



AWT6/9/12/15/19-R32-M



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.

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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. (Annex DD.1)
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.). (Annex DD.1)
3. Do not pierce or burn. (Annex DD.1)
4. Be aware that refrigerants may not contain an odour. (Annex DD.1)
5. Appliance shall be installed, operated and stored in a room with a floor area larger than X m² (refer to specifications sheet). (Annex DD.1)
6. The installation of pipe-work shall be kept to a minimum X m² (refer to specifications sheet). (Annex DD.2.1)
7. Spaces where refrigerant pipes shall be compliance with national gas regulations. (Annex DD.2.1)
8. Servicing shall be performed only as recommended by the manufacturer. (Annex DD.2.1)
9. The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation. (Annex DD.2.2)
10. All working procedure that affects safety means shall only be carried by competent persons. (Annex DD.2.3)

General Notice:

1. Transport of equipment containing flammable refrigerants (Annex CC.1)

Compliance with the transport regulations

2. Marking of equipment using signs (Annex CC.2)

Compliance with local regulations

3. Disposal of equipment using flammable refrigerants (Annex CC.3)

Compliance with national regulations

4. Storage of equipment/appliances (Annex CC.4)

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

5. Storage of packed (unsold) equipment (Annex CC.5)

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 (Annex DD.3)

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 (Annex DD.4)

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 (Annex DD.5)

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 (Annex DD.6)

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 (Annex DD.7)

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 (Annex DD.8)

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 (Annex DD.9)

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.

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13.Charging procedures (Annex DD.10)

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 (Annex DD.11)

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 (Annex DD.12)

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 (Annex DD.13)

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 monoblock only)

12

X1



Sensor Cable for
Water Inlet
Temperature
(for monoblock only)

13

X1



Sensor Cable for
Water Inlet Temperature
(for monoblock only)

14

X1



Sensor Cable for
Water Outlet Temperature
(for monoblock 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 .

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



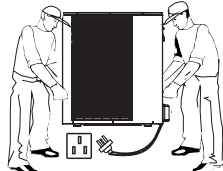
Caution



Prohibition



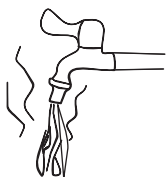
The installation, dismantlement and maintenance of the unit must be performed by qualified personnel. It is forbidden to do any changes to the structure of the unit. Otherwise injury of person or unit damage might happen.



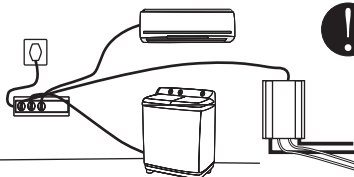
To avoid electrical shock, make sure to disconnect the power supply 1 minute or more before servicing the electrical parts. Even after 1 minute, always measure the voltage at the terminals of main circuit capacitors or electrical parts and, before touching, make sure that those voltages are lower than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



Be sure to read this manual before use.

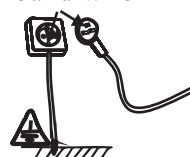


For sanitary hot water, please always add a mixture valve before water tap and set it to proper temperature.



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

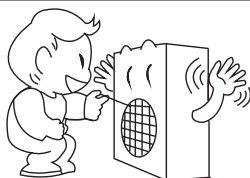
Ground wire



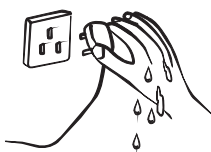
The power supply to the unit must be grounded.



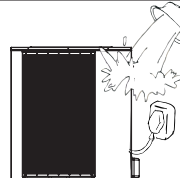
This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. 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.




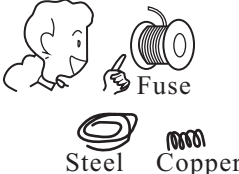
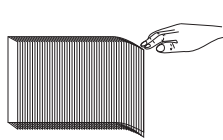
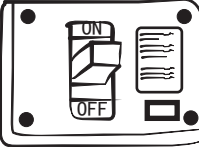

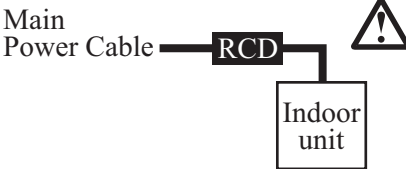

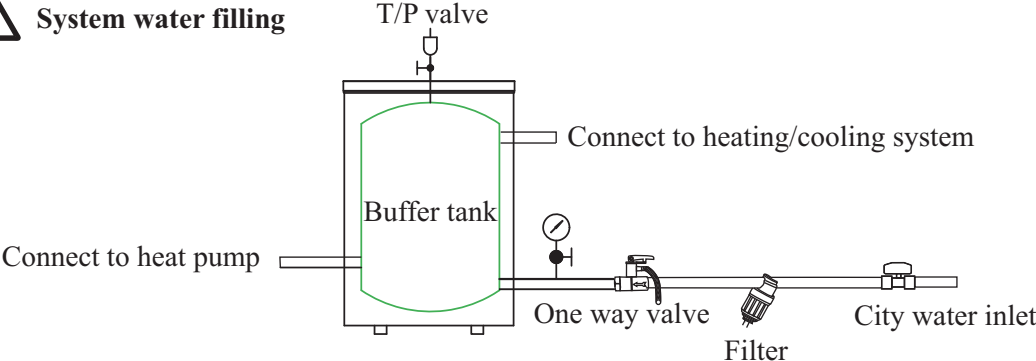


Do not touch the power plug with wet hands. Never pull out the plug by pulling the power cable.



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

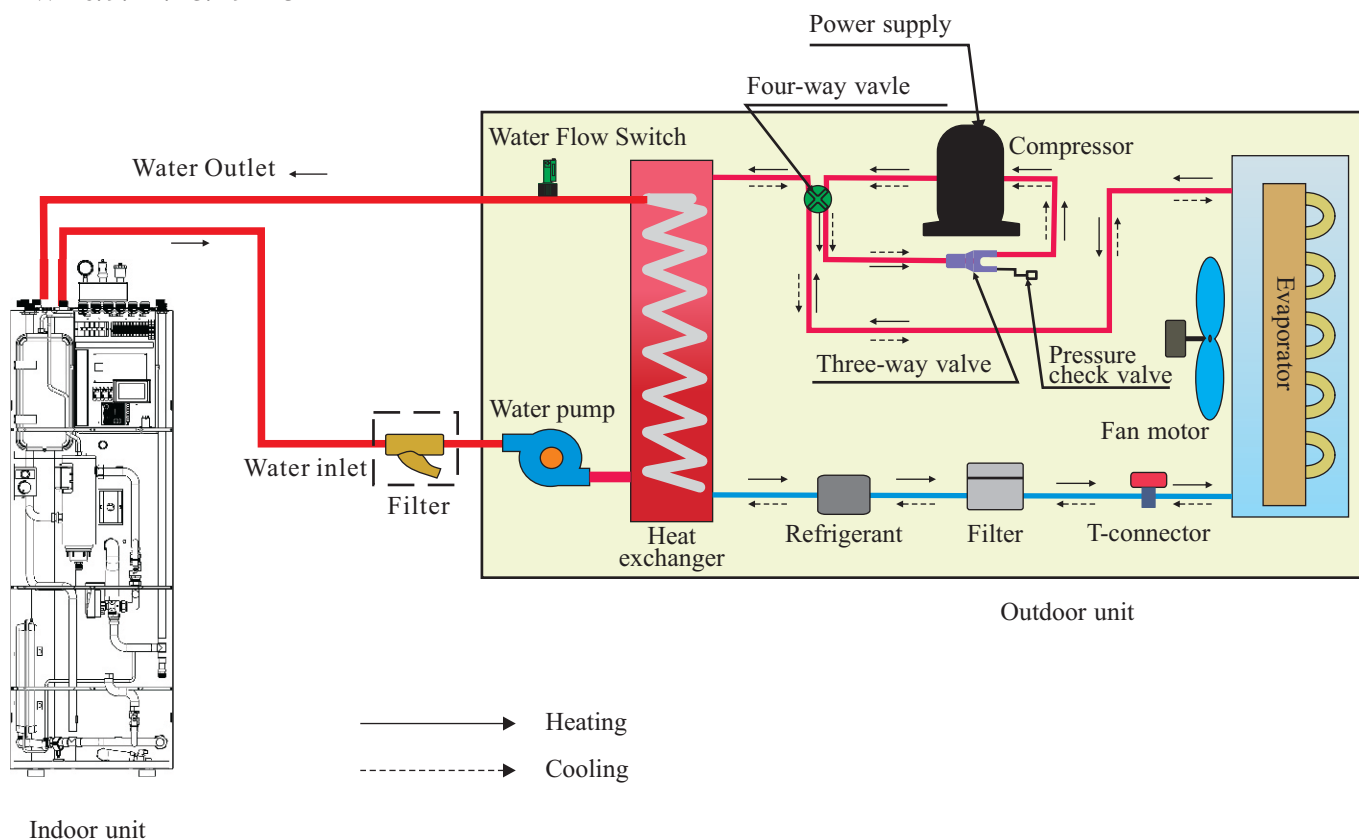
2.2.Safety Precautions

 <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>
<div>  System water filling </div> <div>  </div> <div> <p>1. It's suggested to use pure water for filling the system.</p> <p>2. If use city water for filling, please soften the water and add a filter.</p> <p>Note: After filling, the system of water system should be 0.15~0.6MPa.</p> </div>		
<div>   </div> <div> <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> </div>		

2. Introduction

2.3.Functioning Principles

AWT6/9/12/15/19-R32-M



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

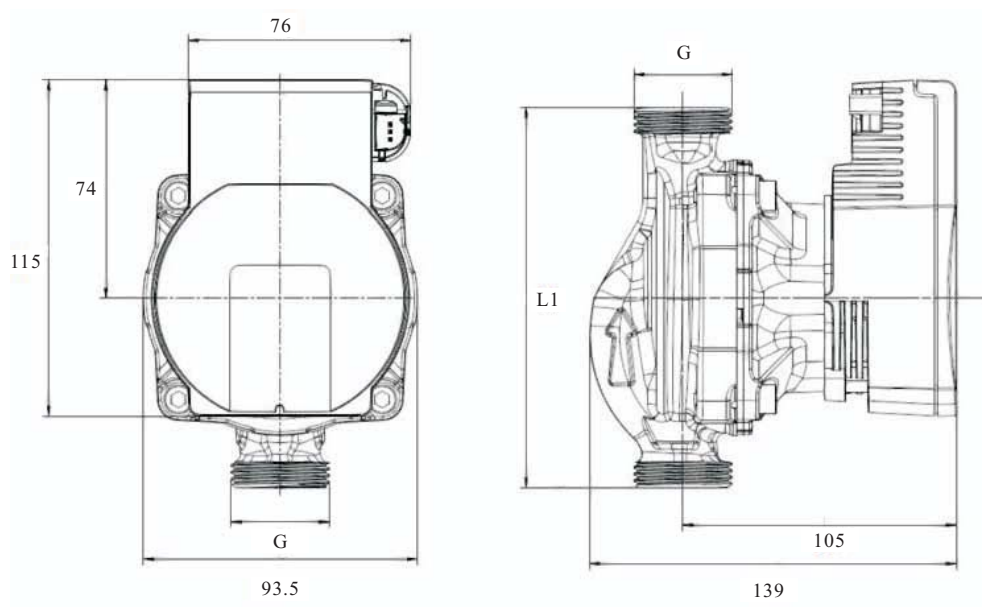
Mains connection	1~230 V +10%/-15%, 50/60 Hz (IEC 60038 standard voltage)
Power (W)	3-87
Electric current (A)	0.03-0.66

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

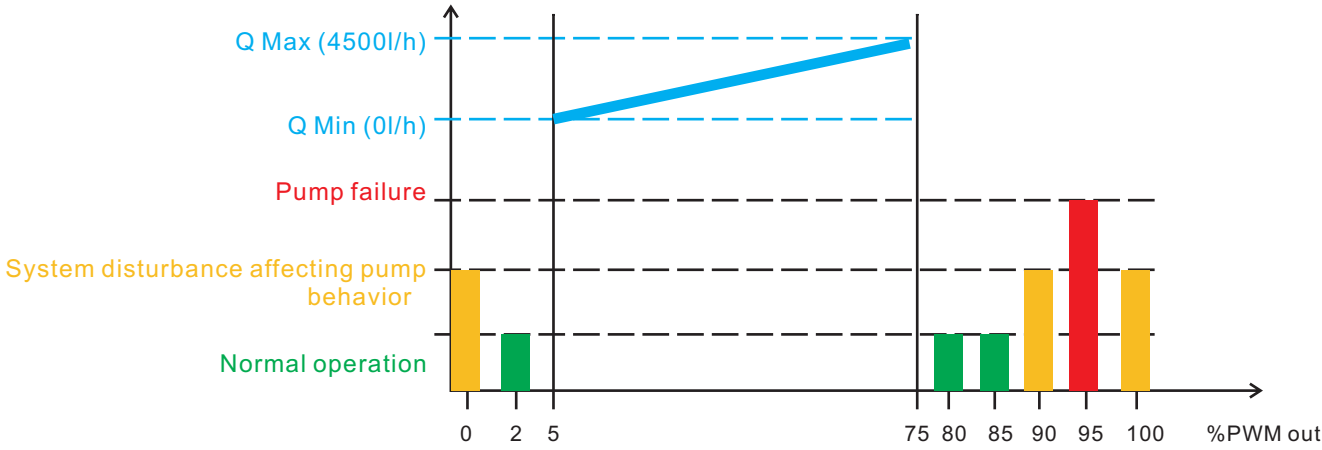
2.4. Water Pump



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

Pump control

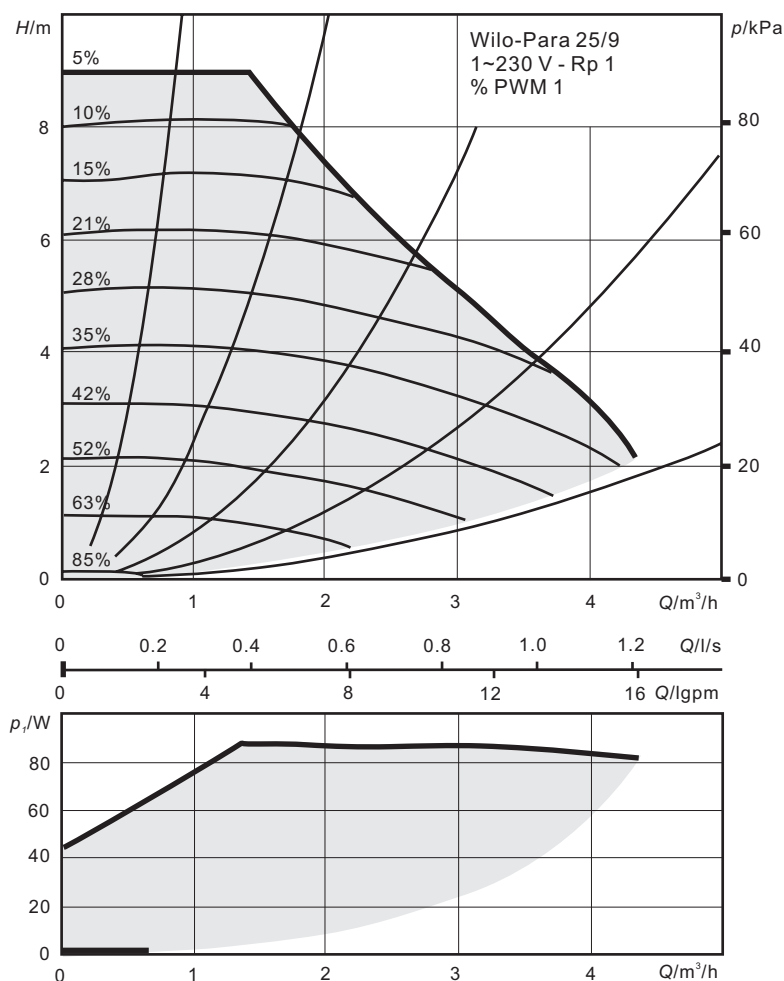
iPWM-out signal logic (heating) (%)



2. Introduction

2.4. Water Pump

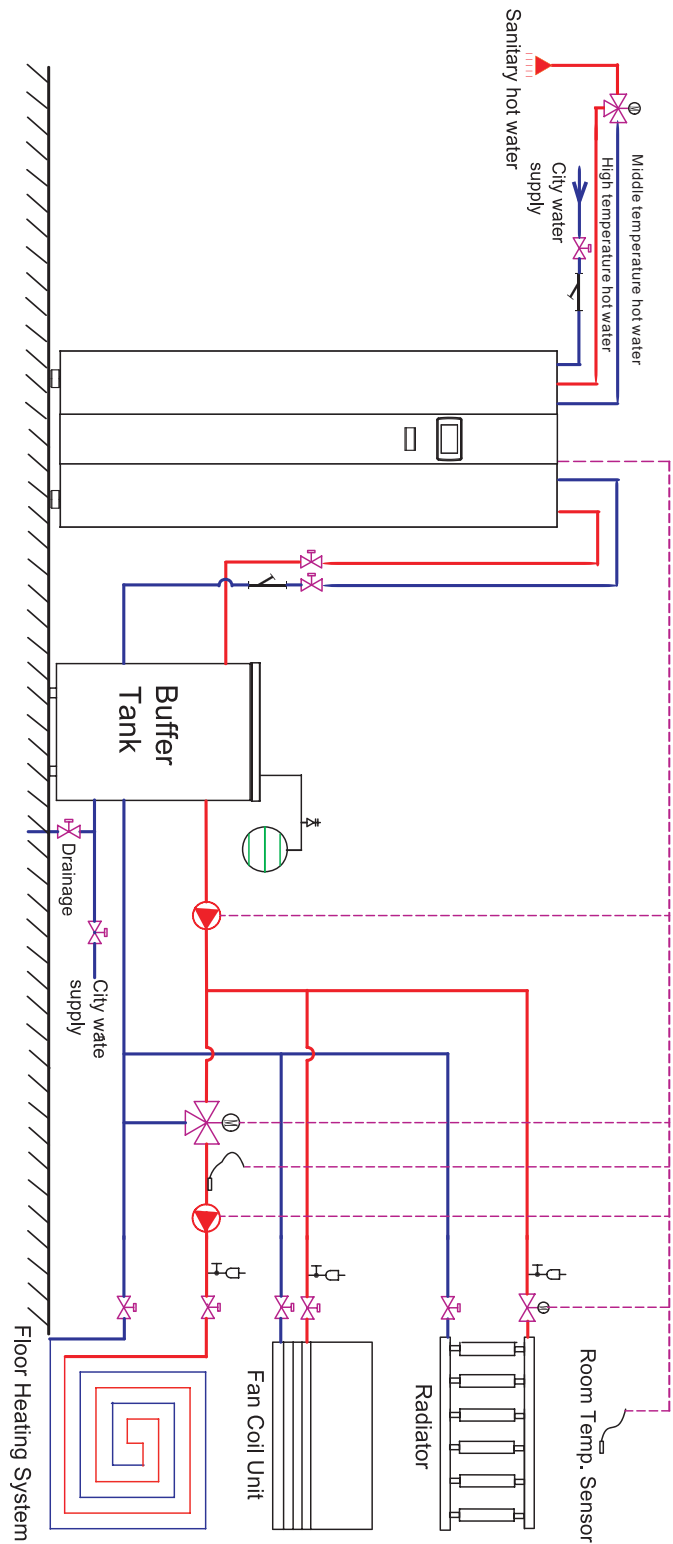
%PWM- out	Status	Potential causes
0	Pump output iPWM interface damaged	iPWM interface in short circuit
2	Stand-by, pump is ready to run	/
5-75	Pump is running normally, flow information is supplied	/
80	Abnormal running mode Pump is running but not at optimal performance	-Undervoltage 160/170-194V -Self 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	Outdoor unit		AW6-R32-M		AW9-R32-M		AW12-R32-M		AW15-R32-M		AW19-R32-M	
Type			Air/water 6kW R32 Monobloc outdoor unit Grey		Air/water 9kW R32 Monobloc outdoor unit Grey		Air/water 12kW R32 Monobloc outdoor unit Grey		Air/water 15kW R32 Monobloc outdoor unit Grey		Air/water 19kW R32 Monobloc outdoor unit Grey	
Article No ES			120290		120291		120292		120293		120294	
IP rating			IPXX	IP34		IP34		IP34		IP34		IP34
Indoor unit tank version												
Model	Indoor unit tank version		AWT6/12-R32-M									
Type			Air/water/tank6-12 kW Monobloc indoor unit White									
Article no ES			120296									
IP rating			IPXX	IP34								
Min/max heating capacity(1)		kW	3.5 / 6.5		4.3/9.2		5.5 / 11.6		6/15.3		9.2/18.5	
El. heating power input min/max(1)		W	758 / 1410		927/2097		1107 / 2683		1223/3209		1834/4142	
C.O.P min/max(1)		W/W	4.5 / 4.7		4.38/4.71		4.3 / 4.9		4.78/5.06		4.47/5.01	
Min/max heating capacity(2)		kW	3.15 / 6		3.9/8.6		4.9 / 11.2		5.6/14.3		8.5/18.2	
El. heating power input min/max(2)		W	943 / 1732		1162/2550		1401 / 3263		1551/3914		2248/4998	
C.O.P min/max(2)		W/W	3.34 / 3.56		3.37/3.58		3.3 / 3.5		3.6/3.82		3.6/3.82	
SCOP - Average climate, low temperature		W	4.74		4.73		4.71		4.98		4.85	
Energy class			A+++		A+++		A+++		A+++		A+++	
Min/max cooling capacity(3)		kW	6.22/7.45		6.7/9.5		- / 9.8		7.2/18.5		8.5/22.5	
El. cooling power input min/max(3)		W	1400/1863		1679/2242		- / 2510		1334/4917		1660/6285	
E.E.R. min/max(3)		W/W	4.05/4.45		4.0/4.6		- / 3.8		3.78/5.42		3.58/5.12	
Min/max cooling capacity(4) (A35/W7)		kW	3.5/4.5		4.9/7.2		4.9 / 6.5		4.5/13		5.5/16	
El. cooling power input min/max(4)		W	1330/1680		1451/2366		1358 / 2444		2590/4390		2970/5510	
E.E.R. min/max(4)		W/W	2.5/2.74		2.8/3.1		2.6 / 3.5		2.96/3.26		2.85/3.2	
Min/max ambient working temp. in heating mode		°C	-25~45									
Min/max ambient working temp. in cooling mode		°C	-1~65									
Max flow temp. in heating mode		°C	58									
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 Hydraulicscircuit		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/	230V/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									
	Pipina connection city water	Inch	3/4									

2. Introduction

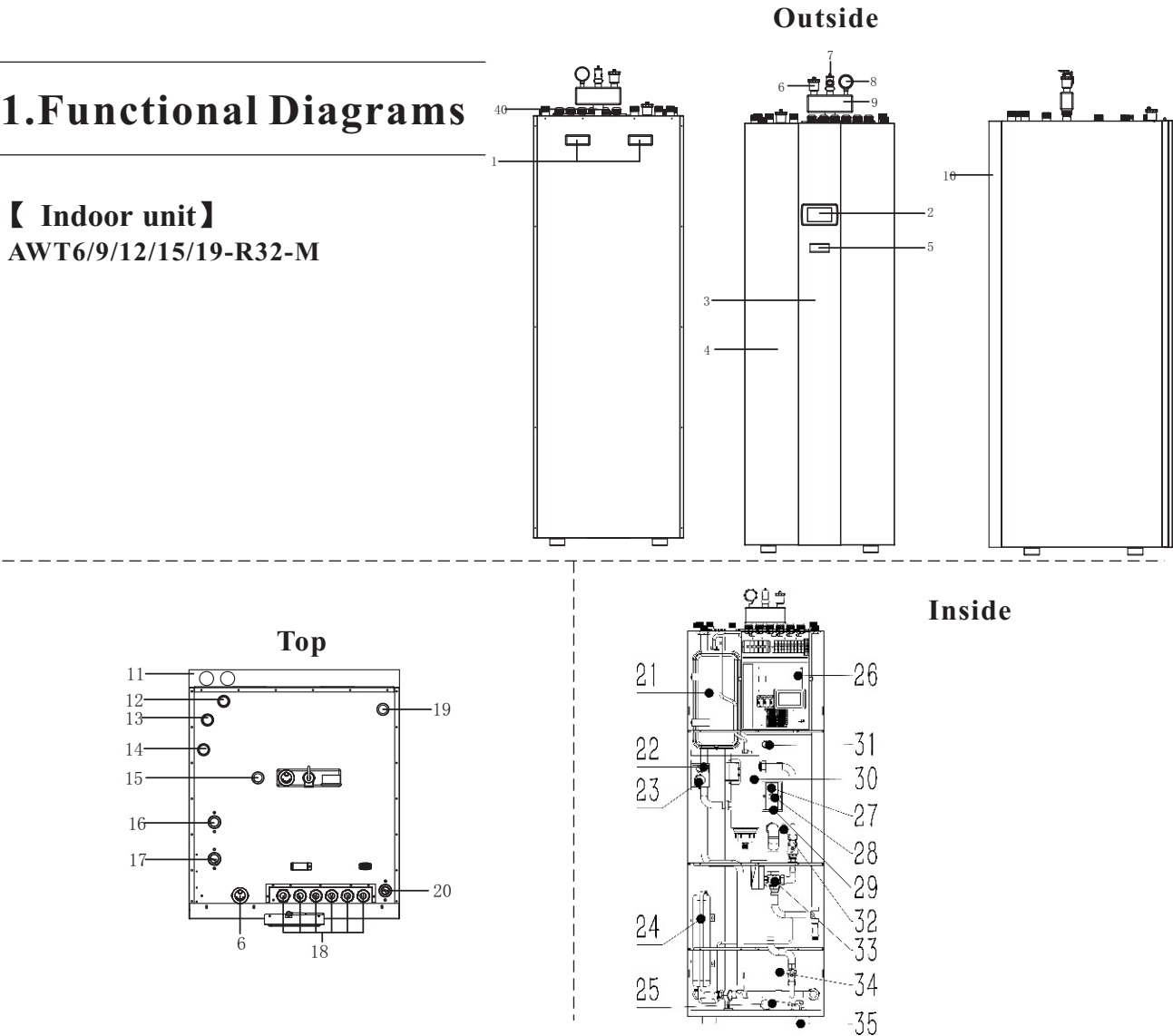
Model			AW6-R32-M	AW9-R32-M	AW12-R32-M	AW15-R32-M	AW19-R32-M
ErP approved circulation pump	Manufacturer		Wilo	Wilo	Wilo	Wilo	Wilo
	type		Para 25-130/9-87/IPWM1	Para 25-130/9-87/IPWM1	Para 25-130/9-87/IPWM1	Para 25-130/9-87/IPWM1	Para 25-130/9-87/IPWM1
Compressor	Manufacturer		Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi
	type		DC inverter (twin rotary)				
Fan	Quantity	pcs	1	1	1	2	2
	Airflow	m³/h	2500	3150	3150	6200	7000
	Rated power	W	34	45	45	90	120
	Blade diameter	mm	φ 496	φ 550	φ 550	φ 550	φ 550
	Fan rotation	Direction	counter-clockwise	counter-clockwise	counter-clockwise	counter-clockwise	counter-clockwise
Sound power level	Outdoor unit	dB (A)	52	53	52	58	61
	Indoor unit tank version	dB (A)	44dB(A)	44dB(A)	44dB(A)	44dB(A)	44dB(A)
Plate heat exchanger	Manufacturer		SWEP				
	Water press. drop	kPa	26	26	26	26	26
	Piping connection	Inch	G1"	G1"	G1"	G1-1/4"	G1-1/4"
Minimum water flow for triggering the flow switch		m³/h - l/s	0.75/0.21	0.94/0.26	1.44/0.40	2.23/0.62	2.66/0.74
Nominal water flow		m³/h	1.04	1.55	2.05	2.62	3.3
Residual current device and overvoltage protection			Required				
Power supply (grounded) Outdoor unit	Outdoor unit	V / Hz / Ph	230/50/1	230/50/1	230/50/1	400/50/3	400/50/3
	Fuse Outdoor unit	A	10A/C	16A/C	16A/C	3P/16A/C	3P/16A/C
Power supply (grounded) Indoor unit tank version	Indoor unit tank version	V / Ph / Hz	400V/3PH/50Hz or 230V/3PH/50Hz				
	Fuse Indoor unit tank version	A	16A/C-400V or 25A/C-230V				
Refrigerant	type		R 32				
	charge	kg	0.9	1.4	1.8	2.55	2.6
	GWP (global warming potential)	GWP	GWP: 675	GWP: 675	GWP: 675	GWP: 675	GWP: 675
	Quantity of hydrofluorocarbons in tonnes of CO2 equivalent	t CO ₂ Equiv.	0.608	0.945	1.215	1.721	1.755
Dimensions net (L x D x H)	Outdoor unit	mm	1010x370x735	1165x370x885	1165x370x885	1085x390x1450	1085x390x1450
	Indoor unit tank version	mm	600x680x1780				
Dimensions Brutto (L x D x H) including carton box and palette	Outdoor unit	mm	1040x455x765	1210x455x915	1210x455x915	1140x475x1605	1140x475x1605
	Indoor unit tank version	mm	650x750x1960				
Net weight	Outdoor unit	kg	67	80	85	120	140
	Indoor unit tank version	kg	125				
Brutto weight including carton box, added manuals, sensors and palette	Outdoor unit	kg	78	95	105	140	155
	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

3. Overview of the Units

3.1.Functional Diagrams

【 Indoor unit】
AWT6/9/12/15/19-R32-M



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

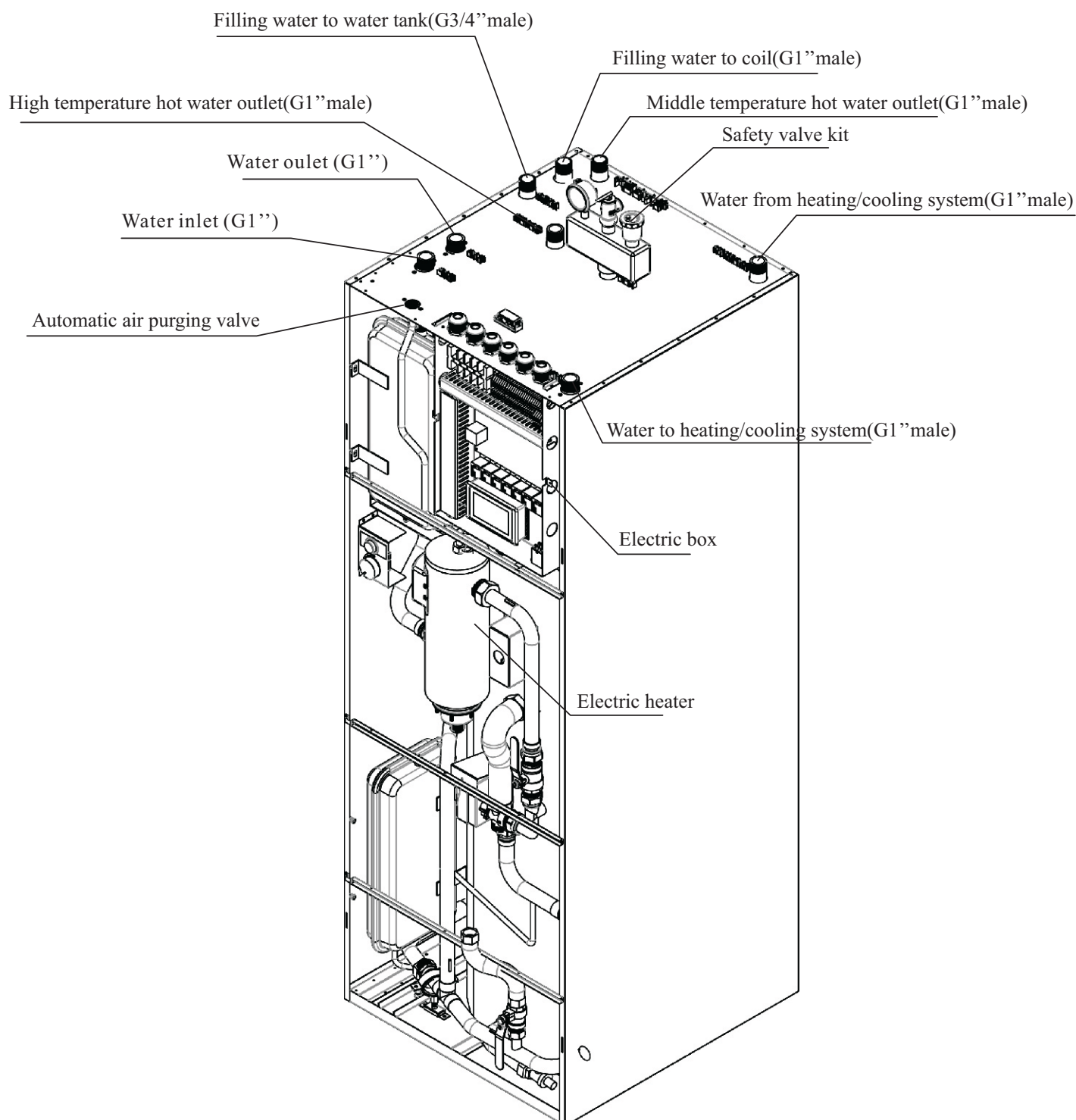
NO.	Name
20	Water to heating/cooling system(G1"male)
21	Water expansion tank
22	Emergency Switch for 9KW electric heater
23	Thermostat knob
24	5L Expansion Tank
26	Drainage
27	Electric box
28	Overheating protector for 500W electric heater
29	Temperature sensor for 500W electric heater
30	500W electric heater 230V/50Hz/1Ph
32	9KW electric heater 400V/50Hz/1Ph
33	Anode Rod
34	Temperature sensor for hot water mode
35	Motorized three-way valve
36	Water tank
37	Rubber absorber feet

3. Overview of the Units

3.1.Functional Diagrams

【 Indoor unit 】

AWT6/9/12/15/19-R32-M



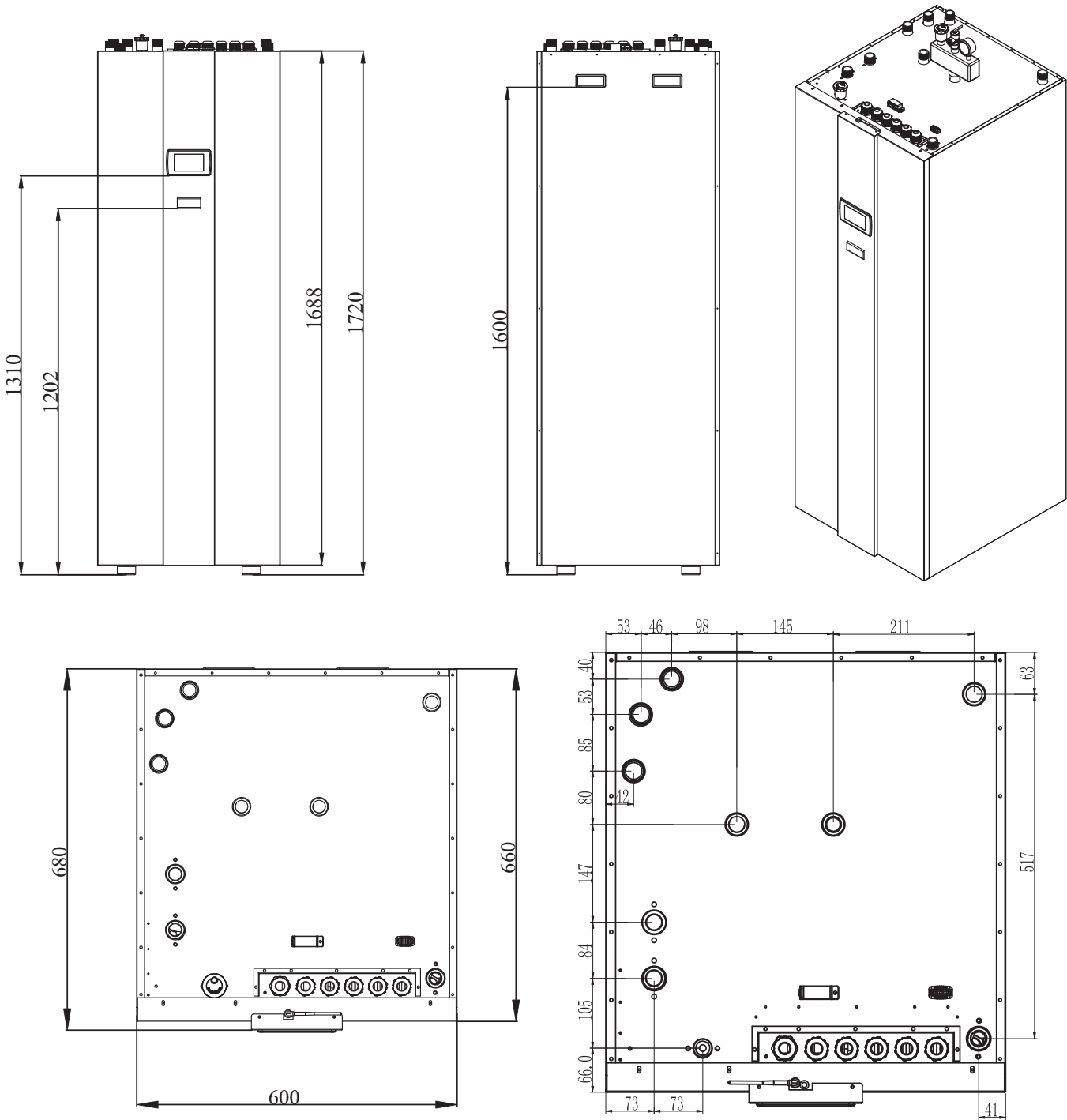
3. Overview of the Units

3.2.Outlines and Dimensions

【 Indoor unit 】

AWT6/9/12/15/19-R32-M

Unit:mm



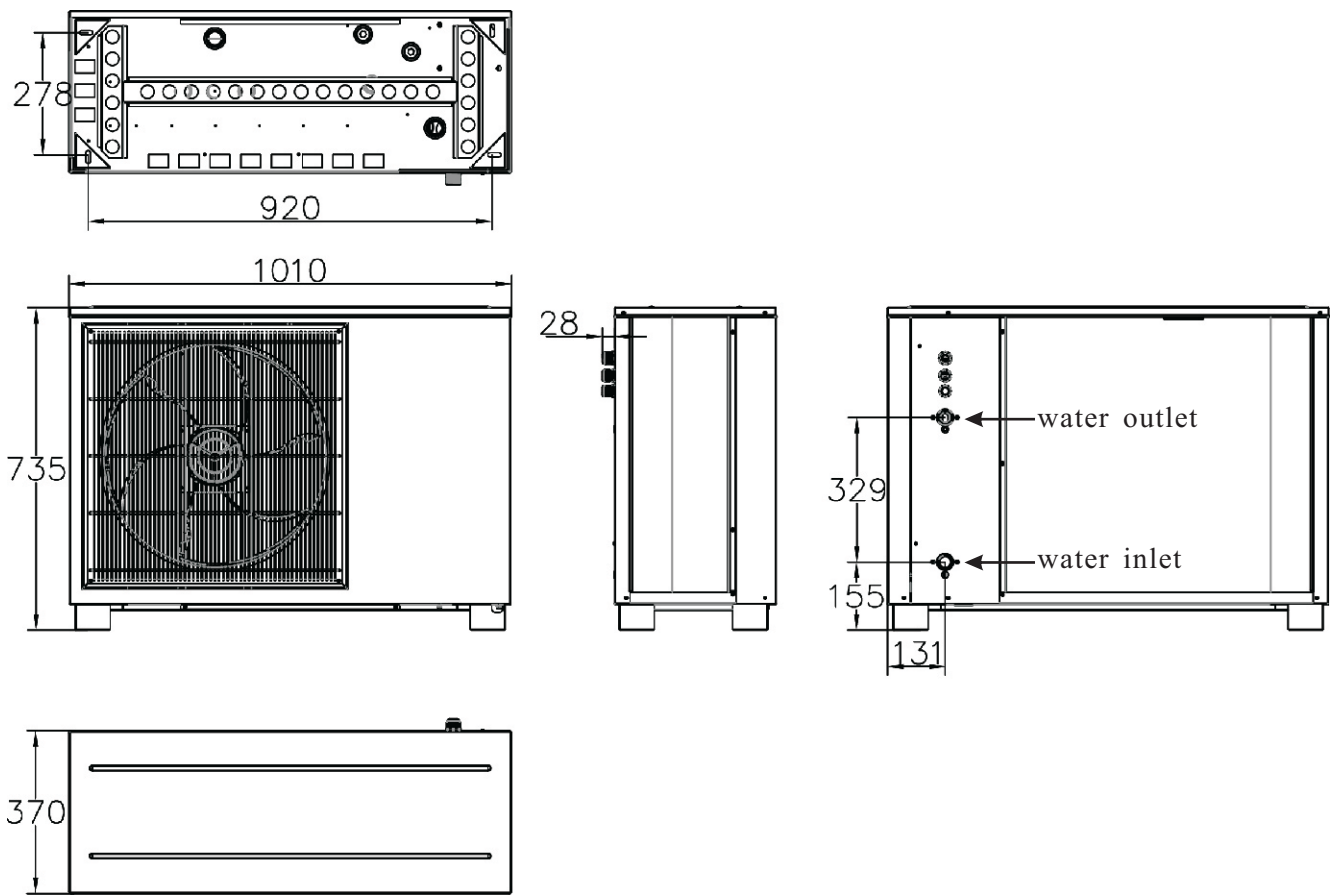
3. Overview of the Units

3.2.Outlines and Dimensions

【 Monoblock unit】

AW6-R32-M

Unit:mm



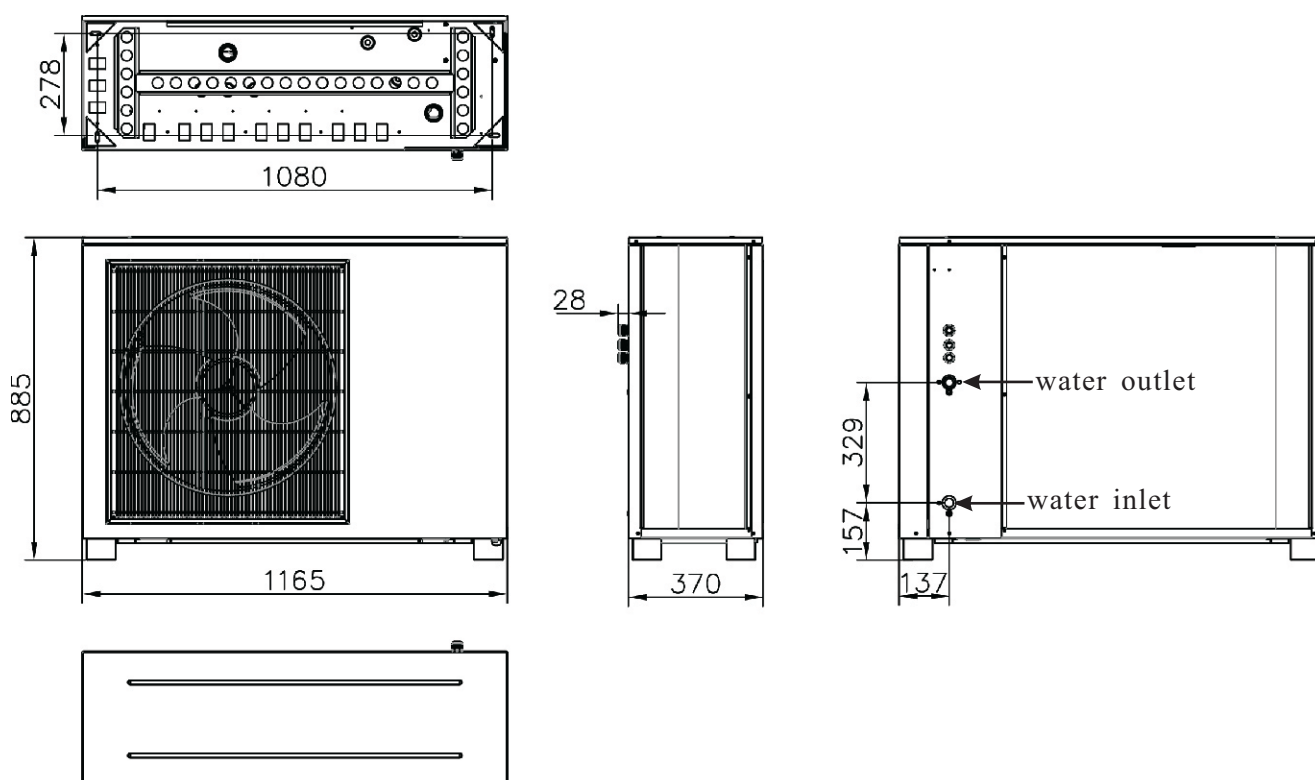
3. Overview of the Units

3.2.Outlines and Dimensions

【 Monoblock unit】

AW9/12-R32-M

Unit:mm



3. Overview of the Units

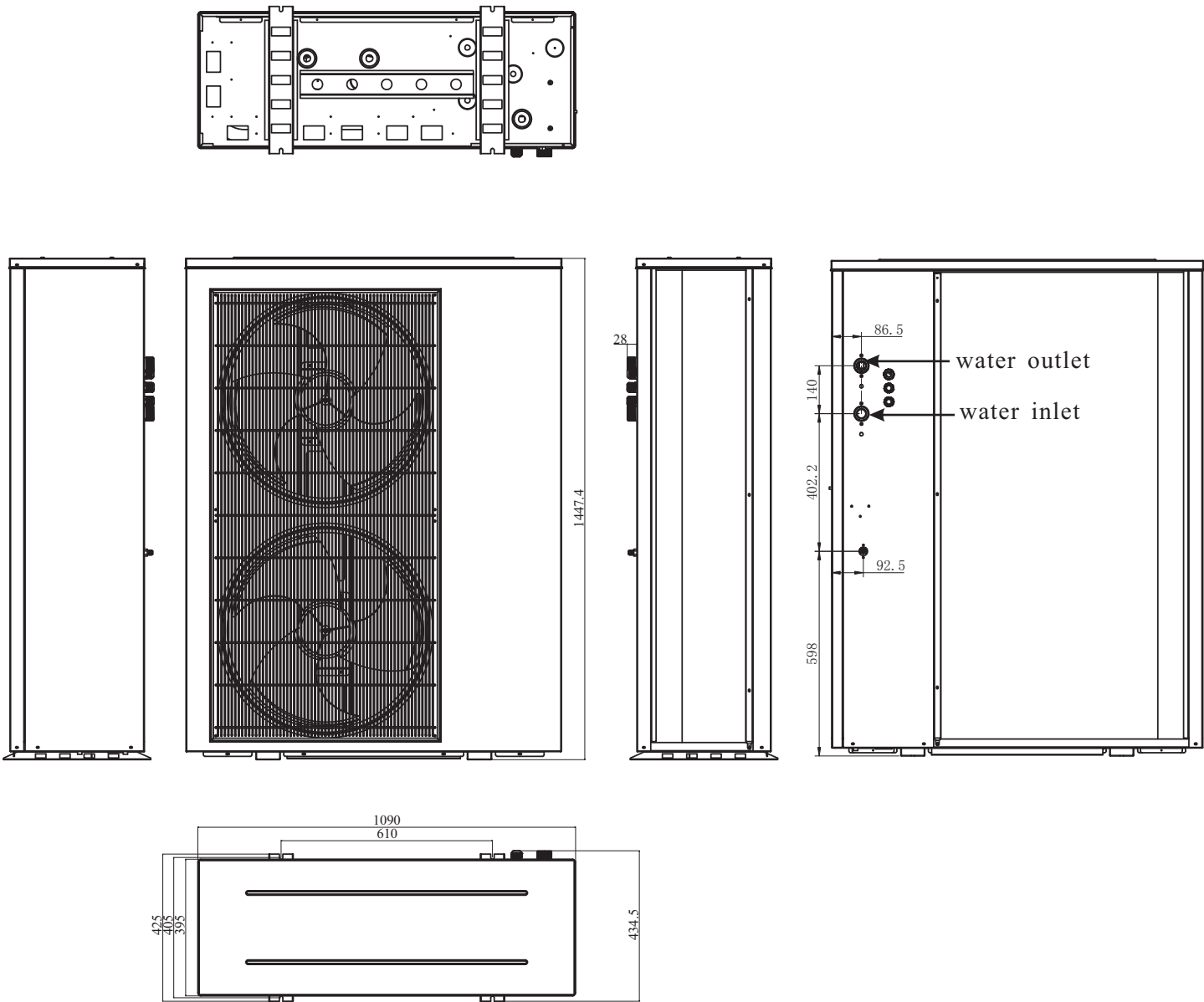
3.2.Outlines and Dimensions

【 Monoblock unit】

AW15-R32-M

AW19-R32-M

Unit:mm



3. Overview of the Units

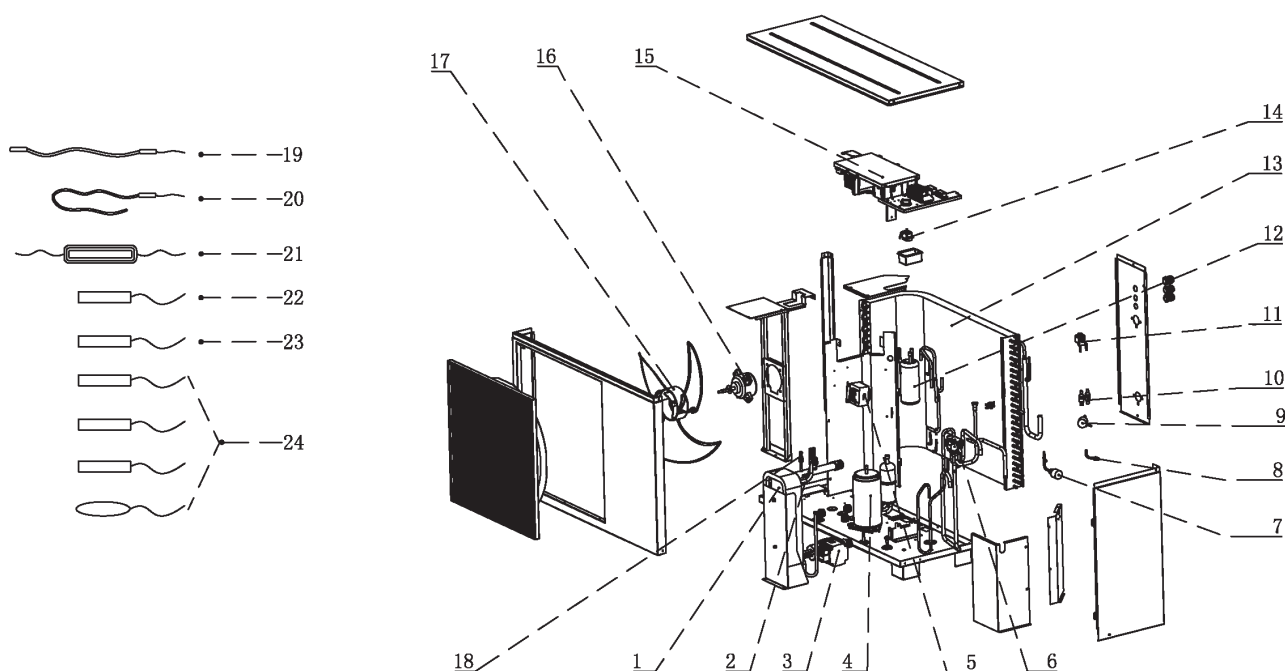
3.3. Exploded view

Outdoor unit:

AW6-R32-M

AW9-R32-M

AW12-R32-M



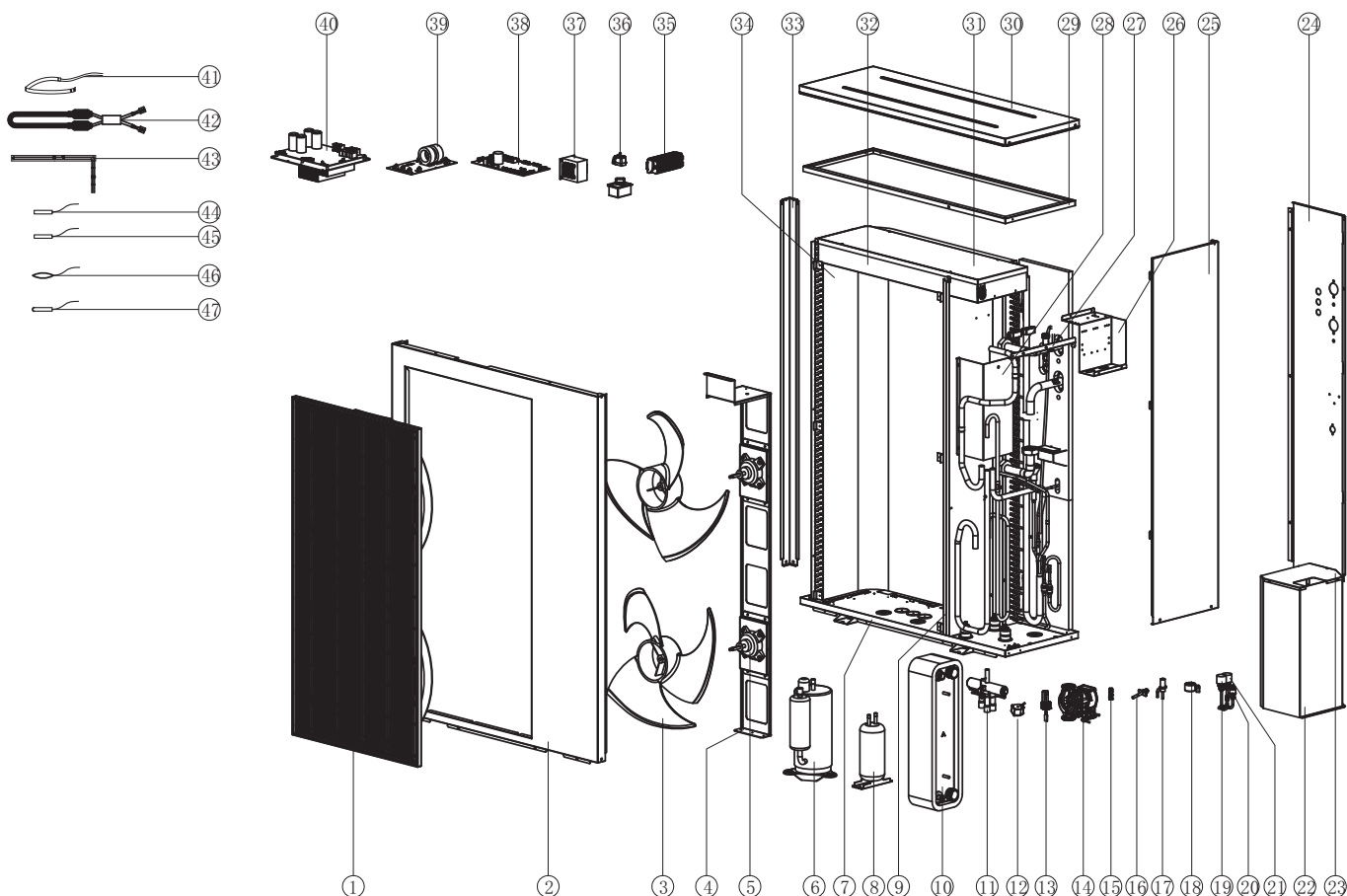
NO	Name	NO	Name	NO	Name
1	Plate heat exchanger	10	Filter	19	Bottom tray heater
2	Water flow switch	11	Electronic expansion valve	20	Electronic heater for Compressor
3	water pump	12	Electronic expansion valve coil		
4	Compressor	13	Evaporator	21	Electronic heater for Plate
5	PFC transducer	14	Mechanical thermostat	22	Water inlet temp sensor
6	Four-way valve	15	Outdoor PCB	23	Water outlet temp sensor
7	High pressure sensor	16	DC fan motor	24	Ambient/coil/compressor discharge/suction Needle valve temp. sensor
8	Check valve	17	Fan		
9	Low pressure sensor	18	Air purging valve		

3. Overview of the Units

3.3. Exploded view

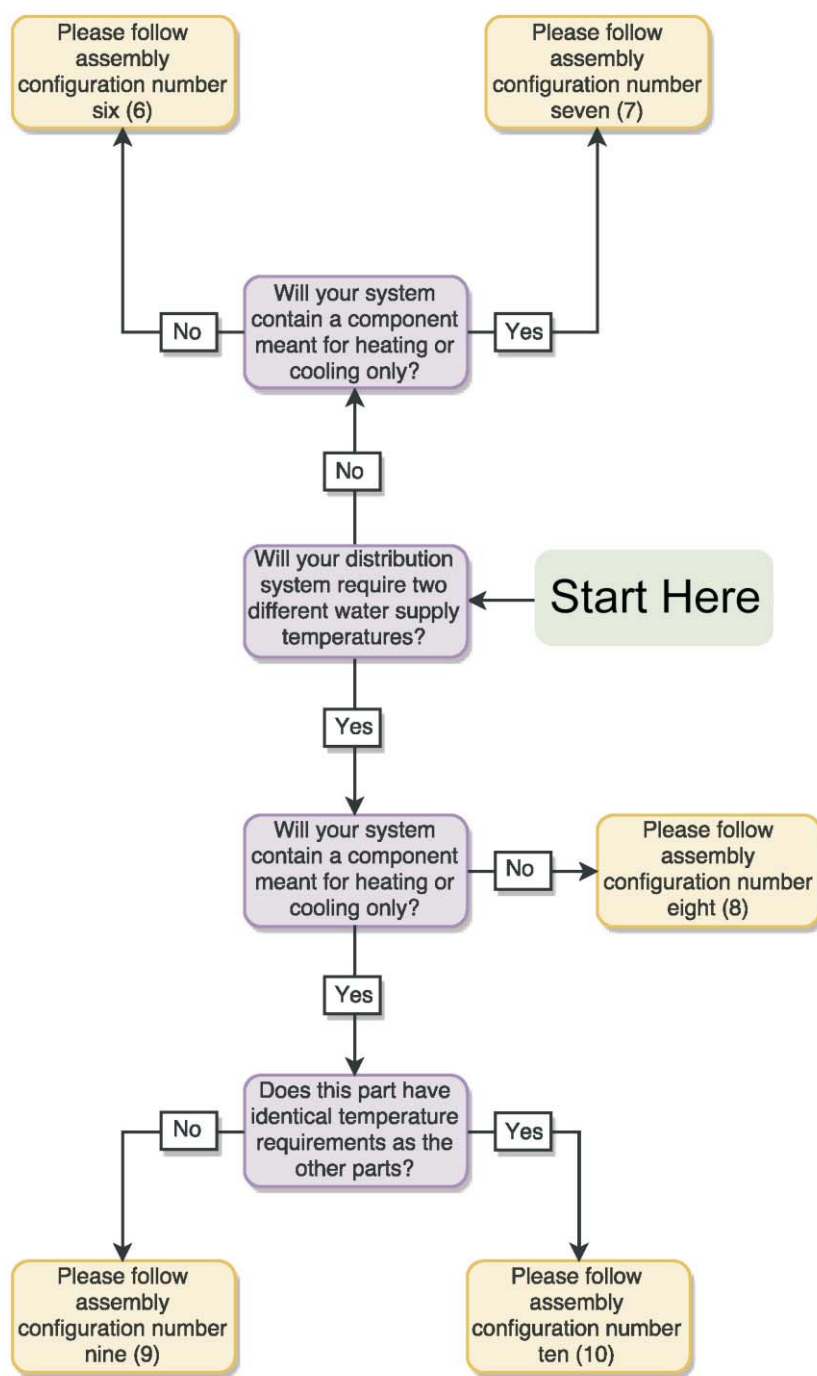
Outdoor unit:

AW15-R32-M
AW19-R32-M



NO	Name	NO	Name	NO	Name
1	Air guide	17	Electronic expansion valve coil	33	Column support
2	Front panel	18	Electronic expansion valve coil	34	Evaporater
3	Fan	19	Low pressor sensor	35	Teminal block
4	Fan motor bracket	20	High pressor switch	36	Terminal switch
5	DC Fan Motor	21	High pressor sensor	37	PFC
6	Compressor	22	Cabinet for compressor	38	Outdoor PCB
7	Bottom plate	23	Cabinet cover for compressor	39	
8	Liquid receiver	24	Back side panel	40	
9	Bulkhead	25	Service panel	41	Bottom tray heater
10	Plate heat exchanger	26	Fixing plate 1 for terminal block	42	Electronic heater for Compressor
11	Four-way valve	27	Fixing plate 2 for terminal block	43	Electronic heater for Plate
12	Four-way valve coil	28	Fixing plate for plate heat exchanger	44	Compressor discharge sensor (50K)
13	Water flow switch	29	Fixing plate	45	suction/coil/water inlet/water outlet
14	Water pump	30	Top cover	46	ambient temperature sensor
15	Air purging valve	31	Electric box cover	47	water inlet/water outlet sensor (Pt1000)
16	Drainage valve	32	Electric box		

4. Assembly Configurations - Flowchart



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.

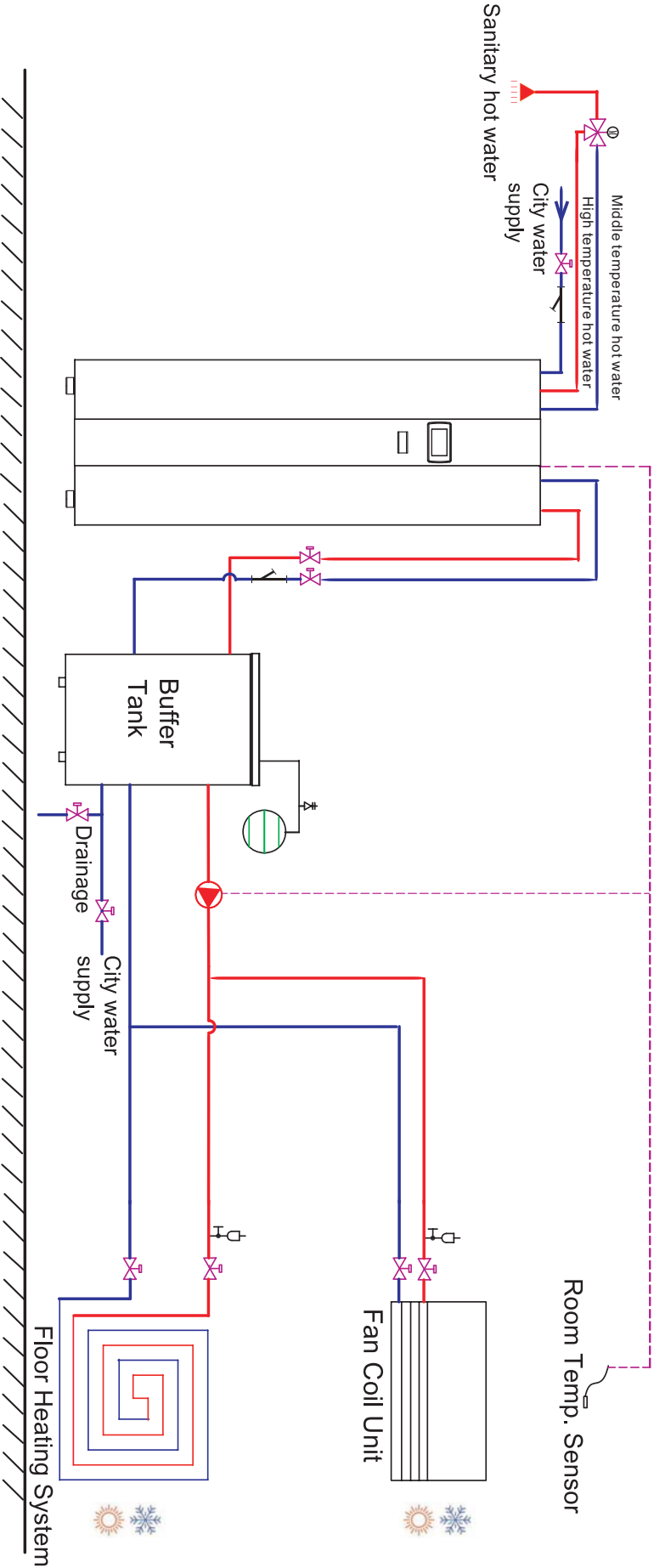
4. Assembly Configurations – Drawing 1

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

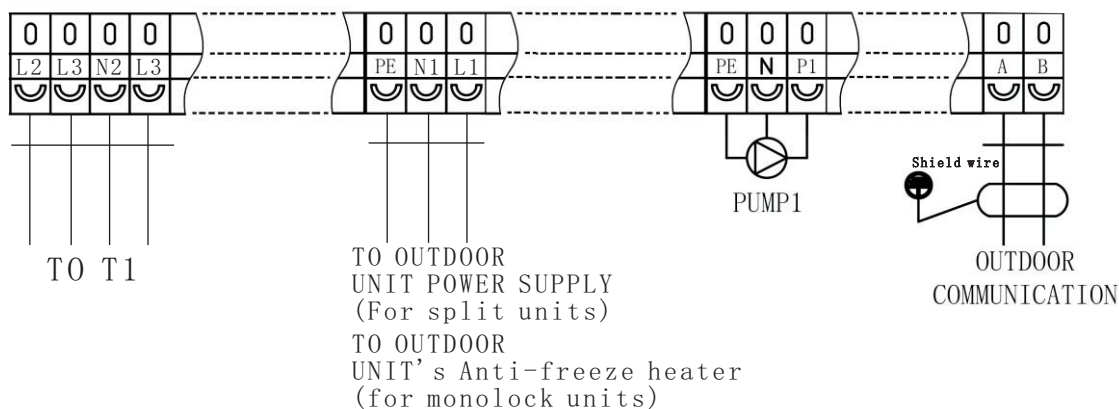


One Temperature Zone, without DHW

4. Assembly Configurations – Drawing 1

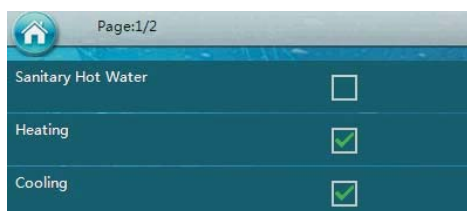
Assembly 1: Wiring Diagram

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:

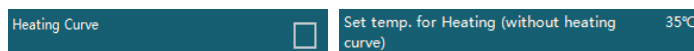


Ambient Temp. 1	-25°C
Ambient Temp. 2	-15°C
Ambient Temp. 3	-5°C
Ambient Temp. 4	5°C
Ambient Temp. 5	10°C

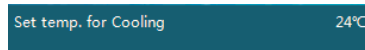
Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C



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.

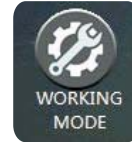
3. Locate and activate the buffer tank and appropriate pumps under



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.

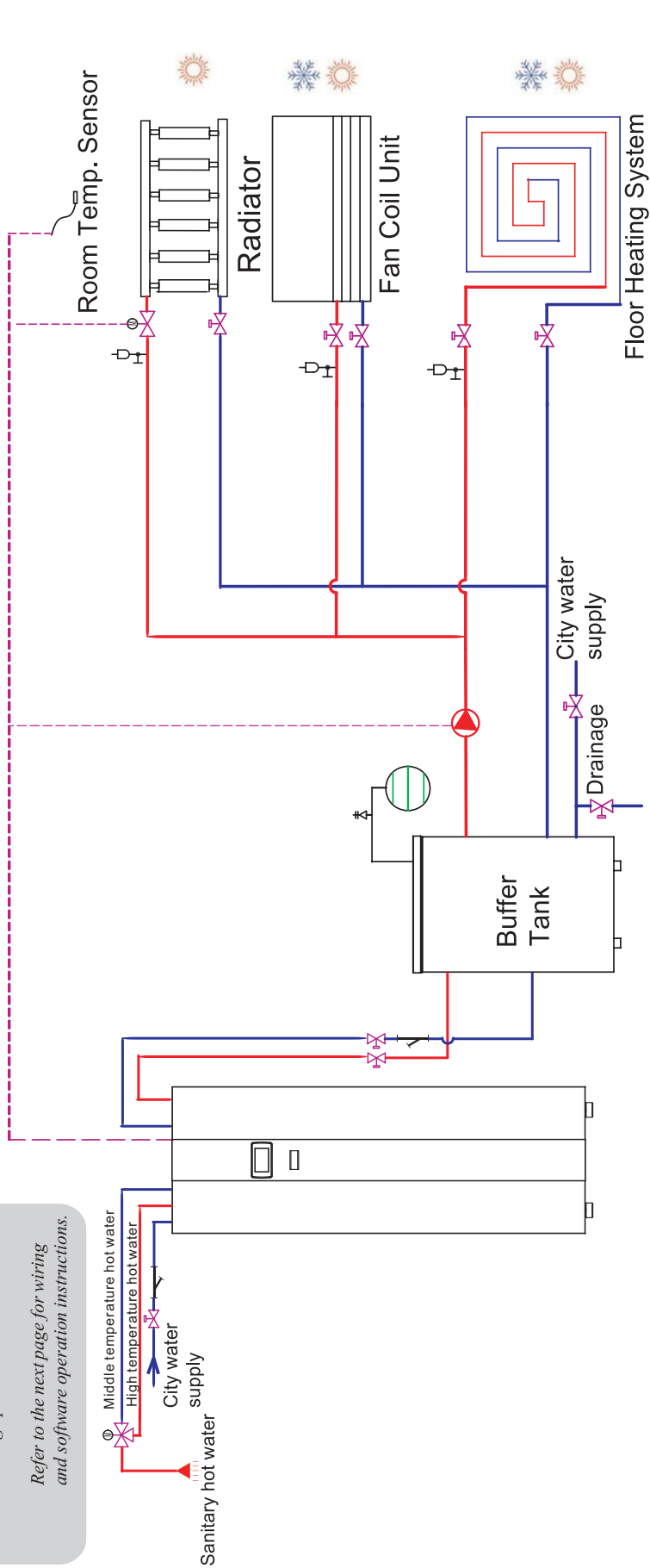
Note: For the cooling-only or heating-only circuit, a motorized two-way valve can be connected to the unit, to cut the water supply during heating or cooling operation.

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.

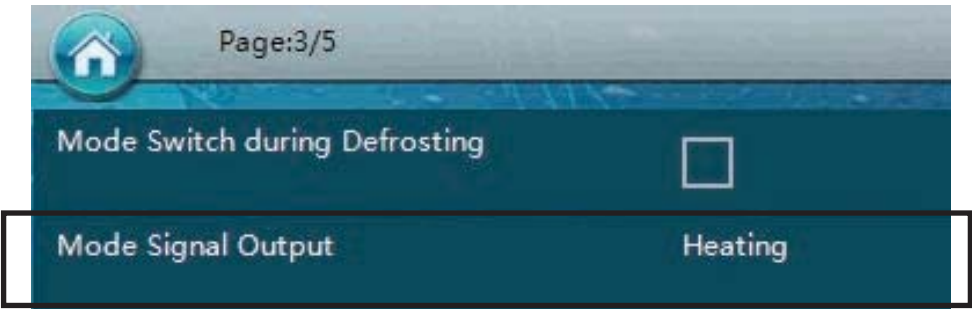
Note: Dotted lines mean "able to be controlled by the Heat Pump".



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):



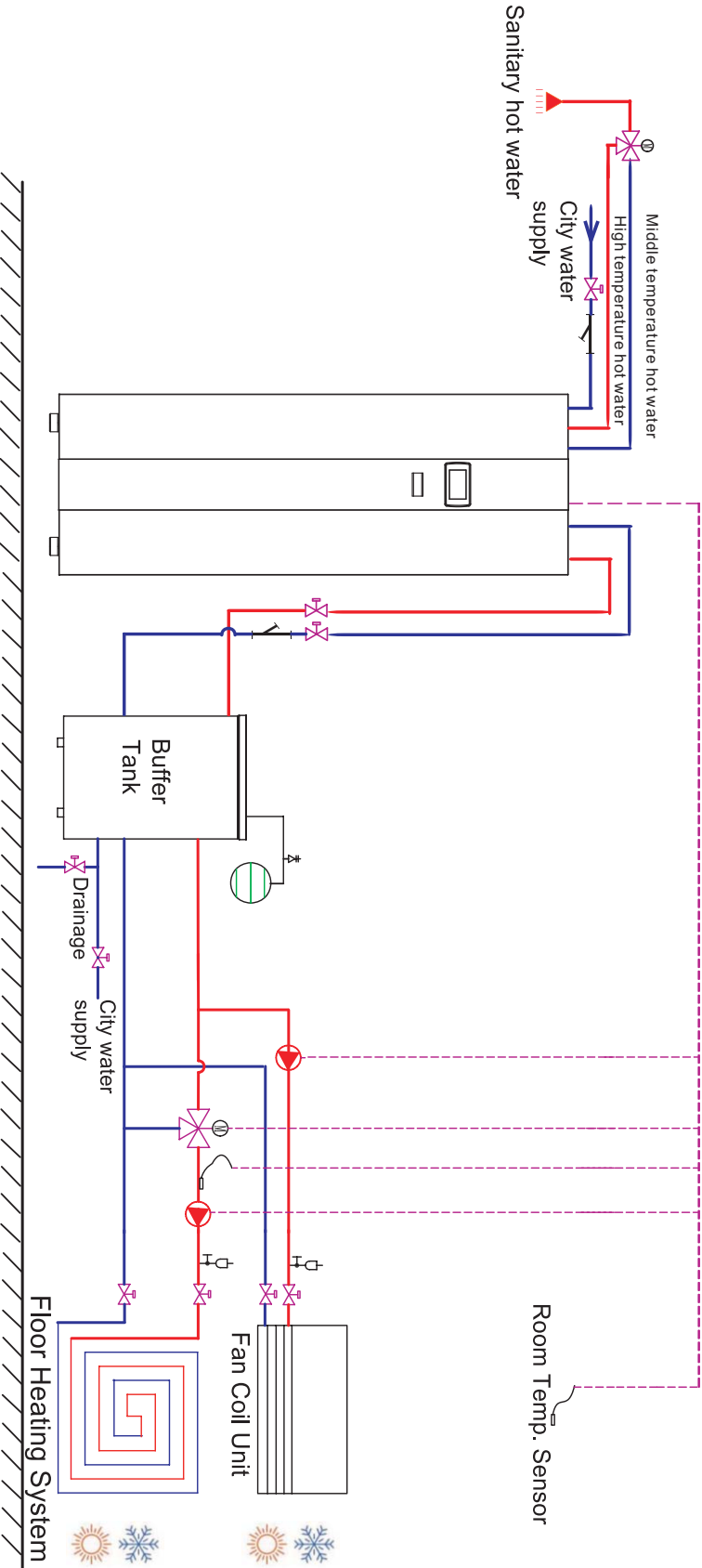
4. Assembly Configurations – Drawing 3

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

Software: Basic Settings (continued)

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

P2 for Heating Operation ☒

P2 for Cooling Operation ☐

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:

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:

Heating Curve ☐

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

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

Set temp. For Cooling 24°C

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

Mixing Valve ☒

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

Sanitary Hot Water ☒



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

Setpoint DHW 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.

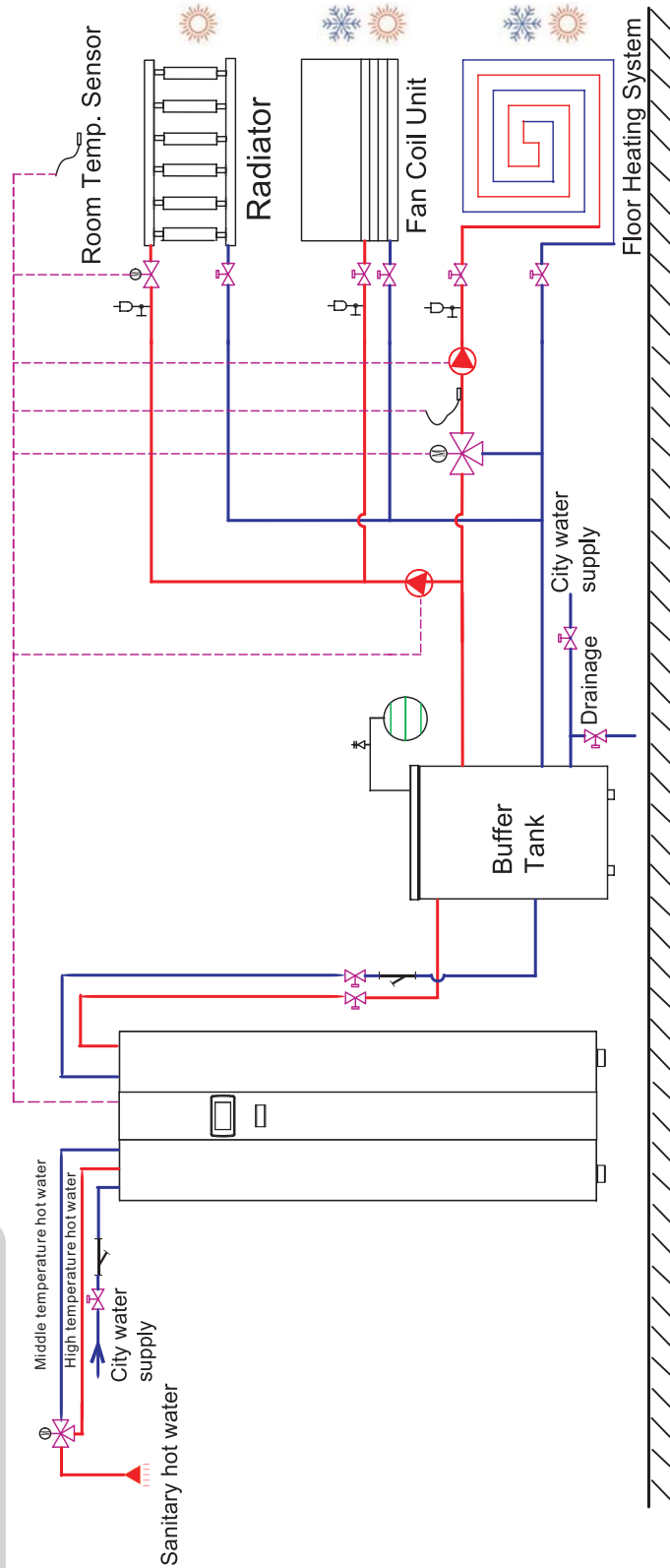
Note: For the cooling-only or heating-only circuit, a motorized two-way valve can be connected to the unit, to cut the water supply during heating or cooling operation.

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

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".

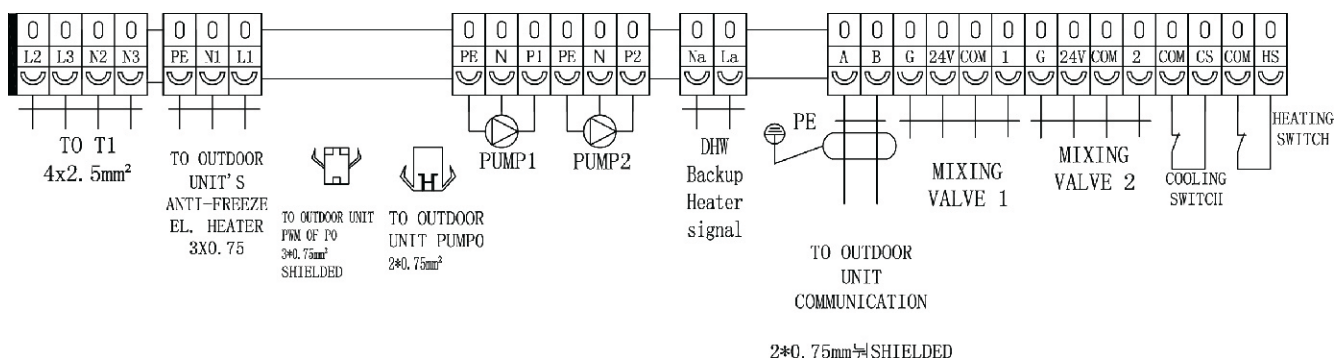


Two Temperature Zones ,without DHW, with a heating-only (or cooling-only) circuit, by usage of a motorized 2-way valve

4. Assembly Configurations – Drawing 4

Assembly 4: Wiring Diagram

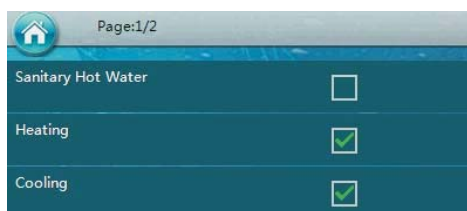
To achieve successful operation at a minimum, ensure the ports below are properly connected.



For connection for mixing valve 2, please refers to the appendix A (on page 70-71) 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:

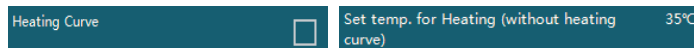
H.1. Setting a heating curve:



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

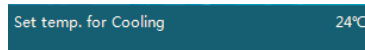
Water Temp. A/Ambient Temp. 1	40°C
Water Temp. B/Ambient Temp. 2	37°C
Water Temp. C/Ambient Temp. 3	33°C
Water Temp. D/Ambient Temp. 4	29°C
Water Temp. E/Ambient Temp. 5	25°C

H.2. If no heating curve is desired:

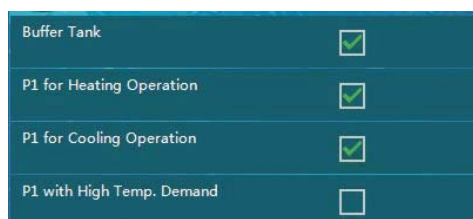


If cooling function is desired, ensure these sections are configured.

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



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



4. Assembly Configurations – Drawing 4

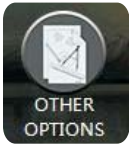
Software: Basic Settings (continued)

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

P2 for Heating Operation ☒

P2 for Cooling Operation ☐

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



Page:3/5

Mode Switch during Defrosting ☐

Mode Signal Output Heating

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:

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:

Heating Curve ☐

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

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

Set temp. For Cooling 24°C

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

Mixing Valve ☒

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

Sanitary Hot Water ☒



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

Setpoint DHW 50°C










Dependent on whether cooling is needed

4. Assembly Configurations – Drawing 5

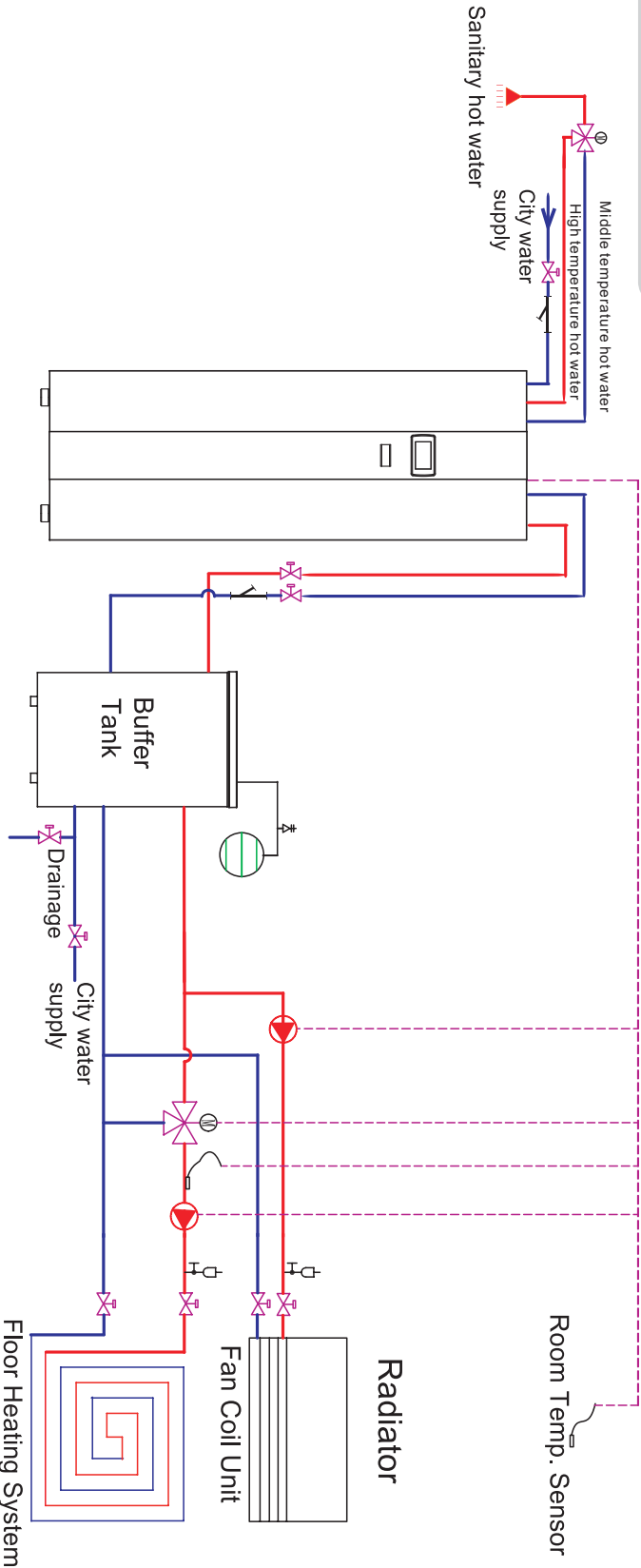
Please ensure that the configuration matches the assembly drawing depicted on the right for a two temperature zone setup that includes domestic hot water, also that utilizes the secondary pump for a heating-only operation.

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".	

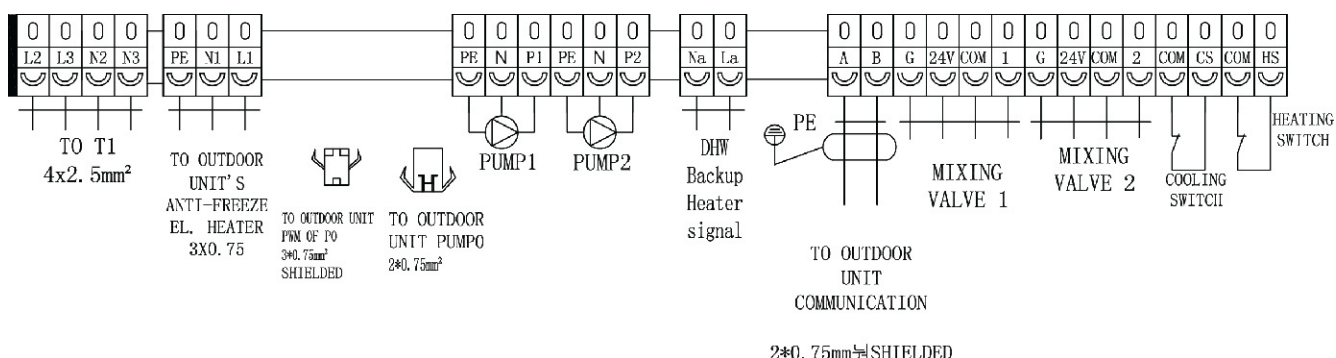
Notice : The Fan Coil Unit, Floor Heating System, and Radiator are placeholder distribution systems only and can be substituted by any other appropriate distribution systems.



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 refers to the appendix A (on page 70-71) 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:

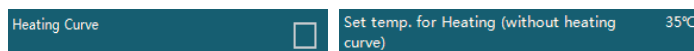
H.1. Setting a heating curve:



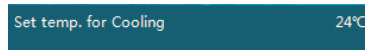
Ambient Temp. 1	-25°C
Ambient Temp. 2	-15°C
Ambient Temp. 3	-5°C
Ambient Temp. 4	5°C
Ambient Temp. 5	10°C

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:

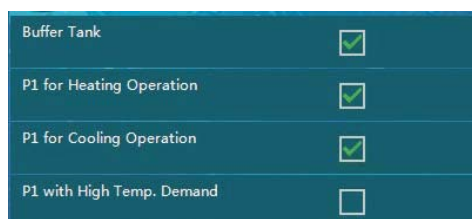


C. Configuring the set water cooling temperature (if applicable):



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 5

Software: Basic Settings (continued)

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

P2 for Heating Operation ☒

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:

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:

Heating Curve ☐

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

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

Set temp. For Cooling 24°C

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

Mixing Valve ☒

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



Sanitary Hot Water ☒

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

Setpoint DHW 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



Page:1/5	
Heating/Cooling Stops Based on Water ΔT	2°C
Heating/Cooling Restarts Based on Water ΔT	2°C
ΔT Compressor Speed-reduction	2°C
Set temp. for Cooling	24°C
Heating Curve	<input checked="" type="checkbox"/>



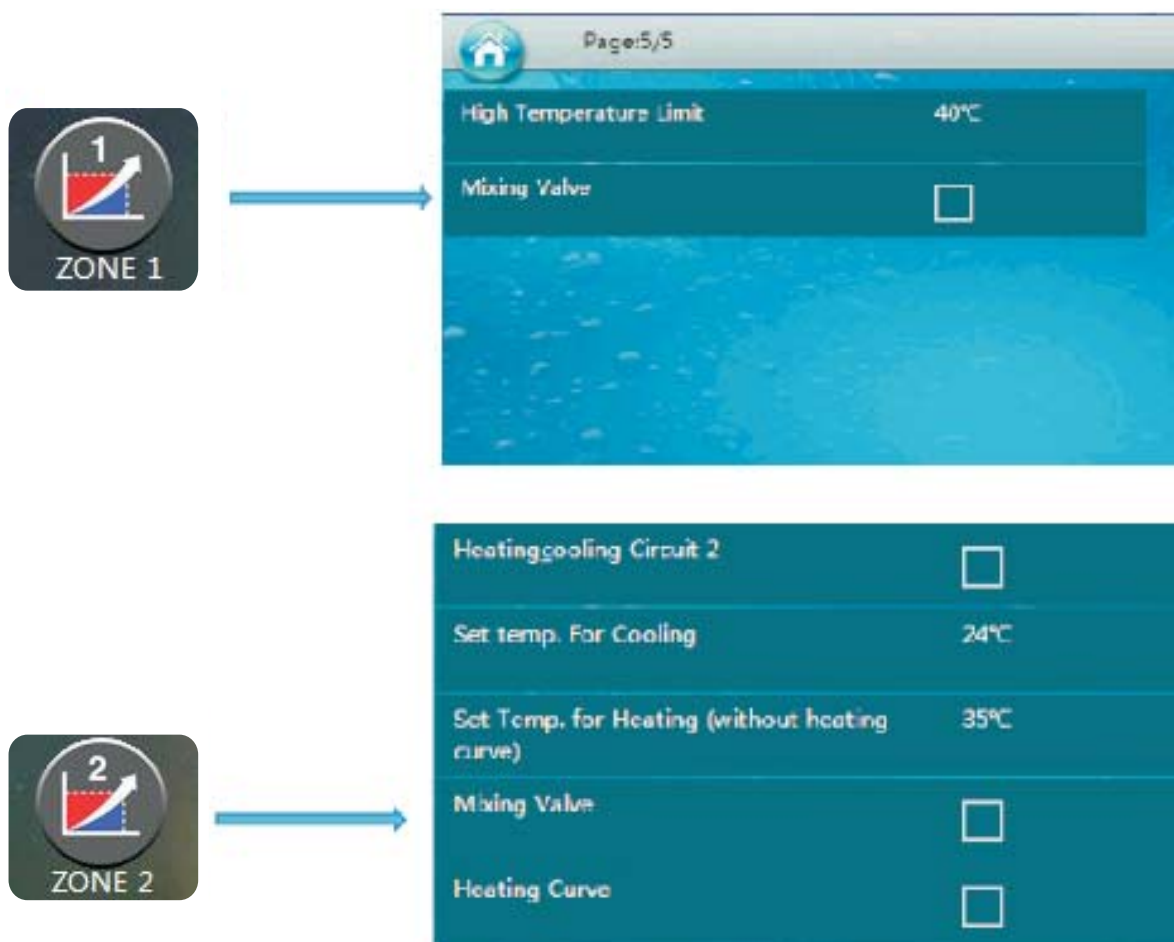
Heatingcooling Circuit 2	<input type="checkbox"/>
Set temp. For Cooling	24°C
Set Temp. for Heating (without heating curve)	35°C
Mixing Valve	<input type="checkbox"/>
Heating Curve	<input checked="" type="checkbox"/>

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 temperaure 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.

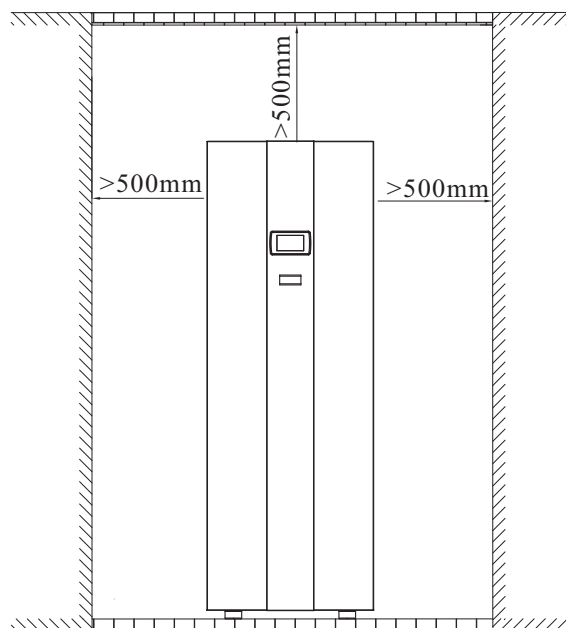
NOTE:It is very important to place the temperature sensor (TR) in a central location with good circulation, with no hot or cold equipment nearby, in a column or interior wall, or somewhere similar.

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 further maintenance.

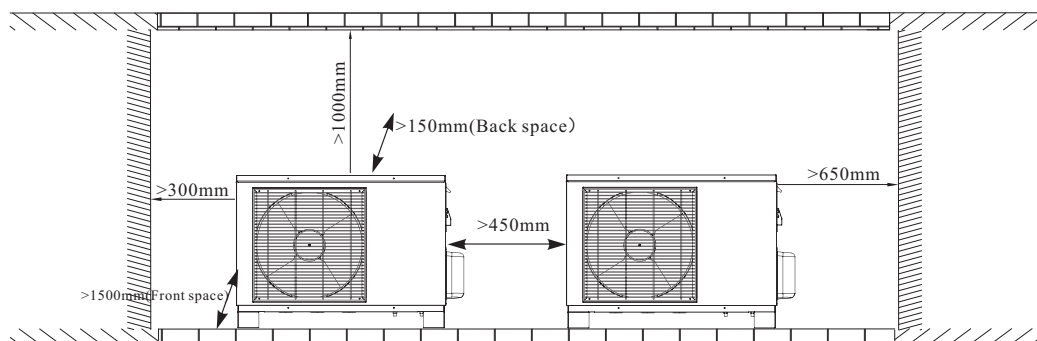


5. Installation Walkthrough

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 condensated 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

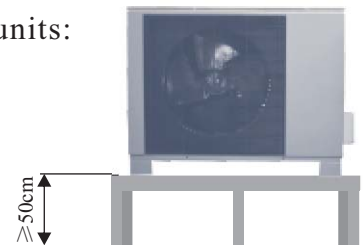
5.4. Outdoor Unit Installation



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

【A. On a concrete stand】

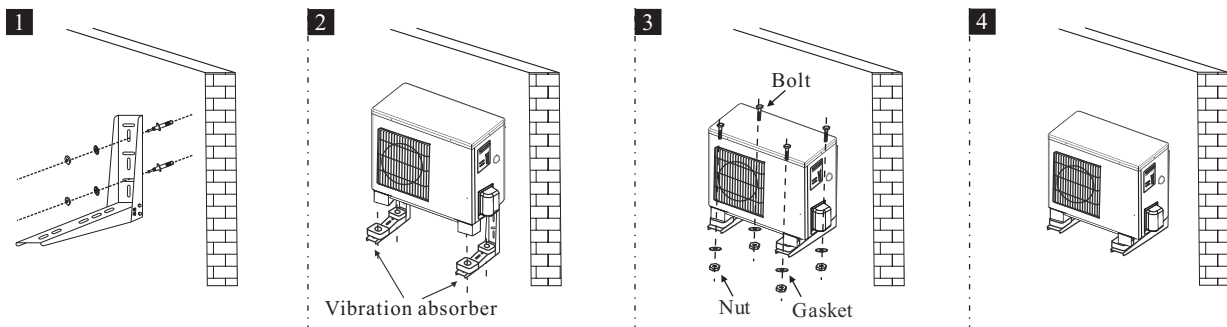
- 1.The unit must be located on a flat,solid,preferably cemented surface.
- 2.When installing the unit,introduce a tilt of 1cm/m for rain water evacuation.
- 3.When installing the unit in harsh climatic conditions,sub-zero temperature ,snow,humidity..., it is recommended to raise the unit off the ground 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】

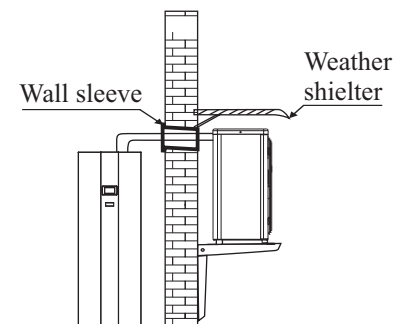
A:If needs to hang the outdoor unit on the wall, please do as followings:

- 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 refrigerant 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.

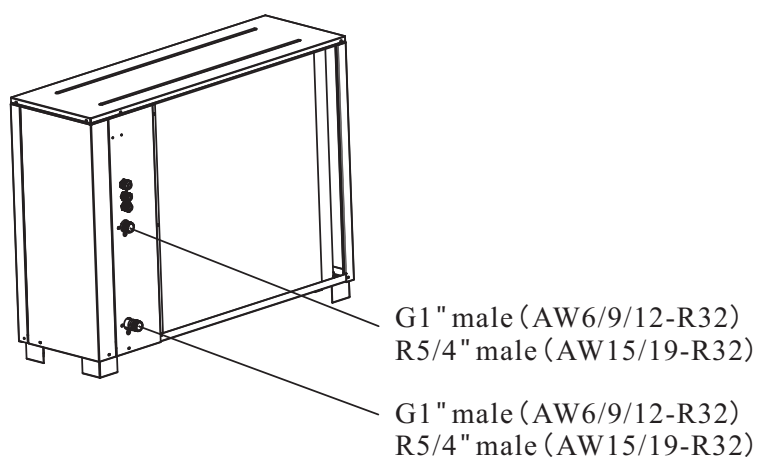


5. Installation Walkthrough

5.5. Water pipe connection

5.5.1.Amount of Refrigerant:

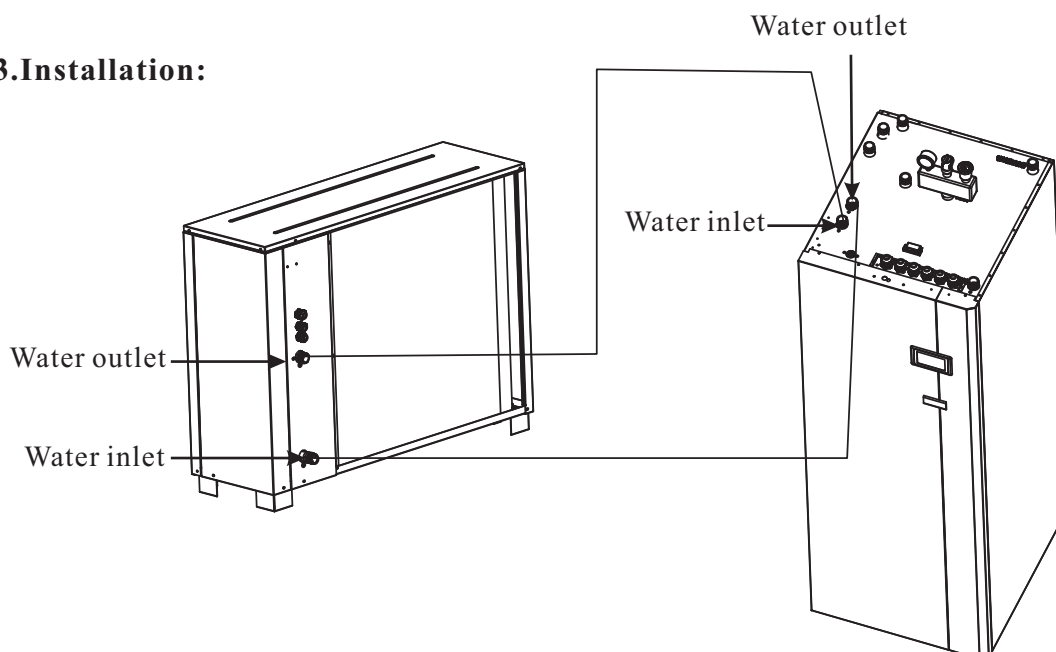
Before connect the water piping between indoor and outdoor unit, please notice the size of water connector, and should choose the proper size of water piping, to avoid leakage.



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:

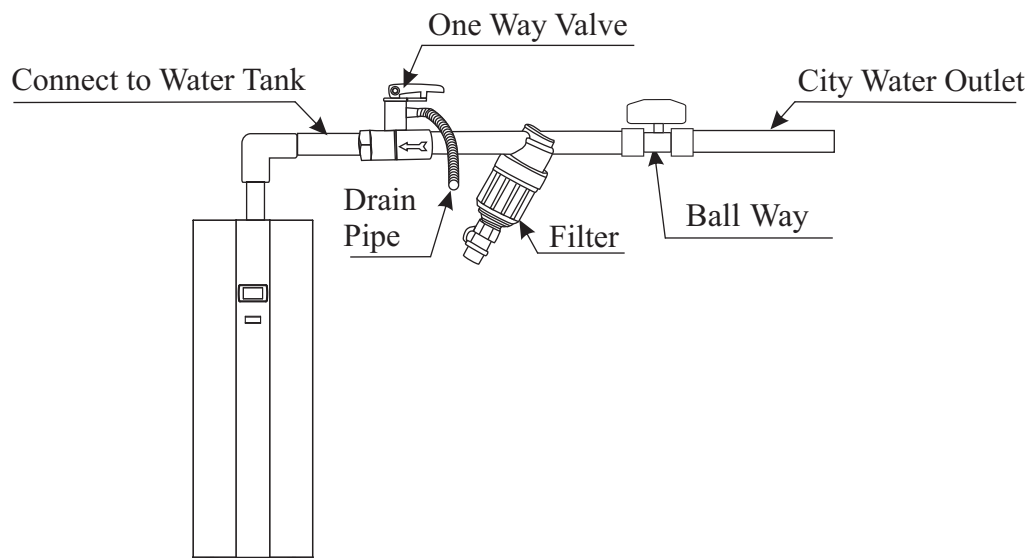
One way valve must be installed to water filling connector, to avoid back-flow of water when water supply stops or water pressure not enough (one way valve is packed with the unit).

▲ 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.

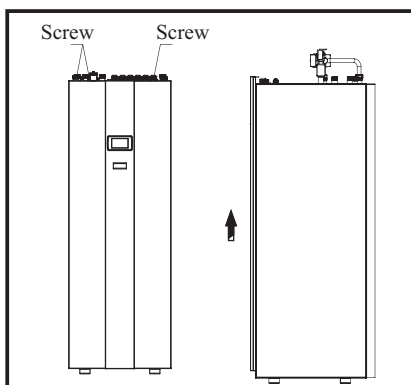
▲ Ball valve:

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

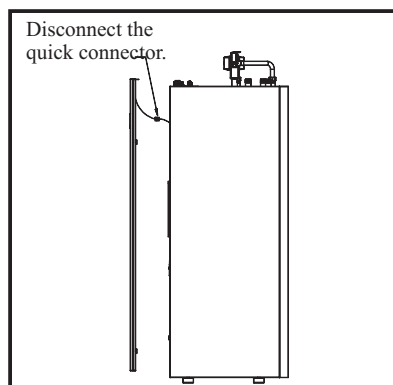


【Connect of drainage pipe】

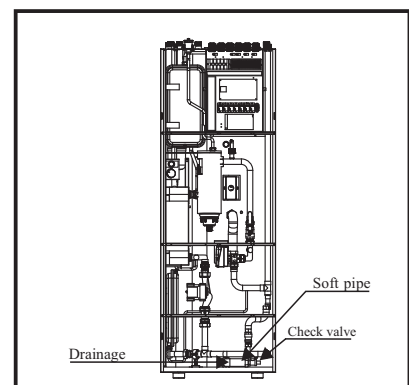
When the tank need to be drained, please do as per following instruction:



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



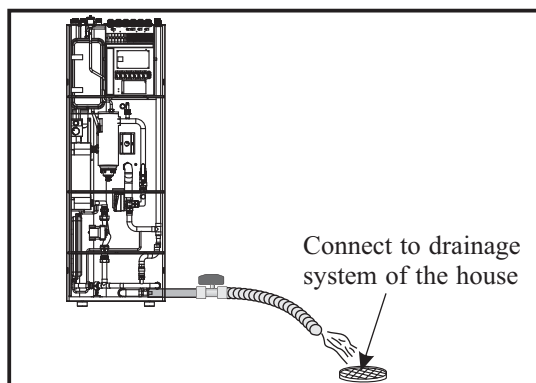
2. Hold the front panel up by 10~15mm, disconnect the quick connector from wired controller, and then take out the front panel.



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).

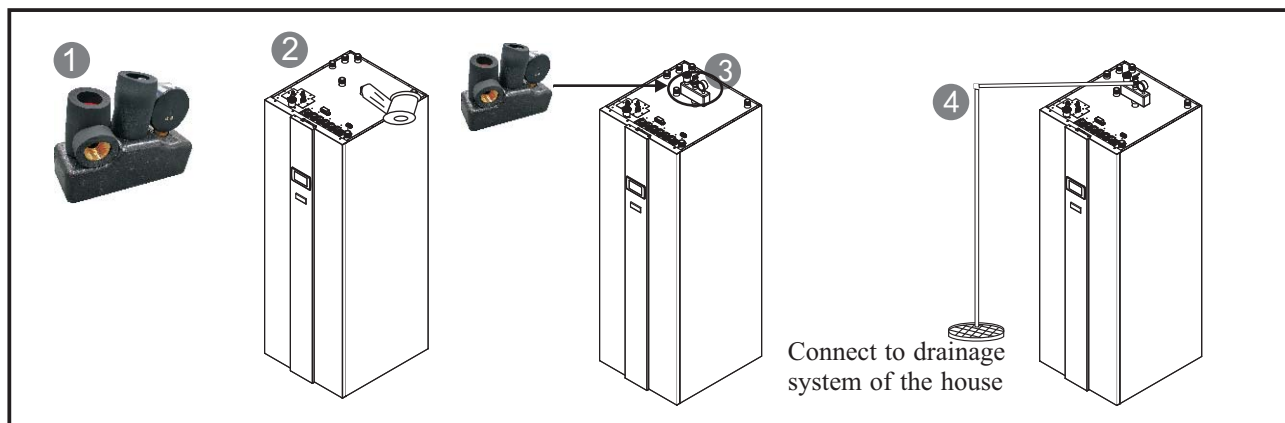


Please ensure enough water pressure to deliver the water to the required height. If the water pressure is not enough, please add water pump to increase the pumping head.

【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.



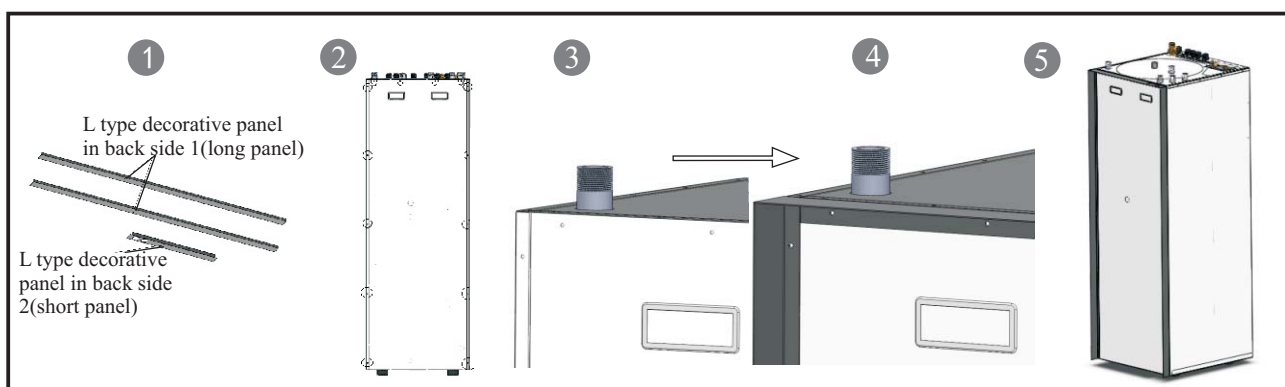
5. Installation Walkthrough

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:

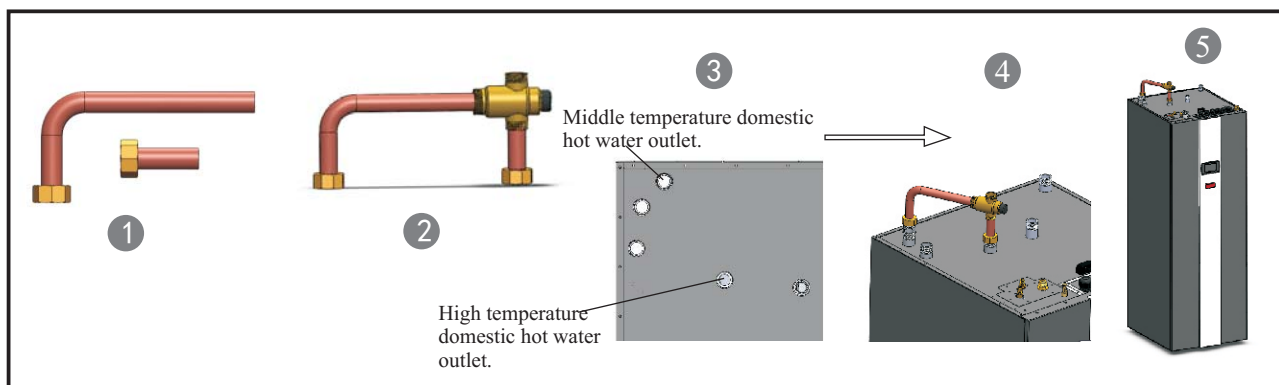
1. Take out 2pcs L type decorative panel in back side 1 and 1pcs L type decorative panel in back side 2.
2. Find 14 screws holes in the picture 2.
3. Fix 2pcs long panel on the right and left back side of the unit, by fasten the screws, and fix 1pcs short panel on the top back side of the unit. Please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

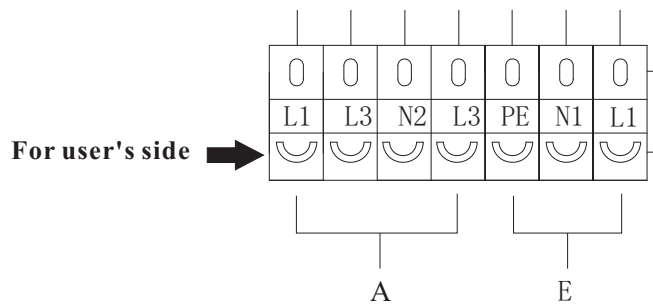
1. Please find the pipings for mixture valve in the accessories. Please refer the picture 1.
2. Connect the pipings to two water inlets of mixture valve.
3. Install the pipings onto the high temperature hot water outlet and middle temperature hot water outlet. Please refer the picture 3 and 4.
4. It's 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: Outdoor unit power supply(for split units)

If the outdoor unit draws power from the indoor unit, this terminal should be connected through cable between the appropriate ports (see Appendix for wiring diagrams).

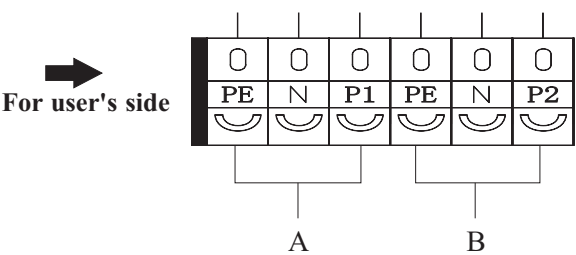
Outdoor Anti-freeze heater power supply(for monblock units)

For supplying electricity to electric heater in outdoor unit, so in case the circuit breaker for outdoor unit power supply is cut, this heater can still have power preventing water from freezing up.

5. Installation Walkthrough

5.7. Wiring

5.7.2. Explanation of Terminal Block 2



A, B: Water Pump

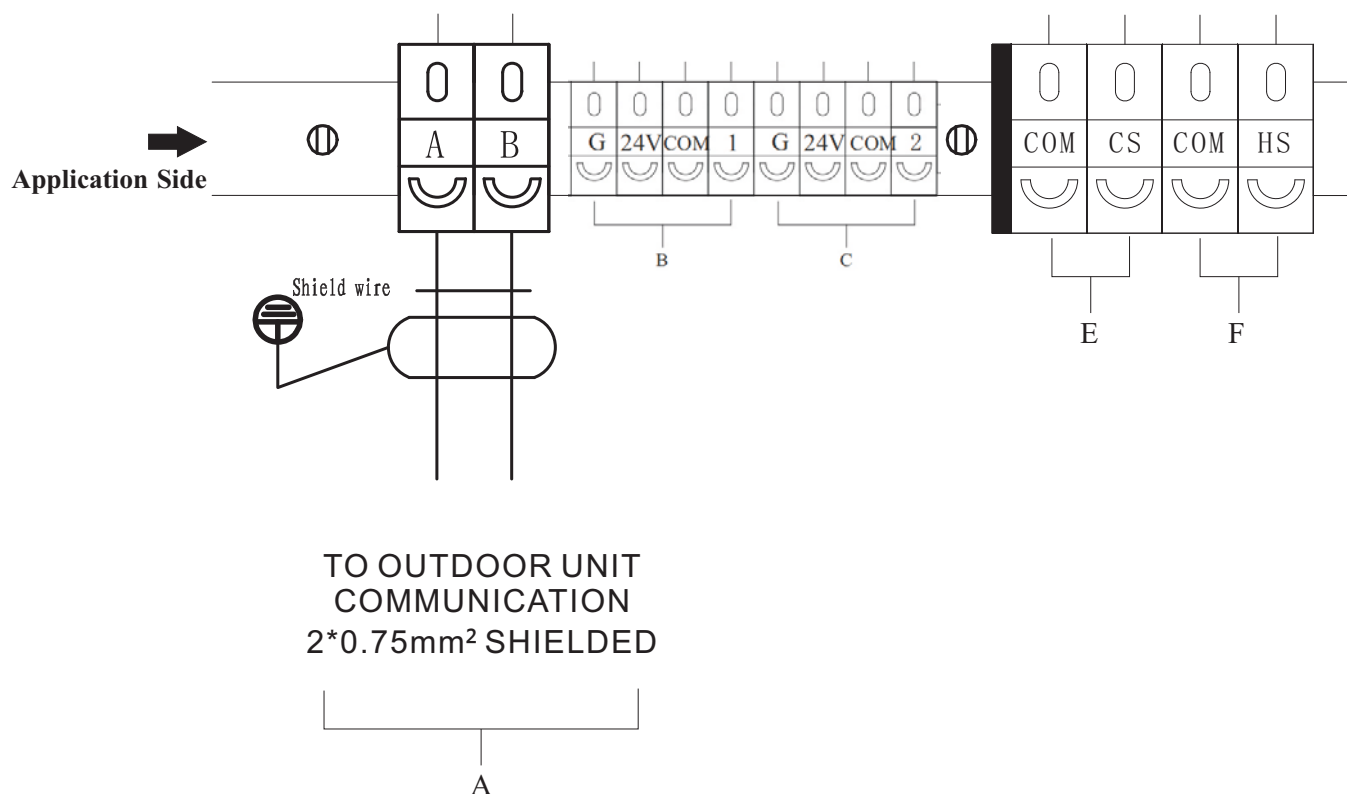
- A-Pump 1: Pump for Heating & Cooling Circuit 1,
- B-Pump 2: Pump for Heating & Cooling Circuit 2,

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

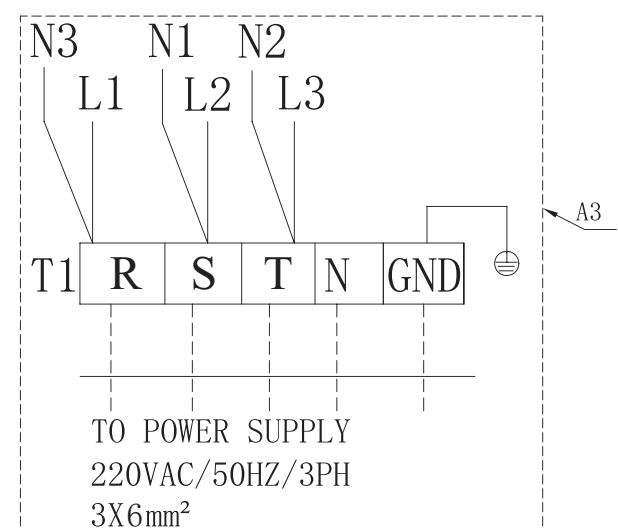
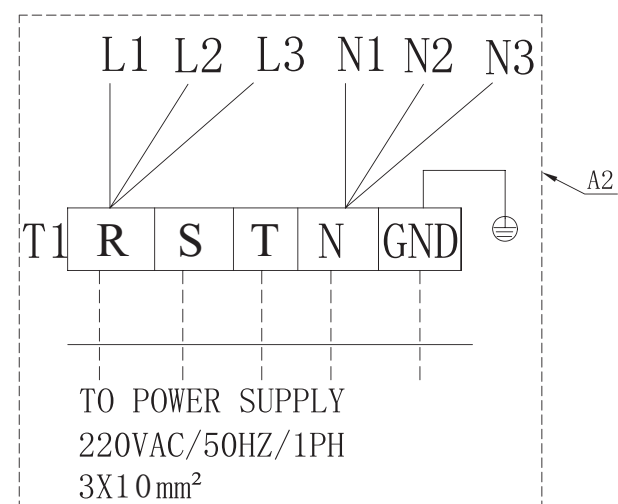
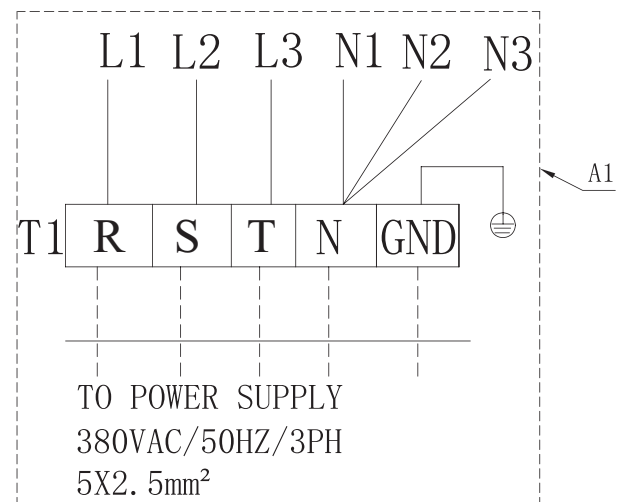
5.7. Wiring

【Important Notice】

With 415V/50Hz/3Ph power supply (as default):
Use wiring diagram A1. L1, L2 and L3 from terminal block T2 should be connected to terminal R, S and T of terminal block T1;N1, N2 and N3 from terminal block T2 should be connected to terminal N of terminal block T1Power supply cable must be able to carry the maximum running current of the system (recommand to use power cable no smaller than 2.5mm2).

With 230V/50Hz/1Ph power supply:
Use wiring diagram A2. L1, L2 and L3 from terminal block T2 should be connected to terminal R of terminal block T1;N1, N2 and N3 from terminal block T2 should be connected to terminal N of terminal block T1.Power supply cable must be able to carry the maximum running current of the system (recommand to use power cable no smaller than 10mm2).

With 230V/50Hz/3Ph power supply:
Use wiring diagram A3. L1 and N1 from terminal block T2 should be connected to terminal R of terminal block T1;L2 and N2 from terminal block T2 should be connected to terminal S of terminal block T1;L3 and N3 from terminal block T2 should be connected to terminal T of terminal block T1; Power supply cable must be able to carry the maximum running current of the system (recommand to use power cable no smaller than 6mm2).



5. Installation Walkthrough

5.7. Wiring

Power supply and electric connections

This unit has a maximum combined output (hot water and heating) of 16,5/18,5/20,5 kW (depending on model). To get maximum output, the unit needs a total of 11 kW power input. However, the unit's output and consumption can be adjusted in accordance to the available power input in the building, and type of backup heater you want to connect. The minimum input is 3 kW.

Observe! If internal back up heaters are not connected, the heat pump must be connected to external automatic backup heating device for space heating and hot water.

Before doing the electric installation you need to plan how much of the unit's total capacity you wish to use, and what kind of power supply that is available (230V or 400V, single phase or three phase). Below it is listed different power consumers built in the unit, and the power input and voltage needed to run them.

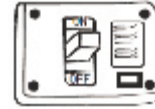
Power consumer	Power	Voltage	Circuit breaker	Explanation
Heat pump + hot water heater	3,5-4 kW	230V/1-ph	25A	Can be individually connected with 1-4 individual 230V/1-ph power supply
Backup heater 1	3,0 kW	230V/1-ph	16A	
Backup heater 2	3,0 kW	230V/1-ph	16A	
Heat pump + hot water heater + Backup Heater 1 + Backup heater 2	9,5-10 kW	400V/3-ph or 230V/3-ph	25A	Heating system connected to 400V/3-ph or 230V/3-ph power supply

Note: There has a "Emergency Switch" inside the unit. This switch should only be switched ON when compressor system is break down. When it is set to ON, it will activate the power connection to a 3kW heater, which shares the power supply of heat pump unit.

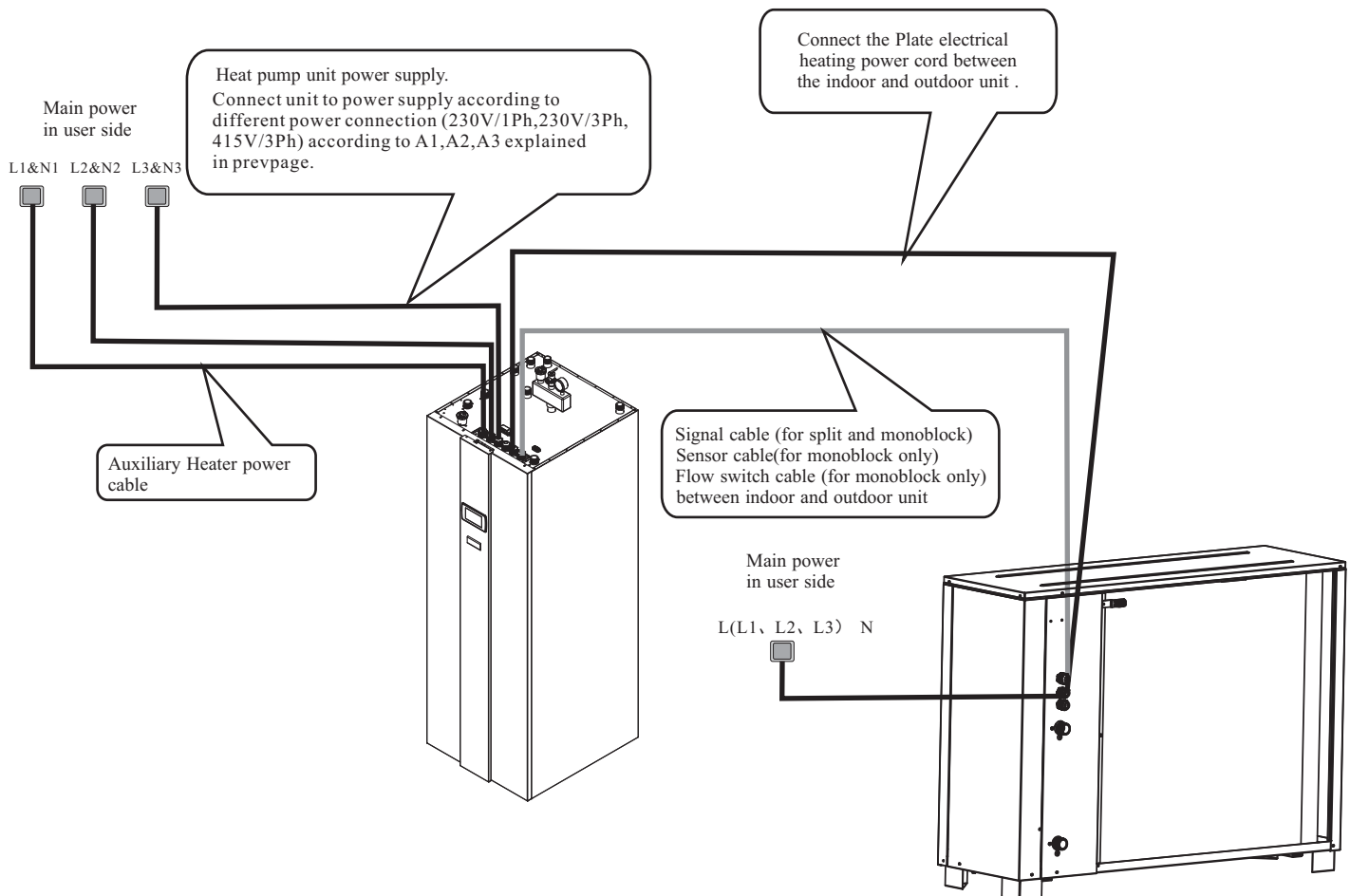
5. Installation Walkthrough

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

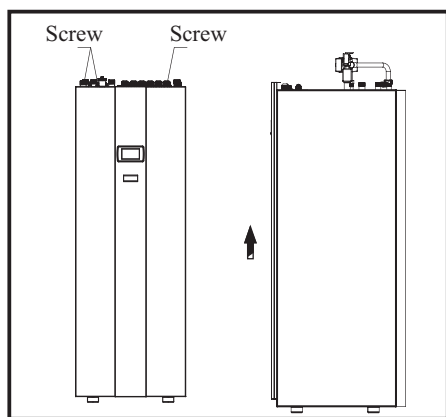
5.7. Wiring

5.7.5. Wiring Process

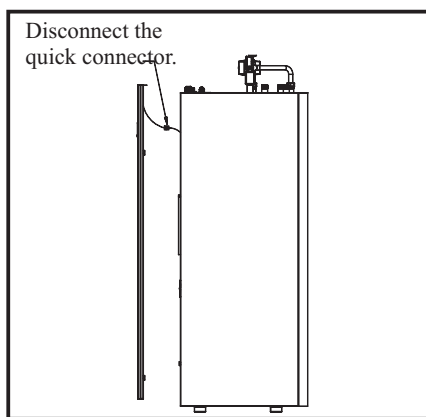
- 1) Open the indoor unit's front panel and remove the electrical box cover.

【Connect of drainage pipe】

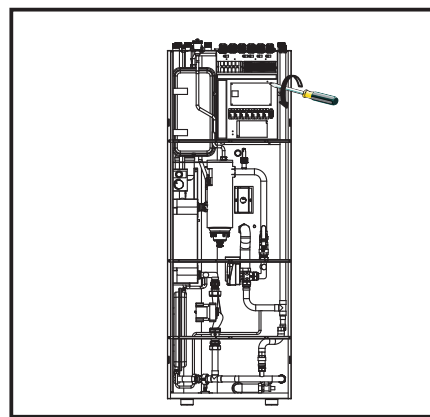
When the tank need to be drained, please do as per following instruction:



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

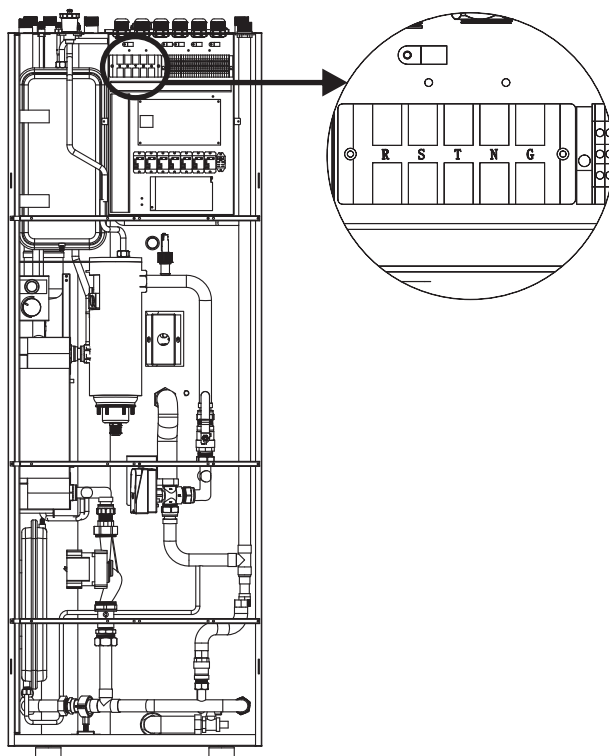


2. Hold the front panel up by 10~15mm, disconnect the quick connector from wired controller, and then take out the front panel.



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.

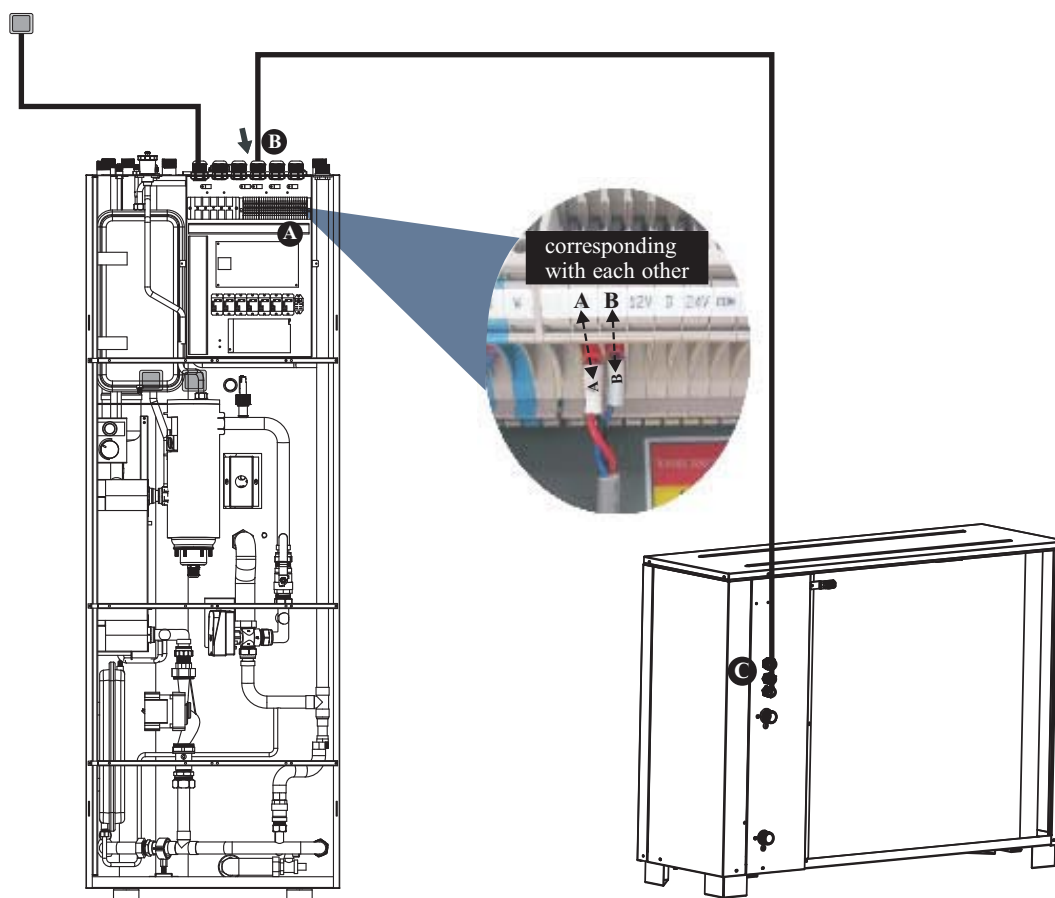
5. Installation Walkthrough

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.

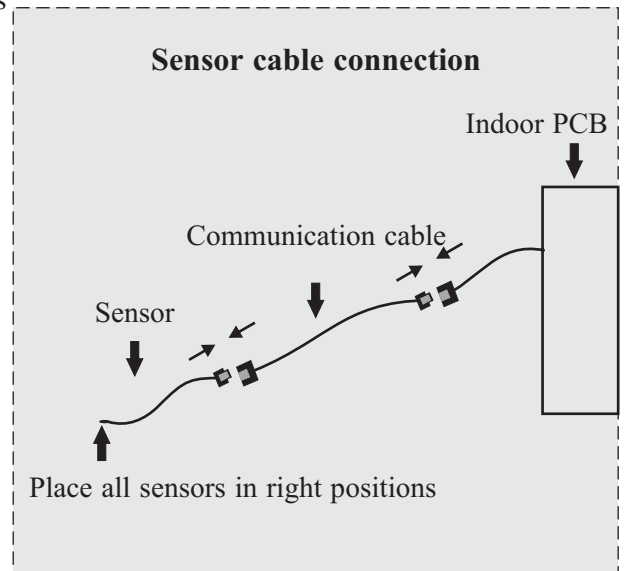
For monoblock unit, connect sensor cables and flow switch cables between indoor and outdoor unit as per wiring diagram and marks on the cable.

5. Installation Walkthrough

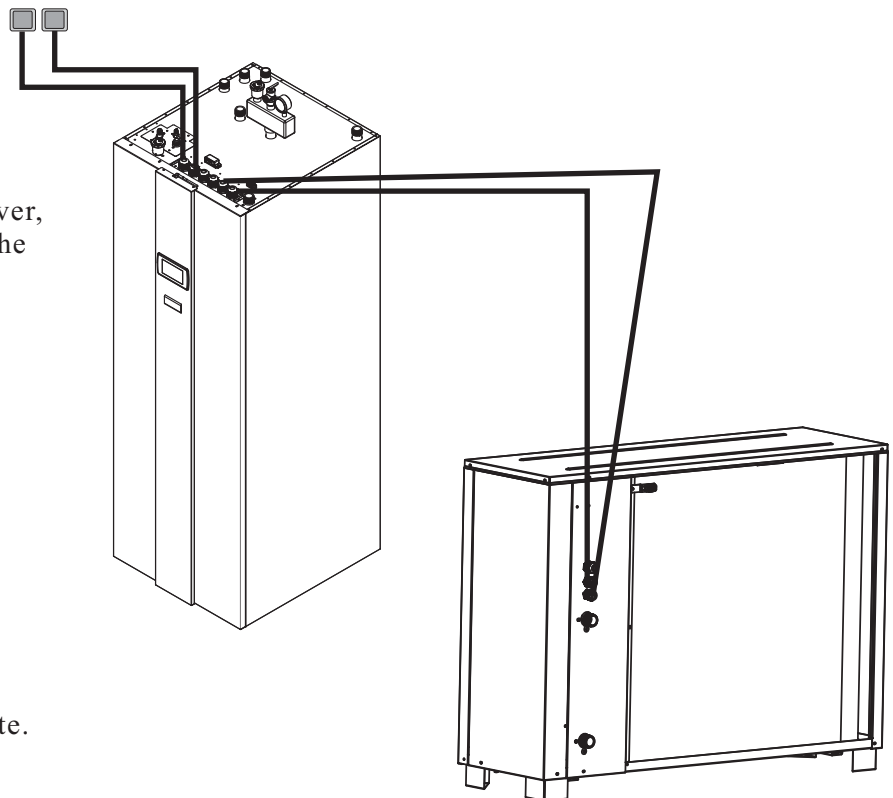
5.7. Wiring

- 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 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

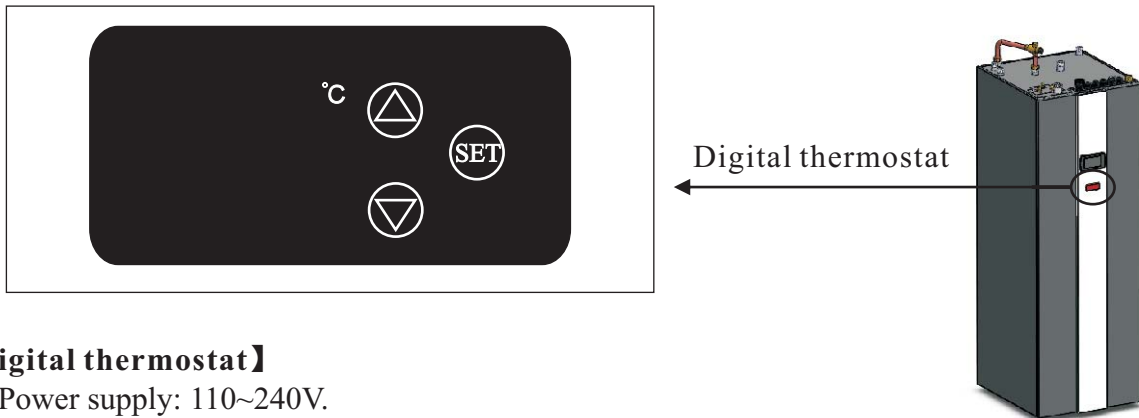
5.9. Electric heating

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.

5. Installation Walkthrough

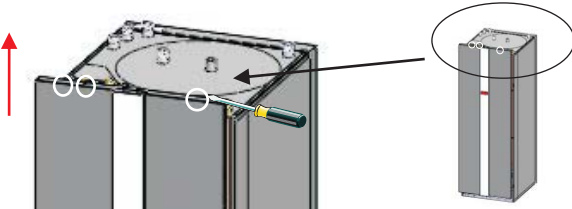
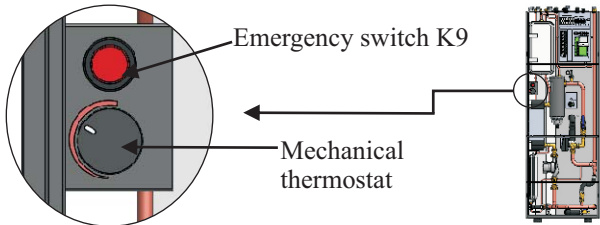
5.9. Electric heating

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.

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

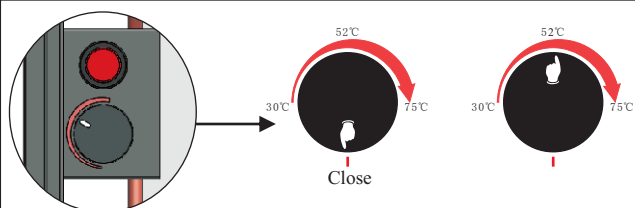
However, if the indoor PCB itself is broken, one can obey the following instructions to turn ON the heater manually:

1	2
	
<p>Unscrew three screws on top, and lift the front panel up by around 20mm, then remove the front panel.</p>	<p>Switch ON the switch K9 inside the unit, as shown in below picture.</p>

5. Installation Walkthrough

5.9. Electric heating

3

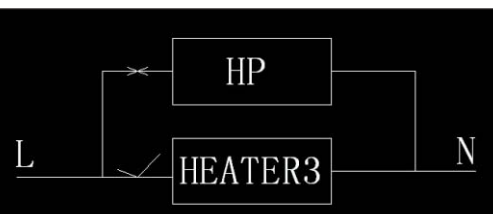


Set the needed water temperature by turning the knob of the mechanical thermostat, so to control the water temperature.

Note:

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

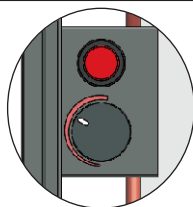
4



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 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.

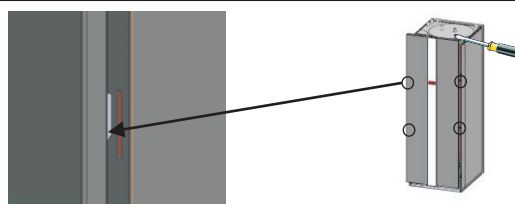
5



Note:

After problem solved, please don't forget to turn the switch K9 to OFF position, otherwise electric heater will keep 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 fastening three screws on top.

5. Installation Walkthrough

5.10. Test run



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

5.10.1. 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.

5.10.2. Starting Up

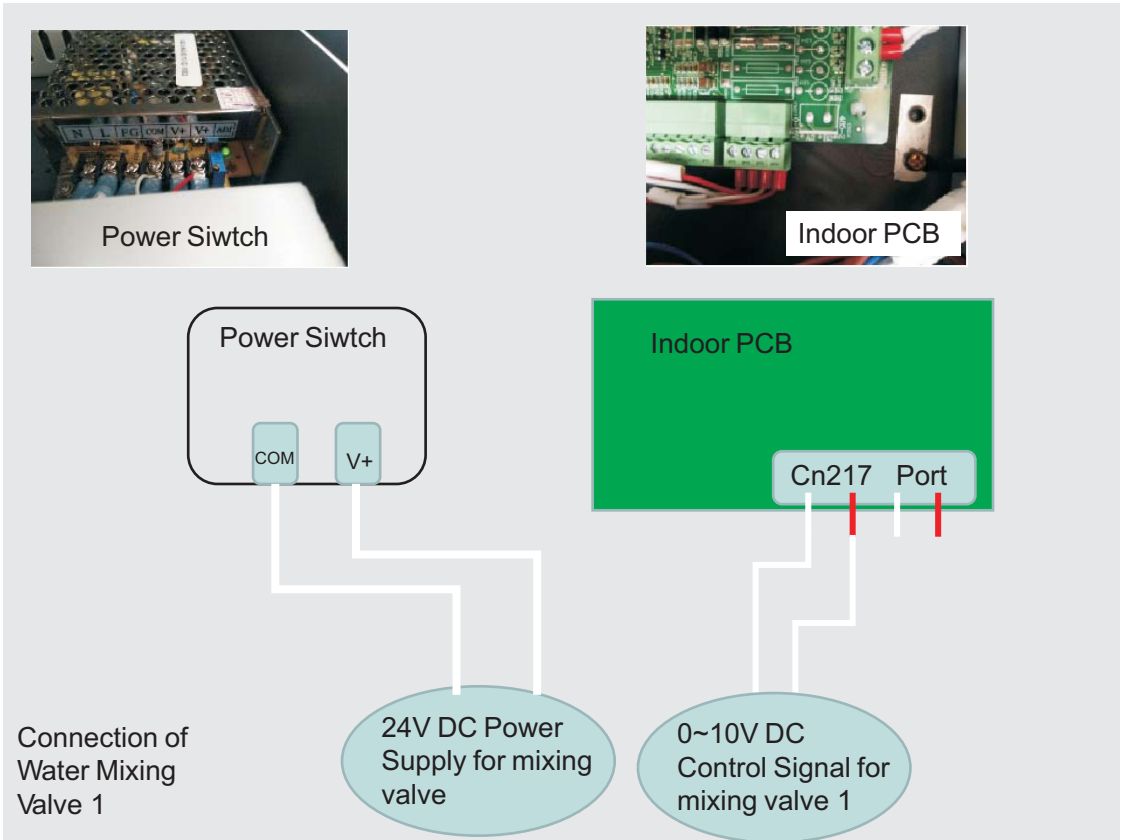
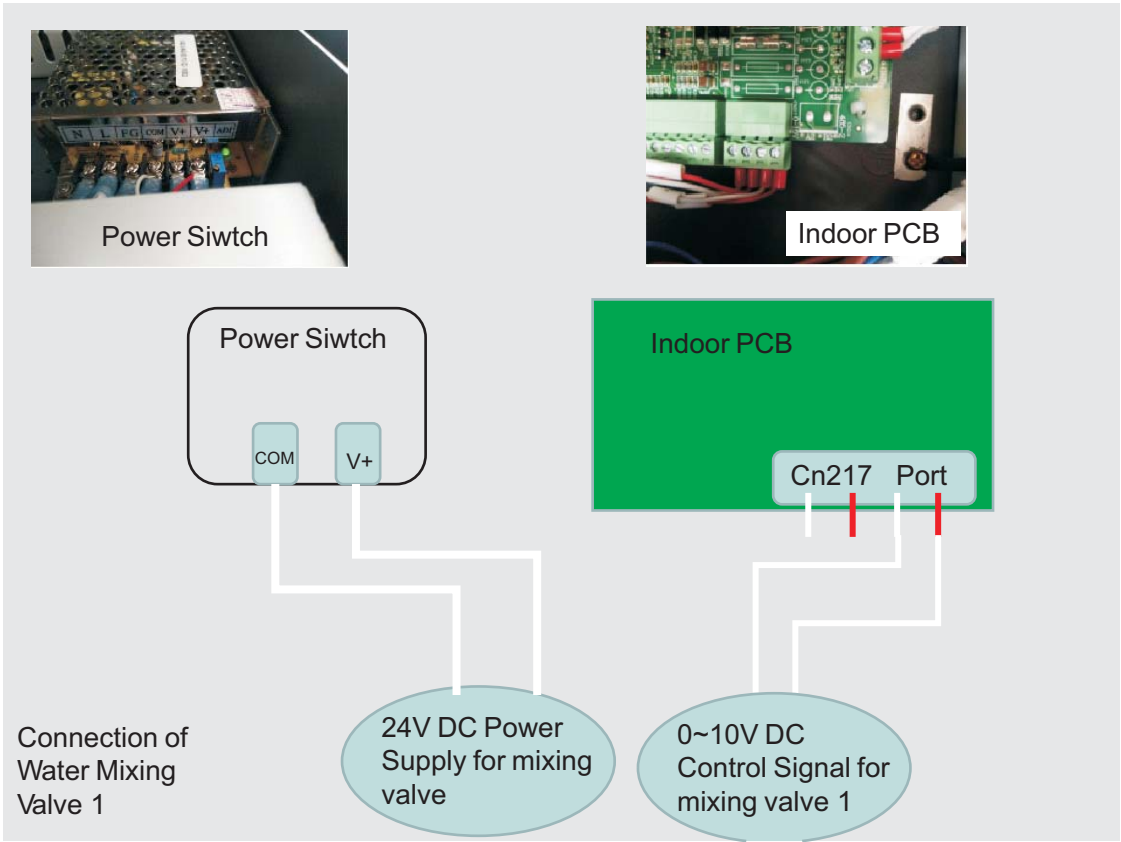
When the installation of the unit is completed, all water system pipes are confirmed to be well-connected, air purging is done, there are no leakages or other problems, the unit can be powered on.

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.

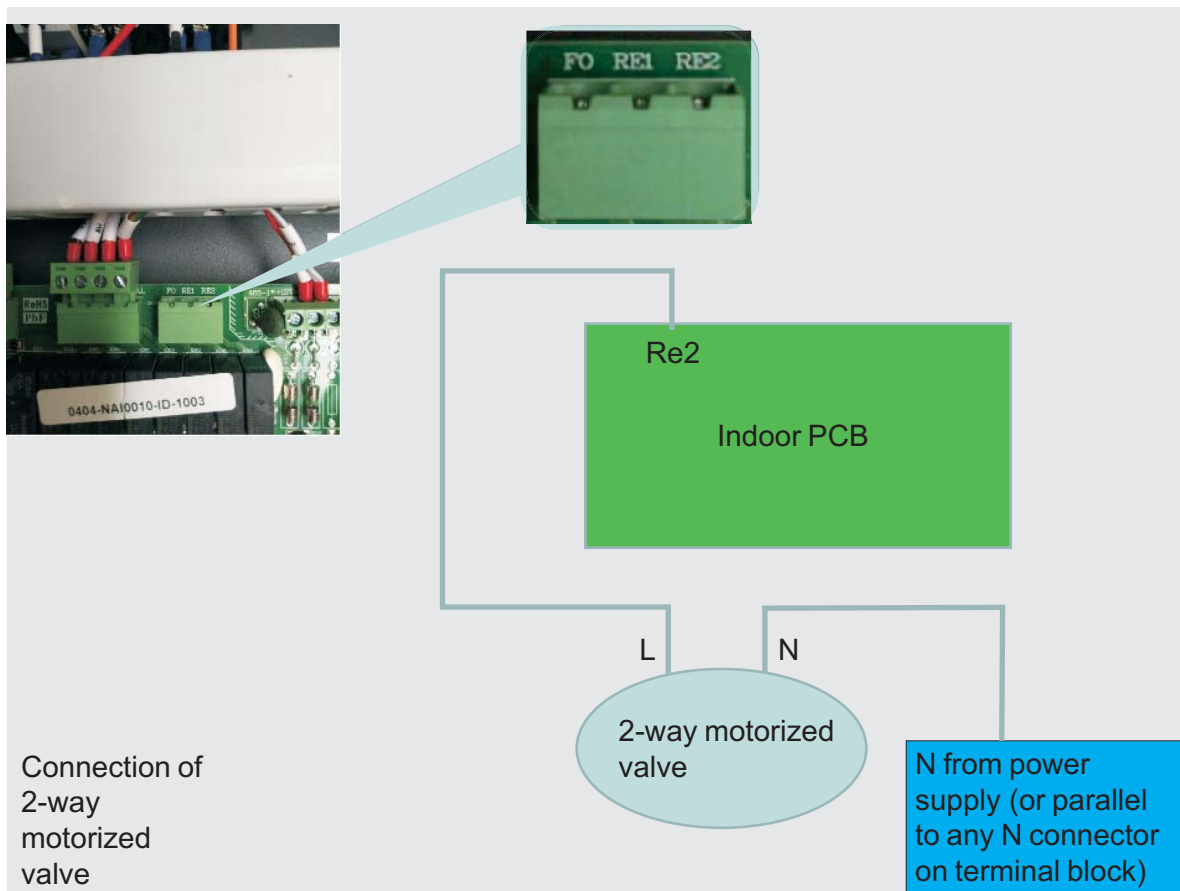
After the unit has been on for 10 minutes and no abnormalities have occurred, the start-up process is complete. For problems and troubleshooting, please refer to the Service and Maintenance manual.

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.

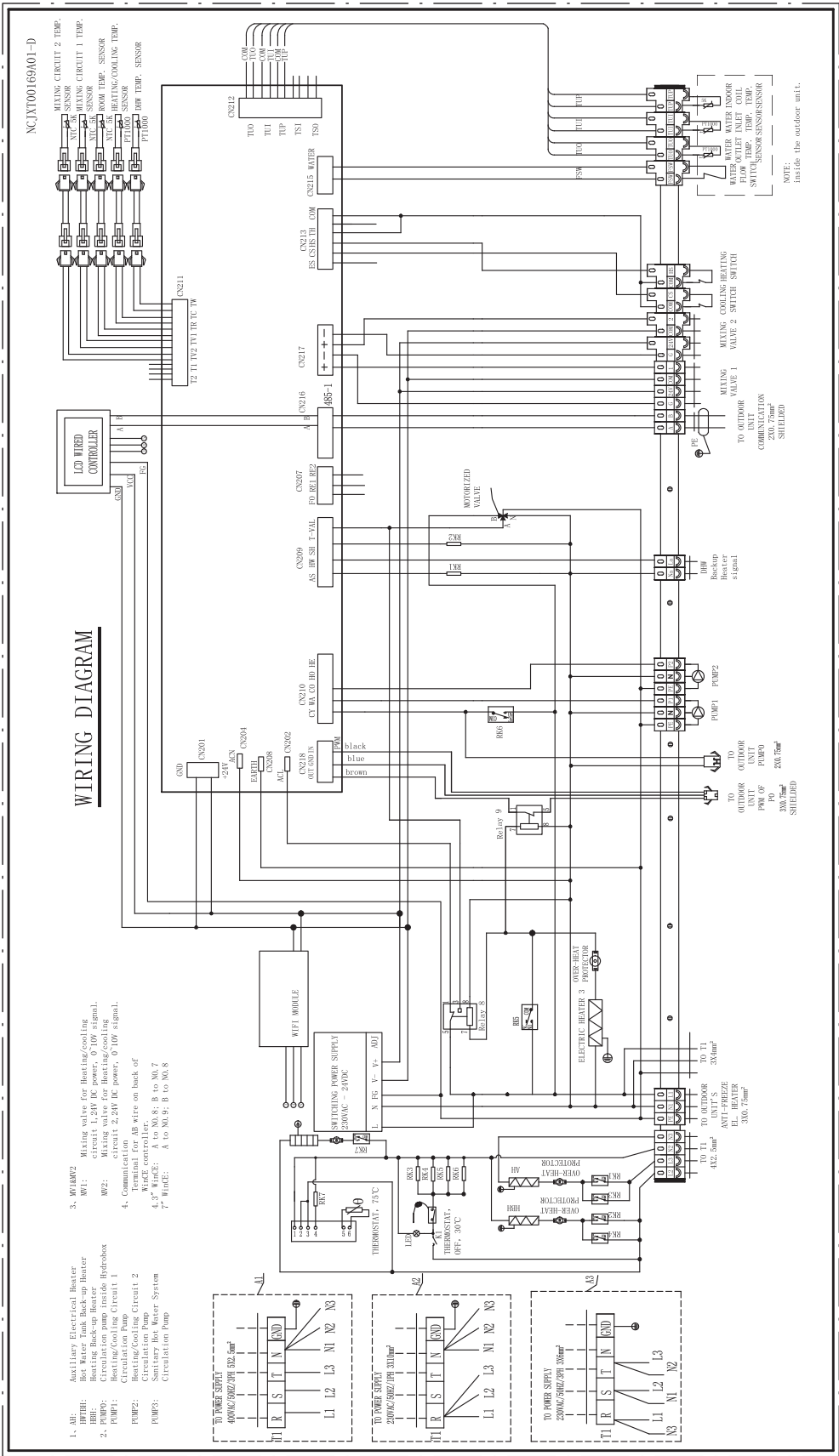
Appendix A: Wiring



Appendix A: Wiring



Appendix B: Wiring

Indoor — AWT6/9/12/15/19-R32-M

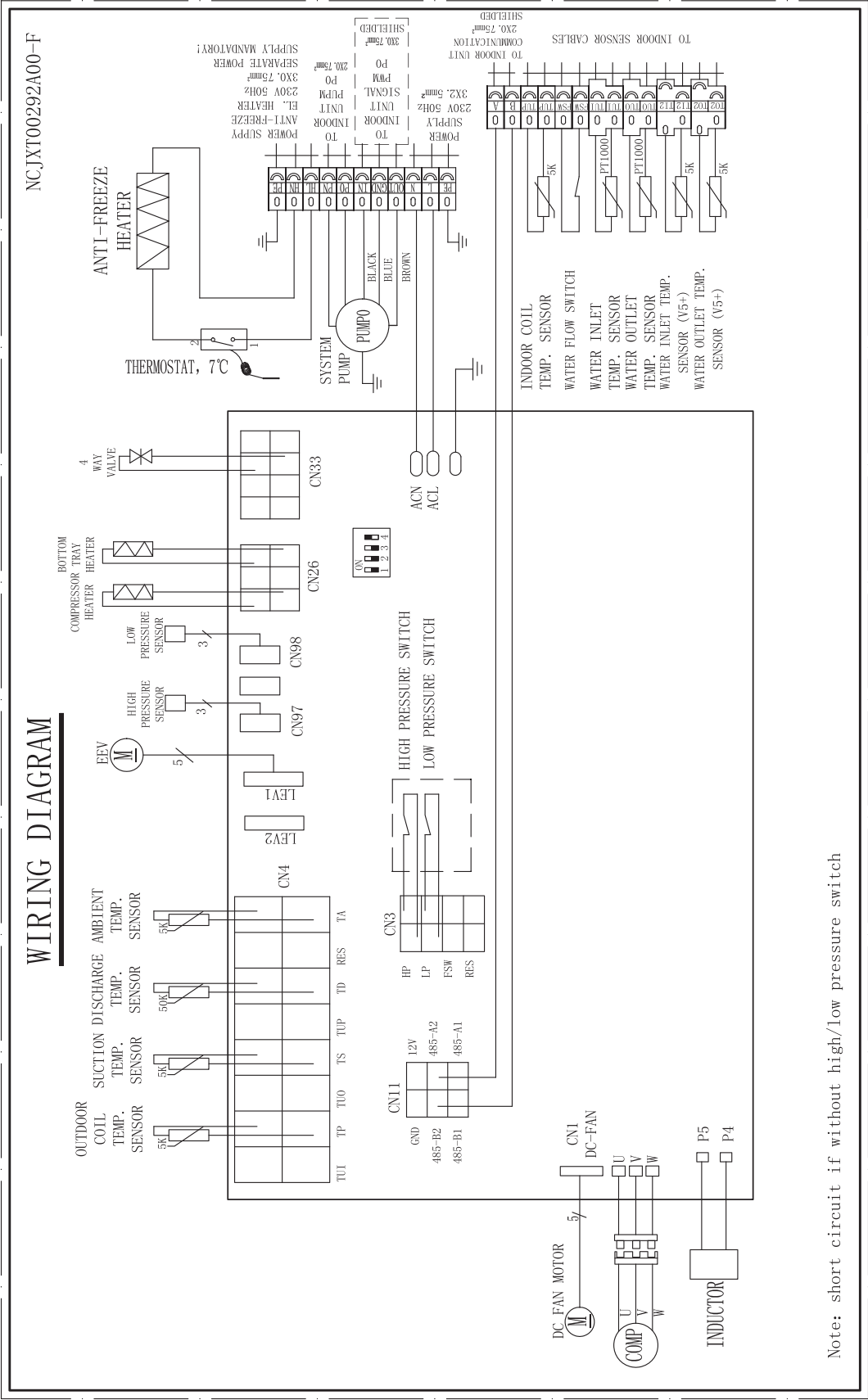
TAKE CARE!

The specifications are subject to change without prior notice.

For actual specifications of the unit, please refer to the specification stickers on the unit.

Appendix B: Wiring

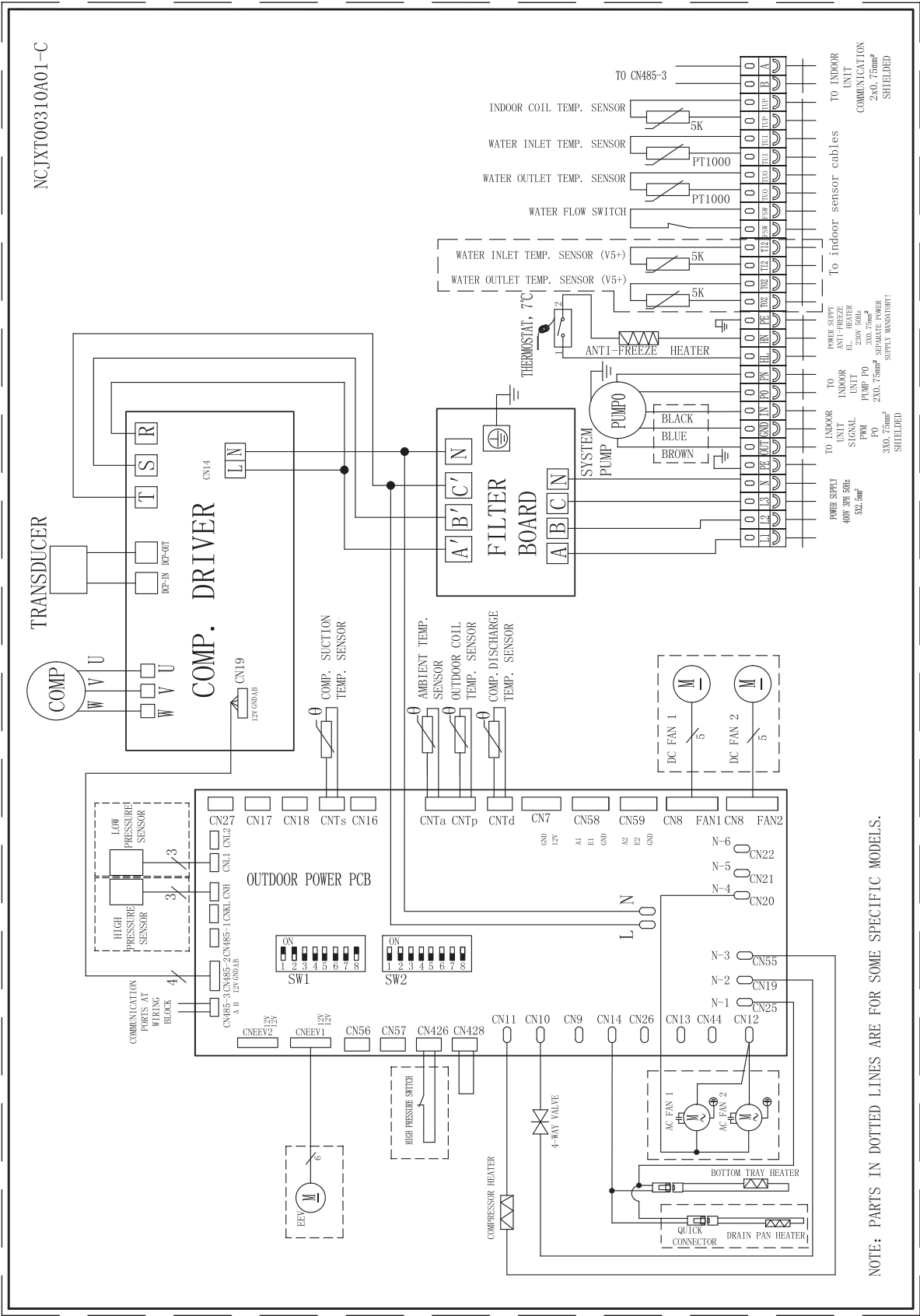
Outdoor — AW6/9/12-R32-M



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.

Outdoor — AW15-R32-M
AW19-R32-M



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.



ES Heat Pumps AB, 44138 Alingsås, Sweden
info@energysave.se
www.energysave.se

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.

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

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.

E-mail:

Telephone: