoid sediments and guarantee water quality.

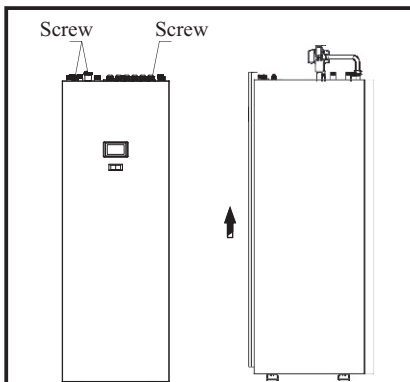
▲ Ball valve:

A ball valve is recommend for easy operation of drainage or filter cleaning.

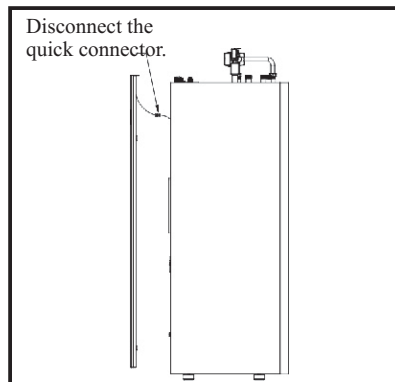


【Connect of drainage pipe】

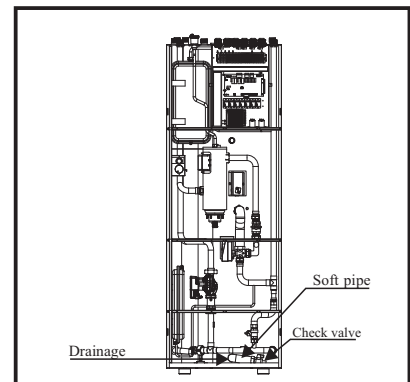
When the tank need to be drained, please do as per following instruction:



1. Unscrew the 3pcs screws on top of front panel.



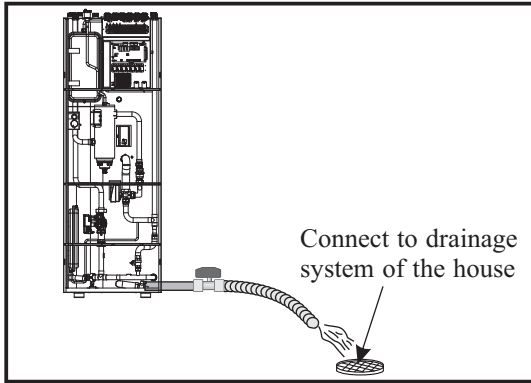
2. Hold the front panel up by 10~15mm, disconnect the quick connector from wired controller, and then take out the front panel.



3. A soft pipe and ball valve have already been connected to the tank. please pull it out from the unit.

5. Installation Walkthrough

5.6. Installation of the kits in the accessories



3. Drain the water to drainage system of the house, and open the ball valve to drain out all water inside the tank. Please extend the drainage pipe by connecting another water pipe, if the distance between the unit and drainage system is long.

【Insulation】

All pipes running hot water should be well insulated. The insulation must be tied up tightly without gap (But please don't wrap up the check valve for future maintenance).

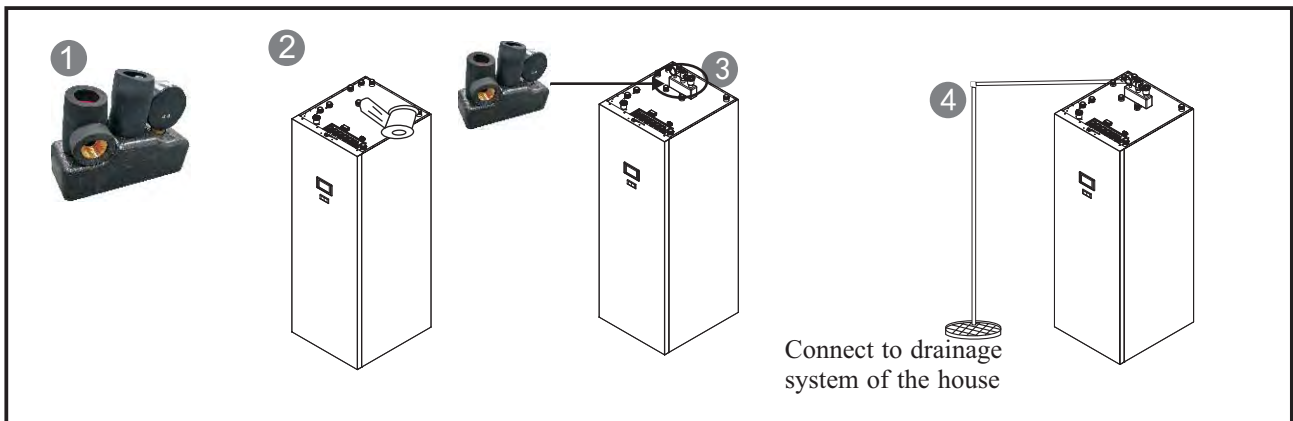


Please ensure enough water pressure to deliver the water to the required height. If the water pressure is not enough, please add water pump to increase the pumping head.

【Four-way safety valve kit】

Four-way safety valve kit includes T/P valve, air purging valve and water pressure gauge. Please make sure it's in the accessories.

1. Take the four-way safety valve kit from accessories.
2. Apply sealant tape on threads of all the valves according to the industry standards.
3. Find the connector on the top of tank according to the label, and install the safety valve kit onto it.
4. Connect the drainage pipe to the T/P valve as shown in the picture.
5. After install the safety valve kit, please loose the small screw cap on the top of air purging valve in order to ensure the gas can be drained away.



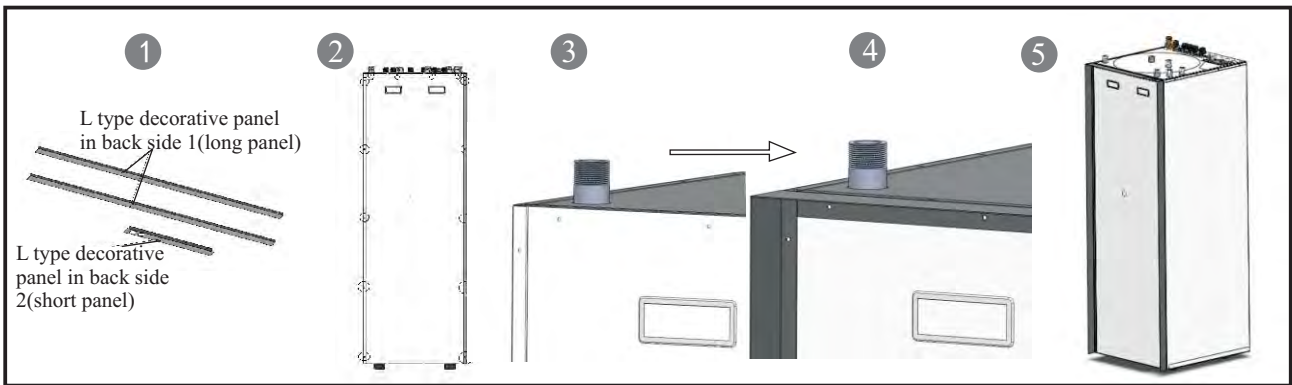
5. Installation Walkthrough

5.6. Installation of the kits in the accessories

【L type decorative panel in back side】

When the pipings are installed in back side of the unit, L type decorative panel can be installed as follows, in order to hide the pipings in backside and look better:

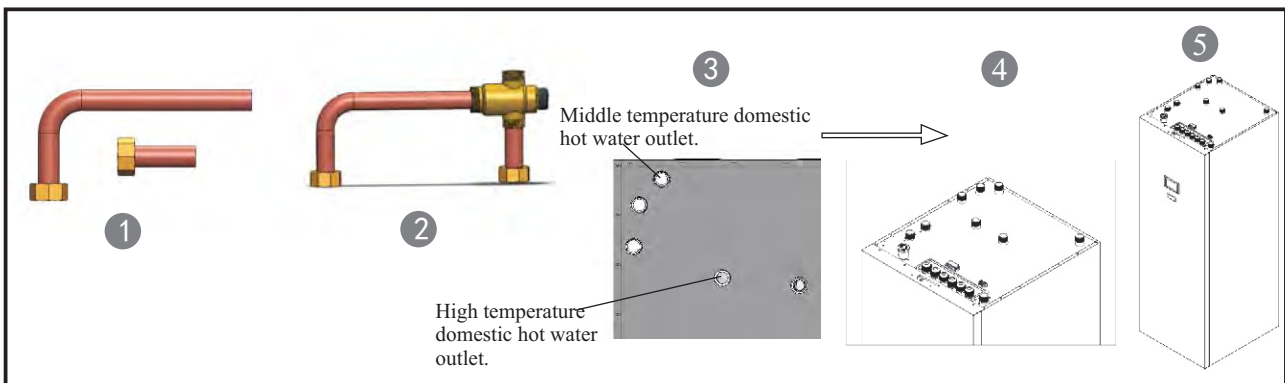
1. Take out 2pcs L type decorative panel in back side 1 and 1pcs L type decorative panel in back side 2.
2. Find 14 screws holes in the picture 2.
3. Fix 2pcs long panel on the right and left back side of the unit, by fasten the screws, and fix 1pcs short panel on the top back side of the unit. Please refer the picture 3 and 4.
4. It's done. Please refer the picture 5.



【Pipings for mixture valve】

It's used to connect the mixture valve with the unit.

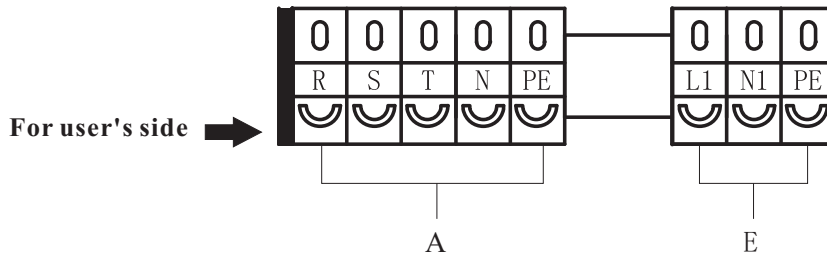
1. Please find the pipings for mixture valve in the accessories. Please refer the picture 1.
2. Connect the pipings to two water inlets of mixture valve.
3. Install the pipings onto the high temperature hot water outlet and middle temperature hot water outlet. Please refer the picture 3 and 4.
4. It's done. Please refer the picture 5.



5. Installation Walkthrough

5.7. Wiring

5.7.1. Explanation of Terminal Block 1



A: Unit power supply

This should be connected directly to the city power supply.

For all units, ensure that a cable of sufficient gauge is used. (found on nameplate)

E: Power supply for anti-freeze electric heater in outdoor unit

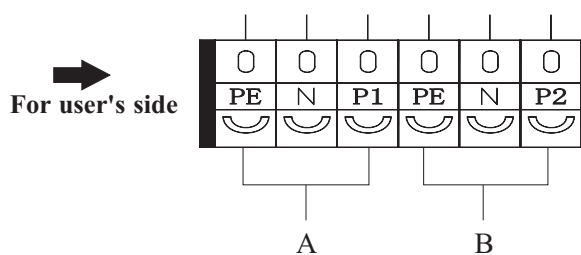
This power supply is from indoor unit to anti-freeze electric heater in outdoor unit.

In case power supply for outdoor unit is cut off, the heater can still work to prevent plate heat exchanger from freezing up.

5. Installation Walkthrough

5.7. Wiring

5.7.2. Explanation of Terminal Block 2



A, B: Water Pump

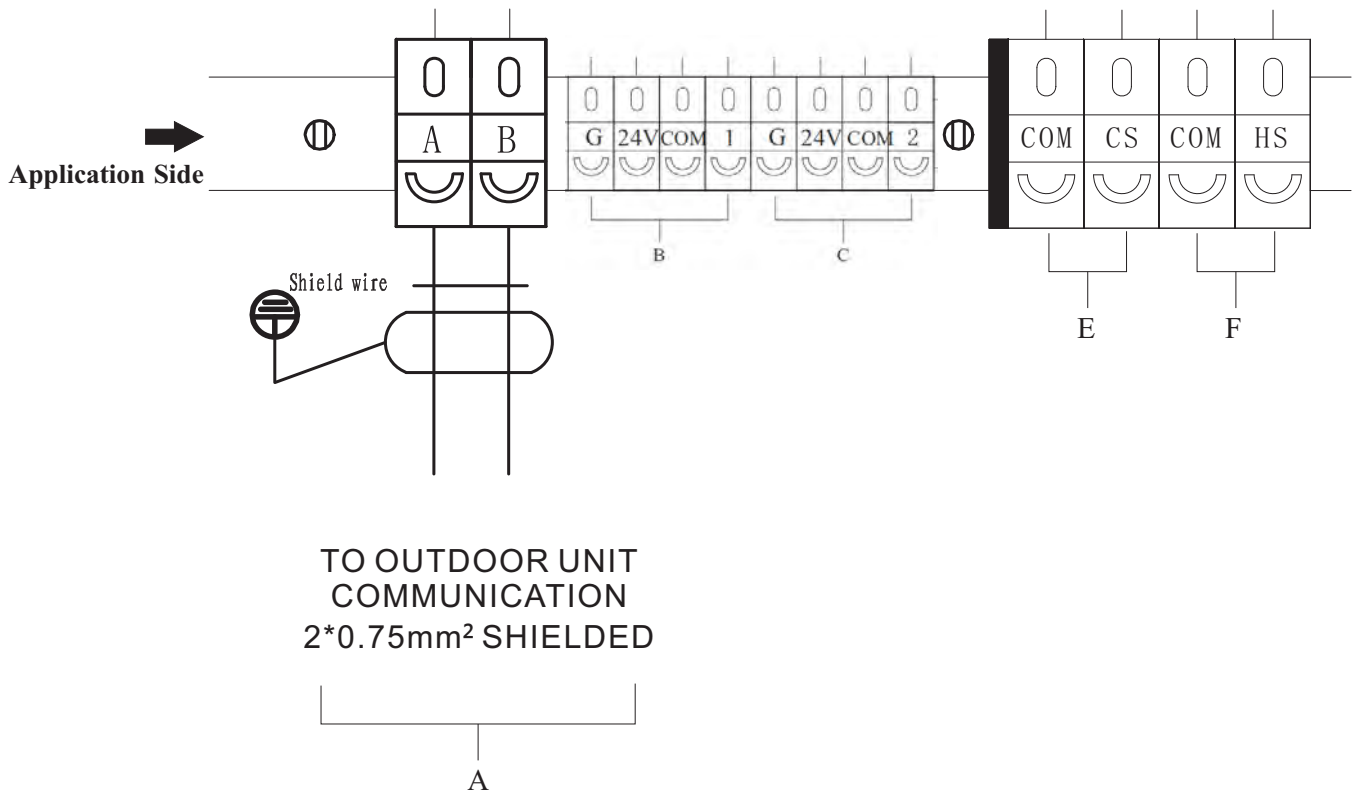
A-Pump 1: Pump for Heating & Cooling Circuit 1,
B-Pump 2: Pump for Heating & Cooling Circuit 2,

If there is an external water pump in heating, cooling and hot water system, it can be connected to these ports, to be under the control of heat pump,

5. Installation Walkthrough

5.7. Wiring

5.7.3. Explanation of Terminal Block 3



A: Signal cable between indoor and outdoor unit.

B,C: Motorized Water mixture valve 1&2:

As explained in System illustration chapters, this unit can have two water mixture valves for distribution system under its control. Water Mixture Valve 1 for Heating & Cooling circuit 1
Water Mixture Valve 2 for Heating & Cooling circuit 2

E,F: Cooling and Heating Mode Switchovers

This unit is capable of switching between heating and cooling automatically, according to the ambient temperature, or external signal input. Please refer to the user's manual for more detailed explanations on ambient temperature setting. For external signal input, the external signal should be connected to "Cool Mode Switch" for cooling operation, and "Heat Mode Switch" for heating operation.

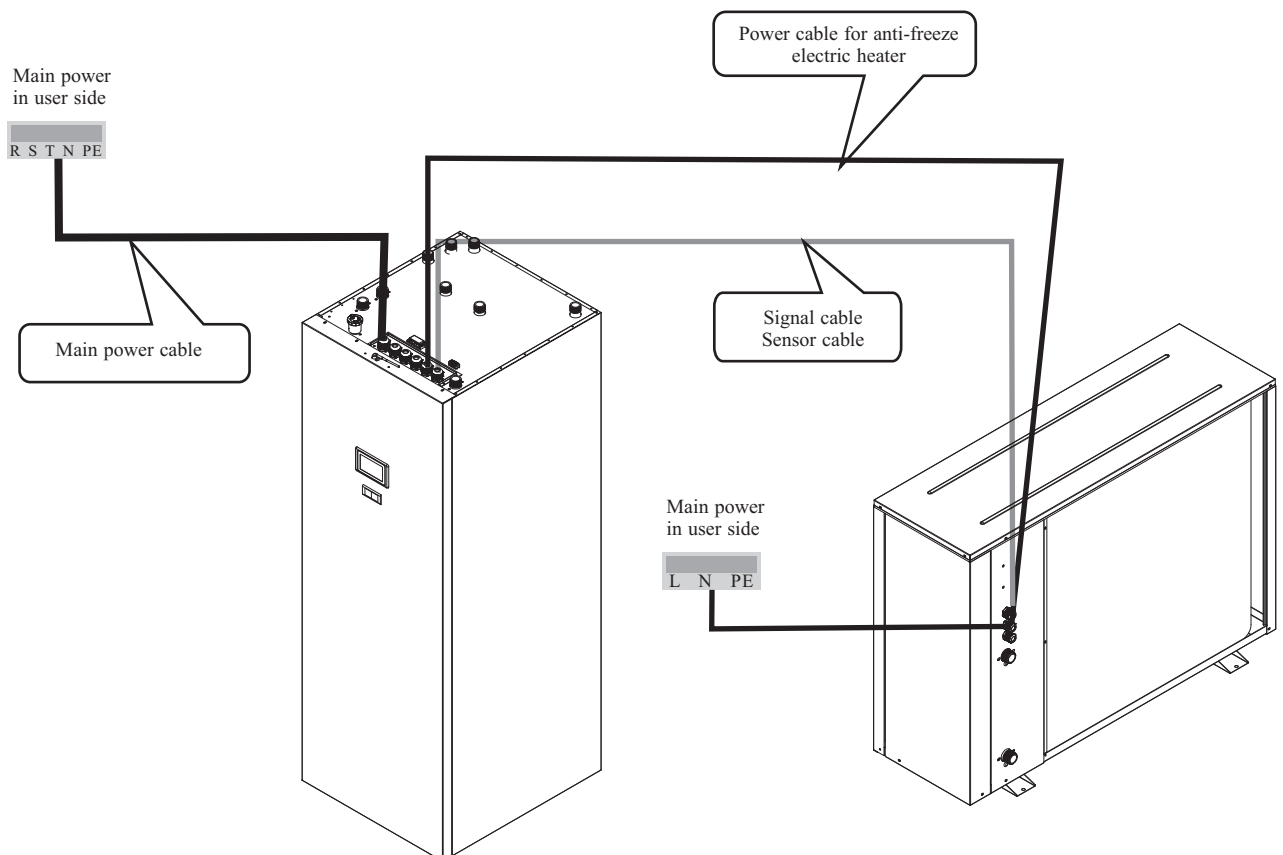
5. Installation Walkthrough

5.7. Wiring

5.7.4. Wiring Process Preliminary Precautions



- Please ensure that a suitable circuit breaker is used for the heat pump.
- The power supply to the heat pump unit must be grounded.
- Wiring should be done by a licensed professional, and comply with industry regulations.
- The unit should be completely powered off before any wiring is done.
- Cables should be properly fastened into place, to prevent loosening from occurring.
- No cable should be fastened to another.
- The power supply should be compliant to all standards located in the rating label.
- The power supply, necessary cables, and sockets should fully meet the input power requirements of the unit.



5. Installation Walkthrough

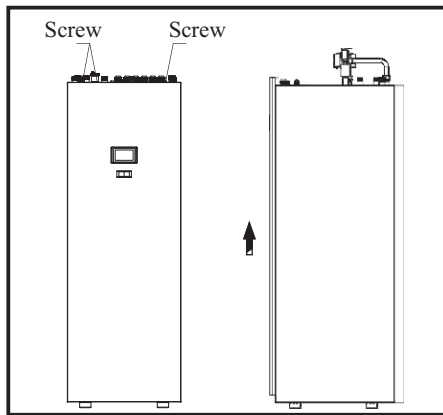
5.7. Wiring

5.7.5. Wiring Process

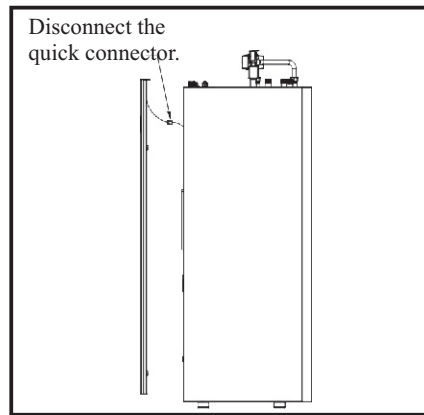
1) Open the indoor unit's front panel and remove the electrical box cover.

【Connect of drainage pipe】

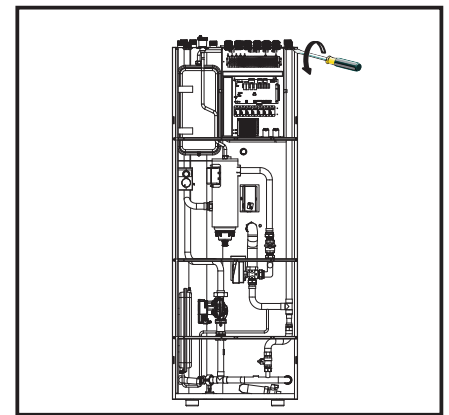
When the tank need to be drained, please do as per following instruction:



1. Unscrew the 3pcs screws on top of front panel.

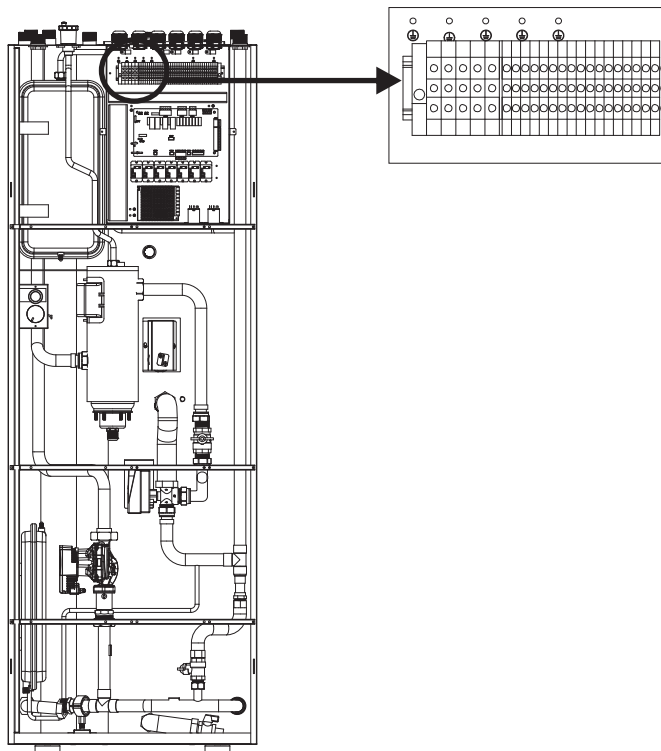


2. Hold the front panel up by 10~15mm, disconnect the quick connector from wired controller, and then take out the front panel.



3. A soft pipe and ball valve have already been connected to the tank. please pull it out from the unit.

2) Acquire power cables of suitable length that is compliant to all local safety regulations.



Connect power cables to the power supply terminal inside the unit.

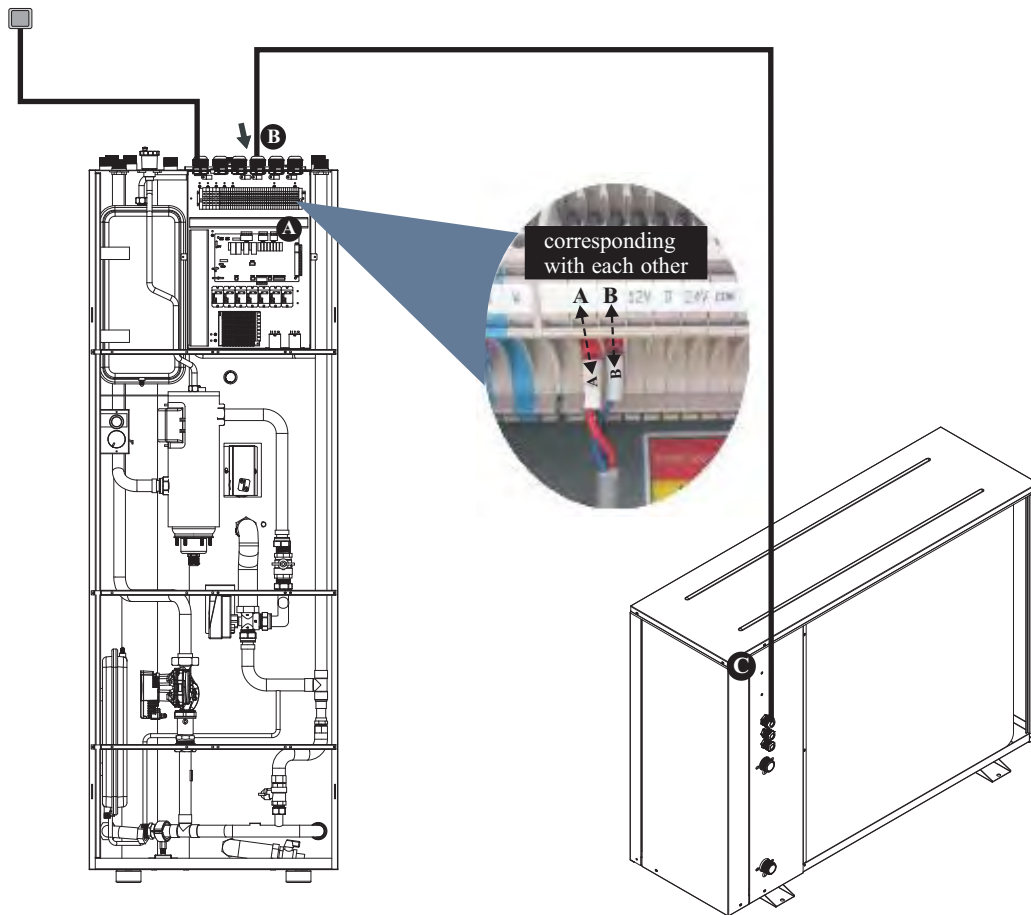
5. Installation Walkthrough

5.7. Wiring

3) Connect the signal cable between the indoor and outdoor unit:

Retrieve the signal cable from the accessories bag.

4) Connect the Plate electrical heating power cord between the indoor and outdoor unit .



- A. Insert one end of this cable through the cable gland on the top of the indoor unit, and connect it to A and B on the appropriate terminal block.
- B. Fasten the cable gland to ensure the cable won't get loosen.
- C. Connect the other end of the cable to the terminal block on the outdoor unit. A and B on the indoor unit should be connected with A, B, and G on the outdoor unit, otherwise communication failure error may occur.

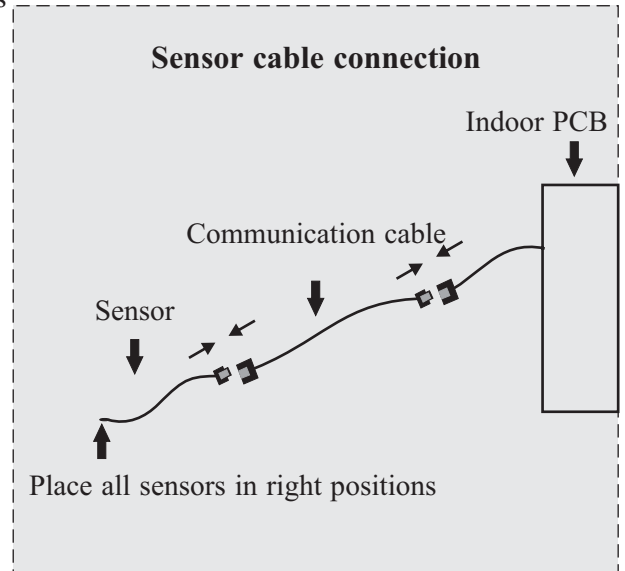
For monoblock unit, connect sensor cables and flow switch cables between indoor and outdoor unit as per wiring diagram and marks on the cable.

5. Installation Walkthrough

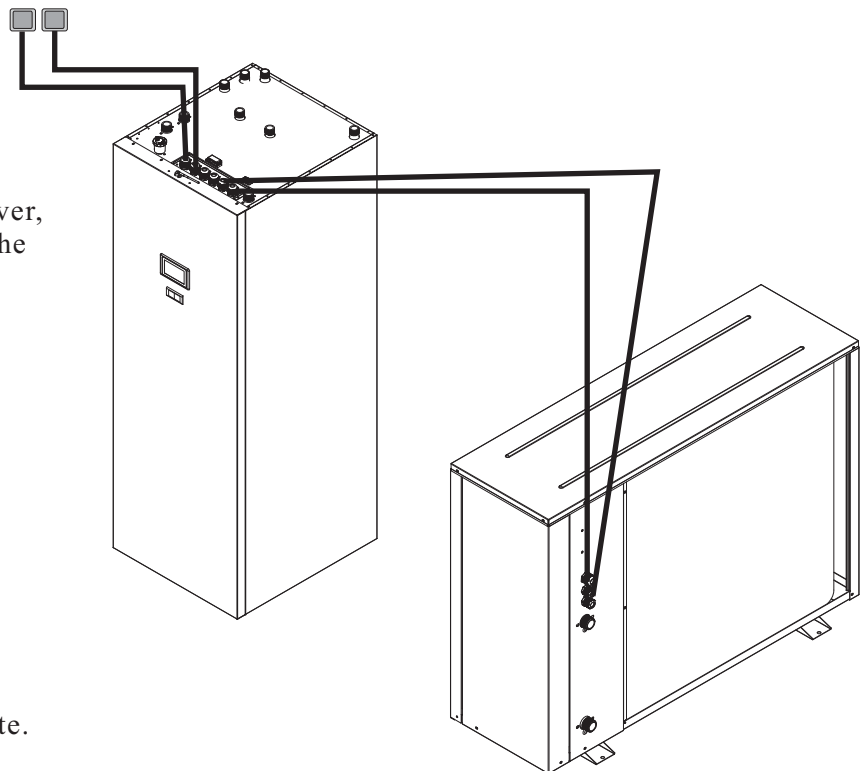
5.7. Wiring

5) Tc (cooling&heating water temperature sensor) and Tr (room temperature sensor) are pre-connected and put inside the indoor unit. Following below instructions if they need to be moved to another place.

- Retrieve all sensors and communication cables from the accessories bag.
- Connect all sensors to the communication cables, and insert the male end into the indoor unit through the cable glands.
- Connect them to the female quick connectors inside the indoor units.
- Place all sensors in the correct positions.
- After everything is connected, fasten the cable glands to prevent cables from loosening.



6) Re-install the electrical box cover, as well as the small handle on the back of the outdoor unit, and close the the indoor unit door.



The wiring process is then complete.

5. Installation Walkthrough

5.8. Attention



- A. The user mustn't change the structure or wiring inside the unit.
- B. The service and maintenance should be performed by qualified and well-trained technician. When the unit fails to run, please cut off power supply immediately.
- C. The smart control system can automatically analyze various protection problems during daily use, and display the failure code on the controller. The unit may recover by itself. Under normal operation, the pipings inside the unit don't need any maintenance.
- D. Under normal running, the user only needs to clean the surface of the outdoor heat exchanger per month or quarter of a year.
- E. If the unit runs in a dirty or oily environment, please clean the outdoor heat exchanger and heat exchanger by professionals, using specified detergent, to ensure the performance and efficiency of the unit.
- F. Please pay attention to the ambient environment, to check if the unit is installed firmly, or if the air inlet and outlet of the outdoor unit is blocked or not.
- G. Unless the water pump is damaged, no service or maintenance should be taken to the water system inside the unit. It's recommended to clean water filter regularly or change it when it's very dirty or blocked.

5. Installation Walkthrough

5.9. Test run



After installation finished, please fulfill the water system with water and purge out air in the system before start-up.

5.9.1. Before start-up

The list of verifications below must be performed before the unit starts up, to ensure best possible conditions for smooth long-term operation. The list is not exhaustive, and should only be used on a minimum reference basis:

- 1) Make sure the fans are rotating freely.
- 2) Confirm correct flow directions in water piping.
- 3) Verify all system piping matches installation instructions.
- 4) Check the voltage of the unit power supply and make certain it complies to authorized limitations.
- 5) The unit must be properly grounded.
- 6) Check for the presence of any damaged devices
- 7) Check all electrical connections and ensure they are secure.
- 8) Make sure there are no leaks in the piping and the space is well-ventilated.

Fix any problems above if they occur. If everything above is satisfied, the unit can start up.

5.9.2. Starting Up

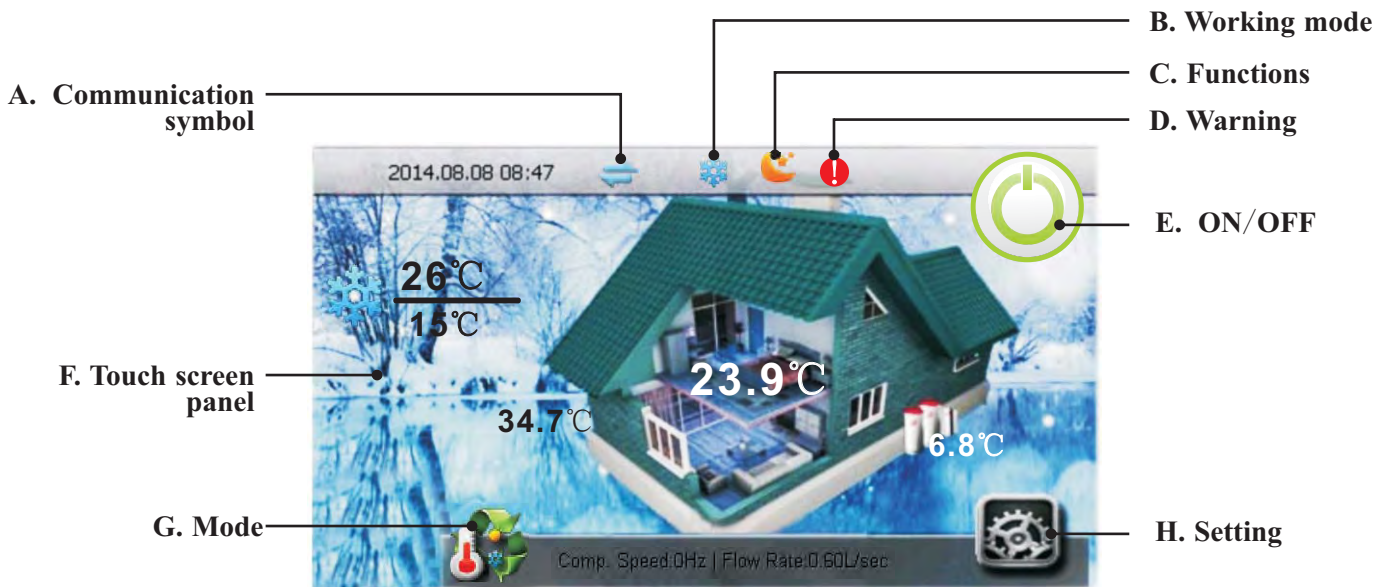
When the installation of the unit is completed, all water system pipes are confirmed to be well-connected, air purging is done, there are no leakages or other problems, the unit can be powered on.

Turn on the unit by pressing the on/off button on the operation panel. Listen carefully for any abnormal noise or vibrations, and ensure the display of the wired controller is normal.

After the unit has been on for 10 minutes and no abnormalities have occurred, the start-up process is complete. For problems and troubleshooting, please refer to the Service and Maintenance manual.

Final note: It is suggested to not run "heating" or "hot water" mode during ambient temperatures above 32°C , otherwise the unit may easily enter protection mode.

6. Introduction Of Operation Panel






A. Communication symbol







When this symbol is in blue, it means communication is working correctly.
When this symbol is in grey, it means communication is broken.

B. Working mode

Working mode switching symbol is ON when system working mode is under switching. If more than one working mode are activated at the same time, corresponding working mode symbol will be shown on the display.

	Heating mode
	Cooling mode
	Hot water mode



C. Functions

	Sleep mode
	Interruption
	Sanitary hot water storage mode
	Preheating mode
	Sanitization mode
	Defrosting mode

6. Introduction Of Operation Panel

D. Warning

When the unit is having a protection or failure, a symbol will be shown on the display. Please enter into "Info" menu to check the protection or failure codes.

	Yellow——Outdoor unit protection or failure
	Red——System protection or failure

Some information, protections and failures that are more likely to happen, will shown in front page so the customers can see it easily:



1. Coil Temp. Too Low

This is indoor coil temperature too low. This happens in cooling operation of the unit. Too low coil temperature may make the water freeze up inside plate heat exchanger and cause damage. Unit recover automatically when this coil temperature goes over the safety value again. When this happens, please:

- A. Check whether set temperature for cooling is too low; whether system has too small water flow rate; check water system especially the filter.
- B. Check whether system has not enough refrigerant inside by measuring the evaporating pressure.
- C. Check whether ambient temperature is lower than 15°C.

2. Water Flow Rate Too Small

It means System water flow rate is less than minimum allowable flow rate. Check the water system, especially the filter; check the working status of water pump.

3. Water Flow Switch Failure

Water flow switch should be in open mode when unit circulation pump is working. If not, the unit thinks the flow switch itself is broken. Check whether flow switch is broken or not well connected. Check whether there is another pump that circulates the water through the unit, when unit circulation pump is working.

4. Communication Failure

Communication failure shown here means the communication between operation panel, indoor PCB and outdoor PCB has been set up, but communication data loses too much. Check whether communication cable is longer than 30M; whether there is a source of the disturbance nearby the unit. Unit recovers when communication recovers.

6. Introduction Of Operation Panel

5. Serial Port Connect Error

Serial port connect error means the communication between operation panel and indoor PCB or outdoor PCB hasn't been set up successfully. Check the cable connection in between. Check whether the last three switches on outdoor power PCB are set to 001; whether last three switches on indoor PCB are set to 001. Unit recovers when communication recovers.

6. Cooling Water Temp. Too Low

Compressor stops if water outlet is too low in cooling mode. This too low water temperature may make the water freeze up inside plate heat exchanger and cause damage. Check whether temperature sensor TC is ok and well connected; whether set water temperature is too low; whether system flow rate is too small.

7. Water Outlet Temp. Too High

Compressor stops if water outlet is too high in heating or hot water mode. This too high water temperature may make the system has too high condensing pressure inside and cause unit malfunction. Check whether temperature sensor Tc and TW is OK and well connected; whether set water temperature is too high; whether system flow rate is too small.

8. Defrosting Failure

If unit continuously failed to finish the defrosting operation for three times, it stops and gives failure code S08. This can only be recovered by re-powering the machine. Please check whether the actual water temperature is too low for the unit to defrost, so the plate heat exchanger has the risk of freezing up.

9. System Initialization

When unit has just been turned ON, this information will be shown. It will disappear after system initialization is finished.

10. Too Small Water Flow Rate Failure

If unit stops due to "small water flow rate" protection (S02) over three times in certain period of time, unit stops and gives S10 failure code. It can only be recovered by re-powering the unit. Check the water system, especially the filter; check the working statue of water pump.

11. Indoor Anti-freezing Protection Failure In Cooling

If unit stops due to "Indoor anti-freezing protection in cooling (S01)" over three times in certain period of time, unit stops and gives S11 failure code. It can only be recovered by re-powering the unit.

E. ON/OFF

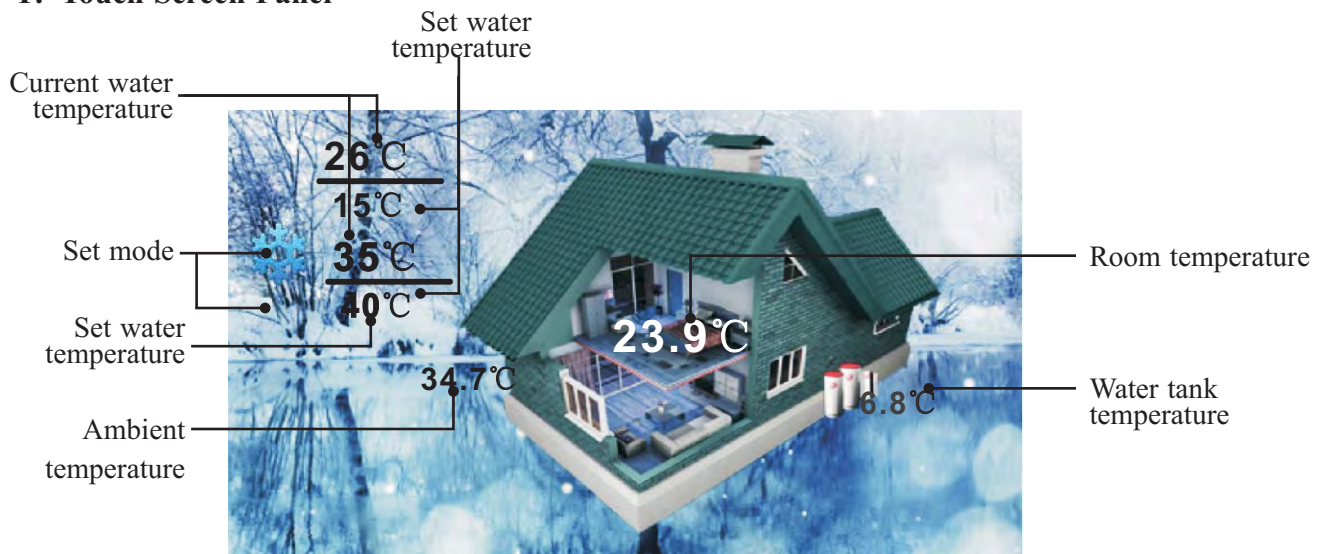
Press to turn ON/OFF of heat pump operation.

When the unit is powered, home page will be shown on the screen. After re-powered, unit will recover its working mode and settings automatically.

6. Introduction Of Operation Panel



F. Touch Screen Panel



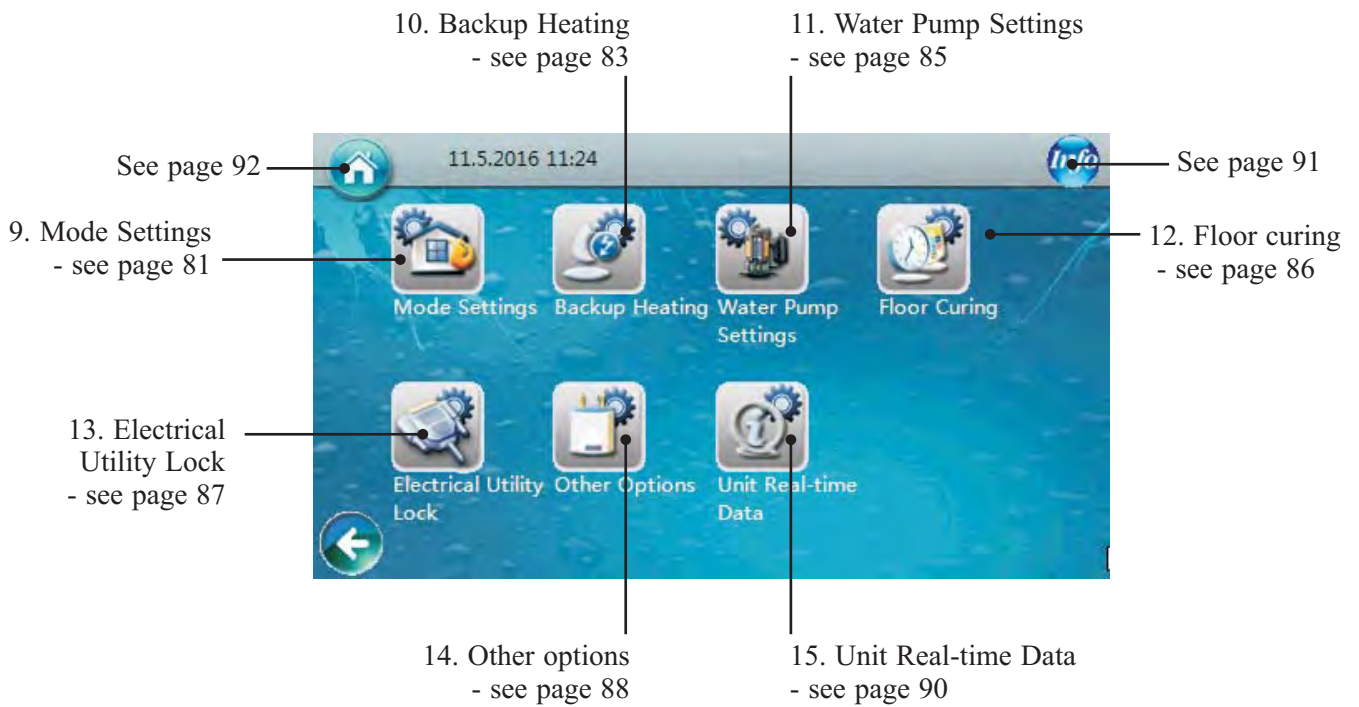
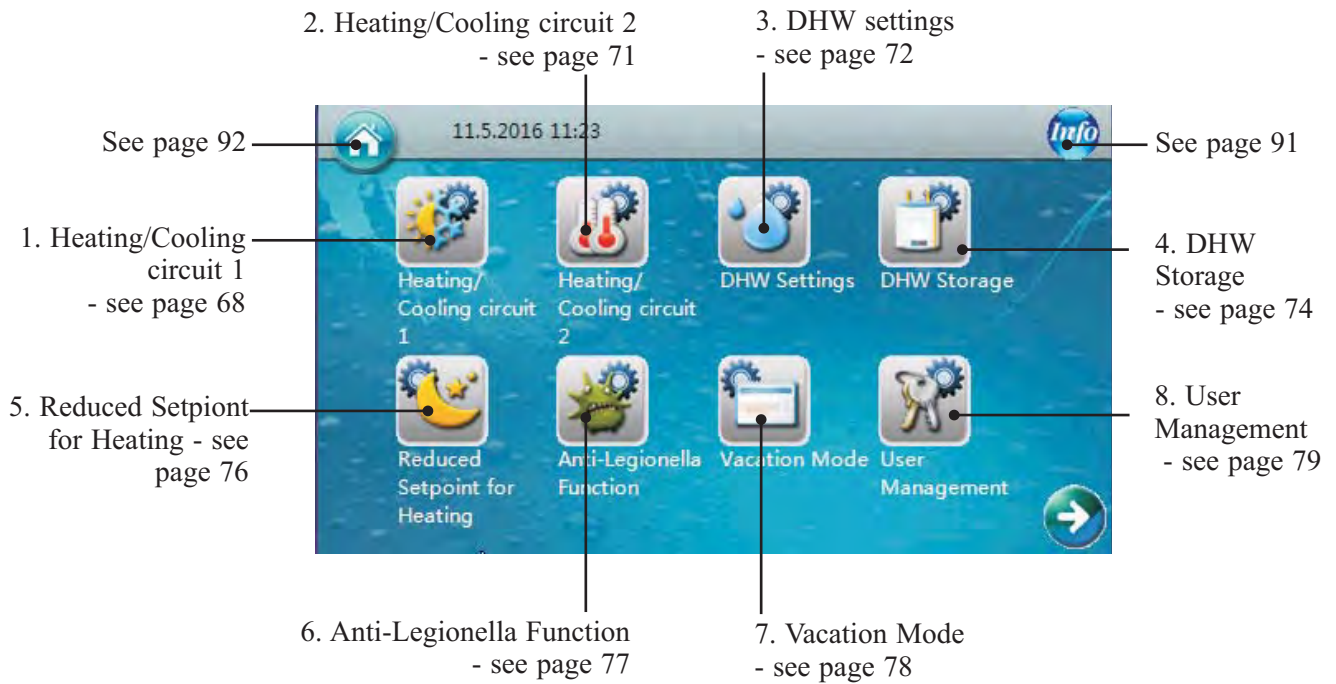
G. Mode

Press to switch unit working mode (Heating, Cooling, Hot water, Auto). In Auto mode, unit switch its working mode between cooling, heating and sanitary hot water automatically according to setting.



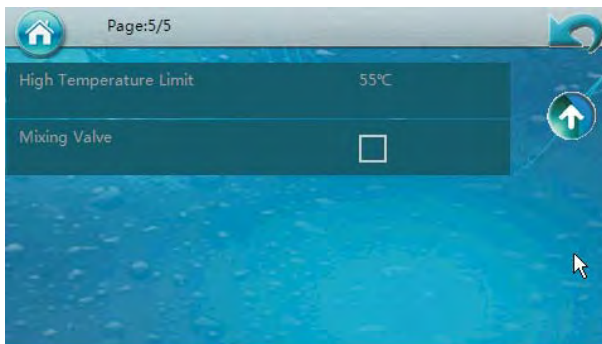
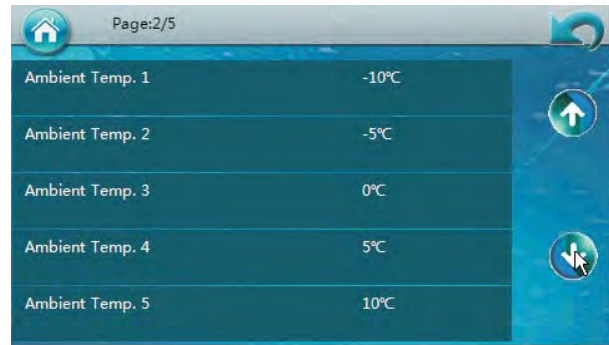
6. Introduction Of Operation Panel

H. Setting: Press to enter into setting menu



7. Operation Instruction

1. Heating/Cooling Circuit 1



1. Heating & Cooling Settings 1, HC/CC 1

1.01) Heating or Cooling Stops based on Water ΔT

1.02) Heating or Cooling Restarts based on Water ΔT

- ◆ 1.01: This is to set a temperature to stop unit. Unit stops operation when $[T_{set}+1.01]$ in heating operation, or $[T_{set}-1.01]$ in cooling operation is reached.
- ◆ 1.02: This is to set a temperature to re-start unit. Unit starts operation again when water temp. drops below $[T_{set}-1.02]$ in heating operation or increases over $[T_{set}+1.02]$ in cooling operation.
- ◆ Both the set values are based on ΔT .
- ◆ For example, in heating mode, if $T_{set}=48$, while $1.01=2^{\circ}\text{C}$, and $1.02=1^{\circ}\text{C}$, when the actual water temperature is higher than 50°C ($T_{set}+1.01$), unit stops. When unit stops and the actual water temperature drops lower than 47°C [$T_{set}-1.02$], unit will restart.

7. Operation Instruction

1.03 ΔT Compressor Speed-Reduction

This parameter is used to set a temperature, at which compressor starts to slow down its speed. Also, the set value is based on ΔT .

Compressor always works with its maximum allowable speed, if actual water temperature is lower than $[T_{set}-1.03]$ (in heating mode) or higher than $[T_{set}+1.03]$ (in cooling mode).

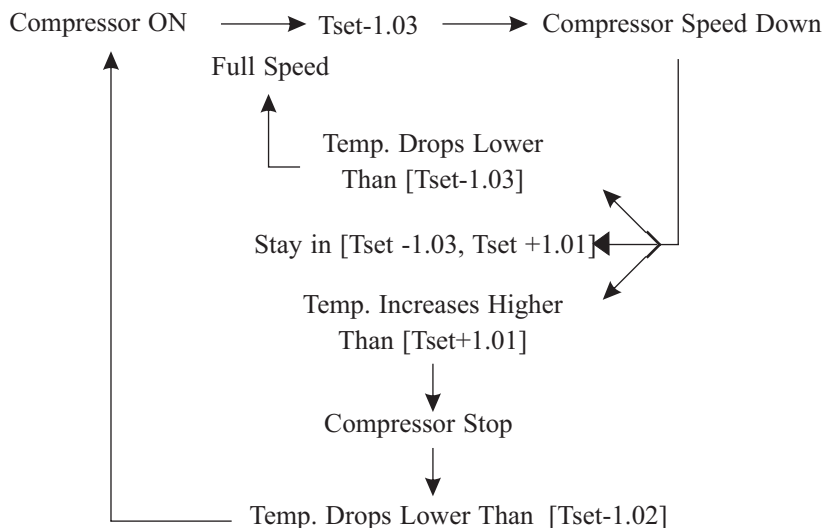
When actual temperature is between $[T_{set}-1.03, T_{set}]$ in heating mode or $[T_{set}, T_{set}+1.03]$ in cooling mode, compressor will adjust its working speed, to balance the total heating output and system load.

This setting is to keep a balance between comfort and energy saving. If this value is set too big even if the room is not warm (or cool) enough, compressor will slow down its speed quite soon to save energy. If this value is set too small, even if the room is warm (or cool) enough, compressor will slow down its speed quite late, which consumes more power.

It's more like a setting that tells the heat pump unit which temperature range you'd prefer to have the heat pump stayed in.

For example, in heating mode, if $T_{set}=48^{\circ}\text{C}$, and $1.03=2^{\circ}\text{C}$, compressor will work as hard as possible to get 46°C as soon as possible. Then compressor will lower its speed. If even the compressor works in its lowest allowable speed, but actual water temperature still goes over $[T_{set}+1.01]$, unit stops.

Working In Heating



1.04) Set Temp. For Cooling

Set an ideal water temperature for cooling via this parameter.

1.05) Heating Curve Function

Set whether heating curve function is needed or not.

If heating curve function is not needed, set 1.05=OFF, and then you can set a fixed water temp. under heating mode via parameter 1.19 "Set Temp For Heating"

1.06~1.15 Set The Heating Curve

1.06 Ambient Temp. 1

1.07 Ambient Temp. 2

1.08 Ambient Temp. 3

1.09 Ambient Temp. 4

1.10 Ambient Temp. 5

1.11 Water Temp. A/Ambient Temp. 1

1.12 Water Temp. B/Ambient Temp. 2

1.13 Water Temp. C/Ambient Temp. 3

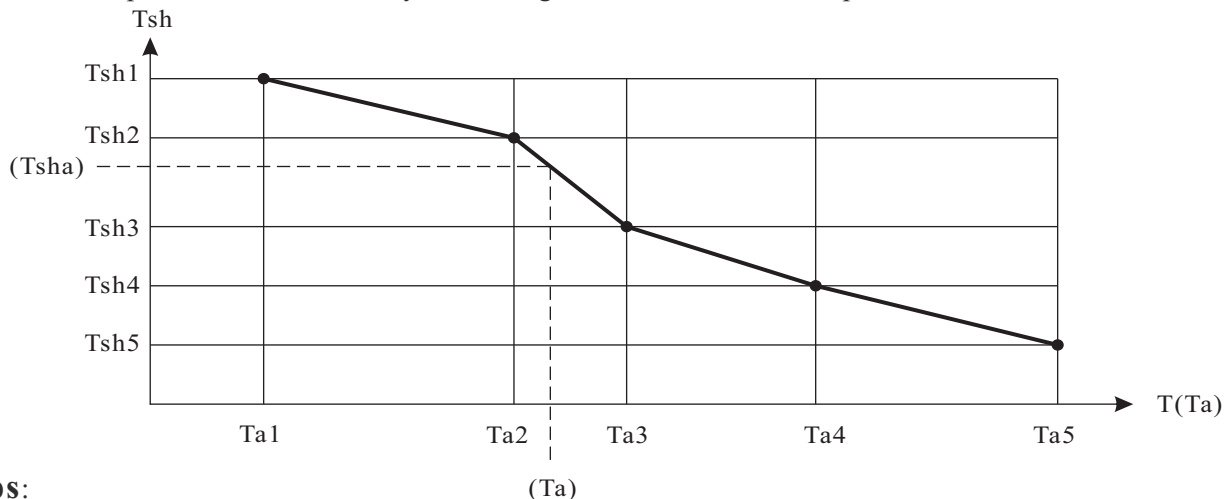
1.14 Water Temp. D/Ambient Temp. 4

1.15 Water Temp. E/Ambient Temp. 5

When 1.05=ON, user can set a heating curve which fits his house, by adjusting the settings of parameter 1.06~1.05

7. Operation Instruction

Parameter 1.06~1.10 is used to set 5 different ambient temperatures; while parameter 1.11~1.15 is used to set 5 corresponding set water temperatures VS these 5 ambient temperatures. Then the controller will create a heating curve according to these settings, and try to reach the set water temperature automatically according to actual ambient temperature.



Tips:

Heating curve function is based on the factor that the lower the ambient, the higher house heating water temperature needs to be. This heating curve function can help the heat pump unit gain a higher COP, as well as make the house more comfortable.

As house insulation level and people's sense of cold may vary from one another, the factory-set curve may not suit you the best. You can set one curve according to your need.

If you feel too hot, you can lower the settings of water temperatures (parameter 1.11~1.15), which correspond to the ambient temperature parameters (1.06~1.10). If you feel too cold, then adjust these settings a little higher. You can also adjust the ambient temperature settings if you think the factory settings are not perfect for your need.

1.16~1.18) Water Temp. Setting Adjustment Function

These three parameters work together to gain an ideal water temperature for an ideal room temperature. When this function is ON, unit will adjust the set water temperature (a set value or calculated value via heating curve), according to the difference between actual room temperature and idea room temperature.

1.16 Room temp. effect on Heating Curve: Turn ON or OFF this function.

1.17 Idea Room temp. in Heating: Set an ideal room temperature in heating. When in Room Temperature Control mode, this parameter will also be the Room Set Temperature.

1.18 Idea Room temp. in Cooling: Set an ideal room temperature in cooling. When in Room Temperature Control mode, this parameter will also be the Room Set Temperature.

For example

If 1.16 = ON, unit works in heating mode.

If water set temperature in the heating curve is 35°C.

If actual room temperature is 27°C, while parameter 1.17 (Ideal Room Temp. in Heating Mode) is set to 22°C, then the unit will deduct (27°C - 22°C) = 5°C from water set temperature, which means unit will take 30°C as the set water temperature.

1.19 Set Temperature For Heating

If heating curve function is OFF, a fixed water temperature for heating can be set via "Set Temp For Heating".

1.20 Low Temperature Limit

1.21 High Temperature Limit

These two parameters are used by the installer, to set the set temperature range for circuit 1 for safety purpose.

1.22) Mixing Valve

Set whether circuit 1 has a mixing valve connected or not. For more details, please refers to chapter 2.1.4.

7. Operation Instruction

2. Heating / Cooling Circuit 2



Water Temp. A/Ambient Temp. 1	38°C
Water Temp. B/Ambient Temp. 2	35°C
Water Temp. C/Ambient Temp. 3	32°C
Water Temp. D/Ambient Temp. 4	30°C
Water Temp. E/Ambient Temp. 5	30°C

Heating_cooling Circuit 2	<input type="checkbox"/>
Set temp. For Cooling	15°C
Set Temp. for Heating (without heating curve)	35°C
Mixing Valve	<input type="checkbox"/>
Heating Curve	<input type="checkbox"/>

High Temperature Limit	55°C
Low Temperature Limit	7°C

2.01 Heating&cooling Circuit 2

Set whether the system has the second circuit .

2.02 Set Temp For Cooling

Set the set temperature for cooling operation of circuit 2.

2.03 Set Temp For Heating

If heating curve function is disabled for circuit 2, a fixed value of set water temperature in heating mode can be set here.

2.04 With/Without Mixing Valve 2

Set whether circuit2 has a mixing valve connected. For more details, please refers to chapter 2.1.5

2.05 Heating Curve

Turn ON/OFF of heating curve function for circuit 2.

2.06 Water Temp. A/Ambient Temp. 1

2.07 Water Temp. B/Ambient Temp. 2

2.08 Water Temp. C/Ambient Temp. 3

2.09 Water Temp. D/Ambient Temp. 4

2.10 Water Temp. E/Ambient Temp. 5

Temperature set here is water temperature, it is based on the same ambient temperature settings for circuit 1, parameters 1.06~1.10.

Temperature settings of the heating operation for circuit 2 VS ambient temperatures. Controller will create a heating curve for secondary heating system according to these settings. If parameter 2.05 is OFF, only 2.03 needs setting, and unit will take this set value as fixed set water temperature for secondary heating system.

2.11 High Temperature Limit

2.12 Low Temperature Limit

These two parameters are used by the installer, to set the set temperature range for circuit 2 for safety purpose.

7. Operation Instruction

3. DHW Settings



Setpoint DHW	50°C
DHW Restart ΔT Setting	5°C
Shifting Priority	<input type="checkbox"/>
Shifting Priority Stating Temp.	15°C
Sanitary Water Min. Working Hours	30Min
Heating Max. Working Hours	90Min
Allowable temp Drift in Heating	6°C
DHW Backup Heater for Shifting Priority	<input type="checkbox"/>

3.01 Setpoint DHW

Set temperature for sanitary hot water.

3.02 DHW Restart ΔT Setting

Heat pump unit will start working for sanitary hot water again, after temperature drops below Tset-3.02 here.

3.03 Shifting Priority

Turn ON/OFF this function.

Air to water heat pump is an equipment that absorbs heat from surrounding air, and transfers it to water. The lower the ambient temperature is, the less heat the unit absorbs. This makes the unit heating capacity and efficiency drop when ambient temperature drops. The unit takes longer time to heat up the sanitary hot water. However, the lower the ambient temperature is, the more heat the house demands. If the unit does not provide enough heat while it is working for hot water, the temperature inside the house may drop too much, and people in it feel uncomfortable. So parameters 3.03~3.08 try to divide the working time for sanitary hot water into several cycles, after ambient temperature drops below a set value. When this function is ON, AH (Auxiliary Heater) or HWTBH (Hot Water Tank Back-up Heater) or both, depending on their priority, will work individually or together to enhance heat pump's capacity in sanitary hot water mode to heat up the water as soon as possible.

3.04 Shifting Priority Starting Temp.

Set an ambient temperature below which this function starts to work. When shifting priority function is activated, heat pump will try to find a balance between DHW and Heating operation after ambient temperature drops below this temperature.

3.05 Sanitary Water Min. Working Hours

Set the minimum working period for sanitary hot water mode.

3.06 Heating Max. Working Hours

Set the maximum working period for heating mode, after unit enters into heating mode.

3.07 Allowable Temp Drift in Heating

Set Allowable temperature drift in heating mode.

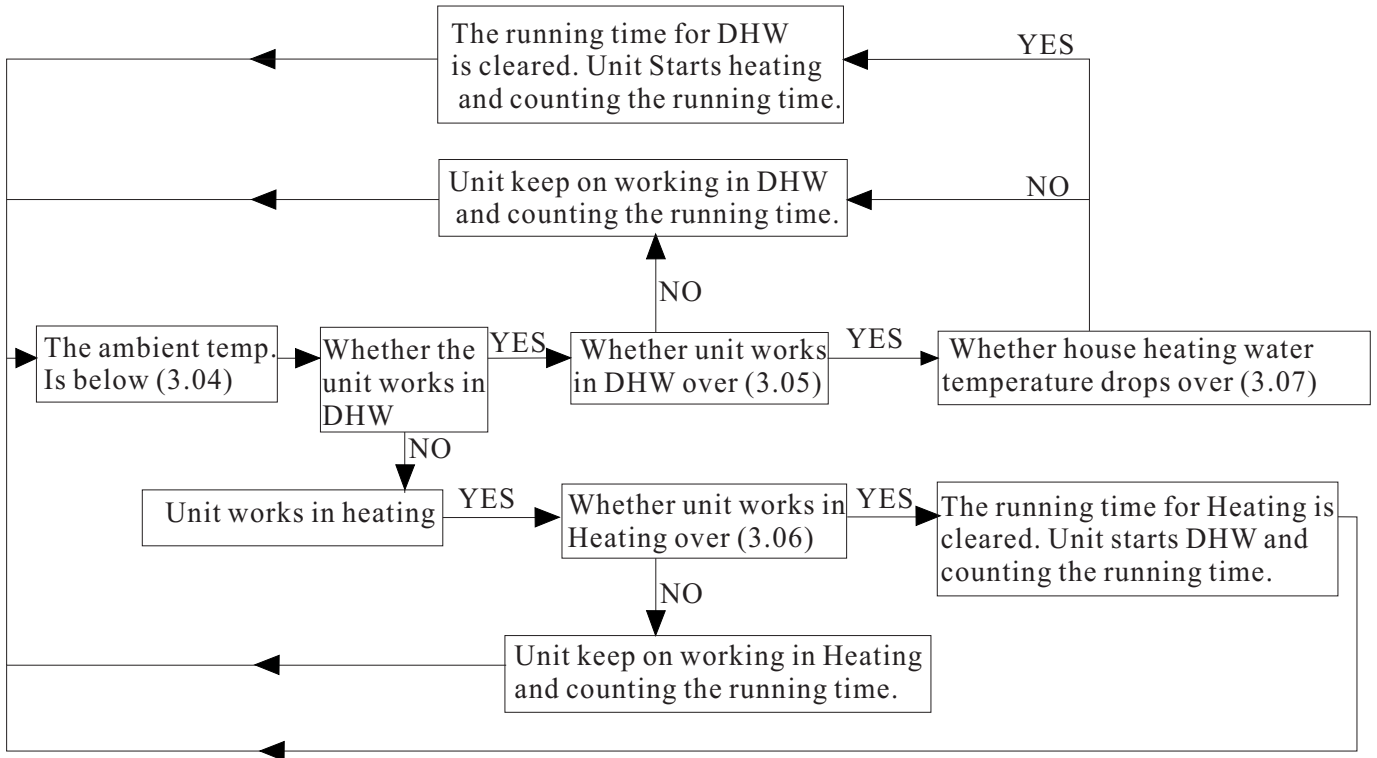
3.08 DHW Backup Heater for Shifting Priority

Working mode of HWTBH (Hot Water Tank Back-up Heater) in this function. If this parameter is set ON, when heat pump is switching to house heating, HWTBH will keep on working to help the unit heat up hot water as soon as possible.

7. Operation Instruction

If shifting priority function is ON, and ambient temperature is lower than [3.04], unit works as shown below:

House heating water under water temperature



7. Operation Instruction

4. DHW Storage



Sanitary Hot Water Storage Function	<input type="checkbox"/>
Sanitary Hot Water Storage Timer	
Reheating Function	<input type="checkbox"/>
Reheating Function Timer	
Reheating Set Temp.	35°C
Reheating Restart ΔT Setting	10°C

Sanitary Hot Water Storage Function

After showers, house usually needs only medium temperature sanitary hot water in day time. This function is used to store high temperature sanitary hot water in low demand time (mid-night, or day time of working days), and reheat the water to medium temperature out of this time period.

4.01 Sanitary Hot Water Storage Function

Turn ON/OFF this function.

4.02 Sanitary Hot Water Storage Timer

Set a working time period for this function, and the unit starts to work towards sanitary hot water set temperature in parameter 3.01 within the set time range. Different time periods for every day in a week can be set.



4.03 Reheating Function

Turn ON/OFF reheat function.

4.04 Reheating Function Timer

Set a working time period for reheat function, and within this time period, unit will work with a lower set value for DHW (value set in parameter 4.05). Different time period for every day in a week can be set.

7. Operation Instruction

4.05 Reheating Set Temp.

Set a lower set value for DHW operation. Unit will work with this set value when reheating function is activated in the set time period (time period set in parameter 4.04).

4.06 Reheating Restart ΔT Setting

Set “reheat restart” water ΔT . When water temperature drops below ΔT based on reheat set temperature within the set reheating time period, unit restarts.

7. Operation Instruction

5. Reduced Setpoint For Heating



Reduced Setpoint Function: Sometimes the house heating demand may be lower than normal, like during sleep period or working time. In this way, a reduced value based on standard set value can be set here for better efficiency of the whole system.

Quiet Operation: Also, for a better noise issue, a Quiet Operation can be also set in this menu. After activating this function and setting the time period for quiet operation, unit will try to reduce its noise level.

Note: Unit efficiency in quiet operation mode will be lower than standard working mode.

5.01 Reduced Setpoint

Turn ON/ OFF Reduced Setpoint function.

5.02 Temp. Drop/Rise

Set temperature drop (in heating) or increase (in cooling) based on standard set temperature during Reduced Setpoint operation.

5.03 Timer for Reduced Setpoint Function

Set a working time period for Reduced Setpoint Function.
Different time periods for every day in a week can be set.

5.04 Quiet Operation

Turn ON/ OFF Quiet Operation function.

5.05 Allowable Temp. Drifting

Set allowable temperature drift during Quiet Operation.

When the unit works in quiet mode, its output may drop because both fan and compressor may need to work in lower speed. However, temperature in the system may drop (in heating) or increase (in cooling) too much due to the lower output. So when actual temperature drift from the standard set value is more than the ΔT set value set here, unit will end this quiet operation, to ensure comfortable house temperature.

5.06 Timer for Quiet Operation

Set a working time period for Reduced Setpoint function
Different time periods for every day in a week can be set.

7. Operation Instruction

6. Anti-Legionella Function



Anti-Legionella Program	<input type="checkbox"/>
Day and Time	
Setpoint	70°C
Duration	20Min
Finish Time	120Min

If user uses sanitary hot water directly out from the HWT (hot water tank), for the health purpose, it's requested that he needs to heat up the water inside the tank over 60°C for anti-legionella purpose once a week.

Note: Please always refers to local regulation for a correct usage of this function.

6.01 Anti-Legionella Program

Turn ON/OFF Anti-Legionella function.

6.02 Day and Time

Set at which time in which weekday(s) for the start of anti-legionella operation.

6.03 Setpoint

Set the target sanitary hot water temperature for anti-legionella. Please refers to the local regulation for the correct setting of this temperature.

6.04 Duration

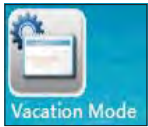
Set for how long the unit should try to keep this set high temperature, to ensure all bacteria in the shower water tank can be killed.

6.05 Finish Time

Set an ending time for this anti-egionella function, even it is not finished successfully. This time should be longer than what it is set in parameter 6.04.

7. Operation Instruction

7. Vacation Mode



Vacation Mode	<input type="checkbox"/>
Sanitary Hot Water temp. Drop during Vacation Mode	20°C
Heating Water temp. Drop during Vacation Mode	20°C
Vacation Start Date	1.1.2015
Vacation Finish Date	1.2.2015

If you need to be away from house for some days, you can use this Vacation Mode function to reduce the set temperatures for both sanitary hot water and house heating, to save more energy.

7.01) Vacation Mode

Turn ON/OFF Vacation Mode.

7.02) Sanitary Hot Water Temp. Drop During Vacation Mode

Set a temperature drop for sanitary hot water based on standard DHW set value during the set time period for vacation mode.

7.03) Heating Water Temp. Drop During Vacation Mode

Set a temperature drop for heating based on standard DHW set value during the set time period for vacation mode.

7.04) Vacation Start Date

Set the date that vacation starts.

7.05) Vacation Finish Date

Set the date that vacation finishes.

7. Operation Instruction

8. User Management



Permission Level	End User
Heating/Cooling ON/OFF Timer	<input type="checkbox"/>
Heating/Cooling ON/OFF Timer	
Language	English
Set Date and Time	5.5.2016 18:48
Distribution System Setting	W/HC(Sanitary Hot Water/Heating+Cooling)
Save Current Settings	
Load Saved Settings	
Reset to Factory Settings	

8.01) Permission Level

For the safety of the product, some parameters can only be adjusted under installer's permission level. The permission level can be changed in this menu. A password is needed for activating the installer's permission level.

8.02) Heating/Cooling ON/OFF Timer

To turn ON/OFF the timer function for heating/cooling operation.

8.03) Heating/Cooling ON/OFF Timer

Set the ON and OFF timer for the heating/cooling operation. Different time periods for every weekdays in a week can be set.



7. Operation Instruction

8.04) Language

Set system language.

8.05) Set Date and Time

Set system clock date and time.

8.06) Distribution System Setting

The unit is default set to have 3-way motorized valve inside the unit, which has different flow directions for sanitary hot water/cooling+heating mode.

If user needs to have sanitary hot water and heating on the same distribution system, he can set this parameter to “Hot Water+Heating/Cooling” .

Note: If it is set to "Sanitary Hot Water+Heating/Cooling", temperature sensor for sanitary hot water (Tw) will be used for the control of heating operation also. Please place it either inside an ideal position in Hot Water Tank.

8.07) Save Current Settings

This parameter is used by installer to save the current settings as “Installer Settings” , so the customer can load the saved settings into the system, when needed.

8.08) Load Saved Settings

Loaded the saved “Installer Settings” .

8.09) Reset to Factory Settings

Reset the whole system back to factory default settings.

Note: Saved “Installer Settings” will be cleared.

Note: Most of above menus and parameters are designed for installer only. They should only be adjusted by installer or professional customer under the instruction of installer, otherwise malfunction of the unit may happen.

7. Operation Instruction

9. Mode Settings



Sanitary Hot Water	<input checked="" type="checkbox"/>
Heating	<input checked="" type="checkbox"/>
Cooling	<input type="checkbox"/>
Basic Operation Modes	<input checked="" type="checkbox"/>
Max Allowed Duration For Min Compressor Speed	20Min
Cooling and Heating Switch	Ambient Temp.
Ambient Temp. To Start Heating	18°C
Ambient Temp. To Start Cooling	25°C

9.01) Sanitary Hot Water

Set whether the system has sanitary hot water circuit or not. When unit works in Sanitary Water mode, 3-way motorized valve will guide water to HWT automatically.

9.02) Heating

Set whether the system has water circuit for house heating purpose or not. When unit works in heating mode, 3-way motorized valve will guide water to heating circuit automatically.

9.03) Cooling

Set whether the system has water circuit for house cooling purpose or not. When unit works in cooling mode, 3-way motorized valve will guide water to cooling circuit automatically.

Note: As whether the system can work in hot water, heating or cooling mode depend quite much on the distribution system, these setting can only be done under installer level, to ensure the safety of the distribution system.

9.04) Basic Operation Mode

This parameter is used to set the basic operation modes, as “Water Temperature Control” or “Room Temperature Control” .

When "Basic Operation Mode" is activated, unit takes room temperature as control object.

When "Basic Operation Mode" is not activated, unit takes water temperature as control object.

Heating or cooling function take water as the control object as default. However when a room temperature sensor is connected to the unit and a more precise control of room temperature where the sensor is placed is preferred, “Room Temperature Control” mode can be selected.

Note: When “Room Temperature Control” mode is selected, system will not operate under the heating curve function and actual water temperature may swing significantly.

7. Operation Instruction

9.05) Max Allowed Duration For Min Compressor Speed

When unit output is higher than demand, compressor speed will be reduced. If compressor has continuously worked in minimum compressor speed for over time set via “Max Allowed Duration For Min Compressor Speed”, unit stops.

9.06) Cooling and Heating Switch

This function is for having the unit start cooling or heating operation automatically, according to:

- ◆ If setting = “Ambient Temp”, system will automatically choose cooling or heating operation based on the outdoor ambient temperature, compared with parameter set in 9.07 and 9.08.

- ◆ If setting = “External Signal Control”, an external room thermostat or central control system in the building can control the cooling or heating requirements by connecting it to the respective signal ports.

The signals are simple 1-0 (on-off) signal. If cooling port receives the signal, the system switches to cooling; If heating port receives the signal, the system switches to heating. When neither port receives the signal, the system stays in standby mode.

- ◆ If setting = “Ambient Temp.+External Signal Control”, unit will take both the ambient temperature and external signal into consideration for cooling or heating mode selection.

Note: If parameter is set to OFF, auto switch function is not activated. Then make sure that parameter (Heating Water Circuit) and (Cooling Water Circuit) are not set to ON simultaneously, as the system can not determine actual requirement, due to mode conflict.

To avoid mode conflict, if “External Signal Control” is used to take control, please ensure that the external signal will not be activated at the cooling and heating ports at the same time.

9.07) Ambient Temp. To Start Heating

This parameter is used to set the ambient temperature to start the heating operation.

For example, if default value is 18°C, the system will start heating operation automatically when ambient temperature is lower than 18°C.

The setting is only available when parameter “Cooling and Heating Switch “=” Ambient Temp. Or “Ambient Temp.+External Signal Control” .

9.08) Ambient Temp. To Start Cooling

This parameter is used to set the ambient temperature to start the cooling operation.

For example, if set value is 28°C, the system will start heating operation automatically when ambient temperature is higher than 28°C.

The setting is only available when parameter “Cooling and Heating Switch “=” Ambient Temp. Or “Ambient Temp.+External Signal Control” .

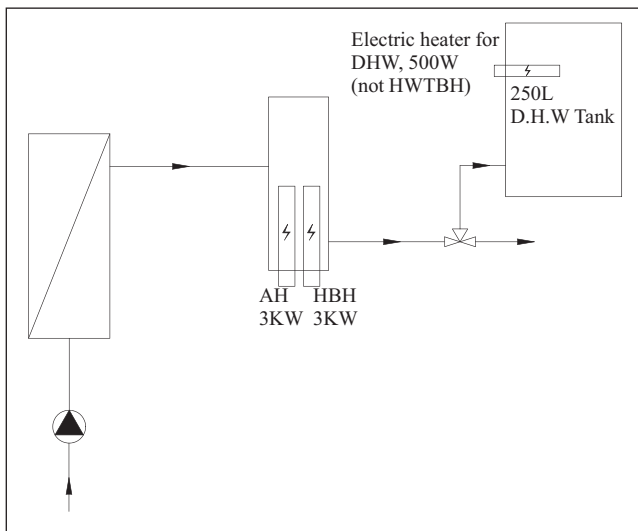
Note: In order to avoid short cycling between different modes, unit will also take the average temperature in the past time for reference of choosing the working mode.

7. Operation Instruction

10. Backup Heating



Backup Heating Sources For Heating	<input type="checkbox"/>
Priority for Backup Heating Sources (HBH)	Lower than AH
Backup Heating Source for Sanitary Hot Water	<input type="checkbox"/>
Priority for Backup Heating Sources (HWTBH)	Higher than AH
Heating Source Start Accumulating Value (HBH)	60
Water Temperature Rise Reading Interval (HWTBH)	10Min
Emergency Operation	<input type="checkbox"/>



- ◆ AH---Auxiliary Heater inside the indoor unit
- ◆ HBH---Heating Back-up Heater
- ◆ HWTBH---Hot Water Tank Back-up Heater
HWTBH is external back up heater for DHW.
If it is connected to "HWTBH signal" in wiring diagram, HWTBH can be controlled by heat pump controller.

10.01) Backup Heating Sources For Heating

Set whether the system has HBH (Heating Back-up Heater).

10.02) Priority for Backup Heating Sources (HBH)

Set the priority of HBH compared with unit AH (Auxiliary Electric Heater inside the indoor unit). When unit works in heating, if heat pump unit can't provide enough power, it will turn on AH or HBH (which set to have the higher priority) automatically. If after AH or HBH is working, that the total output power is still not big enough, unit will turn on the lower priority Backup Heating Source also.

10.03) Backup Heating Source for Sanitary Hot Water

Set whether the system has HWTBH (Hot Water Tank Back-up Heater).

10.04) Priority for Backup Heating Sources (HWTBH)

Set the priority of HWTBH compared with unit AH (Auxiliary Electric Heater inside the indoor unit). When unit works in hot water, if heat pump unit can't provide enough power, it will turn on AH or HWTBH (which set to have the higher priority) automatically. If after AH or HWTBH is working, that the total output power is still not big enough, unit will turn on the lower priority Backup Heating Source also.

10.05) External Heating Source Start Accumulating Value

Accumulated Value between operation time VS set temp. to start other heating source for heating operation.

7. Operation Instruction

This is for adjusting how fast Backup Heating Sources for heating operation will be turned ON if heat pump unit can't provide enough power. The bigger the value is set, longer time it takes to start the Backup Heating Sources if heat pump capacity is not enough.

10.06) Water Temperature Rise Reading Interval

Time interval for checking the temperature increase when unit works in DHW mode. If temperature increases too slow during this set interval time, unit will activate other heating source for DHW operation.

The smaller the value is set, unit is more likely to activate AH or HWTBH for a fast heating of DHW.

Backup Heating for DHW

If system has no HWTBH (set via parameter 10.03), or HWTBH has lower priority than AH (set via parameter 10.04) :

◆ If heat pump capacity is not enough to heat up DHW fast enough, unit starts AH. If after AH starts, it still cannot heat up DHW fast enough, HWTBH starts.

◆ When the set and actual water temperature is higher than heat pump maximum allowable water temperature, heat pump stops and unit starts AH. If after AH starts, hot water temperature still increases too slow, HWTBH starts.

If system has HWTBH (set via parameter 10.03), and HWTBH has higher priority than AH (set via parameter 10.04) :

If system has HWTBH (set via parameter 10.03), and HWTBH has higher priority than AH (set via parameter 10.04) :

◆ When the set and actual water temperature is higher than heat pump maximum allowable water temperature, HWTBH works ALONE for DHW while heat pump unit will work in heating or cooling mode according to demand.

◆ When actual water temperature is lower than heat pump maximum allowable water temperature heat pump works in hot water mode. If heat pump capacity is not enough to heat up DHW fast enough, unit starts HWTBH. If after HWTBH starts, hot water temperature still increases too slow, AH starts.

Under shifting priority operation, according to parameter 3.08, AH or AH+HWTBH work together with heat pump to heat sanitary hot water to the set value as soon as possible, so heat pump unit can concentrate on heating mode afterwards.

10.07) Emergency Operation

When heat pump failed to work, whether the unit should turn ON the back-up heating system automatically.

Note: If this function is activated, customer should check the working status of heat pump unit occasionally, to ensure heat pump unit is functioning well.

7. Operation Instruction

11. Water Pump Settings



Circulation Pump P0 Type	DC Variable Speed Pump (PWM)
Speed Setting of Circulation Pump P0	High Speed
Working Mode of Circulation Pump P0	Interval working mode
Pump Off Interval for P0	10Min
Pump On Time for P0	1Min

Buffer Tank	<input type="checkbox"/>
P1 for Heating Operation	<input type="checkbox"/>
P1 for Cooling Operation	<input type="checkbox"/>
P1 with High Temp. Demand	<input type="checkbox"/>
P2 for Heating Operation	<input type="checkbox"/>

P2 for Cooling Operation	<input type="checkbox"/>
P2 with High Temp. Demand	<input type="checkbox"/>

11.1) Circulation Pump P0 Type

This is to set the type of circulation pump inside the unit, P0.

11.2) Speed Setting of Circulation Pump P0

This is to set the working speed of circulation pump inside the unit, P0.

11.3) Working Mode of Circulation Pump P0

This is to set the working mode of circulation pump for cooling/heating operation inside the unit, P0.

P0 can work as the following settings:

1. Interval working mode. In this setting, P0 stops after compressor stops, but runs for a while after stops for an interval period.
2. ON constantly. P0 will work constantly even if compressor stops after reaching the set temperature.
3. OFF with compressor. It means P0 stops after compressor stops.

11.4) Pump OFF Interval

11.5) Pump On Time

If unit circulation pump P0 working mode is set to “Interval working mode”, that means circulation pump stops after compressor stops, but after it stops, it will runs for [11.5] minutes after stops for every [11.4] minutes interval time.

11.6 Buffer Tank

11.7 P1 for Heating Operation

11.8 P1 for Cooling Operation

11.9 P1 with High Temp. Demand

11.10 P2 for Heating Operation

11.11 P2 for Cooling Operation

11.12 P2 with High Temp. Demand

These parameters are used for setting the working of external circulation pump P1 and P2, for heating/cooling circuit, (HC/CC 1) and heating/cooling circuit, (HC/CC 2).

For more details, please refers to chapter 2.1.3~2.1.5.

7. Operation Instruction

12. Floor Curing



Floor Curing	<input type="checkbox"/>
Floor Curing Temperature Setting Stage 1	30°C
Floor Curing Operation Duration Stage 1	8Hour
Floor Curing Temperature Setting Stage 2	38°C
Floor Curing Operation Duration Stage 2	12Hour
Floor Curing Running Hours	0Hour
Highest Water Temp. in Floor Curing Operation	0°C

After initial Installation or Long Time Non-operation, a floor heating system may be very wet in the concrete. Most of the heating capacity from heat pump unit is consumed to dry up the water in the concrete for its evaporation. This floor curing function is used to dry the floor to ensure the safety of heat pump system.

12.1) Floor Curing

Turn ON/OFF this function. For a newly-built floor heating system, floor must be cured before setting the heat pump into standard working mode.

12.2) Floor Curing Temperature Setting Stage 1

12.3) Floor Curing Operation Duration Stage 1

Set temperature and lasting time for first-stage of Floor Curing operation.

12.4) Floor Curing Temperature Setting Stage 2

12.5) Floor Curing Operation Duration Stage 2

Set temperature and lasting time for second-stage of Floor Curing operation.

12.6) Floor Curing Running Hours

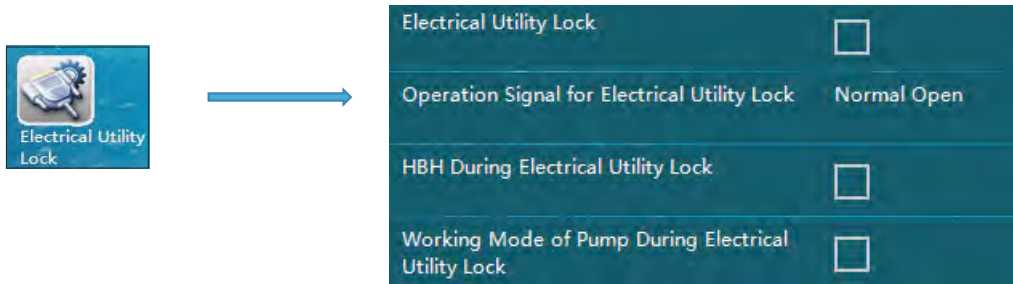
12.7) Highest Water Temp. in Floor Curing Operation

Three two values are operation data during floor curing operation. Unit will take down the operation time and highest water temperature the system has reached during Floor Curing operation.

Note: After Floor Curing operation is finished, if water temperature inside the distribution system is still far below the set value of [12.4], it means there has still some water inside the concrete of floor heating system, thus Floor Curing function should be turned ON again, until temperature can increase over [12.4].

7. Operation Instruction

13. Electrical Utility Lock



Some electricity companies offer a special rate to the houses who lowered their power consumption during peak time. When peak time comes, electricity company will send an ON or OFF signal to every house, indicating that they hope the house owners to turn OFF some electric equipments.

This system can be connected to the unit if the unit is supposed to stop working during this period, and use the following parameter settings to activate this function.

13.1) Electrical Utility Lock

Set ON/OFF Electrical Utility Lock function.

13.2) Operation Signal for Electrical Utility Lock

Set the type of signal from electricity company. “Normally Open” means when unit can work as normal when it gets ON signal; the unit should stop working when it receives a OFF signal; “Normally Close” means the opposite.

13.3) HBH During Electrical Utility Lock

Set whether turn on HBH (Heating Back-up Heater), when it is blocked by Electrical Utility Lock e.g. gas boiler.

13.4) Working Mode of Pump During Electrical Utility Lock

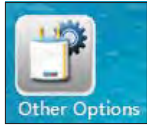
Set the working of circulation pump when unit is blocked by Electrical Utility Lock.

If it's activated, the circulation pump will keep on working when compressor stops.

If it's not activated, the circulation pump will stop working when compressor stops.

7. Operation Instruction

14. Other Options



Ambient Temp. to Activate First Class Anti-freezing	6°C
Ambient Temp. to Activate Second Class Anti-freezing	4°C
Ambient Temp. to Stop Second Class Anti-freezing	6°C
Water Temp. to Activate Second Class Anti-freezing	5°C
Water Temp. to Stop Second Class Anti-freezing	12°C

Motorized Diverting Valve switching time	1Min
Power On Time for Motorized Diverting Valve	1Min
Refrigerant Recycle Function	0S
Control Panel Backlight Light	Allways ON
Exit System	
Mode Switch during Defrosting	<input type="checkbox"/>
Fan Speed Limit	100%

14.1) Motorized Diverting Valve Switching Time

Set how many minutes as switching time of the motorized diverting valve spending on switching the water flow fully between DHW and Heating/Cooling circuit.

Note: This parameter must comply with the motorized diverting valve. Otherwise unit may not be able to work due to not enough water flow rate.

14.2) Power On Time for Motorized Diverting Valve

Set how long the motorized diverting valve should be powered, for switching the water flow fully between DHW and Heating/Cooling circuit.

14.3) Refrigerant Recycle

This function can be used by installers to recycle the refrigerant in the complete system into condensing unit for service purpose. When it is activated, unit will be forced to work in cooling operation for some time, to push all refrigerant back to condensing unit.

14.4) Control Panel Backlight

Set the backlight touch screen operation panel to be "Always on" or how long before it becomes off for energy saving.

14.5) Exit System

Exit from unit program and returns to WINCE operation system. This is used for software updating.

7. Operation Instruction

- 14.6) Ambient Temp. to activate first class anti-freezing
- 14.7) Ambient Temp. to activate second class anti-freezing
- 14.8) Ambient Temp. to stop second class anti-freezing
- 14.9) Water Temp. to activate second class anti-freezing
- 14.10) Water Temp. to stop second class anti-freezing

These parameters are used for setting the anti-freezing protection of the unit in winter time, when unit is powered but turned OFF.

When ambient temperature is lower than first class anti-freezing starting ambient temperature, unit will circulate the water in the system at interval for anti-freezing.

When ambient temperature drops below second class anti-freezing starting ambient Temperature, heat pump unit will start either compressor or backup heating sources to maintain the water temp. within the range “Water Temp. to activate second class anti-freezing” and “Water Temp. To stop second class anti-freezing” .

Note: This function is provided to the customer FREE OF CHARGE for helping their house heating and DHW water system free from freezing up. Customer should always have his own protection system for preventing the water system from freezing up. We have no responsibility or obligation if any damage has caused by water freezing.

14.11) Mode Switch During Defrosting

If water temperature is too low, the condenser may have the risk of freezing up and cause damage the complete refrigerant system. Thus, if water temperature in current working mode is too low for defrosting, unit will check the water temperature in other circuit. If the water temp. in other circuit is good enough for defrosting, it will switch the water flow to this circuit for defrosting operation automatically.

If there is no other circuit, or the water temp in other circuit is also not high enough for defrosting, unit will stop defrosting and automatically lift up the set water temperature, preparing for the next defrosting cycle.

If defrosting failed for over three times continuously, unit stops and can only be recovered by re-powering the machine. Please check the water system at this moment to ensure everything works properly before re-powering the unit.

Note: This function can only work with outdoor software higher than AC13I20.WP.V004_T01 or AC13I17.WP.V009_T01, otherwise this function will interrupt the working of the machine during defrosting all the time.

14.12) Fan Speed Limit

This function is for reducing the fan speed in order to reduce the noise, however it would reduce the performance of the heat pump at the same time. The fan speed limitation can be set at down to two levels 95% and 90%. This function is not recommended unless the noise is strongly complained by customer's neighbor.

7. Operation Instruction

15. Unit Real-time Data



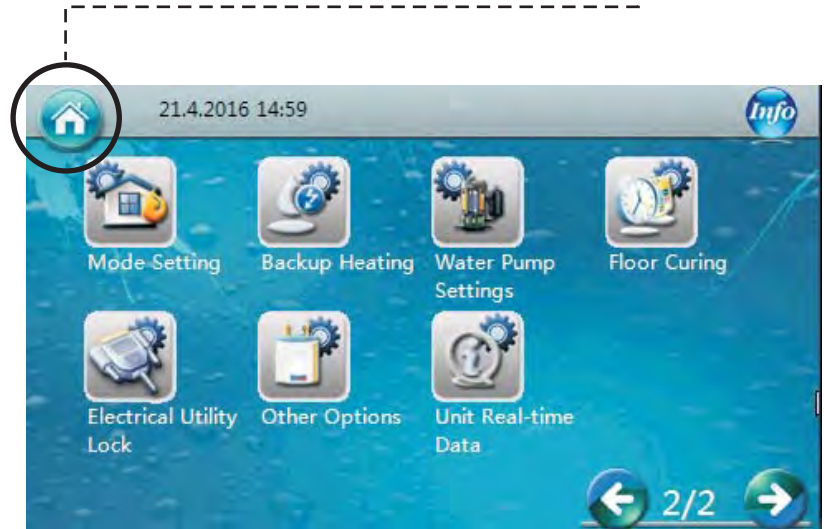
This menu is designed for viewing the running data of the system. Following parameters that are related to the working of the system can be viewed in this menu:

- 01): Control System Version No
- 02): Database Version
- 03): Heat Exchanger Water Outlet Temperature-Indoor - Tuo
- 04): Heat Exchanger Water Return Temperature-Indoor - Tui
- 05): Indoor Coil Temp. - Tup
- 06): Sanitary Hot Water Temp.- TW
- 07): Cooling/Heating Water Temp. -TC
- 08): Water Flow Rate
- 09): Compressor Working Speed
- 10): EEV Openings
- 11): Actual Ambient Temp.
- 12): Average Ambient Temp. in 1 Hour
- 13): Average Ambient Temp. in 24 Hour
- 14): High Pressure - Pd
- 15): Low Pressure - Ps
- 16): Discharge Temp. - Td
- 17): Suction Temp. - Ts
- 18): Outdoor Coil Temp. - Tp
- 19): Source Side Water Inlet temperature (For Water to Water unit only)
- 20): Source Side Water Outlet temperature (For Water to Water unit only)
- 21): Fan Speed
- 22): Fan Speed 2
- 23): Outdoor Unit Working Corrent
- 24): Voltage
- 25): Eeprom Version No.

7. Operation Instruction

Home

Home: Press this button at any page, operation panel goes back to home page.---



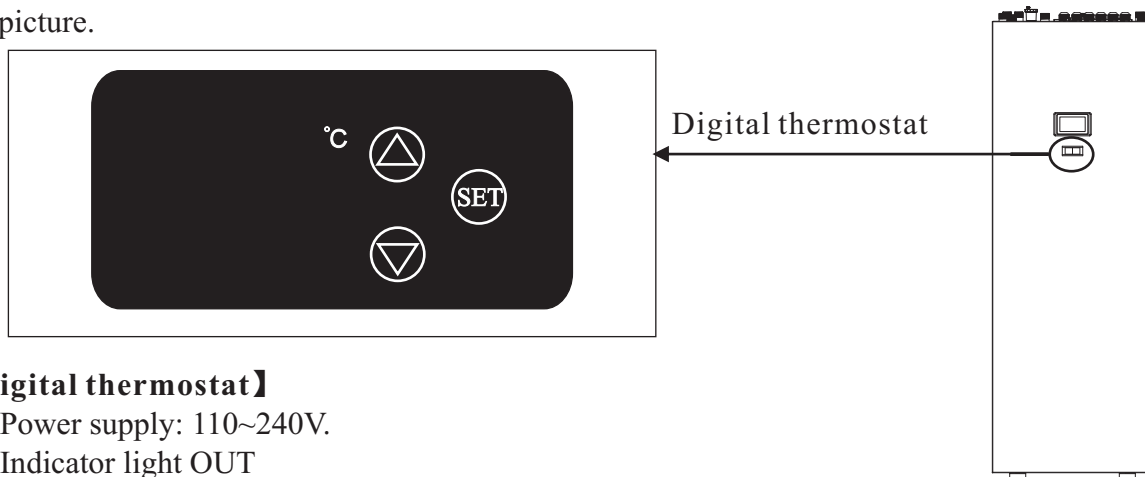
8. Electric Heater

This unit has included two electric heaters inside. Two electric heaters are used to keep the water temperature when heat pump capacity is not enough or heat pump fail to work, as well as heat the water up more rapidly when water temperature is low.

【500W electric heater】

1. 500W electric heater only can be controlled by digital thermostat.
2. Power supply is 230V/50Hz/1Ph, and temperature setting range is 30~75°C.
3. This heater is mainly used to get high temperature sanitary hot water or get hot water faster.
4. If heat pump fails to work, this heater can still work.

Operation knob for 500W heater is on front panel, for easy access. Please refers to following picture.



【Digital thermostat】

Power supply: 110~240V.

Indicator light OUT

When the electric heater is turned on, the indicator light is always ON.

When the electric heater is turn off, the indicator light is OFF.

Temperature setting: Press SET, the set temperature flickers, press ▲ or ▼ to increase or decrease the set temperature. The controller will save the setting.

Press SET again to exit and show the actual water tempeture in the display. If SET is not pressed, the controller will also exit the setting after 3 seconds and show the actual water temperature in the display.

Control logic

When the thermostat is powered on, the display shows the actual water temperature. When the actual water tempeture is lower than (the set tempeture-3°C), the electric heater is turned on.

When the actual water temperature equals or higher than the set temperature, the electric heater stops.

Failure code

When the actual temperature which sensor detects is higher than 120 °C or the sensor for thermostat is short circuit, the display shows the failure code HH, and the electric heater stops.

When the actual temperature which sensor detects is lower than -45 °C or the sensor for thermostat is open circuit, the display shows the failure code LL, and the electric heater stops.

Notice:

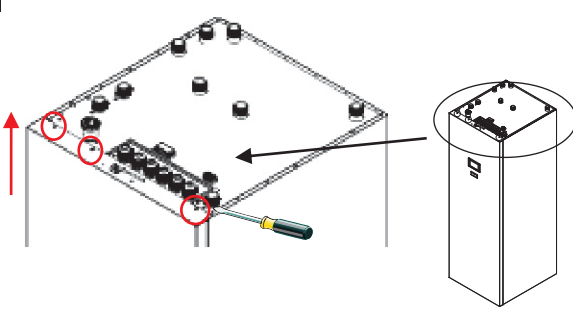
1. Please connect the cables according the wiring diagram.
2. The sensor cable can't be packed with power cable or communication cable, please connect them separately, in order to avoid interference.
3. Sensor can't be dip into the hot water for a long time.
4. The thermostat initilize the setting the first second after power on, so don't touch the button in the first second.
5. When the thermostat start to work, please remove the film on the display.

8. Electric Heater

When heat pump capacity is not enough, or heat pump meets a failure, indoor PCB will turn ON the internal heater automatically.

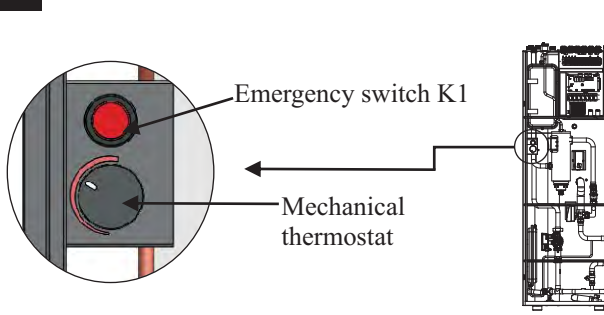
However, if the indoor PCB itself is broken, one can obey the following instructions to turn ON the heater manually:

1



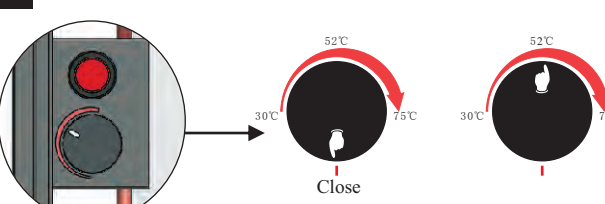
Unscrew three screws on top, and lift the front panel up by around 20mm, then remove the front panel.

2



Switch ON the switch K1 inside the unit, as shown in below picture.

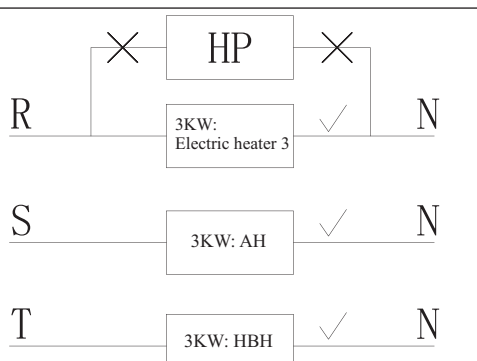
3



Set the needed water temperature by turning the knob of the mechanical thermostat, so to control the water temperature.

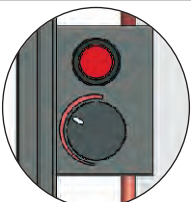
Note:
The control temperature range for the mechanical thermostat is 30~75 °C .If the knob of mechanical thermostat is set between 30 and75 °C , the mechanical thermostat is ON.
If the knob of machnical thermostat is set below 30°C , the mechanical thermostat is OFF.

4



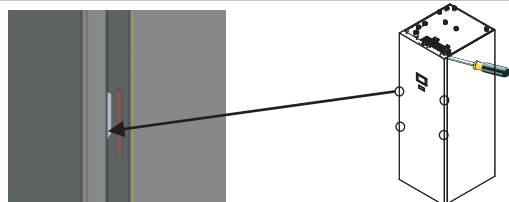
After the emergency switch is set to ON, heat pump power supply will be switched to the last 3kW. If the water temperature is lower than what is set via the digital thermostat, all 3 sets of 3kW heater will be started at the same time, so to have balanced 3 phase 9kW electric heater as the heating source. Please use this "emergency switch" when heat pump breaks down, and set it back to "OFF" once the heat pump unit is OK.

5



Note:
After problem solved, please don't forget to turn the switch K1 to OFF position, otherwise electric heater will keeps on working if actual water temperature is lower than the set value of the mechanical thermostat.

6



Please insert the hooks of the front panel to the holes as shown in the picture, then fix the front panel by fasten three screws on top.

9. Failure Code

【Outdoor】

Type	Code	Description	Blinking times	Unit working statue	Solution
Protection	P01	Main line current protection	1	Compressor stops	Input current too high or too low, or system works in over-load condition. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happened 3 times in a certain period of time, unit stops until repowered. Check unit input current. Check whether fan motor and water pump is working OK; whether condenser is blocked; whether water temperature too high, and whether water inlet&outlet temperature has too big difference (should no bigger than 8℃)
	P02	Compressor phase current protection	2	Compressor stops	Compressor input current too high or too low, or system works in over-load condition. Check compressor input current. Check whether fan motor and water pump is working OK; whether condenser is blocked; whether water temperature too high, and whether water inlet&outlet temperature has too big difference (should no bigger than 8℃)
	P03	IPM module protection	3	Compressor stops	Compressor drive failure. Check whether cable is broken or loosen. Check whether compressor driver PCB or compressor is broken.
	P04	Compressor oil return protection	4	Compressor speed up	If unit has been continuously working in low speed for certain period of time, unit starts this protection to suck compressor oil back into compressor. This is a normal protection and doesn't need any treatment.
	P05	Compressor shut down due to high/low pressure switch open caused by abnormal high/low pressure	5	Compressor stops	If system pressure is too high or too low, it activates this protection. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happened 3 times in a certain period of time, unit stops until repowered. Check whether fan motor and water pump is working OK; whether condenser is blocked; whether water temperature too high, and whether water inlet&outlet temperature has too big difference (should no bigger than 8℃)
	P06	Compressor speed down due to abnormal high pressure detected by condensing pressure sensor	6	Compressor stops	If system pressure is too high , it activates this protection. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happened 3 times in a certain period of time, unit stops until repowered. Check whether fan motor and water pump is working OK; whether condenser is blocked; whether water temperature too high, and whether water inlet&outlet temperature has too big difference (should no bigger than 8℃)
	P07	Compressor preheating	7	Standard function, doesn't need any treatment.	This is a normal protection and doesn't need any treatment. When compressor did not work for long time and ambient temperature is low, compressor crankcase heater work for certain period of time before compressor start to warm up the compressor.
	P08	Compressor discharge temp. too high protection	8	Compressor stops	Check whether water temperature set value is too high, especially when ambient temperature is low; whether water flow rate too small; whether system is lacking of enough refrigerant.
	P09	Outdoor evaporator coil temp. sensor protection	9	Compressor stops	Check whether air circulates fluently in outdoor unit.
	P10	AC over high/low voltage protection	10	Compressor stops	Unit input voltage too high or too low. Check the voltage of unit power supply.
	P11	Compressor shut down due to too high/low ambient temperature	11	Compressor stops	Ambient temperature is too high or too low for unit to work.
	P12	Compressor speed limit due to too high/low ambient temperature	0	Compressor speed down	This is a normal protection and doesn't need any treatment.

9. Failure Code

Type	Code	Description	Blinking times	Unit working statue	Solution
Protection	P14	Compressor speed down due to abnormal low pressure detected by condensing pressure sensor	14	Compressor stops	If system pressure is too low , it activates this protection. Unit recovers automatically after 5 minutes when it happened the first time. If same failure happened 3 times in a certain period of time, unit stops until repowered. Check whether system has not enough refrigerant or leakage inside(more likely it is not enough refrigerant that caused this abnormal evaporating pressure); whether fan motor and water pump is working OK; whether condenser is blocked; whether EEV whether EEV works normally; whether water temperature too low, and whether water inlet&outlet temperature has too big difference in cooling(should no bigger than 8℃).
Failure	F01	Outdoor ambient temp. sensor failure	17	Compressor stops	Check whether ambient temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F02	Outdoor evaporator coil temp. sensor failure	18	Compressor stops	Check whether outdoor coil temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F03	Compressor discharge temp. sensor failure	19	Compressor stops	Check whether compressor discharge temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F04	Outdoor Suction temp. sensor failure	20	Compressor stops	Check whether outdoor suction temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F05	Evaporating pressure sensor failure	21	Compressor stops	Check whether evaporating temperature sensor is open, short-circuit or broken. Replace it if necessary.
	F06	Condensing pressure sensor failure	22	Compressor stops	Check whether condensing temperature sensor is open, short-circuit or broken. Replace it if necessary.
	F07	High/low pressure switch failure	23	Compressor stops	If pressure switch is in open position when unit is in standby statue, or 2 minutes after compressor stops, unit gives this failure. Check whether high or low pressure switch is broken or not well connected.
	F09	DC fan failure (one)	25	Compressor speed down	Speed of DC fan or one of the DC fan (for dual fan system) can't reach the required value or no feedback signal. Please check whether the PCB or fan motor is broken.
Failure	F10	DC fan failure (two)	26	Compressor stops	Speed of both DC fans (for dual fan system) can't reach the required value or no feedback signal. Please check whether the PCB or fan motor is broken.
	F11	System evaporating pressure too low	27	Compressor stops	If system too low pressure protection detected by evaporating pressure sensor happened 3 times in a certain period of time, it gives this failure code and unit can't be restarted until repowered. Check whether system has not enough refrigerant or leakage inside(more likely it is not enough refrigerant that caused this abnormal evaporating pressure); whether fan motor and water pump is working OK; whether condenser is blocked; whether EEV whether EEV works normally; whether water temperature too low, and whether water inlet&outlet temperature has too big difference in cooling (should no bigger than 8℃).
	F12	System condensing pressure too high	28	Compressor stops	If system too high pressure protection detected by condensing pressure sensor happened 3 times in a certain period of time, it gives this failure code and unit can't be restarted until repowered. Check whether water flow rate is not enough (more likely it is not enough water flow rate that caused system build up too high pressure); whether fan motor and water pump is working OK; whether condenser is blocked; whether EEV works normally; whether water temperature too high, and whether water inlet&outlet temperature has too big difference (should no bigger than 8℃)

9. Failure Code

【Indoor】

Type	Code	Description	Blinking times	Unit working statue	Solution
Failure	F13	Room temp. sensor failure	7	Unit stops	Check whether room temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F14	Sanitary hot water temp. sensor failure	3	Unit stops	Check whether sanitary hot water temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F15	Cooling/heating water temp. sensor failure	6	Unit stops	Check whether cooling/heating water temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F16	Unit water outlet temp. sensor failure	4	Unit stops	Check whether unit water outlet temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F17	Unit water inlet temp. sensor failure	5	Unit stops	Check whether unit water inlet temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F18	Indoor coil temp. sensor failure	8	Unit stops	Check whether indoor temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F21	Mixture valve 1 temperature sensor failure	11	Unit keep on working, mixture valve 1 output fixed to 0.	Check whether TV1 temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F22	Mixture valve 2 temperature sensor failure	12	Unit keep on working, mixture valve 2 output fixed to 0.	Check whether TV2 temperature sensor is open, short-circuit or value drifts too much. Replace it if necessary.
	F25	Communication between operation panel and indoor PCB or outdoor PCB failure	1	Unit stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check whether the last three switches on outdoor power PCB are set to 001; Whether four switches on indoor PCB are set to 1000. Unit recovers when communication recovers.
	F27	Indoor EEPROM failure	13	Unit keep on working	Cut the unit power, connect CN213-5 and CN213-6 together, repower the unit and then cut the power and cancel the connect. If still not OK, replace the indoor PCB.
	F28	Water pump PWM signal feedback failure	14	Unit keep on working	Check water pump cable connection; check power supply to water pump; check whether water pump is broken.
	F29	Mixture valve 1 failure	17	Unit keep on working, mixture valve 1 output fixed to 0.	Check MV1 cable connection; check whether PCB output voltage signal; check whether MV1 is broken.
	F30	Mixture valve 2 failure	18	Unit keep on working, mixture valve 2 output fixed to 0.	Check MV2 cable connection; check whether PCB output voltage signal; check whether MV2 is broken.
Protection	S01	Indoor anti-freezing protection in cooling		Compressor speed down or stop	Compressor speed down if coil temp. lower than 2°C; Compressor stops if coil Temp. lower than -1°C; Compressor restarts if coil Temp. higher than 6°C. 1. Check whether set temperature for cooling is too low; whether system has too small water flow rate; check water system especially the filter. 2. Check whether system has not enough refrigerant inside by measuring the evaporating pressure. 3. Check whether ambient temperature is lower than 15°C.
	S02	Too small water flow rate		Compressor stops	System water flow rate is less than minimum allowable flow rate. Check the water system, especially the filter; check the working statue of water pump.
	S03	Water flow switch failure		Warning but unit keeps on working	Water flow switch failed to work. Check whether flow switch is broken or not well connected.

9. Failure Code

Type	Code	Description	Blinking times	Unit working statue	Solution
Protection	S04	Communication failure		Unit stops	Communication data lost too much. Check whether communication cable is longer than 30M; whether there has a source of the disturbance nearby the unit. Unit recovers when communication recovers.
	S05	Serial port connect error		Unit stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check whether the last three switches on outdoor power PCB are set to 001; Whether four switches on indoor PCB are set to 1000. Unit recovers when communication recovers.
	S06	Water outlet Temp. too low protection in cooling		Compressor stops	Compressor stops if water outlet is lower than 5°C in cooling mode. Check whether temperature sensor Tc is OK and well connected; whether set water temperature too low; whether system flow rate too small.
	S07	Water outlet Temp. too high protection in heating/hot water		Compressor stops	Compressor stops if water outlet is higher than 57°C in heating or hot water mode. Check whether temperature sensor Tc and Tw is OK and well connected; whether set water temperature too high; whether system flow rate too small.
	S08	Defrosting Failure		Compressor stops	If unit continuously failed to finish the defrosting operation for three times, it stops and gives failure code S08. This can only be recovered by re-powering the machine. Please check whether the actual water temperature is too low for the unit to defrost, so the plate heat exchanger has the risk of freezing up.
	S09	Water outlet Temp. too low protection in heating/hot water		Compressor stops and AH (or HBH) works	Compressor stops and AH (or HBH) starts if water outlet temperature is lower than 15°C in heating and hot water mode. Compressor restarts when this temperature is higher than 17°C. This is a protection for protecting the safety of the compressor, as too low water temperature in heating or hot water mode may kill the compressor.
	S10	Too small water flow rate failure		Compressor stops	If unit stops due to “too small water flow rate” protection code(S02) over three times in certain period of time, unit stops and gives S10 failure code. It can only be recovered by re-powering the unit. Check the water system, especially the filter, check the working statue of water pump.
	S11	Indoor Anti-freezing Protection Failure in Cooling		Compressor stops	If unit stops due to “Indoor Anti-freezing protection in cooling (S01)” over three times in certain period of time, unit stops and gives S11 failure code. It can only be recovered by re-powering the unit.
System failure	E01	Communication between operation panel and indoor PCB or outdoor PCB failure	33	Compressor stops	Communication failure between operation panel and the indoor or outdoor PCB. Check the cable connection in between. Check whether the last three switches on outdoor power PCB are set to 001; Whether four switches on indoor PCB are set to 1000. Unit recovers when communication recovers.
	E02	Communication between outdoor main control PCB and module PCB	34	Compressor stops	Check the communication cable between outdoor power PCB and deiver PCB. Check whether outdoor power PCB and deiver PCB is broken.
	E03	Compressor phase current failure (open/short circuit)	35	Compressor stops	Check whether the power cable to compressor is broken or short-circuit.
	E04	Compressor phase current overload (over current)	36	Compressor stops	Check whether the power cable to compressor is broken or short-circuit.
	E05	Compressor driver failure	37	Compressor stops	Check whether compressor drive PCB is broken, or cable to compressor is wrong connected.
	E06	Module VDC over high/low voltage failure	38	Compressor stops	Input voltage too high or too low.
	E07	AC current failure	39	Compressor stops	Check the current to outdoor unit, and compare it with the unit current shown on the operation panel. If the difference is not big, check whether the system has enough refrigerant (more likely it is not enough refrigerant that caused this abnormal low current). If the difference is big, outdoor power PCB is broken. Please replace it with a new one.
	E08	EEPROM failure	40	Compressor stops	Cut the unit power and short-circuit JP404 port on outdoor power PCB, repower the unit, cut power again and cancel the short-circuit on JP404 port. If still not OK, replace the outdoor power PCB.

10. Attention



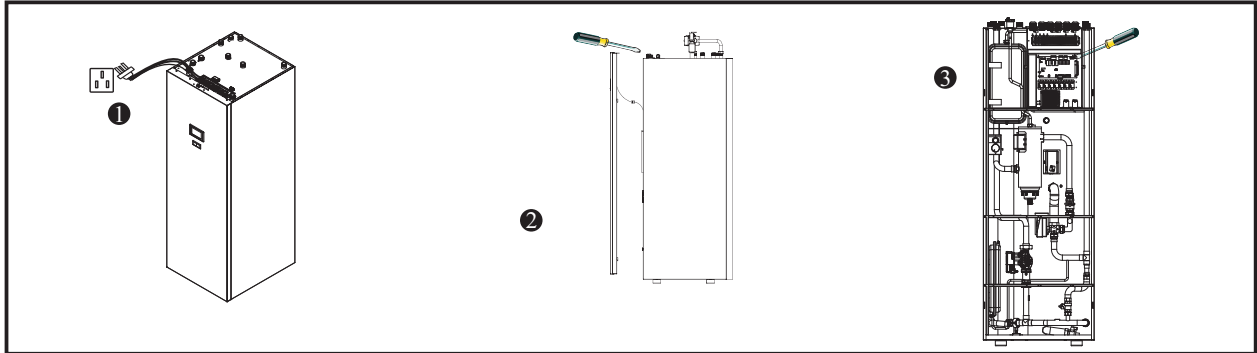
- A. The user mustn't change the structure or wiring inside the unit.
- B. The service and maintenance should be performed by qualified and well-trained technician
When the unit fails to run, please cut off power supply immediately.
- C. The smart control system can automatically analyze various protection problems during daily use, and display the failure code on the controller. The unit may recover by itself.
Under normal operation, the pipings inside the unit don't need any maintenance.
- D. Under normal running, the user only needs to clean the surface of the outdoor heat exchanger per month or quarter of a year.
- E. If the unit runs in a dirty or oily environment, please clean the outdoor heat exchanger and heat exchanger by professionals, using specified detergent, to ensure the performance and efficiency of the unit.
- F. Please pay attention to the ambient environment, to check if the unit is installed firmly, or if the air inlet and outlet of the outdoor unit is blocked or not.
- G. Unless the water pump is damaged, no service or maintenance should be taken to the water system inside the unit. It's recommended to clean water filter regularly or change it when it's very dirty or blocked.

11. Service

【 Indoor unit 】

Service on indoor unit as follows: (this operation must be done by qualified personnel)

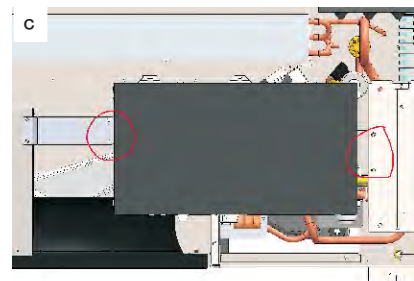
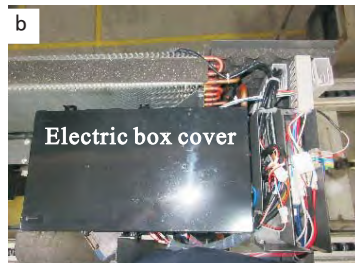
1. Cut off the power supply
2. Remove the front panel (Be care about the cables in between)
3. Check the electric part



【Outdoor unit】

1. Maintenance of controller

- a. Cut off the power supply.
- b. Disconnect all cables.
- c. Unscrew 4 screws, you can take this controller off.



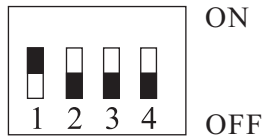
11. Service

【Indoor PCB】

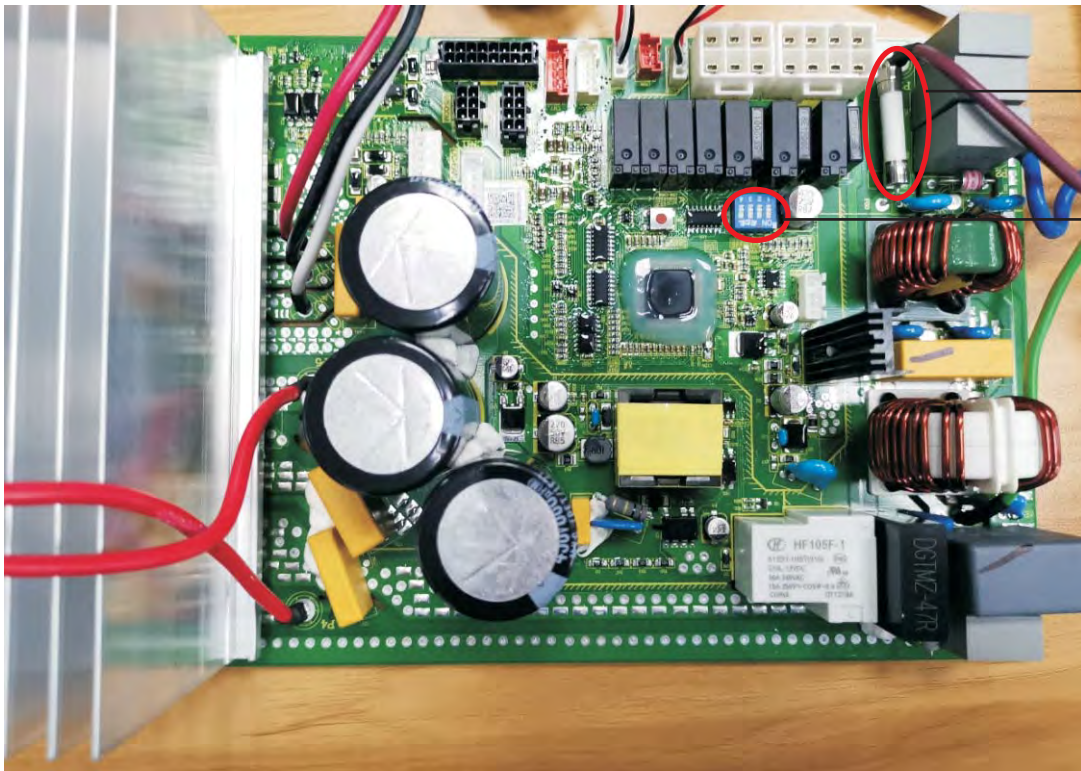


1. LED indicator light on Indoor PCB

2. Dip switch on indoor PCB
Factory Default Setting:



【Outdoor PCB】



1. Dip switch on outdoor PCB Factory Default Setting

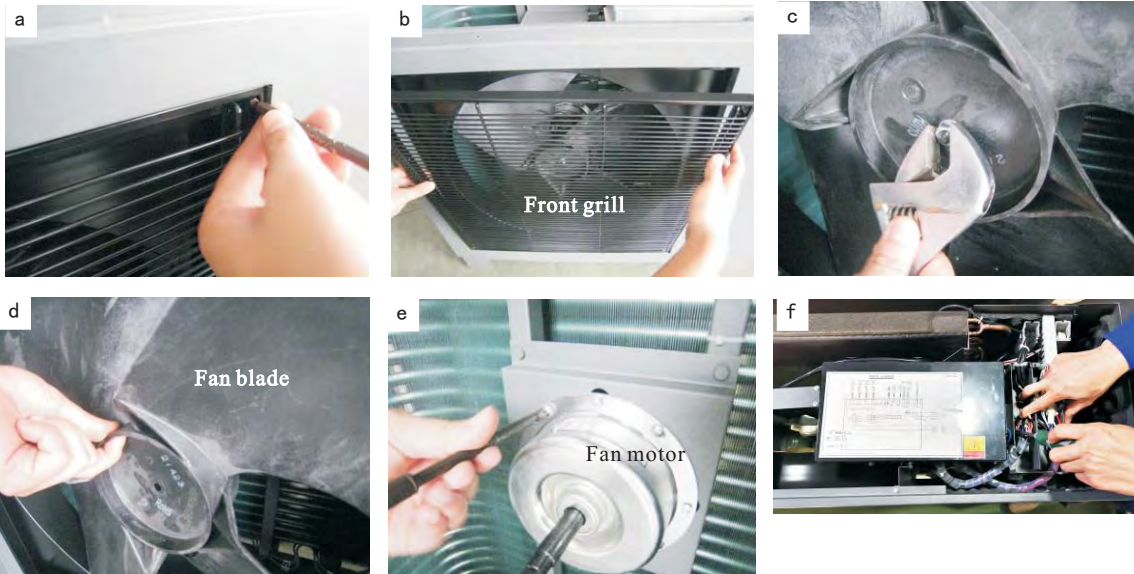


2. Plain cut-out

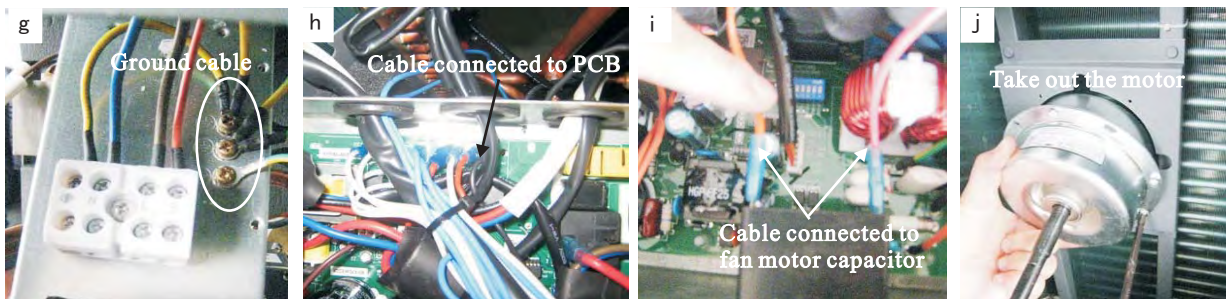
11. Service

2. Replacement of fan motor

- a. Take off screws of the front grill (see picture a and b).
- b. Use a wrench to loosen the nut for fan blade and take out the fan blade(see picture c and d).
- c. Unscrew the screws of fan motor (see picture e).
- d. Then unscrew the small handle (see picture f).

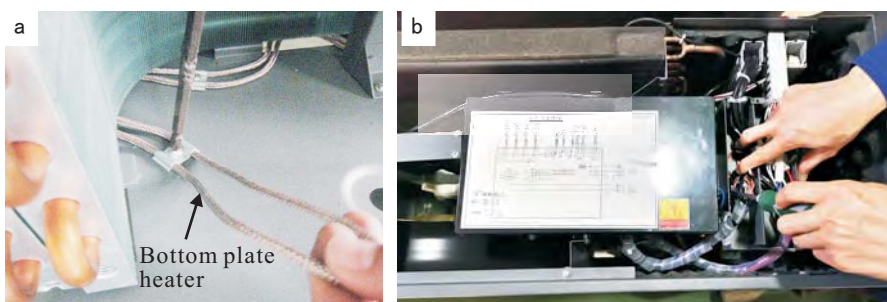


- e. Tracking and take out the ground and power cable for fan motor, and take the whole fan motor with cables out. (see picture g, h, i and j).
- f. Put the repaired or new fan motor back and connect all cables back.



3. Replacement of bottom plate heater

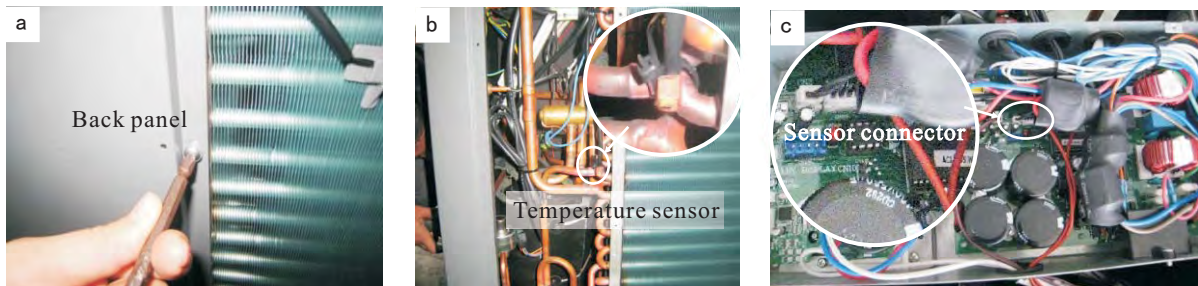
- a. Take out the fan blade in same procedure as 4.6.2.
- b. Unscrew the fixture of bottom plate heater(see picture a).
- c. Disconnect the quick connector for bottom plate heater and take the heater out (see picture b).
- d. Put a new bottom plate heater back, and connect it to the quick connector.



12. Maintenance

4. Replacement of temperature sensor

- a. Take off the back panel (see picture a).
- b. Take out the broken sensor from its fixture, and also pull its connector out from the controller.
- c. Put the new sensor back and connect it to the same port on controller.



【Cleaning of water filter】

The water filter should be cleaned according to the manual of water filter, to ensure the water flow of the water system. It is recommended to be cleaned once in the first month, and then, once half a year.

【Cleaning of heat exchanger】

Heat exchanger should be cleaned once half a year, because after long term running, gap between the fins of heat exchanger may be clogged up by dust, leaves, plastic films or papers, which will affect the efficiency of heat exchange, please clean the heat exchanger as follows:

- A. Use a vacuum cleaner to clean the surface of the fins, to get rid of the dust or other rubbish.
- B. Use a soft nylon brush to clean the fins, rinse by water at the same time (please don't rinse with high water pressure). If the outdoor unit is located in an oily place and is hard to clean, please ask for professional service to clean it.
- C. After cleaning, please leave the unit at a shady and well-ventilated environment to dry the surface of the unit.
 - ①. Avoid splashing water to the electric part when cleaning.
 - ②. Avoid touching the sharp fins when cleaning, or they may cut your skin. It's recommended to wear rubber gloves before cleaning.
 - ③. The fins of heat exchanger are soft, please don't wipe strongly with hard object, or it may damage the fins.
 - ④. If the unit is working in a salty environment, please clean the heat exchanger more often.
 - ⑤. If the fins have corrosion in surface, please move the unit to a better environment.

12. Maintenance

【Gas Charging】

The refrigerant plays an important role in delivering energy in cooling or heating. Insufficient refrigerant affects directly efficiency of cooling and heating. Please pay attention to the following before adding refrigerant:

- A. The work should be done by professionals
- B. Please make sure the copper pipe has no leakage before gas charging. If the copper pipes has leakage, please repair or change the pipes firstly.
- C. Don't add too much refrigerant than required, or it may cause a lot of failures, such as high pressure and low efficiency.
- D. This system contains R32 refrigerant. Never use other refrigerant other than R32 for service.
- E. There must be no air in the refrigerant circulation, because the air will cause abnormal high pressure, which will damage the gas piping and lower heating or cooling efficiency.
- F. If the refrigerant leaks in indoor environment, please ventilate the room.
- G. Copper pipe must be used for gas pipe. Never use iron pipe, aluminium pipe or alloy pipe.

【Cleaning of plate heat exchanger】

Thanks to the normally very high degree of turbulence in the heat exchanger, there is a set self-cleaning effect in the channels. However, in some applications the fouling tendency can be very high, e.g. when using extremely hard water at high temperatures. In such cases it is always possible to clean the exchanger by circulation a cleaning liquid (CIP - Cleaning In Place). Use a tank with weak acid, 5% phosphoric acid or if the exchanger is frequently cleaned, 5% oxalic acid Pump the cleaning liquid through the exchanger. This work should be done by qualified person. For further information, please contact your supplier.

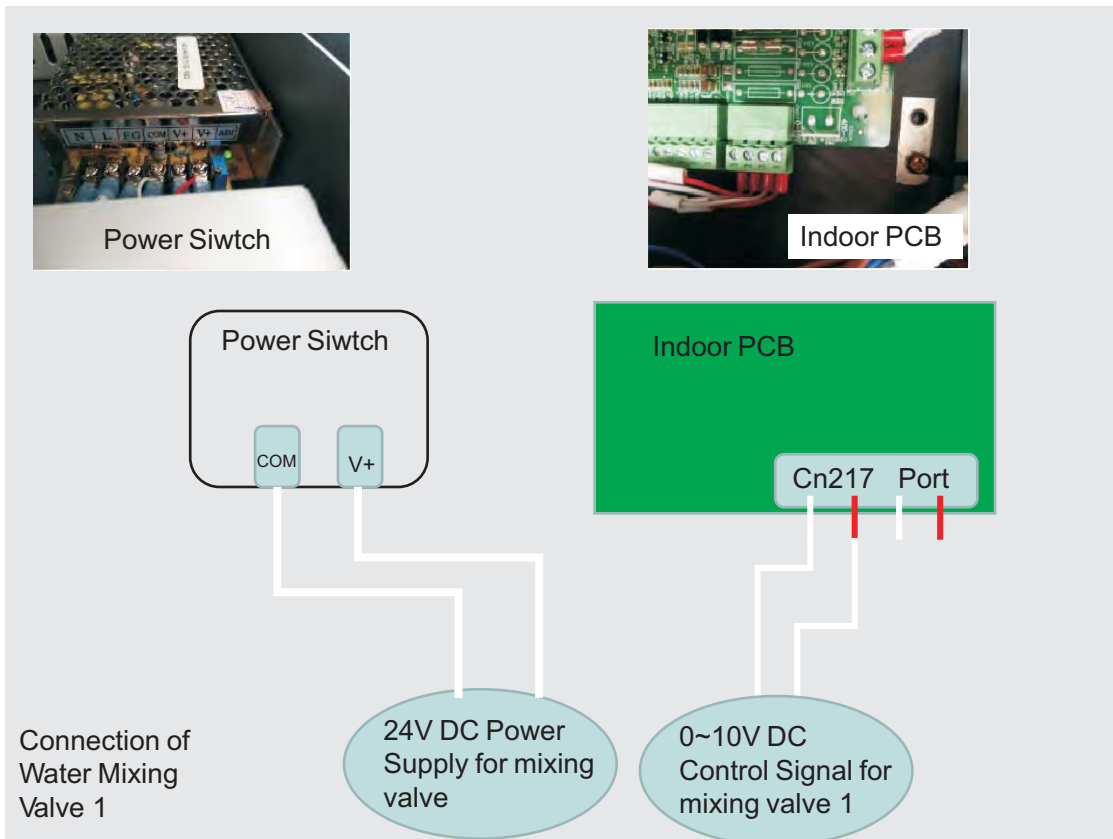
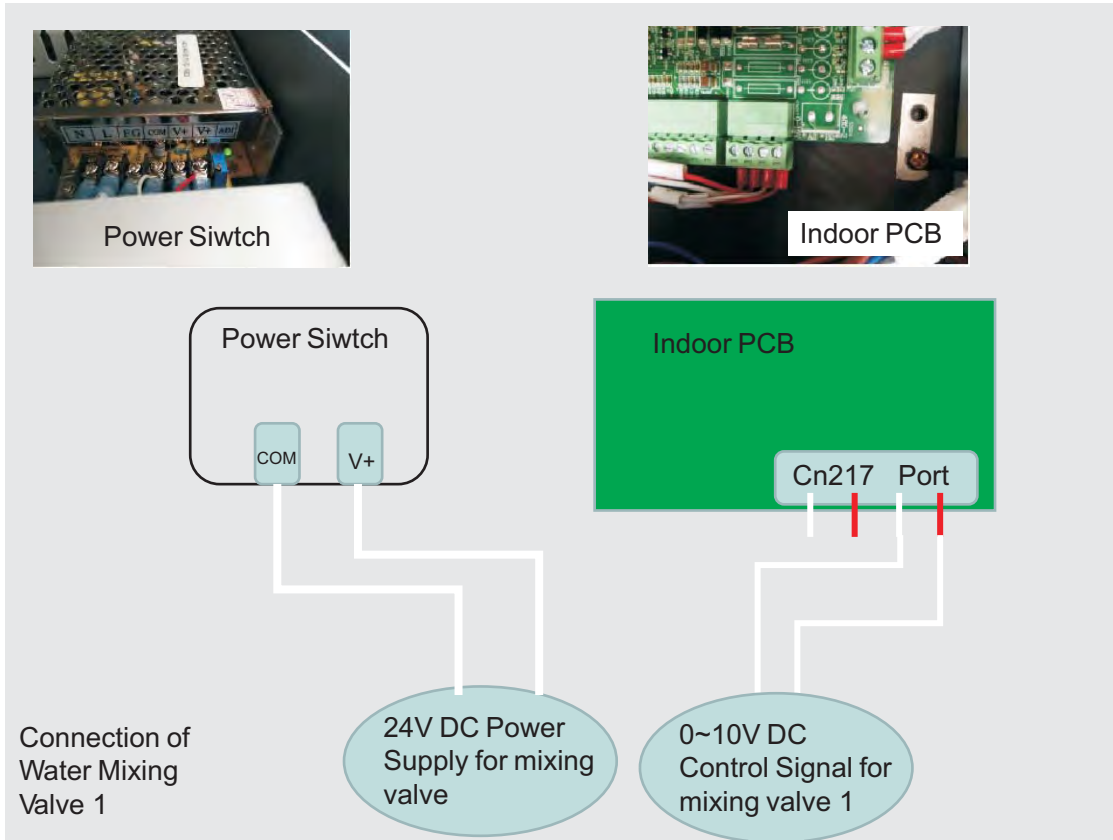
【Antifreeze in Winter】

In order to avoid the water inside unit freeze and damage the unit , please don't turn off the unit very often, keep it working or standby when the ambient temp. is below 0°C.

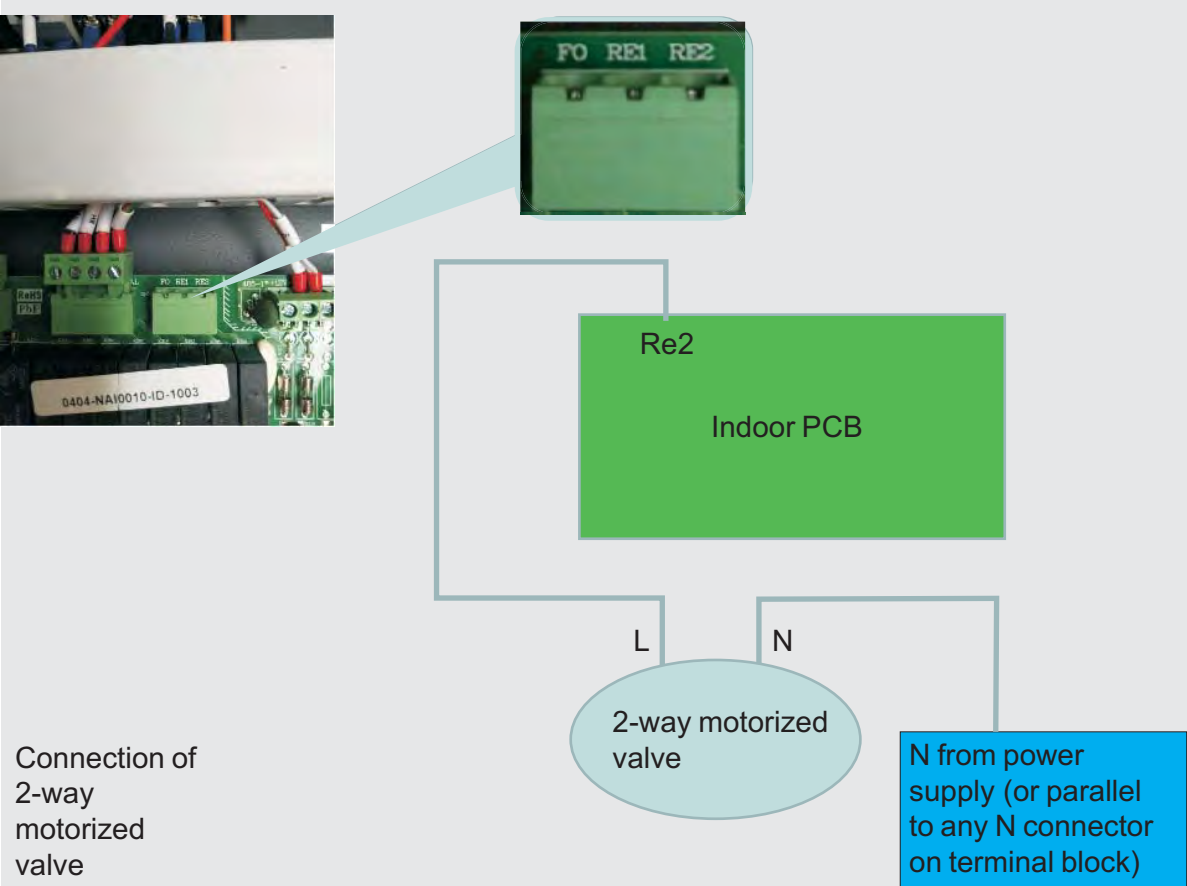
13. Trouble-shooting

Failure	Cause	Solution
Unit can't start up	1. No power supply	1. Check the power supply
	2. Fuse is broken or circuit breaker is disconnected	2. Check if it's open circuit or if the motor coil is earthed. Then change a fuse and reset the breaker, check if the circuit is stable or the connection is well.
	3. Some kind of protection works	3. Check which protection is working, and clear the protection, then restart the unit.
	4. Wiring is loose	4. Check the wire connection and tighten the screws on the terminal
	5. compressor fails	5. Change a compressor
Fan fails to run	1. Fan motor wire loose	1. Check the wire connections.
	2. fan motor failure	2. Change fan motor.
Low heating performance	1. The coil fins are very dirty	1. Clean the evaporator coil
	2. Air inlet is blocked	2. Remove any object that blocks the air circulation of the unit.
	3. Insufficient of refrigerant	3. Inspect the unit for leakage and fix it if any. Discharge all refrigerant and charge the unit again with correct amount.
Too high noise from the water pump, or no water flow when the water pump is running	1. Lacking of water in water system	1. Check the water filling device. Fill the system with enough water.
	2. Air exists in water system	2. Purging the air out.
	3. Valves in water system are not completely opened	3. Check all the valves to ensure they are fully opened.
	4. Water filter is dirty or blocked	4. Clean the water filter
Too high compressor discharge pressure	1. Too much refrigerant	1. Discharge all refrigerant and charge the unit again with right amount.
	2. Air exists in refrigeration system	2. Discharge all refrigerant and charge the unit again with right amount.
	3. Inadequate water flow	3. Check the water flow of the system. Use a bigger pump to increase the water flow if necessary.
	4. Too high water temperature	4. Check the value of the water temperature sensor, to ensure it works properly.
Too low suction pressure	1. Drier filter is blocked	1. Change a new one
	2. Electronic expansion valve is not opened	2. Repair or change a new one
	3. Leakage of refrigerant	3. Inspect the unit for leakage and fix it if any. Discharge all refrigerant and charge the unit again with right amount.
Unit can not defrost properly	1. Coil temperature sensor failure	1. Check the position and value of the coil temperature sensor. Replace it if necessary.
	2. Air inlet/outlet is blocked	2. Remove any object that blocks the air circulation of the unit. Clean the evaporator coil occasionally.

14. Appendix A: Wiring

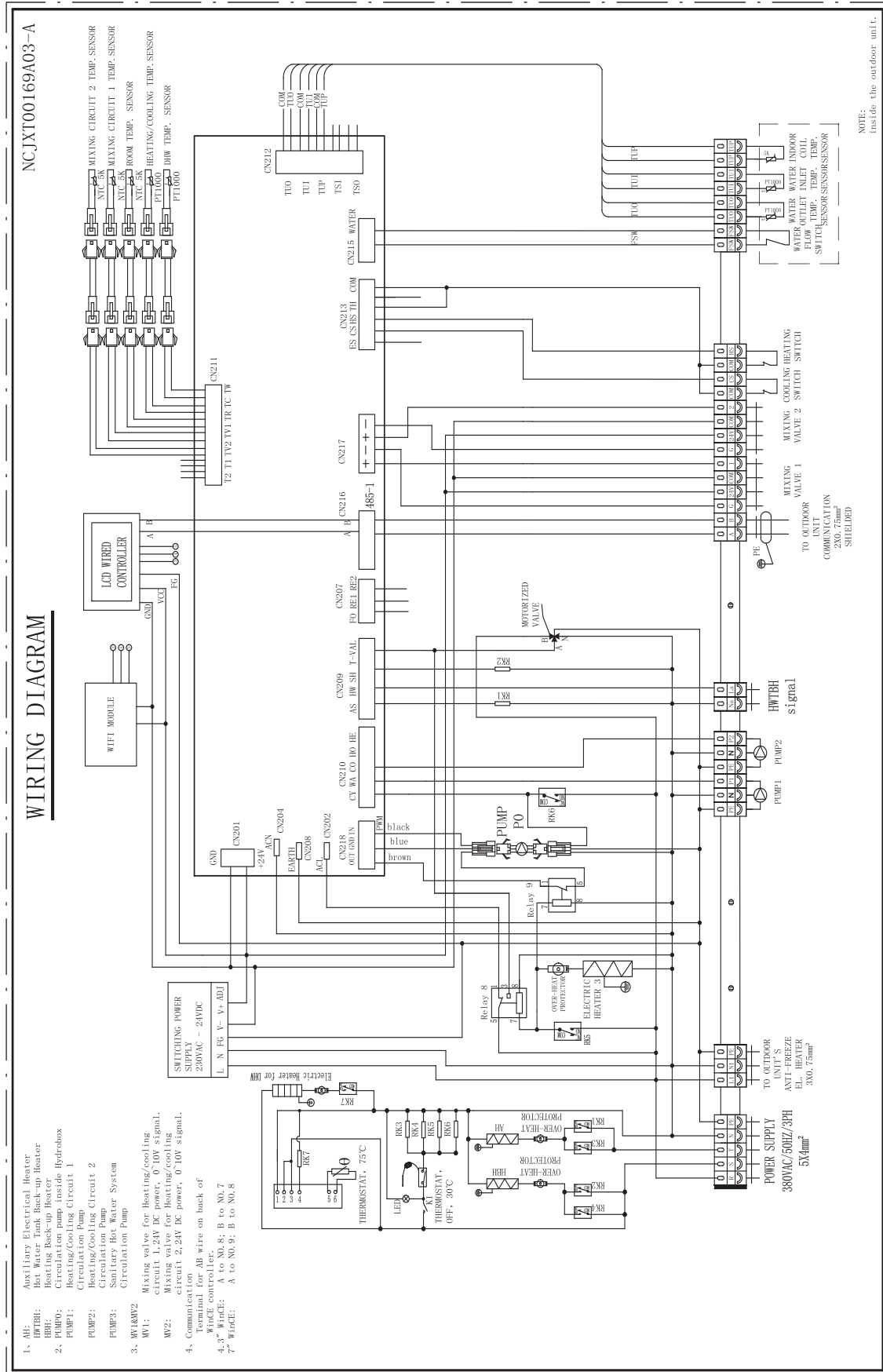


14. Appendix A: Wiring



15. Appendix B: Wiring

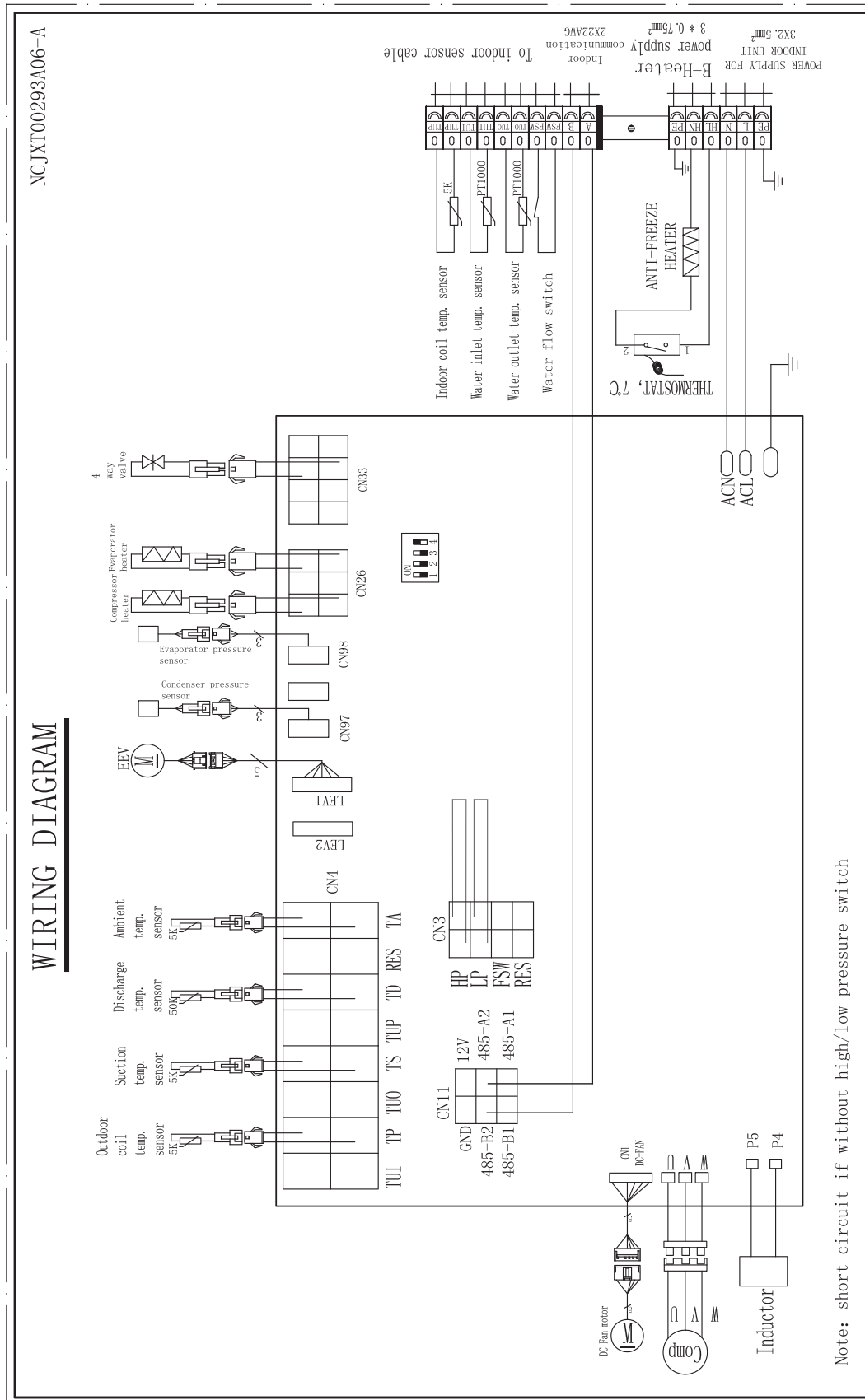
Indoor



TAKE CARE!
 The specifications are subject to change without prior notice.
 For actual specifications of the unit, please refer to the specification stickers on the unit.

15. Appendix B: Wiring

Outdoor —



TAKE CARE!

The specifications are subject to change without prior notice.
For actual specifications of the unit, please refer to the specification stickers on the unit.

Thank you for purchase of our quality product.
Please read this manual thoroughly before use , and
follow the instructions carefully in operating the unit
in order to prevent damages to either the device or persons.

Product specifications are subject to change with improvements ,
without prior notice. Please refer to the specification sticker on
the unit for the most recent specifications.

Please refer to the contact information
below for technical support and enquiries:

E-mail:

Telephone: